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USAID-GROWTH WITH EQUITY IN MINDANAO (GEM) PROGRAM

EVALUATION of the ECONOMIC IMPACT of GEM INFRASTRUCTURE PROJECTS

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Final Report

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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

FOREWORD

The study has two purposes. The primary purpose is to evaluate the economic impact of GEM infrastructure projects over 2002 – 2010. The secondary purpose is to see the extent to which GEM infrastructure has had an effect on peace and order in the Barangay in which it is located. The results show that GEM infrastructure has a positive impact on the incomes of households in the Barangay where GEM infrastructure is located. Barangays where GEM infrastructure is located have a lower level of violence than the Barangays without GEM infrastructure. These basic results confirm that the GEM/USAID program established over 15 years ago is accomplishing its goals.

The study was undertaken at the request of USAID/Philippines. USAID had an active role in designing the scope of work and some of the follow-on design of the study. USAID was also involved in the approval stages of the study. The study forwards USAID's goals of more evaluation studies being conducted and the strengthening of host-country human capacity in the process.

After a competitive process, the Institute for Socio-Economic Development Initiatives (ISFI) at Ateneo de Davao University, Mindanao was selected to conduct the study. ISFI implemented the study, collected all required data, evaluated the data and generated the results. ISFI surveyed thousands of households and businesses on Mindanao and held over 244 Focus Group Discussions involving over 1,800 households to complete the study. ISFI-Ateneo is to be commended for carrying out the first rigorous and extensive household/business survey-based study of its size and scope by the University and perhaps by any institution on Mindanao.

We in the development community look forward to more studies of this nature from ISFI and other Filipino institutions on Mindanao.

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ACRONYMS

AFP	Armed Forces of the Philippines
ARMM	Autonomous Region in Muslim Mindanao
ASG	Abu Sayyaf Group
BAS	Bureau of Agricultural Statistics
BIP	Barangay Infrastructure Projects
BUM	Beneficial Use Monitoring
CAAM	Conflict Affected Areas of Mindanao
CBMS	Community-Based Monitoring System
DOLE	Department of Labor and Employment
DPWH	Department of Public Works and Highway
DTI	Department of Trade and Industry
EIRR	Economic Internal Rate of Return
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GEM	Growth with Equity in Mindanao
GOP	Government of the Philippines
KII	Key Informant Interview
MILF	Moro Islamic Liberation Front
MinDA	Mindanao Development Authority
MNLF	Moro National Liberation Front
NEDA	National Economic Development Authority
NPV	Net Present Value
NSCD	National Statistical Coordination Board
NSO	National Statistics Office
ODA	Official Development Assistance
PDO	Planning and Development Office
RIP	Regional Impact Projects
SOCSARGEN	South Cotabato and Sarangani Provinces, and General Santos City
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Under stringent conditions, a peso invested in the Regional Infrastructure Program category of projects, returned 2.59 pesos in benefits. Under the same conditions, a peso invested in the Barangay Infrastructure Program category of projects returned 2.00 pesos in benefits. Aside from the airports, the highest economic returns are earned by roads and bridges under the GEM 2 and GEM 3 programs. Social, political, and geographical benefits are not included in this study.

Background and Objective

In November 2010, USAID requested that GEM conduct an evaluation of the economic impact of GEM infrastructure projects. GEM with USAID's active participation developed a Scope of Work and RFP that was let out for competitive bid about February 15, 2011. GEM held a bidder's conference on February 28, 2011 and bids were due on March 21. Three bids were submitted of which only one was found to be in the competitive range. GEM held a pre-award interview to ensure a quality study. The bid was then competitively awarded to the Institute for Socio-Economic Development Initiatives (ISFI) at Ateneo de Davao University. Field work was conducted by ISFI in June, July and August of 2011. Several drafts have been submitted and reviewed by GEM, and the draft final report is being prepared now.

The study has a primary purpose and a secondary purpose:

The primary purpose is to "...assess the economic impact of infrastructure projects carried out under GEM on families and communities within the project areas, as well as the collective economic impact of the projects on the ARMM and other CAAM, and on Mindanao as a whole."

The secondary purpose is to assess the degree to which, if any, the GEM infrastructure alone had on the peace and order conditions in the ARMM and other CAAM and Mindanao as a whole.

Approach and Methods

The approach is based on statistical analyses of a stratified random sample of GEM infrastructure projects constructed under both GEM 2 and GEM 3. Since about 1,000 infrastructure projects had been constructed prior to the study under GEM 2 and GEM 3, this was set as the sample's universe. The sample was stratified by concentration of projects, by type of projects, size of projects, and by those projects constructed in high-conflict and moderate conflict areas of Mindanao. For the purposes of the study, there are no low-conflict areas on Mindanao. To specify the types of projects by size of project, the following criteria were used.

GEM divides its infrastructure projects into two categories:

Barangay Infrastructure Projects (BIPs) – these are relatively small “community level” infrastructure projects such as boat landings, road upgrades, water systems, trading or community centers, barangay bridges, footbridges, drainage canals, warehouses/solar dryers, and irrigation systems. Typically, the primary beneficiaries of BIPs are the residents of one or two barangays.

Regional Impact Projects (RIPs) – these are larger projects such as ports, roads, and bridges. Typically, a RIP will have substantially more beneficiaries than would a BIP. Usually, beneficiaries would be the populations of one or more municipalities, and sometimes, in the case of a port or airport, for example, the population of an entire province could be beneficiaries.

The SOW and RFP specified the sample size by type of infrastructure project. For example, there were 13 road upgrades in the RIP category and the sample included 7 of the 13. And some categories of infrastructure were left out by USAID. These included: irrigation systems, hand pumps, community centers and so on. Later, at USAID's request, 20 Barangays with no GEM infrastructure projects were sampled. GEM reduced the number of Solar Driers to be sampled by 20 to 64 in order to compensate for this added burden of the study. Note that social and diplomatic benefits were not estimated or used.

The SOW placed the useful life of the infrastructure projects at 20 years, and set the discount rate at 12%. A discount rate of 12% is used by the World Bank and the Asian Development Bank to judge the viability of projects. It is also the rate used to judge if a project is commercially viable in many cases. A discount rate of 3% is often used by governments to judge the viability of projects for funding because they place a higher value on future benefits to society.

Each project sampled was assessed using the **Net Present Value** approach, using economic as opposed to financial values, where possible, of the benefits and costs of the projects. The Net Present Value of a project is the benefits less the costs of the project over each year of the project's life, adjusted to reflect that not all the benefits and costs occur in the current year. So, benefits and costs forecast to occur in the future are reduced in value to reflect the value of future pesos today. A discount rate of 12% places a heavy value on pesos held today, while a discount rate of 3% places a heavier value on pesos in the future. Inflation is adjusted out of the analysis.

The projects were also tested using the **Benefit-Cost Ratio**. A benefit-cost ratio is the net present value of benefits divided by the net present value of costs. A benefit-cost ratio equal to 1.0 means that the benefits and costs are equal at that discount rate. A benefit-cost ratio that is above one means that the benefits of the project exceeded the costs of the project by the amount greater than one at that discount rate. A benefit-cost ratio that is below one means the costs exceed the benefits at that discount rate.

A sensitivity analysis on the net present values and benefit-cost ratios was also performed to see how the results varied with a 10% increase in costs, a 10% decrease in benefits, and a change in the discount rate from 12% to 3%.

For the study, household surveys for transport projects, household surveys for other projects, vehicle and vessel owner surveys, driver surveys, passenger surveys, Focus Group Discussion forms and forms for Key Informant Interviews were designed. Key Informant Interviews and Focus Group Discussions were held at every sampled GEM infrastructure site, and the sample surveys were also conducted.

The final sample has 233 projects disaggregated into 24 RIPs, and 209 BIPs. Taken together, these projects represent about 20% of the projects that had been constructed to date.

Findings

Economic Findings

Based on the study's surveys, in the Barangays where the GEM Infrastructure was located, the overall level of income increased significantly between 2002 and 2010. Among the control Barangays, there was not an increase in income that was statistically significant compared to the Barangays with the GEM infrastructure projects.

RIP Category of Projects

On average, using a 12% discount rate, the Regional Infrastructure Projects (RIPs) have a benefit/cost ratio of 2.59. This means that on average, for RIPs, a peso invested returned 2.59 pesos in benefits.

On average, at a discount rate of 3% the RIP category projects returned a benefit-cost ratio of 4.61, meaning that for every peso invested 4.61 pesos in benefits resulted.

Among the RIP category of projects, the Airport at Tawi-Tawi has the highest benefit-cost ratio (see Table 1). This result is no surprise given the importance of the airport to the region. Again, using stringent sensitivity testing, the high benefit-cost ratio was robust. RIP roads were subject to the same sensitivity testing and their high result was robust as well. All the RIP results were subject to sensitivity testing and the results remained strong.

Table 1: Benefit-Cost Ratios by Type of Project and by Discount Rate, RIPs

Type of Project	Discount Rate = 12%	Discount Rate = 3%
RIPs		
Boat Landings	2.40	4.40
Bridges	2.46	4.45
Roads	2.74	4.81
Airport	3.90	6.14
RIP Average	2.59	4.61

BIP Category of Projects

For the BIP category of projects; the results were nearly as strong (see Table 2). On average, using a 12% discount rate, the BIP category of projects have a benefit-cost ratio of 2.0, meaning that for every peso invested, the return was 2 pesos in benefits. On average, using a 3% discount rate, the BIP category of projects has a benefit-cost ratio of 3.42, meaning that for every peso invested, the return was 3.42 pesos in benefits.

At a discount rate of 12%, note that the lowest benefit-cost ratio is one for Trading Centers among the BIP category of projects. This reflects the fact that in GEM 2, Trading Centers were located in less economically beneficial areas due to political pressures. Under GEM 3, Trading Centers are located in more beneficial areas, and thus have higher benefit-cost ratios. Trading Centers are used for social and political gatherings as well as for market sales. However, only market sales are taken into account in the above benefit-cost ratios. Typically, market sales days are held only once or twice a week.

Table 2: Benefit-Cost Ratios by Type of Project and by Discount Rate, BIPs

Type of Project	Discount Rate = 12%	Discount Rate = 3%
BIPS		
Boat Landings	1.90	3.42

Type of Project	Discount Rate = 12%	Discount Rate = 3%
Bridges	2.11	3.85
Grain Solar Dryers	2.18	3.34
Roads	3.17	5.61
Trading Centers	1.00	1.55
Warehouse and Grain Solar Dryers	1.70	2.58
BIP Average	2.00	3.42

The highest benefit-cost ratio among the BIP category of projects is for roads. This result was subject to a great deal of sensitivity testing, including having the useful life limited to 7 years with a salvage value and sharply increasing the maintenance costs. Despite these constraints, the benefit-cost ratio for roads remained high as in the table above. All BIPs were subject to the same degree of sensitivity testing as were the RIPs and the results remained robust.

For both categories of projects, benefits considered for transport projects include vehicle operating cost savings (for improved roads and bridges), passenger time savings, passenger fare savings, and handling fees. For the airport, increased terminal fees and tax collections are the primary drivers of the benefits. For vessels, additional benefits are reduced cargo handling fees, terminal use fees, passenger taxes, and docking fees.

Benefits for the grain solar driers and the solar driers with warehouses are the increased value in the dried palay; a decrease in post-harvest losses of palay; and user fees. The benefits do not include that, during non-harvest time, the solar driers, which are concrete slabs, are used as basketball courts. This is a social benefit not included in the study.

Peace and Order Findings

Based on the study's surveys, in the Barangays where the GEM Infrastructure was located, the overall degree of violence declined significantly between 2002 and 2010. Among the control Barangays, there was no decline in violence that was statistically significant, compared to the Barangays with the GEM infrastructure projects. Measures of violence included Rido, or clan violence, military encounters, insurgent bombings, kidnapping, murder, burglaries and domestic violence. Among all these measures, only murder rates showed a significant decline among the control Barangays.

Qualitative Findings

During the study, the ISFI-Ateneo enumerators held 224 Focus Group Discussions, comprising approximately 1,800 people. In the ARMM, 86% recognized GEM's role as "very important" for their livelihood and communities. They considered GEM/USAID an important development partner in

improving access, triggering more trade and commercial activities, and easing the degree of conflict. In some regions, 95% said that GEM was important to improving their livelihoods and the well-being of their communities. In other regions, 86% of the groups said they valued GEM infrastructure because farmers were able to increase their incomes with easy market access. Participants emphasized that they valued the footbridges because now their students could go safely to school. These participants viewed GEM infrastructure as “heaven sent” by making it faster, easier and cheaper to get farm products to market. In virtually all groups, people said that the GEM infrastructure improved their quality of life and incomes.

Conclusions

1. Almost all people said that GEM infrastructure improved their quality of life and incomes.
2. Almost all people, during the Focus Group Discussions, expressed a desire for more and better roads.
3. Farm-to-market roads of the types that can be done under the BIP category of projects are highly valued by rural residents and thus in great demand.
4. Aside from the airport, roads have the highest benefit-cost ratios.
5. Building more roads and bridges makes economic sense and is supported by the fieldwork and statistical analysis.
6. RIP category of projects has a higher average benefit-cost ratio than does the BIP category of projects. Based on the criteria of this study, building more RIPs makes greater economic sense than building more BIPs. However, this does not take into account social benefits, geographical benefits or political objectives.

Chapter I - Introduction

1.1 BACKGROUND AND RATIONALE

The largest and most diverse program being carried out in Mindanao by USAID is its Growth with Equity in Mindanao 3 (GEM-3) Program. GEM is an “umbrella-type” activity, under which USAID is carrying out a wide range of projects throughout Mindanao, but with particular focus on the conflict-affected areas.

GEM'S infrastructure activities like all GEM activities, have the dual objectives of:

- 1) Accelerating economic growth in Mindanao and helping ensure that as many people as possible benefit from the economic growth; and
- 2) Helping bring about and consolidating the peace in Mindanao.

The GEM Program has been underway in Mindanao for approximately 15 years. The first GEM Program (GEM-1) was implemented over a seven-year period. It did not include an infrastructure component. GEM-2, which was implemented over a 5-year period, included the construction of some 870 infrastructure projects. GEM-3, which is approximately 65% of the way through its 5-year tenure, continued and expanded the infrastructure activities carried out under GEM-2. As of 31 December 2010, more than a thousand infrastructure projects were constructed under GEM-2 and GEM-3.

The island of Mindanao contains about 35% of the entire land mass of the Philippines and approximately 25% of the estimated 90 million people who live in the country. The island has long been plagued by insurrection and armed conflict.

Located south of the Philippine islands, Mindanao is primarily an agriculturally based economy. Providing jobs and source of primary livelihood to millions of the island's inhabitants are the industries of rubber, pineapple, banana, coffee and coconut. Multinational companies locate their large-scale plantations and processing plants in Mindanao to take advantage of its fertile soil, largely typhoon-free regions, and improving logistics and commercial services. Based on the 2009 performance as reported by the National Economic and Development Authority (2010), Mindanao only contributed a little less than one-fifth (18.20 percent) to the country's Gross Domestic Product (GDP). By sector, the share of Mindanao's agriculture to the GDP was a mere 4.46 percent for the same year. Poverty affected 45.5 percent of Mindanao's population and 7 out of the 10 poorest provinces in the country are in Mindanao, based on the 2006 poverty level National Statistical Coordination Board (NSCB), as cited in the NEDA report.

From one perspective, Mindanao's situation today is the result of an historical coincidence, in that Mindanao was the northeastern most point reached by Islam as it gradually spread from its starting point in Arabia to various corners of the world. In fact, Islam had only recently established itself in Mindanao and the Sulu archipelago when the Spanish reached the Philippines by coming west across the Pacific in the early 16th century. The fact that most of the people in Mindanao and the Sulu archipelago were Muslims was one of the reasons why Spain was never really able to subdue Mindanao and the Sulu archipelago, Christianize their peoples, and integrate them fully into their Philippines colony.

When the U.S. took the Philippines from Spain at the turn of the 20th century, it managed to more fully integrate Mindanao and the Sulu archipelago. By and large, U.S. colonial policy toward the peoples of Mindanao recognized and was respectful of the cultural differences between its peoples,

and the people of the rest of the Philippines (the Christianized Philippines). The U.S. success in incorporating Mindanao and the Sulu archipelago into the country brought with it what, from the Muslim peoples' perspective was a negative consequence in that with its integration into the rest of the Philippines, emigration to Mindanao from the Visayan Islands and Luzon became easier. Emigration to Mindanao from the rest of the Philippines became so substantial that, while at the turn of the 20th century upwards of 90% of the people of Mindanao and the Sulu archipelago were Muslims, by the turn of the 21st century, only about 18% were Muslims.

This radical shift in the ethnic and religious composition of Mindanao, and therefore of political power on Mindanao, not surprisingly, was accompanied by strains and tensions between the earlier inhabitants and the new settlers. This tension eventually resulted in a desire on the part of substantial portions of the Muslim communities in Mindanao for independence from the Philippines. This desire eventually resulted in a violent and bloody struggle that effectively precluded any significant economic progress for large areas of the region.

1.1.1. AN INCOMPLETE PEACE PROCESS

For almost four decades, Muslim separatist groups in the southern Philippines island of Mindanao have been battling the Armed Forces of the Philippines (AFP) with the goal of attaining independence, or at least substantial autonomy. In September 1996, however, after several years of negotiations, the Government of the Philippines (GOP) and the Moro National Liberation Front (MNLF), the largest of the Muslim separatist groups, signed a Peace Agreement.

There was widespread hope that this Agreement would usher in an era of peace in Mindanao, and that peace would make possible substantial and rapid economic progress in the Muslim areas of the island, which have long been among the poorest parts of the Philippines. This economic progress, it was hoped, would, in turn, institutionalize a durable peace by lessening the motivation of Mindanao's Muslim population to take up arms against the Government.

These hopes have been only partially realized. The MNLF's estimated 45,000 soldiers stood down with the signing of the Peace Agreement, and, for the most part, the leadership of the MNLF has cooperated with efforts of the GOP and various donors to build a sustainable peacetime economy in the Muslim areas of Mindanao. (The armed clashes between MNLF forces and the AFP that have occurred since the Peace Agreement was signed have, to a major extent, been triggered by the "split" in the MNLF between elements loyal to its founder and long-time Chairman, Professor Nur Misuari, and a rival leadership group within the MNLF which ousted Professor Misuari from his Chairmanship position).

However, the estimated 12,000 troops of the Moro Islamic Liberation Front (MILF), a group that splintered off from the MNLF in the 1980s, were not a party to the 1996 Peace Agreement and, while talks are being held with the MILF (and while a "cease-fire" agreement has been reached, and talks continue), a final Peace Agreement between that group and the GOP has yet to be attained. Armed clashes between MILF units and the AFP occasionally occur.

Also, more recently, the Abu Sayyaf Group (ASG), though small in numbers, has perpetrated some highly publicized kidnappings of both foreigners and Filipinos. Despite continuing pursuit and pressure from the sizable AFP contingents sent to eliminate them, ASG continues to terrorize some areas of Mindanao and the Sulu archipelago. The disruption caused by the ASG has been so severe that small contingents of U.S. military forces have been providing assistance to the AFP in its efforts to hunt down the group.

The continuing unrest, armed clashes, kidnappings, and incidents of terrorism in Western and Central Mindanao and the Sulu Archipelago severely limit prospects for significant economic progress in those areas. While Southern and Eastern Mindanao have largely been spared from the violence that has become common in parts of Western and Central Mindanao, and the Sulu Archipelago, their proximity to the areas of violence has meant that economic progress there has

also been limited—as fear of the spread of the violence has meant that few businesses are investing in new businesses or expanding existing businesses in those parts of the island as well.

Effectively, Mindanao is caught in a vicious cycle. Violence and fears of violence are hindering economic growth and the emergence of economic opportunity. The absence of economic opportunity, in turn, helps maintain a situation where many individuals are ready to turn to violence and rebellion with the hope that, through these routes, they will be able to improve their own economic prospects.

To address the situation in Mindanao effectively, the GOP has been pursuing a two-pronged approach. Using military and other security resources, it is trying to contain and eliminate the violence. To try to assure that widespread violence does not re-surface in the future, it is attempting to expand economic opportunity for all the people of Mindanao.

1.1.1. USAID'S ROLE

In support of the GOP efforts, USAID has been mounting major assistance efforts in Mindanao for over a decade. For the first few years, the assistance was focused on the SOCSARGEN (South Cotabato and Sarangani Provinces, and General Santos City) area. In 1995, however, USAID expanded its assistance efforts to cover all of Mindanao and the Sulu Archipelago. After the signing of the Peace Agreement between the MNLF and the GOP in 1996, USAID intensified assistance efforts in the conflict-affected areas of Mindanao.

At this point, USAID is implementing a sizable assistance effort that includes projects and activities in a wide range of areas, including infrastructure development, agricultural development, education improvement, democracy promotion, governance improvement, health services, environmental management improvement, expansion of microfinance services, and reintegration of former combatants. The activities are carried out across Mindanao, but are concentrated in the five provinces that make up the Autonomous Region in Muslim Mindanao (ARMM), and in conflict-affected areas of Mindanao that neighbor the ARMM.

While Mindanao is bursting with economic potential – counting its natural resources, strategic location vis-à-vis countries in the Asia-Pacific – it falls behind in the areas of “agricultural productivity, low level of technology, capital investment and share in the official development assistance (ODA)” compared to Luzon and Visayas (NEDA, 2010). There are also specific locations in Mindanao that are in constant threat to conflict and violence, spurred by diverging ideologies, religious differences, serious crimes and ethnic clashes.

Recognizing these development challenges, GEM has collaborated with the local government units to implement, manage and maintain infrastructure projects. These projects are tangible facilities that respond to the expressed economic and social needs of the host communities and a demonstration of the Philippine and US Governments’ investment to expand opportunity and improve the quality of life in these areas.

1.1.2. GEM INFRASTRUCTURE PROJECTS

GEM divides its infrastructure projects into two categories:

Barangay Infrastructure Projects (BIPs) – these are relatively small “community level” infrastructure projects such as boat landings, road upgrades, water systems, trading or community centers, barangay bridges, footbridges, drainage canals, warehouses/solar dryers, and irrigation systems. Typically, the primary beneficiaries of BIPs are the residents of one or two barangays. The BIPs are intended to help spark or sustain economic growth in the recipient barangays and also to demonstrate the determination of the GRP and USAID to be responsive to the needs and concerns of historically underserved minorities in Mindanao (i.e., the Muslim community). The projects are usually undertaken in partnership with municipal and barangay governments, but sometimes in

partnership with cooperatives. Construction cost of BIPs range from about \$10,000 to up to \$50,000, with average construction cost being about \$33,000 per project. To date, about 1,150 BIPs have been constructed throughout the conflict affected areas of Mindanao.

Regional Impact Projects (RIPs) – these are larger projects such as ports, road, and bridges. Typically, a RIP will have substantially more beneficiaries than would a BIP. Usually, beneficiaries would be the populations of one or more municipalities, and sometimes, in the case of a port or airport, for example, the population of an entire province could be beneficiaries. RIPs are expected to have a wider economic impact than do BIPs, and, because of their visibility, are also expected to have a greater impact in terms of making people aware that the Philippine Government and the U.S. Government are concerned about their well-being and are prepared to expend resources to help bring about an expansion of economic opportunity in their area. The projects are usually undertaken in partnership with provincial or municipal governments, and sometimes with the ARMM Regional Government or with national government agencies. The construction cost of a RIP is more than \$50,000 but can go up to \$4 million. Most RIPs, however, have a construction cost of between \$250,000 and \$1,000,000. Thus far, some 46 RIPs have been constructed.

By activity, these projects range from port/boat landings, road upgrades, bridges, airport runway improvements, commercial/trading centers, water supply systems, solar dryers, warehouses, irrigation systems, drainage canals, and hand pumps, among others. By intent, these projects are built to support the economic and social activities of the residents and the entrepreneurs. Road upgrades allow farmers to bring their produce to the market/buyers, saving time and minimizing spoilage during travel. Dryers and warehouses cut post-harvest losses by appropriately drying and storing grains and therefore improving the quality of the products to fetch better prices at the market. Bridges and footbridges provide safe and quick passage from one destination to the other. Trading centers gather the sellers and buyers under one convenient and organized roof. Water systems lessen the time to gather water and promote sanitation. Drainage canals avert damage to crops and properties during rainy days.

These infrastructure projects only became part of GEM's support in the program's phase two (GEM 2), which commenced in 2002. By the end of October 2010, GEM has already funded more than a thousand (1,115) of these projects in Autonomous Region in Muslim Mindanao (ARMM) and the Conflict Affected Areas of Mindanao (CAAM). With GEM 3 nearing about two-thirds complete, an evaluation of the infrastructure projects is needed to understand the impact of these projects on the local economy and the peace and order situation.

GEM 3 also recognizes the difficulty of isolating the infrastructure projects' discrete contribution, as in most instances, these projects are implemented in collaboration with the local government units and community beneficiaries, the latter providing either cash and non-cash counterpart. Further, there are also communities where support from other donor agencies converges.

I.2 Objectives

This study highlights the economic impact of the GEM's infrastructure projects on families and communities within the project areas. On another level, it also illustrates the collective economic impact of these projects on ARMM and other CAAM, and on Mindanao as a whole. By economic impact, the study presents how the projects influence the livelihoods and the daily routine of farmers, fisher-folks, micro-entrepreneurs and the general population. The study attempts to ascertain if these projects acted as stimulus, what practices and lessons can these tell the GEM and USAID on the most preferred infrastructure project and the most cost-effective investment scale. The study also examines the linkages between USAID/GEM infrastructure projects and the peace and order conditions of the surrounding areas.

I.3 Study Team, Deliverables and Work Schedule

A team of Davao City-based consultants was commissioned to conduct the economic impact study. Members of the team included evaluation specialists, an economist, econometrician, statistician and engineers while the enumerators were a mix of community organizers, social researchers and former scholars of GEM education projects who were familiar with the area and could speak the local dialect.

During the initial month of the engagement, the study team developed the instruments, conducted a pre-test and derived a stratified random sample of projects. In addition to sampling projects, the team included 20 barangays that did not have projects but were similar to the sampled barangays with projects. This is to allow comparison to be made between the "with project" barangays to the "without project" barangays.

Data collection activities took six weeks, with the extreme weather condition and rido adding a few more days of work to the original schedule. Preliminary findings were presented to GEM and USAID. This main report integrates the comments of GEM and USAID. Volume II of this report contains a 2-page profile of each of the sample infrastructure projects, the technical details on the impact by type of project, and the survey questionnaires. Volume III presents the database (raw data) and the individual Net Present Value (NPV) computations per project.

The study team benefited largely from the technical advice of GEM's Assessment Specialist and the Infrastructure Program Manager. Field guidance in locating projects and the key informants were provided by GEM's Beneficial Use Monitoring (BUM) staff.

Chapter 2 – Scope of the Economic Impact Evaluation

1.1 Type of Infrastructure Projects

There are two categories of infrastructure projects, differentiated by the number of partners, by the amount of construction cost and by its projected spatial influence. The first category is “larger” on all counts, the Regional Impact Projects (RIPs), where partners are not confined to the local government units (municipal, provincial and even ARMM regional government), but also extended to the national government agencies. RIPs range between US\$250,000 to US\$ 1,000,000. Economically, RIPs are built with the potential to energize or reinvigorate economic regions, luring investment and creating employment. As of October 2010, there have been 46 RIPs constructed across Mindanao.

The second category is called Barangay Infrastructure Projects (BIPs) and using the indicators mentioned above, are relatively smaller in scale. BIPs are often constructed in collaboration with the municipal and barangay governments and sometimes with cooperatives or associations. The construction costs vary between US\$10,000 to US\$50,000 and the potential population served is small (residents of one or more barangays). Yet the sheer number of BIPs already constructed is way staggering, with 1,155 projects now distributed all over Mindanao.

Table 1 lists the summary of infrastructure projects constructed by GEM (Phases 2 and 3).

Table 1: Summary of Infrastructure Projects, GEM 2 and GEM 3, as of October 2010

RIPs	Number	BIPs	Number
Ports and Boat Landings	11	Boat Landing	81
Road Upgrades	13	Trading Centers	93
Bridges	17	Road Upgrades	61
Airport Runway Improvement	2	Irrigation Systems	10
Commercial Centers	1	Barangay Bridges	188
Water Supply Systems	2	Solar Dryers	280
Total	46	Warehouses	3
		Combination Dryer/Warehouse	66
		Production Facilities	2
		Water Supply Systems	48
		Footbridges	75
		Drainage Canals	99

RIPs	Number	BIPs	Number
		Community Centers	54
		Hand Pumps	10
		Others (sheds, slope protection, etc.)	85
		Total	1,155

1.2 Areas of Coverage

The impact study effectively covers the entire Mindanao, yet the infrastructure projects are concentrated in ARMM and Zamboanga Peninsula. This is expected as GEM's objective states "facilitating an expansion of economic activity in conflict-affected areas". Please refer to Table 2 for the distribution of the sample projects by region.

Table 2: Summary of Sample Infrastructure Projects by Region, by Category

Region	RIPs	BIPs	Total
Region 9 – Zamboanga Peninsula	1	36	37
Region 10 – Northern Mindanao	-	24	24
Region 11 – Davao Region	-	3	3
Region 12 – South Cotabato Sultan Kudarat Sarangani General Santos (SOCCSKSARGEN)	4	66	70
Region 13 – Caraga	-	15	15
Autonomous Region in Muslim Mindanao (ARMM)	19	65	80
Total	24	209	229

1.3 Time Frame

The infrastructure projects that came under scrutiny in this impact study date back as early as 2002, specifically under GEM 2. Infrastructure projects were given more prominence in GEM 3 as shown in Table 3.

Table 3: Summary of Sample Infrastructure Projects, by Year Construction Completed

Year Project Completed	Number
2003	5
2004	18
2005	27
2006	46
2007	53
2008	8
2009	37
2010	39
Total	233

Chapter 3 - Method

3.1. Data Requirement and Types of Data Collected

The study focused on the impact of the GEM infrastructure projects on two levels: first is the **economic impact**, using the Net Present Value (NPV) approach and the 13 indicators (shown in Table 4), and the **peace and security outcomes** based on the qualitative responses of the household respondents, key informant interviews (KII) and Focus Group Discussions (FGD). Below are the other 13 indicators collected by the study to depict the changes directly or indirectly attributed to the presence of GEM infrastructure projects:

Table 4: 13 Indicators to Illustrate Economic Impact

Indicators	Type of Data Collected
1. Change in employment	<ul style="list-style-type: none"> Estimated baseline data on employment; number of persons employed, kinds of job, etc Estimated present employment data, number employed, kinds of job, etc
2. Increases in the number of businesses in the area	<ul style="list-style-type: none"> Estimated baseline survey on the number of businesses and kinds of businesses in the area before the project Estimated present number and kinds of business in the area
3. Increases (over the normal rate) in total commercial activity or sales, and investment	<ul style="list-style-type: none"> Estimated baseline data on volume of trade (sales or revenue annually), and value of investment before project Estimated present volume of trade or commerce or sales, and value of investment
4. Changes in the prices of basic consumer goods and services	<ul style="list-style-type: none"> Estimated time series data on prices of consumer goods Estimated time series data on wages
5. Changes in the traffic volume by vehicle type	<ul style="list-style-type: none"> Estimated traffic count before the project Present traffic counts Estimated annual number of passengers before and after the project Estimated volume of goods transported before and after the project
6. Primary transport benefits	<ul style="list-style-type: none"> Estimated baseline data on cost of maintenance, cost of fuel, and number of vehicular accidents before the project Present data on cost of maintenance, cost of fuel, and number of vehicular accidents Passenger fare, travel time, cost of transporting goods, before and after the project
7. User Fees	<ul style="list-style-type: none"> Estimated baseline data on user fees: market rentals, tolls for use of transport infrastructure Present data on user fees: market rentals, tolls for use of transport infrastructure

Indicators	Type of Data Collected
8. Changes in poverty rates	<ul style="list-style-type: none"> • Estimated baseline data on family income in the project area • Estimated income distribution (family income) in the project area • Government poverty threshold applicable to the project area, before and after the project
9. Benefits to agriculture sector	<ul style="list-style-type: none"> • Estimated time series data on farm gate prices of agricultural products
10. Increases in agricultural production	<ul style="list-style-type: none"> • Estimated time series data on agricultural production, by crop (palay, corn, vegetables, fruit trees) and volume of fish landed • Estimated time series data on yield per hectare, by crop
11. Increases in cultivated land area	<ul style="list-style-type: none"> • Estimated total agricultural area and total cultivated area, before and after the project • Estimated total irrigable area and total irrigated area, before and after the project
12. Increases or decreases in price of agricultural inputs	<ul style="list-style-type: none"> • Estimated time series data on prices of agricultural inputs
13. Increases in diversity of products produced in the area	<ul style="list-style-type: none"> • Estimated list of products produced in the project area before and after the project • Estimated list of agricultural crops produced in the project area before and after the project

3.2 Sources of Secondary Data and Methods of Collection

Relevant national government agencies and local government units were the main sources of secondary data. Referring to national government agencies, the study team requested published/official reports from and browsed the websites of Department of Trade and Industry (DTI), Bureau of Agricultural Statistics (BAS), Department of Labor and Employment (DOLE), National Statistics Office (NSO) and Department of Public Works and Highway (DPWH). From the LGUs, the study team coordinated with the Planning and Development Office, Provincial Agriculture Office, and Business Licensing Office to get documents such as the socio-economic profile, annual reports, and baseline surveys such as the Community-Based Monitoring System (CBMS). These offices/organizations were informed beforehand of the data requirement through an introductory letter and a checklist sent by the Mindanao Development Authority (MinDA).

3.3 Sampling Survey Design

The sampling size was based on the Terms of Reference and modifications following several meetings between the study team and GEM. The number of solar dryers was reduced to accommodate the 21 control barangays.

The infrastructure projects were stratified by three types of strata:

- 1) By general category: RIPs or BIPs

- 2) By level of conflict: High conflict or medium conflict
- 3) By project type: Port/Boat landings, trading centers, road upgrades, bridges, solar dryers, combination dryer/warehouse and footbridges

Please refer to Tables 5 and 6 for the RIPs and BIPs samples. Table 7 shows the control barangays, chosen randomly but are areas believed to bear similarities with most of the BIP barangays.

Table 5: Sample Size for RIPs, by Level of Conflict, by Type of Project

Type of Project	High Conflict	Moderate Conflict	Total	Under the TOR	Actual
Port/Boat Landing	1	5	6	6	6
Road Upgrades	3	4	7	7	7
Bridges	1	8	9	9	10
Airport Runway Improvement	0	1	1	1	1
TOTAL	5	18	23	22	24

Table 6: Sample Size of BIPs, by Level of Conflict, by Type of Project

Type of Project	High Conflict	Moderate Conflict	Total	Under the TOR	Actual
Port/Boat Landings	5	19	24	24	20
Trading Centers	3	25	28	28	29
Road Upgrades	4	16	20	20	18
Barangay Bridges	7	49	56	56	81
Footbridges	3	20	23	23	
Solar Dryers	5	36	41	41	41
Combination dryer/warehouse	3	17	20	20	20
TOTAL	30	182	212	212	209

Table 7: List of Control Barangays

Province/Region	Number of Control BIP Barangays	Barangay, Municipality (Province)
Sulu	1	▪ San Raymundo, Jolo
Basilan	1	▪ Sayugan, Lamitan

Province/Region	Number of Control BIP Barangays	Barangay, Municipality (Province)
Tawi-Tawi	1	<ul style="list-style-type: none"> ▪ Lamion, Bongao
Maguindanao	4	<ul style="list-style-type: none"> ▪ Barurao, Sultan sa Barongis ▪ Makainis, Pandag ▪ Sapad, Matanog ▪ Gang, Sultan Kudarat
Zamboanga	3	<ul style="list-style-type: none"> ▪ Ramon Magsaysay (Zamboanga del Sur) ▪ Monching, Siay (Zamboanga Sibugay) ▪ Upper Inunman, Sindangan (Zamboanga del Norte) ▪ Znac, Tampilisan (Zamboanga del Norte)
Lanao del Sur	2	<ul style="list-style-type: none"> ▪ Dalama, Molundo ▪ Kabasaran, Lumbayanague
Lanao del Norte	1	<ul style="list-style-type: none"> ▪ Bandy, Pantao Ragat
North Cotabato	3	<ul style="list-style-type: none"> ▪ Dalengaoen, Pikit ▪ Don Panaca, Magpet ▪ Camansi, Alamada
SOCCSKSARGEN	2	<ul style="list-style-type: none"> ▪ Bagacay, Alabel (Sarangani) ▪ Kibala, Malungon (Sarangani)
CARAGA	1	<ul style="list-style-type: none"> ▪ Mat-i, Las Nieves
Sultan Kudarat	1	<ul style="list-style-type: none"> ▪ Basak, Lebak

3.4 Sample Survey Data Gathering Procedures and Techniques

With contribution from the GEM Assessment Specialist, the study team formulated ten (10) survey instruments:

- 1) Household Survey for those near a sampled transport project,
- 2) Household Survey for those near a sampled Grains Solar Dryer/Grains Warehouse & Solar Dryer/Trading Center,
- 3) Passenger Survey for Transport Projects,
- 4) Business Establishment Survey,
- 5) Service Station Survey,
- 6) Vessel Survey,
- 7) Vehicle Operator Survey,
- 8) Key Informant Interviews,
- 9) Focus Group Discussions, and
- 10) Control Barangay (attached as annexes in Volume II of this report).

These instruments were pre-tested in four barangays (Pintatagan in Davao Oriental and Cabuyogan, Napnapan and Pangi in Compostela Valley) on a barangay bridge, a footbridge and two grains solar dryers. The field teams' respective deployment plans were finalized in consultation with the GEM's Infrastructure and Security Managers. The BUM Staff alerted the local officials and representatives of cooperatives/associations of the visit.

Upon reaching the project sites, the field teams made courtesy calls with the local officials, introduced the project, and gathered the prepared secondary data. The teams divided themselves to administer the different instruments: households, KIIs and FGDs. Field enumerators asked the questions in the local dialect. The instruments contained both closed-ended and open-ended questions, and probing was done for the latter questions. Enumerators captured the elaboration made by respondents as side notes.

Respondents to the household survey were usually the head of the household. Respondents to the business, vehicle, and service stations were owners or those who managed the enterprises, due to specific information needed for the NPV estimation.

3.5 Procedures for the Conduct of the Focus Group Discussions and Key Informant Interviews

Respondents to the KIIs were barangay captain or other officials of the barangay. If there were no officials present during the visit, the elder of the barangay was tapped to be the respondent. Respondents to the FGDs were other residents of the barangay or users of the infrastructure project.

The interviews with key informants were done at the barangay level, usually at the office of the respondent. The FGDs were conducted in the barangay hall or other areas where residents usually congregated, one team member asking the questions and another team member taking and documenting the responses. The FGDs were usually attended by 6 to 15 people and completed within two hours.

3.6 Data Processing and Auditing of Encoded Data

Dummy tables were prepared for each survey instrument to facilitate the processing and analysis of data. They were also prepared to come up with a systematic classification of the responses generated using qualitative methods such as the Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The tables aimed to illustrate the distribution and degree of variation of the responses on a given set of indicators specified in the survey instruments and on the issues and concerns raised during the FGDs and KIIs. Most importantly, they aimed to provide preliminary information on the effects of GEM infrastructure projects, which can be reference points on the estimation of the NPV and the conduct of impact aggregation. The tables were accomplished using the query facility of Microsoft Access.

Data cleansing and data auditing were periodically conducted to ensure that the data encoded are consistent with the responses in the survey instruments, FGDs and KIIs. The selection of the entries to be audited was conducted through random sampling to fast track the process without sacrificing its reliability. A separate team was tasked to conduct data auditing to ensure that results were not influenced by biases.

3.7 Data Analysis Tools

3.7.1 Descriptive Statistics

Descriptive statistics, such as the proportion and means, was employed to enrich further the level of analysis initially provided by the results of the dummy tables. Frequencies and cross-tabulation were also used to deepen the classification and ascertain the degree of association of two or more economic variables.

3.7.2 Net Present Value and Impact Aggregation

Net Present Value was used in estimating the economic impact of the GEM infrastructure projects. NPV is simply the present value of the future economic benefits minus the present value of the costs associated with the implementation and maintenance of a project or investment. It makes use of a discount rate in getting the present value of the stream of benefits and costs. Two discount rates were used, first is the 12% discount rate as specified in the study scope of work, and the second is the 3% discount which was chosen to appropriately reflect socially oriented projects.

The identification of the benefits and costs of the project is oriented towards the economic impact of the project. Accordingly, projects such as roads, bridges, and ports are evaluated based on their impact to the community as a whole and not only to be based on the benefits accrued to selected individuals or groups.

The general rule is that the higher the value of the NPV, the more desirable or the greater the impact of a project or investment. A positive NPV indicates that the benefits outweigh the costs, indicating that the project or investment was economically good for the community. On the other hand, a negative NPV indicates that the costs outweigh the benefits.

3.7.3 Method of NPV Estimate and Impact Aggregation

Both secondary and primary (survey data) sources were used to estimate the net present value of the projects. Other sources of secondary data include: Philippine Statistical

Yearbook, Development Plans of the municipalities or barangays covered by the survey, and the Department of Agriculture.

Data on costs were derived from the project profile of each sub-project and survey data. Total project cost consists of investments by GEM/USAID and the counterpart funds from the proponent or local government unit (LGU). Maintenance and operational costs were derived from the project profile and from the survey results. The benefits were derived from the survey of the households, vehicle owners, business establishments, and passengers, vessel owners who in one way or another used the facility or have been directly and indirectly benefited by the project. Traffic counts were conducted in places where the roads, bridges, and ports were constructed.

Impact aggregation was done by aggregating the measures of economic impact at the Mindanao level, ARMM level and the rest of the regions of Mindanao covered by the study. Mindanao impact aggregation was effected by using the average of all regions. In ARMM, impact aggregation was done by combining all provinces of ARMM covered by the study. In addition, because of the unique position of the island provinces, they were also presented as a subset of the economic impact of projects in the ARMM. Similarly, to find out if there are differences of the economic impacts of projects according to the conflict environment, the impacts of the projects are also divided according the level of conflict, i.e. projects located in high conflict areas and projects located in moderate conflict areas.

3.7.4 Brief Discussion of the Method Used for the Estimation of NPV

The basic philosophy adopted for the study is that financial returns and costs such as those reflected in the financial analyses do not fully mirror the entire array of costs and benefits of the project to the community. This is because private benefits do not necessarily equal social benefits, and private costs may not be equal to social costs. The most appropriate approach therefore in the estimation of the NPV is to use economic analysis where the differences in private and social costs and benefits are taken into account. There are two most used measures for evaluating an investment. These are: the net present value and the internal rate of return. The accepted norm is that higher values are desired for both measures. Both economic measures require data on the income stream generated by the project. In this study, the income stream is measured annually, i.e. the annual revenue (benefits) generated by the project. Similarly, the total costs include the cost of construction and annual maintenance of the project. The net present value of an income stream is the sum of the present values of the individual amounts in the income stream at a given discount rate. In this study, the discount rate is fixed at 12% for the computation of the NPV. Each future income amount in the stream is discounted until the year when the income is received or is spent. The calculation of the net present value includes the initial costs as well as the subsequent profits. The net present value of an investment indicates how the investment compares with an alternative investment. A positive net present value means that the benefits outweigh cost, thus, the investment is considered profitable.

3.7.5 Estimation of the EIRR

In contrast to the estimation of the NPV where a discount rate is specified exogenously, the discount rate in the Economic Internal Rate of Return (EIRR) is internally generated. This is done by equating the NPV to zero or by having the sum of discounted benefits minus the sum of the discounted cost equal to zero with the discount rate as an unknown. The problem therefore is to find the discount rate that will make the sum of discounted benefits equal to the sum of the discounted cost. The resulting discount rate, which is the EIRR, is then compared to the minimum interest rate specified by the government on the acceptability of a project. It may be noted that the EIRR discount rate correspond to a Benefit – Cost ratio equal to 1 at that given discount rate for that project.

In this study, the costs were mainly the investment costs as reflected in the project brief. As part of investment cost for the airport project, the value of the land and the improvements (coconut) were included.

The benefits identified for the following sub-projects are as follows:

- 1) Airport
 - Terminal Fee
 - Taxes
 - Other fees
- 2) Solar Dryer
 - User's fee (from the use of solar drier)
 - Reduction in post harvest losses
 - Change in price of dried palay value

If the management of the facility did not charge user's fee, this was replaced by the willingness to pay (WTP) which was derived from the focus group discussion.

- 3) Warehouse
 - User's Fee(from the use of solar dryer/warehouse or both)
 - Reduction in post harvest losses
- 4) Trading Center
 - User's Fee
 - Other User's Fee (specify other uses)
 - Reduction of post harvest losses
- 5) Bridges/Roads
 - Travel Time Savings (for passengers)
 - Savings in vehicle operating cost
- 6) Boat Landing and Ports
 - Savings in travel time (for passengers)
 - Cargo handling fee
 - Terminal Fee
 - Passenger tax fee
 - Docking Fee

3.7.6 Assumptions Used for the Computations of the Economic Benefits

The following assumptions were made relative to the different sub-projects:

- 1) Solar Driers/Warehouse

The user fee and capacity was derived from the survey, the utilization rate was assumed at 60% of the total capacity. The reduction in post harvest losses was derived from the household survey and used the actual number of users and not the number of beneficiaries reflected in the project profile benefited/used the project. A post harvest loss of 8% is assumed if the respondents are unable to estimate the losses (Department of Agriculture).

- 2) Trading Centers (TC)

- Capacity and frequency of TC utilization were based from the survey

- Other user's fee was estimated at PhP 250.00 for 2 days weekly
- Post harvest loss was estimated at PhP 300.00 per day
- Capacity and frequency of TC activity is based from the survey
- Other user's fee was estimated at PhP 250.00 for 2 days weekly
- Fully utilized after 5 years of operation

3) Road upgrading/rehabilitation, ports, boat landings, airport, bridges/box culvert projects

Computation of the benefits for road upgrading/rehabilitation, ports, boat landings, airport, bridges/box culvert project used actual primary and secondary data. The estimated number of users was used as beneficiaries rather than the beneficiaries as reflected in the project profile who were expected to benefit from the project. Savings in time was measured on the average multiplied by the opportunity cost per minute at PhP0.45 and the number of actual users/passengers. Reduction of vehicle/vessel maintenance was computed on the average multiplied by the number of vehicle/vessels directly using the project. A 5% increase in traffic count annually, 4.5% increase of cargo annually, and 50% increase in the number of docking ship every 5 year were assumed.

For the airport, the number of flights per month was assumed at 54. This assumption is based on the additional aircrafts flying this route. The average number of passengers per month was pegged at 4,860 based on this number of flights. Terminal fee was PhP20 and the tax fee, PhP10.

4) Discount Rate

Two discount rates were used in the study, viz.: a 12% discount rate as specified in the study terms of reference, and a 3% discount rate used to reflect socially oriented projects.

5) Beneficial Use

It was assumed that the RIP and BIP projects will have a beneficial use of up to 20 years.

6) Operational and Depreciation Costs

For all projects, except the Sanga-Sanga Airport at Bongao, Tawi-Tawi, the annual maintenance costs was assumed to be 1% of the total investment costs, while annual depreciation was placed at 3% of the total project cost. The annual maintenance costs and depreciation costs Sanga-Sanga Airport were assumed to be 2% and 3% respectively of the project cost. The maintenance cost of the road projects is also assumed to spike to 7% of the investment cost every 5 years, for that specific year only.

After the estimation of the NPV, impact aggregation was conducted to evaluate the overall or collective economic impact of GEM infrastructure projects in Mindanao. Impact aggregation was done in two steps. The first step was to get the mean NPV of projects belonging to the same project type in the sample, and multiply it to the total number of projects in the population. The second step is to add the NPV of RIPS in the population with the NPV of BIPs in the population. The other approach to impact aggregation was to get the NPV per capita within the influenced area, and multiply it to the total number of population of a province, and add the NPV of all the provinces. For projects with negative EIRRs were assigned zero for meaningful interpretation.

3.7.7 Peace and Security Outcomes

Survey results on peace outcomes especially those concerned with the number of incidence of rido/clan war were recorded by taking into account only the respondent with the highest number of incidence reported. This is to avoid double counting on the number of incidence of rido in a barangay. Thus, suppose we have respondents A, B and C and A reported the number of incidence in X as 4, B reported 2, and C reported 1, we take the number of incidence of rido in Barangay X as 4, and not $4+2+1$ or 7. The same procedure is used for the number of encounters, incidence of bombing, etc. in a given barangay.

3.7.8 Analysis of Qualitative Data

Results of FGDs and KIs were summarized according to the issues discussed. Reactions of the participants on a specific aspect of an issue discussed are grouped into (a) where consensus was attained by the participants, (b) views of the majority of the participants, and (c) views of the minority. The same is true when the FGD was used to validate information.

3.7.9 Other Statistical Tests

3.1.1.1. t-tests

The t-test for independent observations was used to determine whether there are significant differences between type of project (BIP vs RIP), location of the project (ARMM vs non ARMM) and level of conflict (Moderate conflict vs High conflict) in terms of the Net Present Value of the projects. This test was also used to compare the with and without the project to determine the impact of the project. The t-test for paired observations was used to determine the effects of the project by comparing the before and after scenarios at the 5% level of significance

3.1.1.2. Analysis of Variance (ANOVA)

ANOVA was used to test whether there are significant differences among subprojects within the RIP projects and the BIP projects. This test was done using the 5% level of significance.

If there are significant differences among the sub projects, the Duncan's Multiple Range test was used to isolate the projects with different NPVs with the the projects with comparable NOVs.

Chapter 4 – Findings of the Study

4.1 ECONOMIC IMPACT ON MINDANAO OF GEM PROJECTS

4.1.1 NPVS OF ALL PROJECTS ON MINDANAO

This study calculated the NPV of 233 projects from the total of 1,155 projects implemented by GEM. This translates to about 20% of the total projects. The evaluation covers 24 RIPs and 209 BIPs. Table 8 presents the results of the NPV estimates, the economic internal rate of return (EIRR) and the benefit-cost ratio (B/C) of the said 233 projects. Annex A shows the corresponding economic indicators per project while the raw data are included as Volume III. As explained earlier, the NPV of a project represents the difference between the benefits accruing to the project and the cost associated to the construction of the facility at a chosen discounted rate. In this study, a 12% discount rate is applied. Hence, an EIRR value of a project with positive NPV also indicates a considerable return to investments indicating that investment in this project in Mindanao is highly beneficial. The same conclusion is indicated by the benefit-cost ratio figure. A negative NPV means that cost far outweighs benefits to the society.

Results of the analysis (Table 8) show that of the total 233 sampled projects, 208 projects (or 89.2%) exhibit positive NPVs and 25 projects have negative NPVs. Of those projects with positive NPVs, 24 are RIPs (or 100%) and 184 out of 209 (or 88%) projects are BIPs. All RIP projects included in the study have positive NPVs. This translates to a considerably high percentage of sound investment projects under a commercial discount rate (12%). More importantly, these projects were principally constructed based on strong social considerations rather than economic motivations. Also, some of these facilities are being used with minimal user's fee. Using a social discount rate of 3%, 223 projects (95.7%) of the total sampled projects have positive NPVs. This is a more reasonable assumption considering the social nature of the projects as indicated by their locations and the purpose for which they were implemented in those areas. At this rate, all the sampled RIP projects have positive NPVs while 199 of the 209 BIP projects (95.2%) have positive NPVs. The breakdown by subproject is shown in Table 9.

On the average, the economic indicators show that all the RIP projects in Mindanao are good investments. They yield a considerably high positive average NPV of PhP56,023,578, indicating that the benefits far outweigh costs by that amount at the 12% discount rate. The EIRR is 34.56% , which means that the projects can meet its financial obligations. Based on the BCR, a peso worth of investment in an RIP project yields a PhP2.57 worth of benefits to the society (Table 8).

Table 8: Net present values, economic internal rate of return and benefit-cost ratios of randomly sampled GEM infrastructure projects (12% discount rate), Mindanao

Type of Project	Number of Sample Projects	NPV at 12% in PhP		EIRR	Benefit – Cost Ratio	No. of Projects with Positive NPV
Regional Impact Projects	24					24
• Airport	1	468,458,189		66.26	3.90	1
• Port/Boat Landing	6	51,629,591	ab	31.58	2.40	6
• Roads	7	58,910,587	a	36.61	2.74	7
• Bridges	10	13,728,578	b	32.37	2.46	10
Mean for the RIPs		55,328,984 ^a		34.82	2.59	
Barangay Infrastructure Projects	209					184
• Boat Landings	20	1,839,141		25.32	1.90	17
• Trading Centers	29	-72,986	c	11.62	1.00	14
• Road Upgrades	18	11,825,756	a	42.40	3.17	18
• Barangay Bridges	81	2,178,950	ab	27.55	2.11	76
• Solar Dryers	41	733,141	ab	35.58	2.18	41
• Warehouses	20	693229	ab	25.48	1.70	18
Mean for the BIPs		2,238,98^b		27.78	2.00	

ab - Treatment means followed by the same letter superscripts are significantly different at the 5% level of significance

Table 9: Number of projects with positive net present values of randomly sampled GEM infrastructure projects (3% discount rate), Mindanao

Type of Project	Number of Projects	No. of projects with positive NPV		% to total	
		12%	3%	12%	3%
RIP	24	24	24	100.0	100.0
Airport	1	1	1	100.0	100.0
Port/Boat Landing	6	6	6	100.0	100.0
Roads	7	7	7	100.0	100.0
Bridges	10	10	10	100.0	100.0
BIP	209	184	199	88.0	95.2
Boat landing	20	17	19	85.0	95.0
Trading Center	29	14	25	48.3	86.2
Road Upgrade	18	18	18	100.0	100
Bridges	81	76	77	93.8	95.0
Grains Solar Dryer	41	41	41	100.0	100.0
Warehouse/Solar Dryer	20	18	19	90.0	95.0
Grand Total	233	208	223	89.3	95.7

All RIP sub-projects are sound investments based on the averages of the economic indicators. Among them, the airport project is the most preferred investment for the government in terms of the NPV. This is followed by road upgrading, port/boat landing and bridge. The Sanga-sanga Airport in Bongao, Tawi-tawi, the only airport project sampled, posts the highest NPV at PhP468,458,189. Its economic importance is still increasing given the interest of other airline companies to operate in the area. This will bring about increased trade and employment in the area. For every peso worth of investment in the airport project, the society obtains PhP3.90 worth of economic benefits. This is higher than a road project where for every peso investment, PhP2.74 worth of economic benefits accrue to the society. For the port landings and bridges, the returns are PhP2.40 and PhP2.46 for every peso investment, respectively. Statistical analysis reveals that there are significant differences that exist among the RIP subprojects in terms of the NPV. The NPVs of the road projects are higher compared to the bridge projects but are comparable with the NPVs of the boat landings. The NPVs of the boat landings are comparable to the NPVs of the bridge projects. The airport is not included in the comparison because there is only one airport project included in the study. It has an NPV far greater than any other sub project.

For the BIPs, on the average, the economic indicators are also positive but a little lower in magnitude compared to the RIP projects. This is understandable because the scope of a BIP is not as wide as the RIP project. The average net benefit of a BIP is PhP2,238,986 at the 12% discount rate, an EIRR over twice (27.78%) the commercial discount rate. In terms of the BCR, a peso worth of investment yields an economic benefit of PhP2.00.

It is interesting to note that, except for the trading centers, all BIP sub-projects post favorable economic indicators. Based on the magnitude of the NPVs, road upgrade projects prove to be the best BIP investment followed by barangay bridges, boat landings, grains solar dryers, warehouses/solar dyers and trading centers. In terms of the number of positive NPVs, all the road upgrades and the grains solar dyers post positive NPVs. In terms of the BCR, for every peso worth of investment in road upgrades, PhP3.17 worth of economic benefits accrue to the community, compared to the PhP2.11 and PhP1.90 in barangay bridges and boat landings, respectively. Road upgrade projects post the highest average NPV because of the sunk costs. They require less additional investments to yield higher NPV values. While the trading centers post -PhP72,986, this is close to zero, which means that the benefits are nearly equal to the cost. In terms of the BCR, a peso investment in a trading center gets PhP0.9990 in economic benefits in return. In effect, this means that the expected benefits that can be derived from the use of the trading centers are not fully exploited or fully utilized. Comparing the different BIP sub projects, statistical analysis reveals that roads have significantly higher NPVs than any subproject. The NPVs of the trading centers are significantly lower than the bridges, boat landings, grains solar dyers, and solar dryers/warehouses, which are comparable to each other.

As expected, the RIP projects yield higher NPVs than the BIP projects. The difference in the value of NPVs between them is statistically significant. This means that the RIP projects have NPVs which are far larger than the NPVs of the BIP projects. This is because of the scope of the project, strategic location and the greater number of beneficiaries directly and indirectly affected by the project.

Table 10 shows the overall or aggregated NPV for the different projects in Mindanao. These represent the picture of the projects in Mindanao implemented by GEM. This is computed by multiplying the average NPV of the particular sub-project with the total number of GEM projects implemented in the area. The results show that the projects implemented are not bad investments considering that economic considerations is not the main criterion for their implementation. For one, these projects are implemented mostly in areas not commonly serviced by the government. Some of these areas are considered as high conflict areas.

Table 10: Projected net present values, economic internal rate of return and benefit-cost ratios of all GEM infrastructure projects, Mindanao

Type of Project	Average NPV in PhP	Total No. of Projects	Total NPV in PhP	Aggregate EIRR	Aggregate B/C
Regional Impact Projects					
• Airport	468,458,189	2	936,916,378	66.26	3.90
• Port/Boat Landing	51,629,591	11	567,925,501	31.58	2.40
• Roads	58,910,587	13	765,837,631	36.61	2.74
• Bridges	13,728,578	17	233,385,826	32.37	2.46

Type of Project	Average NPV in PhP	Total No. of Projects	Total NPV in PhP	Aggregate EIRR	Aggregate B/C
Average RIPs	55,328,984	43	2,379,146,312	34.82	2.59
Barangay Impact Projects					
• Boat Landings	1,839,141	81	148,970,421	25.32	1.9
• Trading Centers	-72,986	93	-6,787,698	11.62	1.00
• Road Upgrades	11,825,756	61	721,371,116	42.40	3.17
• Barangay Bridges/Footbridges	2,178,950	263	573,063,850	27.55	2.11
• Solar Dryers	733,141	280	205,279,480	35.58	2.18
• Warehouses	693,229	69	47,832,801	25.48	1.70
Average BIPs	2,238,986	847	1,896,421,142	27.78	2.00

4.2 ECONOMIC IMPACT ON ARMM OF GEM INFRASTRUCTURE PROJECTS

The economic impact of the GEM projects on the ARMM is estimated to determine the impact of the project on ARMM and non-ARMM areas.

4.2.1 REGIONAL IMPACT PROJECTS

Table II shows the economic indicators for the 24 sampled RIP projects implemented by GEM in Mindanao. The raw data for these projects are found in Volume III. There are 19 RIP projects implemented in the ARMM while 5 projects are implemented in the non-ARMM areas. Of the 19 projects implemented in the ARMM, all the projects yield positive economic indicators.

Table II: Net present values, economic internal rate of return and benefit-cost ratios of randomly sampled RIP infrastructure projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	19	56,746,196^a	34.22	2.53	19
• Sulu	2	42,089,026	24.45	1.88	2
• Basilan	4	41,367,812	39.50	3.01	4
• Tawi-Tawi	4	137,748,367	39.00	2.70	4
• Lanao del Sur	2	21,511,021	17.40	1.33	2
• Maguindanao	7	33,501,846	36.06	2.69	7
Non-ARMM	5	49,943,579^a	37.12	2.81	5

^a The means between ARMM and non ARMM are comparable at the 5% level of significance

It appears that both the ARMM and non-ARMM areas are good investment sites for the RIP projects. The average NPV value for the projects in the ARMM is slightly higher than the average NPV value for the non-ARMM areas. Consequently, the EIRR and BCR are also slightly higher in the non-ARMM areas. A peso investment in the ARMM areas gives a PhP2.81 worth of benefits against the PhP2.53 from the ARMM areas. Tawi-tawi posts the highest NPV. This is because of the airport project in Bongao, which yields the highest NPV among all other projects in Mindanao. Comparing the NPVs of the two locations, statistical analysis revealed that the mean NPVs are comparable to each other. This means to say that an RIP project will still be a sound investment whether that is located in the ARMM or non-ARMM.

Following is the breakdown of the economic performance of the RIP projects, by sub-project.

4.2.1.1 Ports/Boats Landings

Table 12 shows the economic indicators for the RIPs port/boat landings. Of all the port/boat landing projects in the ARMM, 4 are noted most promising investments. These include the following: the Port in Lamitan (Ro-Ro Ramp), Siasi Port, Maluso Port Upgrading, and the Bongao Port. The Lamitan Port posts a net benefit of over PhP76,756,102 at the commercial discount rate and an EIRR over three times (40.77%) its discount rate. For every peso investment in this project, the society derives PhP3.12 worth in benefits. The project is constructed to attract large vessels and to offer a better alternative and direct route in order to yield travel time savings, increase traffic, and trigger economic activity in the process. The intermittent peace and security threats in the area have forestalled the entry of large investors which could have created more employment, encouraged trading activities, and raised local revenues.

The significant economic impact of the Bongao Port upgrading is expected since the Port is the most important gateway for trade and travel for the whole province. It also serves as the primary distribution node for inter-island transport of passengers in the area. Currently, it is the only port in the province with the capacity to service large vessels. The improvement in port services has resulted in reduced passenger waiting time and vessel berthing time. The port improvement has also increased productivity of the port area necessary to promote and support local and regional economic development.

Table 12: Net present values, economic internal rate of return and benefit-cost ratio of GEM regional impact ports/boat landing projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	6	51,629,591	31.58	2.40	6
• Sulu	1	76,467,656	31.88	2.44	1
• Basilan	2	75,387,305	33.93	2.53	2
• Tawi-Tawi	3	27,511,759	29.91	2.30	3
• Lanao del Sur	0	-	-	-	0
• Maguindanao	0	-	-	-	0
Non-ARMM	0	-	-	-	0

The economic indicators between ARMM and non-ARMM areas cannot be statistically compared because there are no boat landings in the non- ARMM areas.

4.2.1.2 Road Upgrades

The road upgrade projects appear to be a good investment both in ARMM and non-ARMM areas. The road upgrade projects in the non-ARMM areas, however, yield higher economic indicators when compared to the road projects in the ARMM areas. The average NPV in non-ARMM areas is more than 4 times (4x) that of the ARMM areas. The BCRs are PhP3.65 and PhP2.37, respectively. Aside from the clear economic gains as reflected in the savings in transport costs and vehicle operating costs and increase in the net value of the farm produce, the projects are believed to promote peace and social development in the conflict-affected areas, facilitate effective watershed management and enforcement by the national and local government agencies and civil society organizations.

In the non-ARMM areas, the Pikit-Boliok Road Upgrading Project is the most economically viable road project. The NPV of this project is PhP130,192,377 and EIRR of 58.19. In terms of the BCR, a peso investment in this project yields an economic benefit of PhP4.33. In the ARMM areas, the Shariff Aguak-Sapakan Road Upgrading Project is the most economically viable project. The NPV is estimated at PhP120,242,501 and a BCR of 4.35.

Table 13: Net present values, economic internal rate of return and benefit-cost ratio of GEM regional impact road upgrades, ARMM

Location	Number of Projects	Average NPV	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	5	36,963,560	31.57	2.37	5
• Sulu	1	7,710,396	17.02	1.31	1
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	2	21,511,021	17.4	1.33	2
• Maguindanao	2	67,042,680	53.03	3.94	2
Non-ARMM	2	113,778,156	49.20	3.65	2

4.2.1.3 Bridges

Of the 10 sampled RIP bridge projects, 5 are located in Maguindanao, 2 in Basilan, and 3 in the non-ARMM areas. All the bridge projects post positive NPVs (Table 14). The bridges also prove to be good investment for GEM and its partners.

The economic indicators tend to favor the bridges in the ARMM areas than in the non-ARMM areas in terms of the average NPV. For every peso invested in the bridge projects, the returns to society are PhP2.55 in the ARMM while it is PhP2.24 in the non-ARMM areas. The Busay and Bañas bridge structures were upgraded to accommodate heavy loaded trucks usually carrying farm products and to facilitate the safe and timely transportation of passengers from municipalities on the southern part of Basilan to and from Isabela City. These structures, however, facilitate the entry and exit of lawless elements, causing fear among the residents and traders.

Table 14: Net present values, economic internal rate of return and benefit-cost ratio of GEM regional impact bridge projects, ARMM

Location	Number of Projects	Average NPV	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	7	16,446,314	33.79	2.55	7
• Sulu	0	-	-	-	0
• Basilan	2	7,348,320	45.08	3.50	2
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	5	20,085,512	29.27	2.18	5
Non-ARMM	3	7,387,194	29.08	2.24	3

4.2.1.4 Airport Runway Improvements

Of the 2 airport projects constructed by GEM, only 1 project is subjected to economic assessment. The Sanga-sanga Airport in Bongao proves to be a huge economic success. It was built to support economic activities such as resort development for tourism, high-value mariculture, ornamental fishery and others. Its economic gains, however, do not come outright. The gains have just opened up with the recent entry of two other airlines. The Sanga-sanga Airport is the subject of the case study. The NPV is estimated at PhP468,458,189. It can repay its financial obligations at an opportunity cost of capital at 66.26%. For every peso invested in the project, the GEM gets in return PhP3.90 worth of benefits (Table 15). The improvement in the Sanga-Sanga airport runway in Tawi-Tawi encourages investors to offer more flights and increase passenger occupancy, resulting to higher revenues from taxes and terminal fees. Further, results of the FGD and KIs show that the said project has encouraged the expansion of small livelihood activities and triggered economic activity in the process.

Table 15: Net present values, economic internal rate of return and benefit-cost ratio of GEM regional impact airport landing projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
Sanga-Sanga Airport, Tawi-tawi	1	468,458,189	66.26	3.90	1

4.2.2 BIPS

Of the 209 sampled BIP projects implemented in Mindanao, some 65 projects are implemented in the ARMM and the remaining 144 projects are constructed in the different parts of non-ARMM areas. More than half (52%) of the projects in the ARMM are implemented in Maguindanao (Table 16). Of the total projects implemented in the ARMM areas, 87.7% of these post positive NPVs, slightly lower than in the non-ARMM areas at 89.6%. On the average, the BIP projects implemented in the ARMM register an average NPV of PhP1,778,107 while in the non-ARMM areas, the average NPV is PhP2,447,021. Six of the 9 projects in Lanao del Sur have positive NPVs. Some 87.9% of the projects in Maguindanao post positive NPVs. The BIP projects in Lanao del Sur yield an average NVP of PhP3,157,583, the highest in all the areas in Mindanao. The BCR, however, is slightly lower than Maguindanao. For every peso worth of investment in a BIP project, PhP1.86 worth of economic benefits accrue to the community in Lanao del Sur, whereas in Maguindanao, the return is PhP2.18.

Table 16: Net present values, economic internal rate of return and benefit-cost ratios of randomly sampled GEM BIP infrastructure projects, ARMM

Location	Number of Projects	Average NPV in PhP		EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	65	1,778,107	A	27.37	1.95	57
• Sulu	7	983,572		18.14	1.45	5
• Basilan	12	1,291,421		24.41	1.79	12
• Tawi-Tawi	4	2,612,676		20.15	1.59	3
• Lanao del Sur	9	3,157,583		25.73	1.86	6
• Maguindanao	33	1,646,242		31.72	2.18	29
Non-ARMM	144	2,447,021	A	27.97	2.03	129

A - The means NPVs of projects between ARMM and non-ARMM areas are comparable

Statistical analysis of the data shows that the NPV values are no difference between projects constructed in the ARMM and non-ARMM areas.

4.2.2.1 Boat Landings

Twenty boat landing projects are sampled in Mindanao. Of this total figure, 50% are constructed in the ARMM areas and the remaining 50% are scattered in areas outside ARMM. Some 7 out of 10 boat landing projects in the ARMM are located in either Maguindanao or Basilan (Table 17).

The estimated NPV shows that the boat landing projects, in general, are good investments, regardless of location. It can be seen from Table 17 that the boat landing projects implemented in the ARMM are more economically viable than those in the non-ARMM areas. In the ARMM areas, all of the total sampled projects post positive NPVs compared to the 70.0% in the non-ARMM areas. The Liangan Boat Landing in Zamboanga del Sur, the Kalanganan 2 Boat Landings in North Cotabato

and the Burboanan Boat Landing Construction in Surigao del Sur turn out to be investments with low economic gains given their negative NPVs. In the ARMM, the Datu Piang Boat Landing in Maguindanao posts impressive economic indicators. The BCR is 4.28 against Poblacion Malanga Boat Landing Construction Project's BCR of 2.80, which is the highest in the non-ARMM areas.

Table 17: Net present values, economic internal rate of return and benefit-cost ratio of GEM barangay impact boat landing projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	10	2,153,506	26.72	1.99	10
• Sulu	1	2,889,858	25.13	1.92	1
• Basilan	4	1,587,728	21.87	1.68	4
• Tawi-Tawi	2	1,159,236	19.17	1.49	2
• Lanao del Sur	0	-	-	-	0
• Maguindanao	3	3,325,273	38.74	2.77	3
Non-ARMM	10	1,524,776	23.93	1.8	7

4.2.2.2 Trading Centers

Table 18 shows the results of the NPV estimation for the 29 BIP trading center projects in Mindanao relative to ARMM. ARMM accounts for 53% of the total sampled trading centers. Half of the trading centers in the ARMM are constructed in Maguindanao with SUBASTA accounting for the other 50%. The trading center proves to be a not so attractive investment project given the economic indicators. The average NPVs are negative and the EIRRs are below the discount rate and the BCR is less than one (1). The Lamitan Trading Center and Barangay Marketside Trading Center in Basilan, however, made positive economic impact – an exceptional case given that the majority of the investments in trading centers in other provinces have resulted in an economic loss. This means that the expected benefits that can be derived from the use of the facility are not fully exploited or fully utilized. For instance, some of the trading centers are used only during market days and lay idle or used as parking spaces during ordinary days. If they are used during the market days, the facility cannot accommodate all the vendors because of limited space. The Lamitan Trading Center is being used as a parking space on ordinary days. The Tupi Trading Center stopped operating for renovation. Other plans for the facility are being entertained by the barangay. The Busok Trading Center in Bagumbayan was used only for about three months and was closed during the heavy infestation of black bugs. The barangay is planning to redesign the facility by placing partitions for individual stalls. Also, very minimal fees are being collected.

Of all the trading centers in Mindanao, the Cuyago Trading Center Construction was the most profitable. The net benefit is calculated at PhP1,095,421 at the 12% discount rate. The facility can pay its financial obligation even at an interest of 33.12%. For every peso invested in this facility, some PhP2.10 worth of economic benefits is realized.

Table 18: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP trading center projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	10	-209,431	9.75	0.9	4
• Sulu	2	-208,860	8.43	0.82	1
• Basilan	2	252,003	15.71	1.16	2
• Tawi-Tawi	1	-475,755	7.28	0.79	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	5	-340,967	8.39	0.84	1
Non-ARMM	10	-1,174	12.67	1.05	4

4.2.2.3 Road Upgrades

There are 18 BIP road upgrade projects in Mindanao used in this study. Of this total, 7 are located in the ARMM while 11 road upgrade projects are located in the non-ARMM areas. All of the 7 road projects (or 100%) have positive NPVs (Table 19). Like their RIP road upgrading project counterparts, the BIP road projects are also good investments for the government.

The Sitio Opong Upgrading Project in South Cotabato is the most attractive road investment in the non-ARMM area while the Guimba Rehabilitation Project in Lanao del Sur is the most preferred road investment the ARMM areas. The Sitio Opong Project posts an NPV of PhP97,363,935, an EIRR of 40.20% and a BCR of 2.97. The Guimba Road Rehab Project posted a NPV of PhP11,051,920, an EIRR of 29.12% and a BCR of 2.15.

The road projects are generally well appreciated as respondents feel these have opened to more opportunities for economic development. In some cases, the roads made them think about livelihood activities rather than subservient activities. The road projects are well appreciated because of the following benefits: speed up travel time, cut transportation costs, minimized operating and maintenance costs, comfort, convenience, brought in other modes of transportation, easy transport of goods and passengers.

Table 19: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP road upgrades, ARMM

Location	Number of Projects	Average NPV in PhP		EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	7	5,026,245	aa	28.49	2.11	7
• Sulu	2	953,767		21.38	1.60	2
• Basilan	1	2,951,862		25.68	1.91	1
• Tawi-Tawi	1	8,607,987		34.96	2.58	1
• Lanao del Sur	2	9,115,988		30.68	2.26	2
• Maguindanao	1	3,484,352		34.52	2.55	1
Non-ARMM	11	16,152,718	a	51.25	3.84	11

a - The mean NPVs of the two locations are comparable to each other.

4.2.2.4 Barangay Bridges

The barangay BIP bridge project is also a sound investment for the government. Of the 81 bridge projects included in the survey, 75.3% are implemented in the non-ARMM bridge while 24.7% are implemented in the ARMM areas. The economic indicators are high regardless of their location, i.e., ARMM or non-ARMM areas. Of all the barangay bridge projects implemented in the ARMM, 90% have positive NPVs. For every peso investment in barangay bridge project in the ARMM gives in return a PhP2.16 worth of economic benefits while a P2.10 worth of benefits in the non-ARMM areas (Table 20).

For the ARMM, the BIP barangay bridge project with the soundest investment is the Manindolo Barangay Bridge in Maguindanao. It registers an NPV of PhP11,943,492, an EIRR of 83.05%. The BCR is 4.02, which means that the society gains an additional PhP3.02 for every peso invested in this road project. The bridge connects the sitios in the vicinity of barangay Manindolo. The Mangilala Slab Bridge in North Cotabato is the most favorable barangay bridge project in the non-ARMM areas. While it has posted P14,770,624 in its NPV (higher than its ARMM counterpart), the EIRR is 62.08% and a BCR of 3.13. This bridge is strategically located going to the farm areas. It has greatly helped the farmers transport their goods.

The statistical analysis showed that the bridge projects in the ARMM and non-ARMM areas are equally sound investments.

The bridge projects are also much appreciated because of other indirect benefits they bring such as: minimized dengue cases, controlled flooding, prevention of accidents, among others.

Table 20: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP barangay bridge projects, ARMM

Location	Number of Projects	Average NPV		EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	20	2,187,793	a	28.63	2.16	18
• Sulu	2	1,252,667		21.11	1.71	2
• Basilan	4	1,202,707		26.57	2.01	4
• Tawi-Tawi	0	-		-	-	0
• Lanao del Sur	5	1,742,775		22.40	1.71	3
• Maguindanao	9	3,080,648		34.68	2.57	9
Non-ARMM	61	2,176,050	a	27.20	2.10	59

a- The mean NPVs between ARMM and non-ARMM are comparable.

4.2.2.5 Solar Dryers

Eleven of the 41 sampled solar dryer projects (or 26.8%) are located in the ARMM and the remaining 30 solar dryers are spread over the non- ARMM areas. Of the 11 solar dryers in the ARMM, Maguindanao accounts for 9 (or 82%). It appears that the solar dryers are good investment for the government regardless of their location (Table 21). All solar dryers post sound economic indicators. They yield, on the average, positive NPVs and above social discount rates EIRR. The economic indicators in the ARMM areas are a little higher than in their non-ARMM counterparts. The solar dryers can withstand their financial obligations at over 30%. The BCR is 2.43 in the ARMM while it is 2.09 in the non-ARMM areas. The differences in the NPVs, however, are not statistically significant. This means that the grains solar dryer is a sound investment whether located in ARMM or in a non-ARMM area.

The Christamonte Grains Solar Dryer in Barangay Nato, Esperanza, Agusan del Sur posts the highest NPV while the Macabiso Grains Solar Dryer in Sultan Mastura, Maguindanao gives the highest BCR. All of the farmers in Barangay Nato are users of the facility. The Macabiso Solar Dryer is not quite maintained although it is fully utilized. Farmers dry their products on a first come first serve basis. The facility is not enough for the beneficiaries. For every peso investment in the Macabiso facility, some Php4.09 worth of benefits accrues to the community, while it is only Php2.85 worth of economic benefits are realized in Christamonte.

Table 21: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP solar dryer projects, ARMM

Location	Number of Projects	Average NPV		EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	11	975,793	a	40.46	2.43	11
• Sulu	0	-		-	-	0
• Basilan	1	879,447		41.83	2.47	1
• Tawi-Tawi	0	-		-	-	0
• Lanao del Sur	1	926,644		38.15	2.27	1
• Maguindanao	9	991,959		40.57	2.45	9
Non-ARMM	30	644,169	a	33.79	2.09	30

a -The mean NPVs are comparable in both locations

4.2.2.6 Combination of Warehouse and Solar Dryer

Some 20 warehouse/solar dryer projects are sampled. Of the 20 projects, 7 are located in the ARMM and 13 in the non-ARMM areas. Most of the solar dryers with warehouses in the ARMM are located in Maguindanao, which accounts for 6 of the 7 warehouses (or 86%). The solar dryers with warehouses are promising projects with highly favorable economic benefits. The facilities in the ARMM yield much higher NPVs than non-ARMM areas (Table 22). The differences in the NPVs between the two locations, however, are not significant.

Overall, the warehouse/solar dryers in the ARMM yield favorable economic indicators: positive NPVs, EIRR way higher than the discount rate of 12% and a BCR greater than 1. Two of the 13 warehouse/solar dryers in the non-ARMM post negative NPV. These are the Tibao Grains Warehouse (formerly with Solar Dryer) in Mlang, North Cotabato and the Lanawan Grains Warehouse and Solar Dryer in Zamboanga del Norte. The Tibao facility is not fully utilized because of an opening in the ceiling the birds to feast on the produce.

The Kosga Warehouse and Solar Dryer in Manga, Kolambogan, Lanao del Norte is the only sample facility used for Seaweed production. This too is a sound investment for the government. The NPV is estimated at PhP626,856 with an EIRR of 20.98% and a BCR of 1.43. This means that the community enjoys an additional 43-centavo worth of benefits from every peso spent in this facility. This could increase more. The community sees the need to install a new footbridge to the dryer. There is also a need to reorganize the cooperative. At present, the officers are inactive.

In general, the solar dryers have served their economic purposes. While most of the solar dryers are operational, some warehouses are not fully utilized. This means that the economic benefits could be made even higher. For instance, the Mateo Grains and Warehouse and Solar Dryer in Kidada, Matalam, the warehouse is temporarily used as an evacuation center for people displaced by conflicts in other barangays. In Bual, Isulan, the facility, while open to the public, is almost utilized by only a few people who own vast tracks of land.

Table 22: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP warehouse projects, ARMM

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
ARMM	7	923,278	28.14	1.85	7
• Sulu	0	-	-	-	0
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	1	545,753	20.08	1.36	1
• Maguindanao	6	986,199	29.49	1.93	6
Non-ARMM	13	569,357	24.05	1.61	11

4.3 ECONOMIC IMPACT OF GEM PROJECTS IN HIGH-CONFLICT AND MEDIUM-CONFLICT AREAS

4.3.1 REGIONAL IMPACT PROJECTS

Of the 24 RIPs surveyed, 5 are located in high conflict areas and 19 in moderate conflict areas. Results of the economic evaluation of the 24 projects show that average NPV of the 5 RIPs located in high conflict areas is PhP37,077,279 and an EIRR of 33.66%, and a BCR of 2.52. All of the 5RIPs in the high conflict areas have positive NPVs.

The average NPV of the 19 RIPs in the moderate conflict areas is PhP60,132,065. The average EIRR of the 19 RIP projects is 35.13% and their BCR is 2.60. All of the 19 RIP projects in the moderate conflict areas have positive NPVs (Table 23). Statistical analysis showed that the mean NPVs of the projects in high and moderate conflict areas are comparable to each other.

Table 23: Net present values, economic internal rate of return and benefit-cost ratio of GEM RIP projects in high conflict and moderate conflict areas, Mindanao

Location	Degree of Conflict	
	High	Moderate
Number of Projects	5	19
NPV in PhP	37,077,279 ^a	60,132,065 ^a
EIRR	33.66	35.13
B/C Ratio	2.52	2.60
Number of Projects with Positive NPV	5	19

a - The mean NPVs between high conflict and moderate conflict areas are comparable to each other.

As a whole, the results of economic evaluation reveal that the 24 RIP projects have an average NPV of PhP55,328,984. Their combined EIRR is 34.82% and a BCR of 2.59. On the average therefore, the results show that the RIPs are economically viable projects, that is, the EIRR is higher than the cut-off interest rate of 12%, and the overall BCR, on the average, generate a return of PhP2.57 for every peso investment.

4.3.1.1 Bridges

There are two bridges under the RIP category located in high conflict areas, all in the ARMM. Judging from the economic indicators, these two facilities in the ARMM are sound economic investments. The one in Basilan gives an NPV of PhP7,779,000, an EIRR of 27.81%, and a BCR of 2.12. The other is in Maguindanao.

There are 8 RIP bridges located in moderate conflict areas. Five of these projects are in the ARMM, i.e. 4 in Maguindanao and 1 in Basilan; and 3 are in the non-ARMM areas. All the 2 RIP bridge projects in the non-ARMM areas exhibit positive average NPV of PhP7,387,194 an EIRR of 29.80% and a BCR of 2.24. Likewise, all of the 5 projects in the ARMM moderate conflict areas register an average positive NPV of PhP18,600,470 and a combined BCR of 2.46. The EIRR of the 5 projects is 32.3%, which is over 2 times the cut-off discount rate of 12 %. It is noted that all 4 RIP bridge projects located in Maguindanao have positive NPVs, an EIRR of 24.79%, and a BCR of 1.86.

Table 24: Net present values, economic internal rate of return and benefit-cost ratio of GEM RIP bridges in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	2	11,060,925	37.50	2.80	2
ARMM	2	11,060,925	37.50	2.80	2
• Sulu	0	-	-	-	0
• Basilan	1	7,779,000	27.81	2.12	1
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	1	14,342,850	47.20	3.49	1
Non-ARMM	0	-	-	-	0
Moderate Conflict Areas	8	14,395,491	31.09	2.38	8
ARMM	5	18,600,470	32.30	2.46	5
• Sulu	0	-	-	-	-
• Basilan	1	6,917,639	62.34	4.87	1
• Tawi-Tawi	0	-	-	-	-
• Lanao del Sur	0	-	-	-	-
• Maguindanao	4	21,521,178	24.79	1.86	4
Non-ARMM	3	7,387,194.43	29.08	2.24	3

4.3.1.2 Road Upgrades

There are only 3 sample RIP road upgrade projects in high conflict areas and all of them are located in the ARMM. Two of these RIP road upgrade projects are in Lanao del Sur, and 1 in Maguindanao.

It is noted that all of the 3 projects in the high conflict areas exhibit positive NPVs. In particular, the average NPV of the 3 RIP road upgrade projects is PhP54,421,514. They also have a combined EIRR of 31.09% and a BCR of 2.34. The lone RIP road upgrade project in Maguindanao has an NPV of PhP120,242,501 and a BCR of 4.35. The EIRR of the road upgrade project in Maguindanao at 58.48% is nearly 5 times the cut-off discount rate of 12 % (Table 25). The 2 road projects in Lanao del Sur have an average NPV of PhP21,511,021 and a BCR of 1.33. Thus, in terms of economic viability, it is clear that the sole RIP road upgrade project in Maguindanao generates higher benefits and higher returns to investments compared to the 2 RIP road upgrade projects in Lanao del Sur. These three projects also show that road upgrade projects located in high conflict areas are also economically viable.

Table 25: Net present values, economic internal rate of return and benefit-cost ratio of GEM RIP road upgrade projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	3	54,421,514	31.09	2.34	3
ARMM	3	54,421,514	31.09	2.34	3
• Sulu	0	-	-	-	0
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	2	21,511,021	17.40	1.33	2
• Maguindanao	1	120,242,501	58.48	4.35	1
Non-ARMM	0	-	-	-	0
Moderate Conflict Areas	4	62,277,392	40.75	3.04	4
ARMM	2	10,776,627	32.30	2.42	2
• Sulu	1	7,710,396	17.03	1.31	1
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	1	13,842,859	47.58	3.53	1
Non-ARMM	2	113,778,156	49.20	3.65	2

Four of the sampled RIP road upgrade projects are implemented by GEM in the moderate conflict areas. One of these projects is located in Sulu, and the other in Maguindanao while the rest are in the non-ARMM moderate conflict areas. It is noted that all four RIP road upgrade projects in moderate conflict areas are also economically viable.

Road construction projects appear to be an economically viable project in both high conflict and moderate conflict areas. This happens because a road project facilitates the movements of goods, services and people within and outside their communities. In addition, enabling farmers, fishermen, businessmen and traders to access the markets stimulates the local economy and immediately has a positive impact on the livelihood of the local population.

4.3.1.3 Boat Landings

The RIP boat landing projects of GEM are present only in moderate conflict areas, and only in the ARMM. There are 6 RIP boat landing projects in the ARMM moderate conflict areas distributed as follows: 1 in Sulu; 2 in Basilan; and 3 in Tawi-Tawi. Economic analysis shows that all the boat landing projects in the ARMM are economically viable (Table 26).

The 6 boat landings in the ARMM has an average combined NPV of PhP59,788,906, a BCR of 2.40 and an EIRR of 31.91%.

Table 26: Net present values, economic internal rate of return and benefit-cost ratio of GEM RIP boat landing projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	0	-	-	-	0
ARMM	0	-	-	-	0
• Sulu	0	-	-	-	0
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	0	-	-	-	0
Non-ARMM	0	-	-	-	0
Moderate Conflict Areas	6	59,788,906	31.91	2.40	6
ARMM	6	59,788,906	31.91	2.40	6
• Sulu	1	76,467,656	31.88	2.44	1
• Basilan	2	75,387,305	33.93	2.53	2

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
• Tawi-Tawi	3	27,511,760	29.91	2.30	3
• Lanao del Sur	0	-	-	-	0
• Maguindanao	0	-	-	-	0
Non-ARMM	0	-	-	-	0

4.3.1.4 Airport Runway Improvements

There is only one RIP airport project of GEM and this is the Sanga-sanga Airport located at Bongao, Tawi-Tawi. The project involves the expansion of the existing runway and acquisition of airport facilities to enable the airport to accommodate ICAO Code 4C aircrafts (e.g., B737 and A320). As a result of the project, passenger volume has increased and the scheduled flight of Cebu Pacific using Airbus 319 aircrafts this coming October 2011 is expected to further increase passenger traffic to Tawi-Tawi and vice versa.

The vital role of Sanga-sanga Airport to the local economy of Tawi-Tawi is reflected by its estimated NPV of PhP446,458,189, a BCR of 3.90 and an EIRR of 66.29%. In other words, the investment in RIP Sanga-sanga Airport is a highly desirable enterprise (Table 27).

Table 27: Net present values, economic internal rate of return and benefit-cost ratio of GEM RIP airport project, moderate conflict area, Mindanao

Title of Project	Location	NPV in PhP	EIRR	B/C Ratio
Sanga-Sanga Airport	Tawi-tawi	446,458,189	66.29	3.90

4.3.2 BIPS

A total of 209 BIP projects are covered by this study. Twenty-five of these projects are located in high conflict areas and 184 are in moderate conflict areas. On the average, results of the economic analysis showed that those BIP projects located in moderate conflict areas perform better compared to those in the high conflict areas. Thus, the average NPV of BIP projects in moderate conflict areas is PhP2,247,145, with a BCR of 1.96 and an EIRR of 27.28%. The average NPV of BIP projects in high conflict areas is PhP2,178,940, a BCR of 2.29 and an EIRR of 31.53% (Table 28). It is also noted that of the 25 BIP projects in high conflict areas, 22 registered positive NPVs, while of the 184 BIP projects in the moderate conflict areas, 162 registered positive NPVs.

Statistical analysis reveals no significant differences between levels of conflict in terms of the NPVs.

Table 28: Net present values, economic internal rate of return and benefit-cost ratio of sampled GEM BIP projects in high conflict and moderate conflict areas, Mindanao

Indicator	Degree of Conflict	
	High	Moderate
Number of Projects	25	184
• NPV	2,178,940 ^a	2,247,145 ^a
• EIRR	31.53	27.28
• B/C Ratio	2.29	1.96
Number of Projects with Positive NPV	22	162

a- The mean NPVs of the projects in the high and medium conflict areas are comparable to each other.

4.3.2.1 Boat Landing

There are 20 BIP boat landing projects assessed in this study. There is only one BIP boat landing project located in high conflict areas covered by the study. This facility is located in a Sirawai, Zamboanga del Norte, a non-ARMM area. The facility proves to be a worthy investment. The NPV is PhP2,207,836 with an EIRR equal to 36.77% and a BCR of 2.82. There are, however, 19 BIP boat landing projects in moderate conflict areas distributed as follows: 10 in ARMM of which 1 is in Sulu; 4 are in Basilan; 2 in Tawi-Tawi, and 3 in Maguindanao, the remaining 9 BIP boat landing projects are in non-ARMM areas (Table 29).

Table 29: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP boat landing projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	No. of Projects with Positive NPV
High Conflict Areas	1	2,207,836	36.77	2.82	1
ARMM	0	0	0	0	0
• Sulu	0	0	0	0	0
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	0	0	0	0	0

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	No. of Projects with Positive NPV
• Maguindanao	0	0	0	0	0
Non-ARMM	1	2,207,836	36.77	2.82	1
Moderate Conflict Areas	19	1,810,736	24.72	1.85	16
ARMM	10	2,153,506	26.72	2	10
• Sulu	1	2,889,858	25.13	1.92	1
• Basilan	4	1,587,728	21.87	1.68	4
• Tawi-Tawi	2	1,159,236	19.17	1.49	2
• Lanao del Sur	0	0	0	0	0
• Maguindanao	3	3,325,273	38.74	2.77	3
Non-ARMM	9	1,448,880	22.5	1.69	6

Results of economic analysis of the BIP boat landing projects shows that the 4 boat landing projects in Basilan yield an average NPV of PhP1,587,728 and a BCR of 1.68. In contrast, the 2 boat landing projects in Tawi-Tawi exhibit an NPV of PhP1,159,236, a BCR of 1.49 and an EIRR of 19.17%, while the 3 boat landings in Maguindanao boat landing projects have an average NPV of PhP3,325,273, a BCR of 2.77 and an EIRR of 38.74%. As a whole, the BIP boat landing projects in moderate conflict areas in the ARMM register a viable economic return having an average NPV of PhP1,810,736 a BCR of 1.85 and an EIRR of 24.72%. This is a sound investment in the areas of Sulu, Basilan and Maguindanao. On the other hand, the BIP boat landing projects in non-ARMM moderate conflict areas also provided a viable economic return either with their average NPV at PhP1,448,880, a BCR of 1.69 and an EIRR of 22.50% (Table 29).

4.3.2.2 Trading Centers

A total of 29 BIP trading center projects are included in the study. Of the 29 trading centers, 4 are in the high conflict affected areas and 25 are in the moderate conflict areas. The distribution of the 4 BIP trading center projects in the high conflict areas are as follows: 2 in the ARMM, namely: 1 in Sulu and 1 in Maguindanao, and 1 in the non-ARMM areas. The 25 BIP trading center projects in the moderate conflict areas are distributed as follows: 8 in the ARMM and 17 in the non-ARMM areas.

It is noted that, except for the BIP trading center in Sulu (Siasi Trading Center), the rest of the four BIP trading center projects in high conflict affected areas register negative NPVs. In other words, 3 out of the 4 BIP trading centers in the high conflict areas exhibit a BCR less than 1 at 12% discount rate, and an EIRR below the cut-off rate of 12% (Table 30).

In some cases, the trading centers are also used for barangay activities such as meetings and seminars. The facility is well appreciated because their goods are kept safe from rains and strong heat.

Table 30: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP trading center projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with positive NPV
High Conflict Areas	4	-504,509	6.57	0.76	1
ARMM	2	-217,042	10.61	0.93	1
• Sulu	1	336,694	16.86	1.21	1
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	0	0	0	0	0
• Maguindanao	1	-770,778	4.36	0.36	0
Non-ARMM	2	-79,1976	2.53	0.58	0
Moderate Conflict Areas	25	-3,943	12.43	1.04	13
ARMM	8	-207,528	9.53	0.88	3
• Sulu	1	-754,415	0	0.42	0
• Basilan	2	252,003	15.71	1.16	2
• Tawi-Tawi	1	-475,755	7.28	0.79	0
• Lanao del Sur	0	0	0	0	0
• Maguindanao	4	-233,515	9.39	0.89	1
Non-ARMM	17	91,862	13.79	1.11	10

The economic performance of the BIP trading center projects in the non-ARMM moderate conflict areas is economically feasible. Some 10 out of the 17 BIP trading center projects register positive NPVs, thus, overall, the average NPV of the 17 BIP trading center projects in the non-ARMM areas is PhP91,862, a BCR of 1.11 and an EIRR of 13.79%. One of the main results for the weak performance of the BIP trading center project is that they appear to be underutilized, that is, usually they are used only once a week, i.e. during market day. In addition, as mentioned earlier, the user fee is very minimal and sometimes it is free.

4.3.2.3 Road Upgrades

The GEM BIP road upgrade projects included in this assessment consist of 3 projects in the high conflict areas, and 15 in the moderate conflict areas. All 3 BIP road upgrade projects in the high conflict areas register positive NPV at PhP7,172,997, a BCR of 3.68, and an EIRR of 49.39% (Table 31). Similarly, in the moderate conflict areas, the BIP road upgrade projects exhibit good economic performance. It appears that the road projects in the moderate conflict areas are more profitable than in the high conflict areas.

Table 31: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP road upgrade projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV in PhP	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	3	7,172,997	49.39	3.68	3
ARMM	1	843,206	19.51	1.47	2
• Sulu	1	843,206	19.51	1.47	1
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	0	0	0	0	0
• Maguindanao	0	0	0	0	0
Non-ARMM	2	10,337,893	64.33	4.7	2
Moderate Conflict Areas	15	12,756,308	41.0	3.0	15
ARMM	6	5,723,418	30	2.22	6
• Sulu	1	1,064,328	23.25	1.73	1
• Basilan	1	2,951,862	25.86	1.91	1
• Tawi-Tawi	1	8,607,987	34.96	2.58	1
• Lanao del Sur	2	9,115,988	30.68	2.27	2
• Maguindanao	1	3,484,352	34.52	2.55	1
Non-ARMM	9	17,444,901	48.34	3.63	9

It is noted that the economic performance of the road upgrading projects is consistent with those observed in the RIP category. Road projects seem to produce considerable benefits to the local economy and investment therefore in road projects gives a fairly high return to the community.

4.3.2.4 Barangay Bridges

The number of BIP barangay bridge projects included in the study consists of 9 bridge projects in high conflict areas and 72 bridge projects in the moderate conflict areas. Of the 9 bridge projects in the high conflict areas, 3 are in the ARMM (2 in Lanao del Sur, and 1 in Maguindanao), and 6 in the non-ARMM areas. The 72 BIP bridge projects in the moderate conflict areas are distributed as follows: 17 are in the ARMM and 55 in the non-ARMM areas.

Table 32: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP barangay bridge projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	9	2,883,161	33.95	2.59	9
ARMM	3	2,615,345	27.07	2.07	3
• Sulu	0	0	0	0	0
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	2	2,285,860	23.71	1.81	2
• Maguindanao	1	3,274,314	33.78	2.59	1
Non-ARMM	6	3,017,070	37.40	2.85	6
Moderate Conflict Areas	72	2,090,923	26.75	2.05	68
ARMM	17	2,112,343	28.91	2.17	16
• Sulu	2	1,252,667	21.11	1.70	2
• Basilan	4	1,202,706	26.57	2.00	4
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	3	1,380,718	21.53	1.65	1
• Maguindanao	8	3,056,440	34.80	2.57	8
Non-ARMM	55	2,084,303	26.09	2.02	51

As a whole, the economic performance of the BIP barangay bridge projects is a sound investment for GEM. The economic indicators in the moderate conflict areas are better than those in the high conflict areas. In the moderate conflict areas, the NPV is PhP2,090,923 and an EIRR of 26.75%. A peso investment in a road project in the high conflict area yields a Php2.05 worth of economic benefits to the area. On the other hand, the economic indicators for the high conflict areas are:

NPV of PhP2,883,161, an EIRR of 33.95%. A peso investment in a bridge project in the moderate conflict areas yields a PhP2.59 worth of economic benefits.

4.3.2.5 Solar Dryers

A total of 41 GEM BIP solar dryers are included in this study. Five of these solar dryers are located in high conflict areas and 36 are in moderate conflict areas. It can be seen that the solar dryer is also one good investment for the government in both high conflict and moderate conflict areas. The economic indicators for the two locations are highly comparable (Table 33).

Table 33: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP solar dryer projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV	EIRR	B/C Ratio	Number of Projects with Positive NPV
High Conflict Areas	5	762,653	34.99	2.15	5
ARMM	2	731,247	30.49	1.9	2
• Sulu	0	0	0	0	0
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	1	926,644	38.15	2.27	1
• Maguindanao	1	535,849	22.83	1.52	1
Non-ARMM	3	783,590	37.99	2.32	3
Moderate Conflict Areas	36	729,042	35.66	2.19	36
ARMM	9	1,030,137	42.68	2.55	9
• Sulu	0	0	0	0	0
• Basilan	1	879,447	41.83	2.47	1
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	0	0	0	0	0
• Maguindanao	8	1,048,973	42.78	2.56	8
Non-ARMM	27	628,678	33.33	2.07	27

4.3.2.6 Warehouses

There are only 3 BIP warehouse projects in the high conflict areas, 1 of the 3 is in Maguindanao or in the ARMM area and the remaining 2 are in the non-ARMM areas. BIP warehouse projects in the moderate conflict areas are distributed as follows: 17 in ARMM broken down into 1 in Lanao de Sur and 5 in Maguindanao; and 11 in the non-ARMM areas. It is noted that all of the 11 BIP warehouse projects in the moderate conflict areas register positive NPVs, i.e regardless of location. It is noted that all the 3 BIP warehouse projects in high conflict areas also registered positive NPVs, a high EIRR and a BCR of 2.11. In the moderate conflict areas, the NPV is PhP638,917. The EIRR is 24.31% and a BCR of 1.62 (Table 34).

Table 34: Net present values, economic internal rate of return and benefit-cost ratio of GEM BIP warehouse projects in high conflict and moderate conflict areas, Mindanao

Location	Number of Projects	Average NPV	EIRR	B/C Ratio	No. of Projects with + NPV
High Conflict Areas	3	1,001,001	32.13	2.11	3
ARMM	1	1,112,075	28.36	2.06	1
• Sulu	0	-	-	-	0
• Basilan	0	-	-	-	0
• Tawi-Tawi	0	-	-	-	0
• Lanao del Sur	0	-	-	-	0
• Maguindanao	1	1,112,075	28.36	2.22	1
Non-ARMM	2	945,464	34.01	2.06	2
Moderate Conflict Areas	17	638,917	24.31	1.62	17
ARMM	6	891,812	28.11	1.78	6
• Sulu	0	0	0	0	0
• Basilan	0	0	0	0	0
• Tawi-Tawi	0	0	0	0	0
• Lanao del Sur	1	545,753	20.08	1.36	1
• Maguindanao	5	961,023	29.17	1.87	5
Non-ARMM	11	500,974	22.24	1.53	9

It is further noted that the BIP warehouse project in Maguindanao high conflict area exhibit higher economic viability compared to the one located in the non-ARMM high conflict area. Specifically, the NPV of the BIP warehouse project in Maguindanao high conflict area amounted to PhP1,112,075

while the NPV of the BIP warehouse project in the non-ARMM high conflict area has an NPV of PhP945,464. The BIP warehouse project in Maguindanao high conflict area also exhibited a high EIRR of 28.36% and a BCR of 2.22 compared to the EIRR of 29.17% and a BCR of 1.87 for the BIP warehouse project in the Maguindanao moderate conflict area.

4.4. SENSITIVITY ANALYSIS

In this study, only two scenarios are considered to test the sensitivity of the results of the economic analysis, namely: (1) a 10% increase in the cost of the project and (2) a 10% reduction of the benefits of the project. It is noted that a 10% increase in project cost did not affect the viability of the 233 projects covered by the report. The same is also true when the benefits of the projects are decreased by 10%. Two discount rates are applied: one at a commercial rate (12%) and the other one at a social rate (3%).

4.4.1. IF COSTS ARE INCREASED BY 10%

At the 12% discount rate, only 2 projects are sensitive to a 10% increase in the cost, that is, these projects turned out to be not economically viable from having positive NPVs. That brings to 27 the total numbers of negative projects. At the base scenario, 25 BIP projects have negative NPVs. Both are BIPs and located in the non-ARMM. At the 3% discount rate, only one project is sensitive to the 10% increase in cost. This brings to 11 the total number of projects that are negative. The sensitive projects are broken down in details and are presented in Table. 25.

Table 35: Number of projects sensitive to a 10% increase in the cost, by location, by type of project, Mindanao at the 12% and 3% discount rates

Type of Project	Sub-project	Number of Projects - 12%		Number of Projects - 3%	
		ARMM	Non-ARMM	ARMM	Non-ARMM
RIP	Airport	0	0	0	0
	Boat Landing	0	0	0	0
	Bridges	0	0	0	0
	Road Upgrades	0	0	0	0
	Total	0	0	0	0
BIP	Boat Landing	0	0	0	0
	Barangay Bridges	0	1	0	0
	Grains Solar Dryers	0	1	0	0
	Road Upgrades	0	0	0	0
	Trading Centers	0	0	0	0
	Warehouses/Solar Dryers	0	0	0	1
	Total	0	2	0	1
Grand Total		0	2	0	1

4.4.2. IF BENEFITS ARE DECREASED BY 10%

At the 12% discount rate, 3 projects are sensitive to a 10% decrease in benefits. Of these 3 projects, all are BIPs. This brings to 28 the total number of projects with negative NPVs. At the 3%, however, only one project is sensitive to a decrease in benefits by 10%. Table 36 shows the details of this sensitive project.

Table 36: Number of projects sensitive to a 10% decrease in benefits, by location, by type of project, Mindanao at the 12% and 3% discount rates

Type of Project	Sub-project	Number of Projects - 12%		Number of Projects - 3%	
		ARMM	Non -ARMM	ARMM	Non -ARMM
RIP	Airport	0	0	0	0
	Boat Landing	0	0	0	0
	Bridges	0	0	0	0
	Road Upgrades	0	0	0	0
	Total	0	0	0	0
BIP	Boat Landing	0	0	0	0
	Barangay Bridges	0	1	0	0
	Grains Solar Dryers	0	2	0	0
	Road Upgrades	0	0	0	0
	Trading Centers	0	0	0	0
	Warehouses/ Solar Dryers	0	0	0	1
	Total	0	3	0	1
Grand Total		0	3	0	1

It is noted that 10 projects were not viable projects even at the very low rate of discount even without increasing the cost or decreasing the benefits. These are:

- 1) Kalanganan 2 Boat Landing Project in North Cotabato
- 2) Bulod-San Antonio Box Culvert Construction in Lanao del Norte
- 3) Danlag Pedestrian Footbridge Construction in South Cotabato
- 4) Bislig Borboanan Footbridge Construction in Surigao del Sur
- 5) Balacbaan Box Culvert Construction in Balacbaan, Zamboanga del Norte

- 6) Campo Islam Trading Center in Sulu
- 7) Taytay Manobo Trading Center in Zamboanga Sibugay
- 8) Kabatan Trading Center in Zamboanga del Sur
- 9) Alibangbang Trading Center in Zamboanga Sibugay, and
- 10) Tibao Grains Warehouse Construction in North Cotabato

Details of the results of the sensitivity analysis, by project, are presented in Annex B.

4.5. COMPARISON OF “WITH PROJECT” TO “WITHOUT PROJECT” BARANGAYS

In addition to using the NPV, BCR and EIRR to assess the economic viability of the projects, this study also utilizes the indicators to assess the changes, which the GEM infrastructure projects may have brought to the community. Using these change indicators involves the comparison of “before-the-project” and “after-the-project” situation in the project area, and the comparison of the conditions in the project barangay with the conditions in the control barangay, or comparing the “with-project” situation with the “without project” situation. It should be noted that in most cases the change indicators are being measured as a perception of the survey respondents.

There are other indicators that encompass the total effects of the GEM infrastructure projects. These other indicators are categorized as general indicators. This section presents the general indicators first. When appropriate, a comparison between the barangays without the project and the barangays with the project using the import indicators. In this study, 21 barangays served as control, referring to barangays without the GEM-USAID infrastructure projects.

General Indicators

4.5.1. PERCEIVED BENEFITS FROM THE GEM TRANSPORT INFRASTRUCTURE PROJECTS

As a whole, about 84.6% of the 1,449 sample household respondents report that they have benefited from the GEM infrastructure projects, while 3.5% answer that they have not benefited from the projects, and 11.9% did not give any response to the question. By region, the results show that 77.52% of the ARMM household respondents report that they benefited from the GEM transport infrastructure projects, a little lower than the 89.03% of the non-ARMM household respondents who say that they benefited from the same projects. It is noted that only 1.9% of the household respondents from the non-ARMM areas report that they did not benefit from the GEM transport infrastructure projects, while 6.1% of the household respondents from the ARMM areas say that they were not able to benefit from the GEM transport infrastructure projects.

A breakdown of the sources of benefits of the GEM infrastructure projects for the whole of Mindanao shows that 36.7% of the total responses cited “safer travel” as major benefit from the projects followed by “more trip to the market” with 20.3%; “higher income” with 19.6%; and “more frequent travel around the barangay/municipality” with 15.2%. Responses of the household respondents on the effects of the GEM transport infrastructure projects on the costs and prices of consumer goods and prices appear to be limited, thus only 0.7% of the total responses say that they benefited from “lower cost of farm inputs” and only 1.2% reported “lower cost of consumer goods”. Similarly, only 3.2% of the total responses cite “higher prices of crops” as a benefit, and only 3.1% of the responses report that they “sell more products at distant market” (Table 37). An almost the same percentage of contribution of similar sources of benefits are observed in both the ARMM and non-ARMM areas.

Table 37: Sources of benefits, by subproject

Source of Benefits	Mindanao (1,449)				ARMM (556)				Non-ARMM (893)			
	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes
Have you benefitted from the project constructed by GEM?	1226	51	172	84.61	431	34	91	77.52	795	17	81	89.03
If Yes, how?												
• Higher income	627 (19.6%)				229 (19.5%)				398 (19.8%)			
• More trips to the market	648 (20.3%)				233 (19.8%)				415 (20.6%)			
• More frequent travel around barangay/ Municipality	485 (15.2%)				161 (13.7%)				324 (16.1%)			
• Sell more products at distant market	99 (3.1%)				40 (3.4%)				59 (2.9%)			
• Safer travel	1172 (36.7%)				432 (36.7%)				740 (36.7%)			
• Lower cost of consumer goods	38 (1.2%)				19 (1.6%)				19 (0.9%)			
• Lower cost of farm inputs	22 (0.7%)				14 (1.2%)				8 (0.4%)			
• Higher prices for crops	101 (3.2%)				48 (4.1%)				53 (2.6%)			
• Others (specify)												

Source of Benefits	Mindanao (1,449)				ARMM (556)				Non-ARMM (893)			
	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes
TOTAL (multiple answer allowed)	3,192				1,176				2,016			

4.5.2. PERCEIVED BENEFITS FROM THE GEM GWSD INFRASTRUCTURE PROJECTS

Among the 848 sample household respondents, 80.6% report that they have benefited from the solar dryer infrastructure projects followed by the combination solar dryer and warehouse, trading center and warehouse with 80.4%, 74.7% and 44.4% respectively. This is consistent in ARMM. In the non-ARMM, however, the combination of solar dryer and warehouse appears to be the most beneficial infrastructure (Table 38).

Table 38: Percentage of total respondents who benefited from the subprojects constructed by GEM, by type of subproject, all provinces

Type of Sub-project	Mindanao (848)				ARMM (274)				Non-ARMM (574)			
	Resp.	Yes	No	% Yes	Resp.	Yes	No	% Yes	Resp	Yes	No	% Yes
Solar Dryers	423	341	38	80.6	119	89	19	74.8	304	252	19	82.9
Solar Dryers/ Warehouse	163	131	19	80.4	72	44	16	61.1	91	87	3	95.6
Trading Center	253	189	32	74.7	83	60	13	72.3	170	129	19	75.9
Warehouse	9	4	4	44.4					9	4	4	44.4

In general, benefits of the GWSD infrastructures were derived from higher income/profit (88%) due to lower post-harvest losses (55%). The sources of benefits of the solar dryer, warehouse and the combination was improved quality of crops and sell crops at higher prices. For the trading center, buying more sanitary products recorded to be highest source of benefits followed by selling products at higher prices (Table 39).

Table 39: Sources of benefits, by subproject, all provinces

Source of Benefits	Mindanao (848)		ARMM (274)		Non-ARMM (574)	
	Yes	% of Total	Yes	% of Total	Yes	% of Total
All projects						
Higher income/profit	746	88.0	159	58.0	314	54.7
Lower post harvest losses	473	55.8	76	27.7	99	17.2
Improved quality of Products	175	20.6	63	23.0	247	43.0
Sell higher volume of products	310	36.6	18	6.6	81	14.1
Sell more types of products	99	11.7	14	5.1	41	7.1

Source of Benefits	Mindanao (848)		ARMM (274)		Non-ARMM (574)	
	Yes	% of Total	Yes	% of Total	Yes	% of Total
Lower cost of consumer goods	55	6.5	3	1.1	26	4.5
Higher prices of crops	29	3.4	104	38.0	88	15.3
Solar Dryer and Warehouse						
Sell crops at higher price	220	25.9	74	27.0	146	25.4
Sell when prices are highest	41	4.8	23	8.4	18	3.1
To protect crop from weather	228	26.9	59	21.5	169	29.4
Improve quality of crop	258	30.4	88	32.1	170	29.6
Lower storage cost	65	7.7	25	9.1	40	7.0
Trading Center						
Able to sell products at a higher price	82	9.7	31	11.3	51	8.9
Able to buy more sanitary products	83	9.8	25	9.1	58	10.1
Experiencing better health	60	7.1	34	12.4	26	4.5
Able to compare shop	43	5.1	11	4.0	32	5.6
Able to buy a wider variety of goods	67	7.9	23	8.4	44	7.7
Able to buy at a lower price	70	8.3	21	7.7	49	8.5

4.5.3. INCREASE IN HOUSEHOLD INCOME

The perception of household respondents is that their income has increased after the GEM infrastructure projects are implemented. For the whole of Mindanao, 55.28% reports that their household income has increased, the corresponding figures for ARMM and non-ARMM areas are 55.22% and 55.32% of the household respondents respectively. Results of the survey reveal that for the whole of Mindanao, only 6.63% of the household respondents report a decrease in their household income. Percentage-wise, the ARMM household respondents register the highest percentage of household respondents (7.73%) who say their household income has decreased, while the non-ARMM report the lowest with 5.94. On the other hand, about 18% of the respondents in the Mindanao, ARMM and non-ARMM areas say that their household income has not changed (Table 40). It should be noted that about 20% of the respondents did not answer the question on changes in household income, thus, the row total in Table 40 does not add up to 100%.

Income in the GWSD infrastructures respondents also recorded increased in income from before to after the project. The perception in the increased in income almost did not differ among the GWSD sub-projects (Table 42).

Table 40: Changes in household income in the with-project areas, before GEM versus 2010

Province	No. of Respondents	Increase		Decrease		Remain the Same	
		Freq.	%	Freq.	%	Freq.	%
Mindanao	1,449	801	55.28	96	6.63	264	18.22
ARMM	556	307	55.22	43	7.73	100	17.99
Non-ARMM	893	494	55.32	53	5.94	164	18.37

Table 41: Changes in household income during the period 2002 to 2010, control barangays, by province

Province	No. of Respondents	% Increase	% Decrease	% Remain the Same
Mindanao	479	67.9	8.6	14.2
ARMM	212	78.8	4.3	9.0
• Basilan	30	76.7	6.7	10
• Sulu	30	96.7	0	3.3
• Tawi-tawi	30	93.3	0	3.3
• Lanao del Sur	60	70.0	1.7	13.3
• Maguindanao	62	72.6	9.7	9.7
Non-ARMM	267	59.2	12.0	18.4

Table 42: Changes in household income during the period 2002 to 2010, GWSD infrastructure, all provinces

Type of Sub-project	Mindanao (848)				ARMM (274)				Non-ARMM (574)			
	Re sp.	% Increased	% Decreased	% Remained the same	Re sp.	% Increased	% Decreased	% Remained the same	Re sp.	% Increased	% Decreased	% Remained the same
Solar Dryers	422	52.1	6.9	9.7	119	58.0	10.1	15.1	304	50.0	5.6	7.6
Solar Dryers/Warehouse	163	53.4	4.9	8.6	72	55.6	5.6	18.1	91	51.6	4.4	1.1
Trading Center	253	56.5	6.7	15.4	83	62.7	6.0	10.8	170	53.5	7.1	17.6
Warehouse	9	55.6	11.1	11.1					9	55.6	11.1	11.1

On the other hand, a higher percentage of the respondents in the barangays without the GEM/USAID facility report that their incomes increased from 2002 to 2010. The figure is higher by 12.6% than in areas with the project. This increase in income is most perceived by respondents in the ARMM where 78.8% of the total respondents claimed that their incomes increased. This is especially highest in Sulu and Tawi-tawi where 96.7% and 93.3%, respectively claim a rise in income. In the non-ARMM control areas, the percentage of respondents who claim that there was an increase in income is similar to those in the non-ARMM areas with the project at 59.2%. The percentage of respondents who claim that their income decreased, however, is higher (8.6%) compared to those in areas with the project (Table 43) .

Table 43: Changes in household income during the period 2002 to 2010, Control, all provinces

Province	No. of Respondents	% Increase	% Decrease	% Remain the Same
Mindanao	479	67.9	8.6	14.2
ARMM	212	78.8	4.3	9.0
• Basilan	30	76.7	6.7	10
• Sulu	30	96.7	0	3.3
• Tawi-tawi	30	93.3	0	3.3
• Lanao del Sur	60	70.0	1.7	13.3

Province	No. of Respondents	% Increase	% Decrease	% Remain the Same
• Maguindanao	62	72.6	9.7	9.7
Non-ARMM	267	59.2	12.0	18.4
High Conflict	111	67.6	6.3	10.8
Moderate Conflict	368	67.9	9.2	15.2

4.5.4. UTILIZATION OF GEM INFRASTRUCTURE PROJECTS

Results of the survey reveal that after the implementation of GEM infrastructure projects, there has been an increased in the use of larger vehicles/vessels on the route served by the project. Overall, 84.68% of the household respondents report a shift to larger vehicles after the GEM infrastructure projects have been implemented. The corresponding percentage for the ARMM is 83.27% and for the non-ARMM areas 85.55%. As a whole, the result of the survey shows the breakdown of these shifts as follows: 36% of the total responses reported a shift from motorcycles to motorized tricycles; 24% reported a shift from motorized tricycles to jeeps; 12% reported a shift from jeeps to buses, and about 16% reported a shift from bus to truck. Similarly, as a result of GEM's port projects a little over 7% of the responses say that there is a shift from bancas to a larger vessel, and about 5% indicates that there is a shift from smaller to larger vessels (Table 44).

A comparison of these shifts to larger vehicles as a result of the implementation of GEM infrastructure projects on the ARMM and non-ARMM areas reveals variation of these shifts as perceived by the household respondents. In particular, the percentage of responses on the shift from motorcycle to motorized tricycle is highest in the non-ARMM areas compared to the ARMM areas (39% versus 32%). On the other hand, responses from the ARMM areas reveal a higher percentage indicating a higher percentage (27%) reporting a shift from motorized tricycle to jeep compared to 22% in the non-ARMM areas, but about 20% of the household respondents' responses reported a shift from bus to truck in the non-ARMM areas compared to 10% in the ARMM areas. Obviously, these differences in the utilization of infrastructure projects indicate that in the non-ARMM areas, the upgrading of roads and the construction of bridges has resulted in the increase flow of goods in and outside the area.

The result of the survey showed that the GEM infrastructure projects do not result in a widespread reduction of transport fares. As a whole, only about 31% of the total household respondents report cheaper fares after the GEM infrastructure projects, in contrast, 56.3% of the total household respondents report that they did not pay cheaper fare after the project has been implemented. Note that 12.7% of the respondents did not respond to the question on changes of transport fares. Similar results may be observed in the ARMM and non-ARMM areas. Thus, about 56% of the total household respondents from the ARMM report that they did not pay cheaper fare after the project, while about 56% of the non-ARMM sample households say the same. Correspondingly, 32% of the non-ARMM sample households report that they paid cheaper fare after the GEM infrastructure projects, slightly higher than the 29% of the ARMM sample households who say that they paid cheaper fare.

Table 44: Utilization of transport projects

Source of Benefits	Mindanao (1,449)				ARMM (556)				Non-ARMM (893)			
	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes	Yes	No	No Resp.	% Yes
Since the project was constructed, do larger vehicles use this route?	1227	144	78	84.68	463	67	26	83.27	764	77	52	85.55
If Yes, how?												
• Motorcycle to motorized tricycle	990 (35.97%)				376				614			
• Motorized tricycle to jeep	665 (24.16)				318				347			
• Jeep to bus	331 (12.02%)				162				169			
• Bus to truck	429 (15.58%)				117				312			
• Banca to larger vessel	213 (7.73%)				127				86			
• Smaller vessel to larger vessel	124 (4.5%)				79				45			
TOTAL (multiple responses)	2,752				1,179				1,573			
Since the project was constructed, do you pay a cheaper fare to use this route?	449	816	184	30.99	163	311	82	29.32	286	505	102	32.03

Project Impact Indicators

4.5.5. CHANGE IN EMPLOYMENT

The effects of the GEM infrastructure projects on employment are derived by asking the household respondents on whether they have observed an increase or a decrease in employment in their area after the project/projects have been implemented, or whether employment has remained the same. The results of the survey are presented by region and by project category.

For RIPs, the results of the survey show that as a whole (all regions), 12.42% of the total household respondents say that there has been an increase in employment because of the project, while only 1.27% report that there has been a decrease in employment. A large portion of the household respondents, i.e. 59.23%, says that there is no change in employment. Note that a sizeable portion of the respondents did not answer the question on the effects of GEM infrastructure projects on employment, hence the total employment effects does not add to 100%.

Region-wise, the effects of RIPs vary. In the ARMM, 14.34% of the household respondents report that there has been an increase in employment because of the project. This percentage is double the percentage of the household respondents from the non-ARMM areas that report that there has been an increase in employment because of the RIP projects. On the other hand, household respondents from the non-ARMM areas report no decrease in employment because of the project, while the ARMM household respondents say there has been a 1.73% decrease in employment. In both regions, however, a large portion, 56.08% in the ARMM and 67.86% in the non-ARMM household respondents, report that employment has remained the same after the project has been implemented (Table 45).

The assessment of the household respondents on the employment effects of BIPs show that overall, 11.1% of the sample households report an increase in employment after the BIPs are implemented and only 1.14% say there has been a decrease in employment, while 61.41% answer that there was no change in employment after the BIPs are implemented.

By region, however, the results of the survey show that 17.18% of the household respondents from the ARMM report an increase in employment after the BIPs are implemented, this is again double the percentage of 8.65% obtained from the non-ARMM sample households' responses. The percentage of sample households that answer there has been a decrease in employment is 1.53% in the ARMM and 0.98% in the non-ARMM, while the percentage of sample households who say that employment has remained the same is 56.44% in the ARMM and 63.41% in the non-ARMM areas. As a whole, therefore, both the RIPs and the BIPs have positive effects on employment in both the ARMM and the non-ARMM areas with the ARMM areas reporting a higher percentage of sample households indicating increase in employment.

Table 45: Effects of Regional Impact Projects (RIPs) and Barangay Impact Projects (BIPs) on employment in the ARMM and non-ARMM areas

Region	Change in Employment (%)			Percent of No Response
	Increase	Decrease	Remain the same	
Regional Impact Projects				
Mindanao (n = 314)	12.42	1.27	59.23	27.08
ARMM (n = 230)	14.34	1.73	56.08	27.85

Region	Change in Employment (%)			Percent of No Response
	Increase	Decrease	Remain the same	
Non-ARMM (n = 84)	7.14	0	67.86	25.00
Barangay Impact Projects				
Mindanao (n = 1,135)	11.10	1.14	61.41	26.35
ARMM (n = 326)	17.18	1.53	56.44	24.85
Non-ARMM (n = 809)	8.65	0.98	63.41	26.96
Control Barangays				
Mindanao (n = 479)	16.91	0.42	60.96	21.71
ARMM (n = 212)	19.8	0.47	62.74	16.99
Basilan (n = 30)	0.00	0.00	70.00	30.00
Sulu (n = 30)	40.00	0.00	56.67	3.33
Tawi – tawi (n = 30)	36.67	0.00	53.33	10.00
Lanao del Sur (n = 60)	17.39	0.00	82.61	0.00
Maguindanao (n = 62)	17.74	1.61	54.84	25.81
Non-ARMM (n = 267)	14.61	0.37	59.55	25.47

In terms of a change in employment in the area, on the whole, 60.9% of the respondents claim that the number of employment in the area remained the same. This figure is similar to those in areas with the project. This high percentage of responses is reflected in all areas in Mindanao. The figure is highest in Lanao del Sur, where 82.61% of the respondents affirm this observation. Less than 20% of the respondents say that there was an increase in the number of employment, except in Sulu and Tawi-tawi where 40% and 36.7% of the total respondents, respectively say otherwise. Except for Maguindanao, less than 1% of the total population claims that employment in the area decreased. In Maguindanao, 1.61% of the respondents claim there was a decrease in employment.

The survey result on the change in the status of employment point to a 2.72% increase (70.98% in 2002 to 73.7% in 2010) in the percent fully employed. The percentage of unemployed has decreased from 2.30% in 2002 to 1.67% in 2010.

There has been almost no change in the ARMM while the shift is high in the non-ARMM area where a 4.49% change in percent fully employed is observed (from 59.55% in 2002 to 64.04% in 2010). The percent unemployed has decreased from 3.37% in 2002 to 2.25% in 2010. No respondent from Lanao del Sur and Maguindanao claim of being unemployed during the two periods.

4.5.6. INCREASE IN TOTAL COMMERCIAL ACTIVITY OR SALES AND INVESTMENTS

Almost all of the businesses in the area are of single proprietorship. All businesses in the area claim increases in capital assets, regardless of location. On the whole, there is a 300% increase in corporation, 129.17% in cooperatives, 24.14% in partnerships and 20.82% in single proprietorship (Table 46).

Table 46: Change in the average capital asset of business establishments, all provinces

Type of Business Establishment	Mindanao (471)		ARMM (197)		Non-ARMM (271)	
	No. of Resp.	Average Capital/Total Assets (PhP)	No. of Resp.	Average Capital/Total Assets (PhP)	No. of Resp.	Average Capital/Total Assets (PhP)
		% Change		% Change		% Change
Single Proprietorship	455	20.82	193	38.00	262	7.43
Partnership	3	24.14	3	24.14	0	-
Corporation	1	300.00	0	-	1	300.00
Cooperative	9	129.17	1	100.00	8	106.55

In terms of the average gross revenues/sales/income, there is an increase in revenue and income before and after the project. This is more evident in non-ARMM areas than in the ARMM areas. On the whole, monthly revenues increased by 16.29% while income increased by 15.82% (Table 47).

Table 47: Respondent business establishments' average gross revenue/sales and average income before and after GEM infrastructure projects, all provinces

Item	Mindanao (471)			ARMM (198)			Non-ARMM (273)		
	Before GEM (PhP)	2010 (PhP)	Percent Change	Before GEM (PhP)	2010 (PhP)	Percent Change	Before GEM (PhP)	2010 (PhP)	Percent Change
Average Monthly Revenue	30,373.13	35,321.33	16.29	36,132.06	41,392.13	14.56	24,068.09	30,832.20	28.10
Average Monthly Income	8,600.11	9,961.06	15.82	10,958.66	13,129.22	19.81	5,925.69	7,538.35	27.21

4.5.7. USER FEES, SUCH AS RENTALS FOR MARKET USE, OR TOLLS FOR USE OF TRANSPORT INFRASTRUCTURE

Results of the survey show that the organization (cooperative or LGU) that manages the solar dryers, solar dryer and warehouses, and trading centers charge none or minimal fees on the use of the infrastructure facilities built by GEM. For example, for the use of a solar dryer, the farmer is charged PhP 5 and in some cases the use is free of charge. The same is observed in the use of warehouses. User fees for the use of space within the trading center building is also minimal, e.g. PhP 5 to PhP 10 per stall. Accordingly, the survey resorted to the use of willingness-to-pay approach to obtain an estimate of the amount of user fee that might acceptable to the clientele for the facilities.

The survey finds that there are no toll fees charged to the users of road, bridges including footbridges constructed by GEM. The same is true for passengers of boats using the GEM ports projects.

4.5.8. CHANGES IN POVERTY RATES

The results of the survey show that as a whole, the average monthly income of households of household respondents has increased from PhP 6,380.56 before GEM to PhP 8,514.78 in 2010 or an increase of 33.44% after the GEM infrastructure projects have been implemented. By region, the corresponding change in the ARMM is from PhP 6,496.17 average household income before GEM to PhP8,475.18 in 2010 or a 30.46% increase in average household monthly income in 2010, while in non-ARMM areas, the average monthly household income increased from PhP 6,308.58 before GEM to PhP 8,539.44 in 2010 or an increase of 35.36%. Using the t-test for independent samples, the result was significant. This means that there was a significant increase in income before and after the project. These sizeable increases in household income, however, appear to have no impact on the percentage of population below poverty line.

Using the annual per capita poverty threshold¹ for 2003 of PhP 10,196.00 and PhP 16,287.00 for the annual per capita poverty threshold for 2009, the results of the survey show that the percentage of population below poverty line has increased from 45.68% before GEM to 54.87% in 2010 or an increase of 9.19% percentage points after the GEM infrastructure projects are implemented in all regions (Table 48). The percentage of the sample population below poverty threshold has also increased in the ARMM from 39.75% before GEM to 50.9% in 2010, while in the non-ARMM areas, the percentage of sample population below the poverty threshold has increased from 48.88% before GEM to 57.45% in 2010.

Table 49 shows the monthly income estimates of the control barangays. It can be seen from the tables that there is a shift to higher income brackets from 2002 to 2010. Notable is the decrease in the two lowest income brackets to the 3rd lowest income bracket and the shift of the two respondents from the 3rd highest income level to the top two highest income levels. This pattern is reflective of the ARMM but not for the non-ARMM areas. There is an increase in the lowest income level in the non-ARMM areas from 2002 to 2010. This means that 5 more people became poor in 2010. The median income, on the whole increased from PhP12,012.00 in 2002 to PhP17,040.00 in 2010. The different in income, however, was not statistically significant. The increase in income is more evident in the ARMM areas where the median income rose from PhP14,460.00 in 2002 to PhP22,800.00 in 2010. In contrast, the non-ARMM areas register a median income of P10,800 in 2002 to P13,100.40 in 2010. Some 37.0% of the respondents lived below the poverty threshold in

¹ The poverty threshold for both 2003 and 2009 came from the NSCB. Please note, poverty thresholds are in current prices.

2002, whereas there are 47% of the respondents who lived below the poverty line in 2010. The number of respondents who live below the poverty line is higher in the non-ARMM areas at 47.9% in 2002 to 60.3% in 2010.

Table 48: Monthly household income interval estimate, all projects

Amount in PhP	Mindanao (1,449)			ARMM (556)			Non-ARMM (893)		
	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	201 (Freq.)	Difference (2010-Before)
0 to 5,000	856	674	-182	320	223	-97	536	451	-85
5001 to 10,000	367	421	54	162	201	39	205	220	15
10,001 to 15,000	117	174	57	37	76	39	80	98	18
15,001 to 20,000	45	88	43	16	27	11	29	61	32
20,001 to 25,000	24	32	8	7	14	7	17	18	1
25,001 to 30,000	9	16	7	4	5	1	5	11	6
30,001 to 35,000	5	10	5	2	3	1	3	7	4
35,001 to 40,000	2	8	6	0	2	2	2	6	4
40,001 to 45,000	1	6	5	1	0	-1	0	6	6
45,001 to 50,000	1	3	2	0	1	1	1	2	1
50,001 to 55,000	0	1	1	0	0	0	0	1	1
55,001 to 60,000	0	0	0	0	0	0	0	0	0
60,001 to 65,000	1	1	0	0	0	0	0	1	1
65,001 to 70,000	1	2	1	0	0	0	1	2	1

Amount in PhP	Mindanao (1,449)			ARMM (556)			Non-ARMM (893)		
	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	201 (Freq.)	Difference (2010-Before)
Average (Mean)	6,380.56	8,514.78	2134.22	6,496.17	8,475.18	1979.01	6,308.58	8,539.44	2230.86
Median	4,500.00	6000.00	1500	5,000.00	6,550.00	1550	4,500.00	6,000.00	1500
Standard Deviation	8,180.59	8,662.37		9,602.17	6,431.13		7,159.23	9,801.68	
Percent below Poverty Threshold	45.68	54.87	+9.19	39.75	50.90	+11.15	48.88	57.45	+8.57
Annual Per Capita Poverty Threshold (www.nscb.gov.ph)	2009-16,287.00 2003-10,196.00			2009-16,334.00 2003-9,664.00			2009-16,277.60 2003-10,302.4		

Table 49: Monthly household income interval estimate, control barangays, all provinces, 2002 and 2010

Amount in PhP	Mindanao (479)			ARMM (212)			Non-ARMM (267)		
	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)
0 to 5,000	224	197	-27	96	64	-32	128	133	5
5001 to 10,000	126	114	-12	56	53	-3	70	61	-9
10,001 to 15,000	54	82	28	30	46	16	24	36	12
15,001 to 20,000	29	28	-1	18	12	-6	11	16	5
20,001 to 25,000	7	17	10	6	11	5	1	6	5
25,001 to 30,000	3	10	7	1	7	6	2	3	1
30,001 to 35,000	2	5	3	0	1	1	2	4	2
35,001 to 40,000	3	5	2	2	5	3	1	0	-1
40,001 to 45,000	0	3	3	0	3	3	0	0	0
45,001 to 50,000	0	3	3	0	3	3	0	0	0
50,001 to 55,000	0	1	1	0	0	0	0	1	1
55,001 to 60,000	2	0	-2	0	0	0	2	0	-2
60,001 to 65,000	0	1	1	0	0	0	0	1	1
65,001 to 70,000	0	1	1	0	1	1	0	0	0

Amount in PHP	Mindanao (479)			ARMM (212)			Non-ARMM (267)		
	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)	Before GEM (Freq.)	2010 (Freq.)	Difference (2010-Before)
Average (Mean)	18,818.5	25,407.3	-6,588.80	23,017.8	30,739.3	7,721.5	15,484.3	19,629.1	4,144.8
Median	12,012.0	17,040.0	5,048.00	14,460.0	22,800.0	8,340.0	10,800.0	13,100.4	2,300.4
Standard Deviation	26,114.3	27,404.9		32,530.1	25,985.1		18,996.2	22,115.0	
Percent below Poverty Threshold	37.0	47.0	10.0	20.8	30.7	9.9	47.9	60.3	12.4
Annual Per Capita Poverty Threshold (www.nscb.gov.ph)	2009-16,287.00 2003-10,196.00			2009-16,334.00 2003-9,664.00			2009-16,277.60 2003-10,302.4		

4.5.9. BENEFITS TO AGRICULTURE SECTOR

4.5.9.1. Increases in agricultural Production

There is a very high non-response for portion of the survey questionnaire. As a whole, there is no clear emerging pattern, it appears that farm production either increased slightly or remained the same (Table 50).

Table 50: Effects of GEM infrastructure projects on farm production, by sub-project, all provinces

Type of Sub-project	Total Resp.	Mindanao (1,449)			Total Resp.	ARMM (556)			Total Resp.	Non-ARMM (893)		
		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same
RIP	314	%	%	%	230	%	%	%	84	%	%	%
Airport	7	0.0	0.0	0.0	7	0.0	0.0	0.0	0	-	-	-
Ports/Boat Landing	66	3.0	0.0	0.0	66	3.0	0.0	0.0	0	-	-	-
Road Upgrades	102	11.8	9.8	11.8	72	9.7	11.1	8.3	30	16.7	6.7	20.0
Bridges	139	5.0	2.2	10.8	85	5.9	2.4	12.9	54	3.7	1.9	7.4
BIP	1,135				326				809			
Boat landings	165	3.6	0.6	5.5	75	1.3	1.3	6.7	90	5.6	0.0	4.4

Type of Sub-project	Total Resp.	Mindanao (1,449)			Total Resp.	ARMM (556)			Total Resp.	Non-ARMM (893)		
		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same		Increased Farm Production	Decreased Farm Production	Farm Production Remained the same
Bridges	32	3.1	3.1	0.0	32	3.1	3.1	0.0	0	-	-	-
Barangay Bridges	754	11.8	4.8	10.9	161	6.2	7.5	12.4	593	13.3	4.0	10.5
Road improvements	184	12.5	6.5	13.6	58	6.9	3.4	5.2	126	15.1	7.9	17.5

The pattern is similar with grains solar dryers, warehouses and trading centers, albeit much relatively higher compared to the transport infrastructure projects.

Total respondents claim an increase in farm production and 19.4% claim farm production remained the same. With solar dryers/warehouses, 55.2% of the respondents claimed that production either increased or remained the same. The response is equally split between these two responses. The effect of the trading centers on farm production is not felt by the respondents. The respondents are ambivalent to this question.

Table 51: Effects of GEM infrastructure projects on farm production, by sub-project, all provinces (in %), grains infrastructure projects

Type of Sub-project	Mindanao (848)				ARMM (274)				Non-ARMM (574)			
	Res p.	Increase	Decrease	Remained the same	Res p.	Increase	Decrease	Remained the same	Res p.	Increase	Decrease	Remained the same
Solar Dryers	423	28.1	11.1	19.4	118	29.4	9.2	23.5	304	27.6	11.8	17.8
Solar Dryers/Warehouse	163	27.6	8.59	27.6	72	23.6	5.6	30.6	91	30.8	11.0	25.3
Trading Center	253	4.35	1.98	4.74	83	6.0	1.2	9.6	170	3.5	2.4	2.4
Warehouse	9	11.1	0	55.6					9	11.1	0.0	55.6

The common sentiment observed is that production has remained the same from 2002 to 2010. On the whole, only about 13% of the total respondents claim that production remained the same. It is 11.79% in the ARMM and 13.86% in the non-ARMM areas. The 30 respondents in Tawi-tawi did not respond. Highest response is recorded in Basilan where 26.67% said that production did not increase nor decrease. Some 11.06% of the respondents in Mindanao claim an increase in production. This is higher in the non-ARMM areas where 12.36% of the respondents said an increase in production; whereas it is 9.43% in the ARMM areas (Table 52).

Table 52: Changes in farm production, control barangays, 2002 and 2010

Province	Total Number of respondents	Increased Farm Production (number)	Decreased Farm Production (number)	Farm Production Remain the Same (number)	% Increased in Farm Production	% Decreased in Farm production	% farm production Remained the same
Mindanao	479	53	34	62	11.06	7.10	12.94
ARMM	212	20	14	25	9.43	6.6	11.79
•Basilan	30	1	6	8	3.33	20.00	26.67
•Sulu	30	0	0	0	0.00	0.00	0.00
•Tawi-tawi	30	2	0	0	6.67	0.00	0.00
•Lanao del Sur	60	4	2	6	6.67	3.33	10.00
•Maguindanao	62	13	6	11	20.97	9.68	17.74
Non-ARMM	267	33	20	37	12.36	7.49	13.86
High Conflict	111	10	10	15	9.00	9.00	13.50
Moderate Conflict	368	44	25	47	11.96	6.79	12.77

Table 53 shows the change in crop production by sub sector and by major commodity. On the whole, there is an increase in the production of all types of palay. Production of irrigated rice increased by 1.09%, rainfed rice by 2.82% and upland rice by 19.81%. Corn production, however, has decreased by 2.60%. There is, however, a decrease in the number of livestock and poultry production before and after the project in transportation projects.

Among grains infrastructure projects, increase in production is mixed. Production in irrigated and rainfed rice but production in upland rice has decreased. Corn production is observed to have decreased.

Table 53: Changes in crops and livestock production, transport infrastructures, 2002 and 2010

Item	Mindanao (1,449)						ARMM (556)						Non-ARMM (893)					
	Before GEM		2010		% Change		Before GEM		2010		% Change		Before GEM		2010		% Change	
	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)
Palay																		
• Irrigated	1.26	5.83	1.27	5.89	1.20	1.09	1.24	4.76	1.26	5.12	1.74	7.46	1.26	6.27	1.27	6.23	0.98	-0.70
• Rainfed	1.52	5.45	1.46	5.60	-3.42	2.82	1.66	3.83	1.62	3.94	-2.82	2.77	1.39	6.91	1.34	6.97	-3.28	0.87
• Upland	2.07	4.33	2.05	5.16	-0.83	19.18	2.64	6.34	2.54	6.73	-3.69	6.18	1.83	3.49	1.85	4.43	1.46	27.07
Corn	1.53	4.43	1.50	4.31	-2.59	-2.60	1.78	5.75	1.66	5.08	-7.25	-11.69	1.41	3.76	1.42	3.94	0.61	4.97
Livestock	No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change	
• Cattle	128		127		-0.78		70		54		-22.86		58		73		25.86	
• Carabao	188		182		-3.19		85		52		-38.82		103		130		26.21	
• Swine	273		196		-28.21		10		9		-10.00		263		187		-28.90	
• Goat	265		237		-10.57		46		46		0.00		219		191		-12.79	
• Chicken	2891		2329		-19.44		1517		879		-42.06		1374		1450		5.53	
Others	3004		936		-68.84		733		650		-11.32		2271		25270		1012.73	

Table 54: Changes in crops and livestock production, GWSD infrastructure, 2002 and 2010

Item	Mindanao (848)						ARMM (274)						Non-ARMM (574)					
	Before GEM		2010		% Change		Before GEM		2010		% Change		Before GEM		2010		% Change	
Palay	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)
Irrigated	0.33	24.76	0.84	25.21	152.67	1.81	0.32	8.62	0.32	8.35	2.30	-3.09	32.47	1.08	33.25	220.10	2.43	32.47
Rainfed	0.23	37.64	0.23	44.50	-0.51	18.23	0.28	14.55	0.30	14.79	6.49	1.66	48.66	0.20	58.67	-5.00	20.59	48.66
Upland	0.12	23.46	0.09	22.52	-19.19	-3.99	0.18	36.66	0.11	38.28	-	4.41	17.16	0.09	15.00	0.00	-	17.16
Corn	1.02	201.92	0.99	192.23	-3.01	-4.80	0.56	438.84	0.42	407.49	-	-7.14	88.82	1.26	89.48	1.83	0.74	88.82
Livestock	No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change	
Cattle	65		84		29.23		23		33		43.48		42		51		21.43	
Carabao	150		146		-2.67		62		41		-33.87		88		105		19.32	
Swine	110		86		-21.82		23		23		0.00		87		63		-27.59	
Goat	151		254		68.21		67		135		101.49		84		119		41.67	
Chicken	1525		1855		21.64		659		705		6.98		866		1150		32.79	

Table 55 shows the change in crop production by sub sector and by major commodity. On the whole, there is a decrease in both the area and production of irrigated rice. Production of rainfed rice and upland rice, however, has increased by 117.23% and 78.12%, respectively. Corn hectarage contracted by 7.41%, but the production increased by 47.76%. Most of the increase comes from the non-ARMM areas than in the ARMM areas. In terms of the livestock sub sector, there was an increase in the production of cattle, goat chicken and other livestock but there was a decrease in the production of swine and carabao.

Table 55: Changes in crops and livestock production, control barangays, 2002 and 2010

Item	Mindanao (1,449)						ARMM (556)						Non-ARMM (893)						
	Before GEM		2010		% Change		Before GEM		2010		% Change		Before GEM		2010		% Change		
	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	Area (Has.)	Prod. (MT)	
Palay																			
Irrigated	1.34	4.40	1.24	4.15	-6.82	-5.73	1.60	5.34	1.44	5.01	-10.00	-6.29	0.99	3.22	0.97	3.02	-1.48	-6.34	
Rainfed	1.49	3.05	1.43	3.20	-3.75	5.02	1.63	3.60	1.75	3.96	7.69	10.10	1.13	1.69	0.75	1.79	-33.33	6.14	
Upland	1.15	1.70	1.15	1.63	0.00	-4.46	1.10	1.92	1.11	1.77	1.01	-7.98	1.19	1.54	1.17	1.54	-1.21	0.05	
Corn	1.66	4.22	1.58	4.01	-5.06	-4.88	1.28	4.10	1.28	3.59	0.00	-12.57	1.87	4.27	1.74	4.23	-7.22	-1.15	
Livestock	No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change		No. Of Heads		No. Of Heads		% Change		
Cattle	49		69		40.82		1.91		2.4		25.65		2.5		2.25		-10		
Carabao	75		74		-1.33		1.5		1.37		-8.67		1.74		1.57		-9.77		
Swine	82		68		-17.07		2.8		2.19		-21.79		1.86		1.57		-15.59		
Goat	116		119		2.59		3.9		4.89		25.38		2.27		2.6		14.54		
Chicken	639		774		21.13		9.57		8.9		-7		8.24		9.42		14.32		
Others	24		56		133.33		2		14		600		1.53		2		30.72		

4.5.10. INCREASE IN CULTIVATED LAND AREA

For this indicator, farm land is used as cultivated land area. Results of the survey reveal that as a whole, the implementation of GEM infrastructure projects do not affect considerably the farm land area. A major reason perhaps why this is so is that not many households included in the sample or within the influence of the infrastructure projects do not own land or are not engaged in farming. Thus, it is noted that a large percentage of household respondents elected not to answer the question on changes in cultivated area because they are not engaged in farming. Nevertheless, for those who answered the question, the results show that for the RIPs, 4.14% of the total household respondents report an increase in farm area, while 2.55% said there is a decrease in farm area while 24.2% said that their farm area remained the same. Note that for the entire sample households, 69.11% did not respond to the question. By region, only 2.61% of the household respondents report an increase in their farm area due to the RIPs and 3.04% indicate that there has been a decrease in their farm area, while some 16.52% say that their farm area remained the same. The highest percentage of household respondents that report an increase in their farm area is reported by the non-ARMM areas with 8.33%. The non-ARMM respondents also register the lowest percentage of sample households indicating a decrease in their farm area with 1.19%, but also return the highest percentage of the sample households that report no change in their farm area with 44.05%. Note that both the ARMM and the non-ARMM register very high percentage of respondents who did not answer the question (Table 55).

Table 56: Effects of RIPs and BIPs on farm area in ARMM and non-ARMM areas

Region	Change in Farm Area (%)			Percent of No Response
	Increase	Decrease	Remain the same	
Regional Impact Projects				
Mindanao (n = 314)	4.14	2.55	24.2	69.11
ARMM (n = 230)	2.61	3.04	16.52	77.83
Non-ARMM (n = 84)	8.33	1.29	44.05	46.43
Barangay Impact Projects				
Mindanao (n = 1,135)	5.20	1.5	35.51	57.79
ARMM (n = 326)	6.44	3.68	26.38	63.50
Non-ARMM (n = 809)	4.70	0.62	39.31	55.37
Control Barangays				
Mindanao (n = 479)	6.68	4.18	31.73	57.41
ARMM (n = 212)	4.26	4.72	27.36	63.66
Basilan (n = 30)	3.33	26.67	70.00	0.00

Region	Change in Farm Area (%)			Percent of No Response
	Increase	Decrease	Remain the same	
Sulu (n = 30)	0.00	0.00	0.00	100.00
Tawi – tawi (n = 30)	6.67	0.00	0.00	93.33
Lanao del Sur (n = 60)	0.00	0.00	45.65	54.35
Maguindanao (n = 62)	9.68	3.23	25.81	61.28
Non-ARMM (n = 267)	8.61	3.75	35.21	52.43

On the effects of the BIPs on farm area, as a whole, 5.2% of the household respondents indicate that there was an increase in their farm area, while only 1.5% say their farm area has decreased and some 35.51% report that their farm area remained the same. By region, 6.44% of the household respondents from the ARMM report an increase in farm area, but 3.64% say that their farm area has decreased while 26.38% said that there was no change in their farm area. The percentage of households who report an increase in their farm area due to the implementation of the BIPs in the non-ARMM areas is smaller at 4.7%. It is noted, however, that only 0.62% of the household respondents in the non-ARMM say that their farm area has decreased, while 39.31% reveal that their farm area remained the same.

The non-response is very high for this question is very high at 57.41% in the control barangays. Of those who responded, they claim that the land they devoted to the cultivation of crops remained the same. On the whole, some 31.73% say that the farm area remained the same. This is 7.53% higher than those in areas with the project. In the ARMM, 27.36% claim that the area remained the same while in the non-ARMM areas it was 35.21%. The response is even higher in Basilan where it registers 70%. Some 6.68% of the respondents claim that there was an increase in farm area. This is 2.54% higher than in areas with the GEM/USAID projects.

Comparing the differences in the farm area between with and without the project areas, results showed that the change in the farm areas were higher in the project areas than in the without project areas.

4.6. PEACE AND SECURITY OUTCOMES

One of the objectives often attached to development projects in Mindanao is that the project will improve the peace and security condition in the project area. Indeed, by concentrating investments on infrastructure projects in the high conflict and moderate conflict areas in Mindanao, GEM-USAID underlined explicitly and implicitly the ultimate role of those projects, i.e. that they will contribute towards the alleviation of conflict condition in the project areas.

To find out the peace and security outcomes of GEM infrastructure projects, the household survey questionnaire includes, among others, questions on the number of incidence of conflict in the barangay where they reside before GEM or before 2002 and after GEM or in 2010; and the perception of respondents on the contribution of the projects on peace and security. The change in the peace and security in the project areas was calculated by comparing the “before-project” with the “after-project” condition. Furthermore, the changes brought about by the GEM infrastructure projects on peace and security in the project areas are compared with the changes in peace and security condition in the Control barangays to find out the difference of the “with project” effects from the “without project” effects.

To supplement statistics on the incidence of conflict in the project area, this section also includes the result of the perception of the survey respondents on the effects of the GEM infrastructure projects in the project areas.

4.6.1. INCIDENCE OF CONFLICT, MINDANAO, ARMM, NON-ARMM AND CONTROL BARANGAYS

Table 57 presents the number of incidence of conflict under 8 categories, namely: (1) Rido/clan feud; (2) Encounter between the military and rebel groups; (3) Incidence of insurgent bombing within the barangay; (4) Incidence of insurgent bombing in neighboring barangays; (5) Kidnapping; (6) Murder; (7) Thief, and (8) Domestic violence. Changes in the incidence of conflict for the with-project barangays are calculated at the aggregate level, i.e. Mindanao level or ARMM plus non-ARMM; by ARMM, and by non-ARMM. Changes in the incidence of conflict in the Control barangays are presented under the Control category. In addition, the incidence of conflict before and after the project per barangay is also calculated. It is also noted that because of the large sample size on the project barangays, the count on number of incidences of conflict in the project barangays are much higher compared to those in the Control barangays. To remove the difference in sample size, the average number of incidence of conflict is calculated. Thus, the average number of incidence of conflict per barangay between the “with-project” and “without-project” is done by comparing their averages.

Result of the survey show that the incidence of rido/clan war in the barangays where the GEM infrastructure projects are located is reduced by as much as -59% in the non-ARMM areas and -54% in the ARMM areas or an aggregate reduction of rido/clan war in all project barangays by -56%. These percentage reductions in the incidence of rido/clan war in project areas are more than double the percentage reduction of rido/clan war in the Control barangays over the same period of -23%. The same conclusion on the considerable reduction of the incidence of conflict in the project barangays may be seen in the average number of rido/clan war before and after the project. Before the GEM infrastructure projects, the average incidence of rido/clan war in the ARMM per barangay was 3.29, this dropped to 1.51 in 2010, while in the non-ARMM project areas the average incidence of rido/clan war before the project was 0.88, in 2010 the average rido/clan war per barangay was 0.36. For both ARMM and non-ARMM project areas therefore, the average incidence of rido/clan war is reduced by more than 50%. On the other hand, the average number of incidence of rido/clan

war in the control barangays was 2 before 2000 and 1.51 in 2010 or a reduction of the incidence of rido/clan war over the same period of only -22.5% (Table 57).

The survey also shows that the percentage reduction of the number of encounters between the military and the rebel groups are higher in the project areas compared to those in the Control barangays. The steepest decline in the number of encounters between the military and the rebel groups occurred in the ARMM barangays where the GEM infrastructure projects are located with reduction of -72%, followed by the non-ARMM project areas with -67%. The percentage reduction on the number of encounter between the military and the rebel groups during the same period is -56%. The result of the survey show that before the project, the average number of encounter between the military and the rebel groups in the ARMM project barangays is 1.39 and this drops to 0.39 in 2010. The corresponding figure in the Control barangay is 0.90 before 2002 and 0.40 in 2010.

The number of incidence of insurgent bombing within the barangay appears to have been reduced considerably with the GEM infrastructure projects especially in the ARMM project barangays. Thus, incidence of insurgent bombing with the barangay in ARMM is reduced by 85% in 2010 compared to before project. It is noted however that the number of incidence of insurgent bombing within the Control barangays is reduced by -81% over the same period. It is also interesting to note that based on the perception of the respondents from the Control barangays, the incidence of insurgent bombing in the neighboring barangays is reduced by -80% from 2002 to 2010. This perception converges with the considerable reduction on the incidence of insurgent bombings in project barangays both in the ARMM and non-ARMM areas.

The average number of incidence kidnapping in the ARMM before the project registers the highest with 1.35 per barangay compared to 0.3 for the Control barangays and 0.08 in the non-ARMM barangays. In 2010, the average number of kidnapping per barangays in the ARMM project areas is reduced to 0.94 or a reduction of -30%, while the reduction of kidnapping in the control barangays is -17%. It is interesting to note that the number of kidnapping in the non-ARMM project areas increased by 62% over the same period. This supports the anecdotal information that incidence of kidnapping is rampant in some areas of Mindanao.

Results of the survey also show that percentage-wise, the GEM infrastructure projects appear to have reduced considerably the incidence of murder in the ARMM and the non-ARMM project areas compared to those in the control barangays during the period from 2002 or before GEM infrastructure projects to 2010 or after GEM infrastructure projects. Thus, the largest percentage decline on murder is registered by the ARMM barangays with -67% followed by the non-ARMM barangays with -60%. On the other hand, the incidence of murder is reduced by -43% in the Control barangays during the same period.

The highest average incidence of thief in 2002 (or before GEM infrastructure projects) is registered by the Control barangays with 8.9 per barangay followed by the ARMM barangays with 4 and the non-ARMM barangays with 2.98. In 2010 (or after GEM infrastructure projects) the average number of thief per barangay in the Control is 4.9 followed by the non-ARMM barangays with 2, and the ARMM with 1.39. The largest reduction in the number of incidence of thief is exhibited by the ARMM barangays with -65% followed by the Control barangays with -45% and the non-ARMM barangays with -33%.

The greatest reduction on the incidence of domestic violence is registered by the ARMM barangays with -87% while the non-ARMM barangays reported a reduction of domestic violence of only -30%. The Control barangay respondents reported no incidence of domestic violence in 2002 (before GEM) and only 1 is reported in 2010 (after GEM).

Table 57: Changes in the incidence of conflict in with-project (experimental) and without-project (control) areas, before (2002) and after (2020)

	Rido/Clan feud		Encounter between military and rebel groups		Incidence of insurgent bombing within the barangay		Incidence of insurgent bombing in neighboring barangays		Kidnapping		Murder		Thief		Domestic Violence	
	BEFORE	2010	BEFORE	2010	BEFORE	2010	BEFORE	2010	BEFORE	2010	BEFORE	2010	BEFORE	2010	BEFORE	2010
Aggregate (projects)	302	132	173	54	156	44	198	55	79	67	255	96	673	388	181	68
• ARMM	161	74	68	19	73	11	97	32	66	46	93	31	196	68	104	14
• Non-ARMM	141	58	105	35	83	33	101	23	13	21	162	65	477	320	77	54
Control	40	31	18	8	11	2	15	3	6	5	35	20	178	98	0	2
Percentage Change																
Aggregate (projects)	-56.29		-68.78		-71.79		-72.22		-15.19		-62.35		-42.35		-62.43	
ARMM	-54.04		-72.05		-84.93		-67.01		-30.3		-66.67		-65.31		-86.54	
Non-ARMM	-58.87		-66.67		-60.24		-77.23		61.54		-59.88		-32.91		-29.87	
Control	-22.50		-55.56		-81.82		-80.00		-16.67		-42.86		-44.94		-	
Average per Barangay																
Aggregate (projects)	1.44	0.63	0.83	0.26	0.74	0.21	0.94	0.26	0.38	0.32	1.22	0.46	3.22	1.85	0.87	0.32

	Rido/Clan feud		Encounter between military and rebel groups		Incidence of insurgent bombing within the barangay		Incidence of insurgent bombing in neighboring barangays		Kidnapping		Murder		Thief		Domestic Violence	
ARMM	3.29	1.51	1.39	0.39	1.49	0.22	1.98	0.65	1.35	0.94	1.90	0.63	4.00	1.39	2.12	0.29
Non-ARMM	0.88	0.36	0.66	0.22	0.52	0.21	0.63	0.14	0.08	0.13	1.01	0.41	2.98	2.00	0.48	0.34
Control	2	1.55	0.9	0.4	0.55	0.1	0.75	0.15	0.3	0.25	1.75	1	8.9	4.9	0	0.1

4.7.2 RESULTS OF THE STATISTICAL TEST ON THE INCIDENCE OF CONFLICT IN “WITH-PROJECT” AND “WITHOUT-PROJECT” BARANGAYS

To find out whether the reduction of the incidence of conflict in each of the 8 categories is statistically significant, t-test was conducted on the paired values, i.e. the Year 2002 (before GEM) and the Year 2010 values for both the “with-project” and “without-project” barangays. Tables 58 and 59 present the results of the t-test on the incidence of conflict under 8 categories in the “with-project” barangays and the “without-project” or Control barangays.

Table 58 (last column) shows the reduction of conflict in the “with-project” barangays are all highly significant, except in the kidnapping category wherein the reduction during the before GEM (Year 2002) to Year 2010 is not statistically significant. In other words, although as a whole, kidnapping in the “with-project” barangays has been reduced by -15% during the period 2002 (before GEM) to 2010, this reduction, statistically is not different from zero. The reason for this, of course, is that the reduction is not large enough, and there is mixed trend on the incidence of kidnapping in the ARMM and the non-ARMM barangays. In particular, although the reduction of kidnapping in the ARMM is -30%, the incidence of kidnapping in the non-ARMM barangays has increased by +62% (Table 58).

Table 58: Test of significances of the difference between the before GEM and the 2010 values of incidence of conflict in "with-project" barangays

		Paired Differences							Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	
					Lower	Upper			
Pair 1	RIDO02 - RIDO10	.81340	2.90368	.20085	.41743	1.20936	4.050	208	.000
Pair 2	ENC02 - ENC10	.56938	1.31054	.09065	.39066	.74809	6.281	208	.000
Pair 3	INC02 - INC10	.53589	2.91216	.20144	.13876	.93301	2.660	208	.008
Pair 4	INCNEIG02 - INCNEIG10	.68421	3.15555	.21827	.25390	1.11452	3.135	208	.002
Pair 5	KID02 - KID10	.05742	.85853	.05939	-.05966	.17449	.967	208	.335
Pair 6	MURDER02 - MURDER10	.76077	2.12589	.14705	.47086	1.05067	5.173	208	.000
Pair 7	THEIF02 -	1.36364	3.83203	.26507	.84107	1.88620	5.144	208	.000

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
	THEIF10								
Pair 8	DOM02 - DOM10	.54067	3.17737	.21978	.10738	.97396	2.460	208	.015

Results of the t-test on the reduction of the incidence of conflict under eight categories in the “without-project” or Control barangays revealed that except for the reduction of murder, all other categories of the incidence of conflict in the “without-project” barangays are statistically not significant. In other words, the difference between the number of incidence of conflict in Year 2002 and Year 2010, with the exception of murder, is statistically not different from zero for the rest of the 7 categories, namely: Rido/clan feud; Encounter between the military and rebel groups; Incidence of insurgent bombing within the barangay; Incidence of insurgent bombing in neighboring barangays; Kidnapping; Thief, and Domestic violence (Table 59).

Table 59: Test of significance of the difference between Year 2002 and Year 2010 values of incidence of conflict in "without-project" barangays

Category of Conflict		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t-value	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	RIDO02 - RIDO10	.45000	2.45967	.55000	-.70116	1.60116	.818	19	.423
Pair 2	ENC02 - ENC10	.50000	1.82093	.40717	-.35222	1.35222	1.228	19	.234
Pair 3	INC02 - INC10	.45000	1.46808	.32827	-.23708	1.13708	1.371	19	.186
Pair 4	INCNEIG02 - INCNEIG10	.60000	1.84676	.41295	-.26431	1.46431	1.453	19	.163
Pair 5	KID02 - KID10	.05000	.22361	.05000	-.05465	.15465	1.000	19	.330
Pair 6	MURDER02 - MURDER10	.75000	1.51744	.33931	.03982	1.46018	2.210	19	.040
Pair 7	THIEF02 - THIEF10	4.00000	13.38499	2.99297	-2.26437	10.26437	1.336	19	.197

Category of Conflict		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t-value	df	Sig. (2-tailed)
					Lower	Upper			
Pair 8	DOM02 - DOM10	-.10000	.44721	.10000	-.30930	.10930	-1.00	19	.330

The results of the survey on peace outcomes provide a very strong evidence that the GEM infrastructure projects have statistically reduced the incidence of Rido/clan feud; Encounter between the military and rebel groups; Incidence of insurgent bombing within the barangay; Incidence of insurgent bombing in neighboring barangays; Murder; Thief, and Domestic violence in the “with project” barangays. Not only that the percentage reduction of incidence of conflict is higher in the “with-project”, except on the “Incidence of bombing in neighboring barangays” compared to the Control barangays, the reduction of incidence of conflict in the “with-project” barangays are all statistically significant except on kidnapping. This is in contrast to the “without-project” barangays where only the reduction on the incidence of murder is statistically significant. It may be concluded therefore that the GEM infrastructure projects have contributed considerably on the improvement of peace and security of the project barangays, more so in the ARMM project barangays.

4.6.2. ANECDOTAL SUMMARY OF THE RESPONDENTS’ PERCEPTION ON THE PEACE AND SECURITY EFFECTS OF THE GEM INFRASTRUCTURE PROJECTS

The section presents the survey respondents’ perception on the peace and security effects of the GEM infrastructure projects.

Overall, some 24% of the 5,399 responses to questions asked during the barangay FGDs signify that things have gotten better in their area because of the GEM-USAID infrastructure projects. Percentage-wise, this is highest among other categories taking into account the entire number of responses of FGD participants. By province, the highest percentage of response that things have gotten better because of the GEM-USAID infrastructure projects is registered by Surigao del Sur with 33% , and the lowest is exhibited by Lanao del Sur with 20.3%. The rest of the provinces included in the survey register percentages between these two values. Respondents know that the projects have responded to some of their needs (such as having dedicated post-harvest facility to use, having a bridge that allow their children to safely cross rivers and creeks, and having a convenient place to conduct trading activities). They find that the facilities can be used for other social purposes – such as the warehouses that have temporarily sheltered evacuees, trading centers that served as community meeting place, solar driers that function as sports facility. They interpret GEM’s infrastructure project as a manifestation of the US and Philippine governments’ concern for poverty-stricken, conflict-affected communities. Respondents say that the projects symbolize hope for the community, serving as their rallying point to work together and make the most of their resources.

Relatedly, there is a sizeable number of respondents who are strongly convinced of the influence of GEM projects on the peace and security of their communities. As a whole, about 6% of the total responses indicate that “violence involving the MILF, or the NPA, or the ASG, or the clans would have been different today without the GEM-USAID infrastructure projects. On the other hand, about 4% indicate that the violence in their area is not related to the projects. For example, they

say that the project has nothing to do with the Rido or the rebels. This is because they said, the conflict in their area is not dependent on the projects but on the people, if they are easily discouraged or frustrated that their needs are given attention. Nevertheless, some 16% of the total responses in Basilan signify that there would have been higher incidence of conflict if there were no GEM-USAID projects, the corresponding figures in Lanao del Sur is 13%; North Cotabato 10%, Zamboanga City 9% Sultan Kudarat 8%, Davao del Sur 8% and Tawi-Tawi 7%. Some 13% of the total responses in Zamboanga del Sur, however, indicate that the conflict situation is not related to the projects. The same percentage and reason is registered by Zamboanga Sibugay. The rest of the provinces included in the survey reported that their barangays are peaceful because there are no rebels in their areas.

As a whole, some 9% of the total responses during the FGDs indicate that the level of violence would have been higher if GEM-USAID is inactive. By province, however, 25% of the total responses in Compostela Valley Province indicated that the level of violence would have higher if GEM-USAID is inactive. The corresponding figures for the other provinces are: Davao del Sur 19%; Basilan 18%; Sulu 18%; Zamboanga del Norte 16%; Agusan del Sur 13% ; Zamboanga Sibugay 12%; and Zamboanga City 12%. The rest of the provinces reported 11% and below that violence would have been higher if GEM-USAID is inactive. It is interesting to note that Basilan and Sulu exhibited higher percentages on this question, hence underlining the important role of GEM-USAID in the improving peace and order condition in high conflict affected areas of Mindanao .

Overall, some 12% of the total responses during the FGDs indicate that GEM and USAID activities have been a factor in influencing the decision of the respondents neighbors and friends from not taking up arms against the government. Among the provinces, the highest percentage were registered by Surigao del Norte with 33%; followed by South Cotabato with 25%; Sarangani with 24%; Compostela Valley with 23%; Agusan del Sur with 23%; Zamboanga del Sur with 19%; Zamboanga City with 18% , and Sulu with 15%. Some 14% of the total responses from Basilan however report that there are other reasons for their neighbors and friends not taking arms against the government, the corresponding figures for Surigao del Sur is 13%. Lanao del Sur reports the same percentage.

The result of the FGDs supports the earlier findings of the study that the GEM infrastructure projects have improved the lives of people in the project areas. The result also supports the findings that the GEM-USAID projects have a positive impact on the peace and order condition of the project areas.

Table 60: Anecdotal summary of the respondents' perception on peace and security effects of GEM infrastructure projects, Mindanao and Provinces of Region IX and Region X

		TOTAL FOR MINDANAO	Percentage Share (Mindanao)	Zamboanga del Norte		Zamboanga del Sur		Zamboanga Sibugay		Zamboanga City		Lanao del Norte	
				F	%	F	%	F	%	F	%	F	%
1. Do you think the violence involving the MILF or the NPA or the ASG or the Clans would be different today without these GEM infrastructure projects? Why?	Little or no relation with the project	225	4.2%	0	0.0%	33	13.3%	38	12.8%	0	0.0%	16	2.8%
	I don't Know	275	5.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	29	5.0%
	Higher Incidence of Conflict	298	5.5%	9	4.0%	1	0.4%	6	2.0%	10	8.9%	31	5.4%
	Lower Incidence of Conflict	4	0.1%	0	0.0%	4	1.6%	0	0.0%	0	0.0%	0	0.0%
	Peaceful since, no presence of rebels	437	8.1%	47	21.0%	15	6.0%	14	4.7%	8	7.1%	66	11.5%
	No Response	112	2.1%	0	0.0%	9	3.6%	16	5.4%	10	8.9%	2	0.3%
2. In places where GEM or USAID are active, what do you think the level of violence would be if USAID is inactive in your barangay? Municipality? Province? Will it be higher? Lower?	Higher if GEM is inactive	474	8.8%	36	16.1%	9	3.6%	34	11.5%	13	11.6%	29	5.0%
	Lower if GEM is inactive	9	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%
	Peaceful since/unchanged situation	311	5.8%	0	0.0%	2	0.8%	8	2.7%	6	5.4%	42	7.3%

		TOTAL FOR MINDANAO	Percentage Share (Mindanao)	Zamboanga del Norte		Zamboanga del Sur		Zamboanga Sibugay		Zamboanga City		Lanao del Norte	
				F	%	F	%	F	%	F	%	F	%
Unchanged? Why?	Violence has no relation to the project	185	3.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	35	6.1%
	Depends on the people and the LGU	143	2.6%	0	0.0%	1	0.4%	2	0.7%	0	0.0%	32	5.6%
	Economic reason for the conflict	13	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	No Idea	118	2.2%	20	8.9%	38	15.3%	22	7.4%	2	1.8%	2	0.3%
	No Response	96	1.8%	0	0.0%	12	4.8%	8	2.7%	7	6.3%	3	0.5%
3. Do you think things in general have gotten better in your area because of the GEM infrastructure or USAID projects? Or will get better because of these projects?	Has Gotten Better	1281	23.7%	56	25.0%	62	25.0%	71	24.0%	26	23.2%	139	24.1%
	Has Gotten Worse	5	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Unchanged	7	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	No Response	58	1.1%	0	0.0%	0	0.0%	3	1.0%	2	1.8%	5	0.9%
4. Do you think that GEM and USAID activities have been a factor in influencing the decision of your	Project Influenced Them	639	11.8%	43	19.2%	5	2.0%	23	7.8%	20	17.9%	58	10.1%
	There are other reasons	268	5.0%	12	5.4%	6	2.4%	7	2.4%	6	5.4%	29	5.0%

		TOTAL FOR MINDANAO	Percentage Share (Mindanao)	Zamboanga del Norte		Zamboanga del Sur		Zamboanga Sibugay		Zamboanga City		Lanao del Norte	
				F	%	F	%	F	%	F	%	F	%
neighbors and friends from not taking up arms against the government?	No Idea	285	5.3%	0	0.0%	37	14.9%	39	13.2%	0	0.0%	50	8.7%
	No Response	159	2.9%	1	0.4%	14	5.6%	5	1.7%	2	1.8%	7	1.2%

Table 61: Anecdotal summary of the respondents' perception on peace and security effects of GEM infrastructure projects, Region XI and Region XII

		Compostela Valley		Davao del Sur		North Cotabato		Sarangani		South Cotabato		Sultan Kudarat	
		F	%	F	%	F	%	F	%	F	%	F	%
1. Do you think the violence involving the MILF or the NPA or the ASG or the Clans would be different today without these GEM infrastructure projects? Why?	Little or no relation with the project	1	2.5%	0	0.0%	29	4.6%	3	1.1%	5	1.4%	7	1.9%
	I don't Know	0	0.0%	0	0.0%	48	7.6%	11	3.9%	25	6.9%	31	8.5%
	Higher Incidence of Conflict	0	0.0%	6	7.5%	63	10.0%	16	5.7%	4	1.1%	29	8.0%
	Lower Incidence of Conflict	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Peaceful since, no presence of rebels	9	22.5%	12	15.0%	13	2.1%	38	13.6%	53	14.7%	22	6.0%
	No Response	0	0.0%	2	2.5%	5	0.8%	2	0.7%	3	0.8%	2	0.5%
2. In places where GEM or USAID are active, what do you think the level of violence would be if USAID is inactive in your barangay? Municipality? Province? Will it be higher? Lower? Unchanged? Why?	Higher if GEM is inactive	10	25.0%	15	18.8%	32	5.1%	31	11.1%	9	2.5%	16	4.4%
	Lower if GEM is inactive	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Peaceful since/unchanged situation	0	0.0%	3	3.8%	63	10.0%	10	3.6%	77	21.4%	35	9.6%
	Violence has no relation to the project	0	0.0%	0	0.0%	26	4.1%	26	9.3%	2	0.6%	16	4.4%

		Compostela Valley		Davao del Sur		North Cotabato		Sarangani		South Cotabato		Sultan Kudarat	
		F	%	F	%	F	%	F	%	F	%	F	%
	Depends on the people and the LGU	0	0.0%	0	0.0%	25	4.0%	1	0.4%	0	0.0%	22	6.0%
	Economic reason for the conflict	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	No Idea	0	0.0%	0	0.0%	4	0.6%	0	0.0%	1	0.3%	2	0.5%
	No Response	0	0.0%	2	2.5%	8	1.3%	2	0.7%	1	0.3%	0	0.0%
3. Do you think things in general have gotten better in your area because of the GEM infrastructure or USAID projects? Or will get better because of these projects?	Has Gotten Better	10	25.0%	20	25.0%	158	25.0%	69	24.6%	88	24.4%	88	24.2%
	Has Gotten Worse	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Unchanged	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.5%
	No Response	0	0.0%	0	0.0%	0	0.0%	1	0.4%	2	0.6%	1	0.3%
4. Do you think that GEM and USAID activities have been a factor in influencing the decision of your neighbors and friends from not taking up arms against the government?	Project Influenced Them	9	22.5%	15	18.8%	55	8.7%	66	23.6%	89	24.7%	44	12.1%
	There are other reasons	0	0.0%	0	0.0%	48	7.6%	2	0.7%	0	0.0%	15	4.1%
	No Idea	1	2.5%	3	3.8%	20	3.2%	0	0.0%	1	0.3%	21	5.8%
	No Response	0	0.0%	2	2.5%	35	5.5%	2	0.7%	0	0.0%	11	3.0%

Table 62: Anecdotal summary of the respondents' perception on peace and security effects of GEM infrastructure projects, Region XIII

		Agusan del Sur		Surigao del Norte		Surigao del Sur	
		F	%	F	%	F	%
1. Do you think the violence involving the MILF or the NPA or the ASG or the Clans would be different today without these GEM infrastructure projects? Why?	Little or no relation with the project	1	0.8%	0	0.0%	0	0.0%
	I don't Know	0	0.0%	2	2.2%	1	1.7%
	Higher Incidence of Conflict	4	3.3%	1	1.1%	3	5.0%
	Lower Incidence of Conflict	0	0.0%	0	0.0%	0	0.0%
	Peaceful since, no presence of rebels	25	20.8%	25	27.8%	16	26.7%
	No Response	0	0.0%	2	2.2%	0	0.0%
2. In places where GEM or USAID are active, what do you think the level of violence would be if USAID is inactive in your barangay? Municipality? Province? Will it be higher? Lower? Unchanged? Why?	Higher if GEM is inactive	16	13.3%	8	8.9%	0	0.0%
	Lower if GEM is inactive	4	3.3%	2	2.2%	0	0.0%
	Peaceful since/unchanged situation	10	8.3%	17	18.9%	3	5.0%
	Violence has no relation to the project	0	0.0%	1	1.1%	7	11.7%
	Depends on the people and the LGU	0	0.0%	0	0.0%	8	13.3%
	Economic reason for the conflict	0	0.0%	0	0.0%	0	0.0%
	No Idea	0	0.0%	1	1.1%	2	3.3%
	No Response	0	0.0%	1	1.1%	0	0.0%

		Agusan del Sur		Surigao del Norte		Surigao del Sur	
		F	%	F	%	F	%
3. Do you think things in general have gotten better in your area because of the GEM infrastructure or USAID projects? Or will get better because of these projects?	Has Gotten Better	29	24.2%	25	27.8%	20	33.3%
	Has Gotten Worse	0	0.0%	0	0.0%	0	0.0%
	Unchanged	0	0.0%	3	3.3%	0	0.0%
	No Response	1	0.8%	2	2.2%	0	0.0%
4. Do you think that GEM and USAID activities have been a factor in influencing the decision of your neighbors and friends from not taking up arms against the government? Yes? Explain. No? Explain. Don't know? Explain	Project Influenced Them	28	23.3%	30	33.3%	7	11.7%
	There are other reasons	1	0.8%	0	0.0%	8	13.3%
	No Idea	1	0.8%	0	0.0%	5	8.3%
	No Response	0	0.0%	0	0.0%	0	0.0%

Table 63: Anecdotal summary of the respondents' perception on peace and security effects of GEM infrastructure projects, ARMM

		Basilan		Lanao del Sur		Maguindanao		Sulu		Tawi-Tawi	
		F	%	F	%	F	%	F	%	F	%
1. Do you think the violence involving the MILF or the NPA or the ASG or the Clans would be different today without these GEM infrastructure projects? Why?	Little or no relation with the project	11	2.8%	1	1.6%	42	4.5%	33	14.0%	5	4.8%
	I don't Know	39	9.9%	6	9.4%	68	7.2%	12	5.1%	3	2.9%
	Higher Incidence of Conflict	63	16.0%	8	12.5%	37	3.9%	0	0.0%	7	6.7%
	Lower Incidence of Conflict	0	0.0%	0	0.0%	-	0.0%	0	0.0%	0	0.0%
	Peaceful since, no presence of rebels	3	0.8%	0	0.0%	59	6.3%	1	0.4%	10	9.6%
	No Response	15	3.8%	1	1.6%	29	3.1%	13	5.5%	1	1.0%
2. In places where GEM or USAID are active, what do you think the level of violence would be if USAID is inactive in your barangay? Municipality? Province? Will it be higher? Lower? Unchanged? Why?	Higher if GEM is inactive	71	18.1%	5	7.8%	93	9.9%	42	17.9%	5	4.8%
	Lower if GEM is inactive	0	0.0%	0	0.0%	0	0.0%	2	0.9%	0	0.0%
	Peaceful since/unchanged situation	11	2.8%	0	0.0%	14	1.5%	3	1.3%	7	6.7%
	Violence has no relation to the project	6	1.5%	6	9.4%	51	5.4%	2	0.9%	7	6.7%
	Depends on the people and the LGU	17	4.3%	0	0.0%	27	2.9%	2	0.9%	6	5.8%

		Basilan		Lanao del Sur		Maguindanao		Sulu		Tawi-Tawi	
		F	%	F	%	F	%	F	%	F	%
	Economic reason for the conflict	4	1.0%	0	0.0%	8	0.9%	0	0.0%	1	1.0%
	No Idea	7	1.8%	0	0.0%	17	1.8%	0	0.0%	0	0.0%
	No Response	15	3.8%	5	7.8%	25	2.7%	7	3.0%	0	0.0%
3. Do you think things in general have gotten better in your area because of the GEM infrastructure or USAID projects? Or will get better because of these projects?	Has Gotten Better	123	31.3%	13	20.3%	205	21.8%	52	22.1%	26	25.0%
	Has Gotten Worse	0	0.0%	2	3.1%	1	0.1%	2	0.9%	0	0.0%
	Unchanged	0	0.0%	0	0.0%	2	0.2%	0	0.0%	0	0.0%
	No Response	8	2.0%	1	1.6%	27	2.9%	5	2.1%	0	0.0%
4. Do you think that GEM and USAID activities have been a factor in influencing the decision of your neighbors and friends from not taking up arms against the government? Yes? Explain. No? Explain. Don't know? Explain	Project Influenced Them	28	7.1%	2	3.1%	70	7.4%	34	14.5%	12	11.5%
	There are other reasons	54	13.7%	8	12.5%	50	5.3%	14	6.0%	8	7.7%
	No Idea	18	4.6%	1	1.6%	86	9.1%	0	0.0%	2	1.9%
	No Response	31	7.9%	5	7.8%	29	3.1%	11	4.7%	4	3.8%

CHAPTER 5 – CONCLUSIONS

5.1. CONCLUSIONS

This study evaluated the economic impact of GEM Infrastructure projects. The measures used for evaluating the economic performance of the projects are the Net Present Value (NPV) and the Benefit-Cost Ratio (BCR) of the project. The discount rate used in the computation of the NPV and the BCR of the projects is 12% (as specified in the terms of reference of the study). The study, however, also computed the NPV and the BCR of the projects using a discount rate of 3%. This rate was used to underline the fact that the GEM infrastructure projects are not for the financial returns of the investment, but more on the social impact of the project. In addition, the Economic Internal Rate of Return (EIRR) of the projects were also computed to find out the rate of discount when the BCR is equal to 1, and for those interested, to compare the computed EIRR of a project to the minimum discount rate used by the Government of the Philippines for evaluating public projects.

The study computed the NPVs and BCRs of 233 projects. This figure translates to about 20% of the 1,155 infrastructure projects implemented by GEM. The evaluation covered 24 RIPs and 209 BIPs. Results of the analysis showed that of the total 233 sampled projects, 210 projects (or 90.1%) exhibited positive NPVs and 23 projects have negative NPVs. Of those projects with positive NPVs, 24 are RIPs (or 100%) and 186 out of 209 (or 89.0%) projects are BIPs. These translate to a very high percentage of sound investment projects under a discount rate of 12%. More importantly, these projects were principally constructed based on strong social rather than economic considerations. Also, some of these facilities are being used with minimal user's fee. Using a social discount rate of 3 percent, 225 projects (96.6%) of the total sampled projects have positive NPVs. The 3% discount is perhaps a more reasonable discount rate considering the social nature of the projects as indicated by their locations and the purpose for which they were implemented. At this rate, all the sampled RIP projects have positive NPVs while 201 of the 209 BIP projects (96.2%) have positive NPVs.

On the average, the economic indicators show that all the RIP projects in Mindanao are good investments. At 12% discount rate, they yielded a considerably high positive average NPV of PhP56,023,578, their average EIRR is 34.56%, more than twice the cut-off interest rate used by the Government of the Philippines in evaluating an infrastructure project and a BCR of 2.59, hence every peso invested gives a return of PhP 2.59. Among the RIPs, the airport project is the most profitable investment for the government. This is followed by road upgrading, port/boat landing and bridges. The Sanga-sanga Airport in Bongao, Tawi-tawi, the only airport project sampled, posted the highest NPV of PhP468,458,189. With a BCR of 3.90, Sanga-sanga Airport project gives a return of PhP 3.90 for every peso invested. This is higher than a road project where for every investment of PhP1 will give PhP2.74 return to the society. For the port landings and bridges, the returns are PhP2.40 and PhP2.37 respectively for every peso invested.

The BIPs, on the average, are also good investments. The average NPV of the BIP projects, however, is lower in magnitude compared to the RIP projects. This is understandable because the scope of a BIP is not as large as the RIP project. The average NPV of a BIP is PhP3,486,912 at the 12% discount rate, an EIRR of 28.72%, and a BCR of 2.00, hence every peso invested in the BIP yields a return of PhP2.00.

It is interesting to note that, except for the trading centers, all BIP sub projects posted favorable economic indicators. Based on the magnitude of the NPVs, road upgrade projects proved to be best BIP investment followed by barangay bridges, boat landings, grains solar dryers, warehouses/ solar

dryers and trading centers. In terms of the number of positive NPVs, all the road upgrades and the grains solar dryers posted positive NPVs. In terms of the BCR, for every PhP1 worth of investment in road upgrades, P2.98 worth of economic benefits accrue to the community, compared to the PhP2.14 and PhP1.90 in barangay bridges and boat landings, respectively. On the other hand, the trading centers posted -PhP72,986 and a BCR of 0.9990, which means a PhP 1 investment in trading centers yield a less than PhP1 return. This means that that trading centers were not able to generate enough benefits to equal at least the cost of the project.

As expected, the RIP projects yielded higher NPVs than the BIP projects. The difference in the value of NPVs between them is large. This is because of the scope of the project, strategic location and the greater number of beneficiaries directly and indirectly affected by the project. The average NPVs of the two (2) types of projects were compared statistically. Results showed that there are significant differences between these two types of projects, i.e., the NPVs of the RIPs are much higher than the NPVs of the BIP projects. It means that RIP projects have greater economic impacts than their BIP project counterparts.

The NPVs of the different sub project of the two types of projects were also compared using the analysis of variance. In the computation, the airport was omitted because of lack of degrees of freedom. There is only one airport under study. Results of the statistical analysis showed significant differences among sub projects of the RIP. This means that the NPVs of the different RIP projects were statistically not comparable. The NPVs of the road upgrade projects were higher than the NPVs of the bridge projects. The NPVs of the boat landings, however, were comparable to the bridges and the road projects.

For the BIPs, results showed that there are significant differences among its sub projects. This means that the NPVs of the different BIP sub projects are not comparable to each other. The NPVs of the road projects are higher compared to the other road projects. This is followed by barangay bridges. The NPVs of the bridges are comparable to that of the boat landings, solar dryers, warehouse/solar dryers but higher than the trading centers, which are comparable to the boat landing, solar dryers and warehouse/solar dryers.

The perception of household respondents on the effects of GEM infrastructure projects on employment showed that, as a whole, 12.4% of the sample households for the RIPs and 11.1% of the sample households in the BIPS projects reported that there was an increase in employment. Surprisingly, these results are lower than the 16.7% of sample households in the control barangay who reported an increase in employment in their areas over the same period.

The results of the study showed the average household monthly income in GEM infrastructure project areas has increased by as much as 33.4% after the projects were implemented. The same trend is observed in the control barangays, i.e. the comparable non-project areas. It is also noted that, on the average, the poverty incidence in both the project areas and the control barangays has increase over the same period with the percentage of population under the poverty threshold often higher in the project barangays. A possible explanation for this phenomenon is that the constraints imposed by the unsettled condition in the project are difficult to overcome by purely infrastructure projects. In addition, the infrastructure projects often serve only as a catalyst for productive activities, in other words, infrastructure projects have to be accompanied by the introduction of production technologies and other support projects.

The most interesting result of the study, however, is on the effects of the GEM infrastructure projects on the peace and security condition in the project areas. The result of the survey on peace outcomes provide a very strong evidence that the GEM infrastructure projects have significantly reduced the incidence of Rido/clan feud; Encounter between the military and rebel groups; Incidence of insurgent bombing within the barangay; Incidence of insurgent bombing in neighboring barangays; Murder; Thief, and Domestic violence in the “with project” barangays. Not only that the percentage reduction of incidence of conflict is higher in the “with-project”, except on the “Incidence of bombing in neighboring barangays” compared to the Control barangays, the reduction of incidence

of conflict in the “with-project” barangays are all statistically significant except on kidnapping. This is in contrast to the “without-project” barangays where only the reduction on the incidence of murder is statistically significant. It may be concluded therefore that the GEM infrastructure projects have contributed considerably on the improvement of peace and security of the project barangays, more so in the ARMM project barangays. These results underlined the fact that the benefits from the GEM infrastructure projects go beyond the economic and financial returns to amount invested in those projects.

ANNEX

A

NPVs, IERRs and BCRs All Projects

Table 64: NPVs, EIRRs and BCRs of RIP Projects

Sub-Project	Project	Region I	Location	Level	At 12%			At 3%		
					NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Airport	Sanga-sanga Airport	ARMM	Tawi-tawi	Moderate	468,458,188.52	66.26	3.90	1,142,514,862.14	66.26	468,458,188.52
BoatLanding	Bongao Port	ARMM	Tawi-tawi	Moderate	73,956,247.33	26.01	2.02	269,254,989.57	26.01	73,956,247.33
BoatLanding	Bauno Garing - Panglima Sugala	ARMM	Tawi-tawi	Moderate	6,695,045.15	37.76	2.90	20,455,439.21	37.76	6,695,045.15
BoatLanding	Pahut Boat Landing- Panglima Sugala	ARMM	Tawi-tawi	Moderate	1,883,986.79	25.96	1.98	6,810,146.38	25.96	1,883,986.79
Boatlanding	Siasi Port	ARMM	Sulu	Moderate	76,467,656.02	31.88	2.44	248,274,682.72	31.88	76,467,656.02
BoatLanding	Port Lamitan (Ro-Ro Rampt)	ARMM	Basilan	Moderate	76,756,102.32	40.77	3.12	228,657,267.10	40.77	76,756,102.32
Boatlanding	Maluso Port Upgrading - Maluso	ARMM	Basilan	Moderate	74,018,507.10	27.08	1.94	250,999,312.49	27.08	74,018,507.10
Bridge	Sitio Sarmiento Bridge - Langkong	ARMM	Maguindanao	Moderate	40,024,778.32	27.37	2.09	140,094,659.79	27.37	40,024,778.32
Bridge	Pigkalagan Bridge	ARMM	Maguindanao	Moderate	14,765,286.09	21.94	1.63	56,996,997.31	21.94	14,765,286.09
Bridge	Dawamato Bridge	ARMM	Maguindanao	Moderate	23,032,043.61	33.09	2.43	68,650,211.39	33.09	23,032,043.61

Sub-Project	Project	Region I	Location	Level	At 12%			At 3%		
					NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Matuber 2 Bridge Construction - Upi	ARMM	Maguindanao	Moderate	8,262,602.04	16.75	1.28	47,525,780.99	16.75	8,262,602.04
Bridge	Campo Bridge Construction, Campo and Ramco, Paglat and SK Pendatun	ARMM	Maguindanao	High	14,342,849.56	47.20	3.49	38,534,077.53	47.20	14,342,849.56
Bridge	Busay Bridge	ARMM	Basilan	Moderate	6,917,638.65	62.34	4.87	19,051,387.55	62.34	6,917,638.65
Bridge	Bañas Bridge - Lantawan	ARMM	Basilan	High	7,779,000.45	27.81	2.12	26,969,235.11	27.81	7,779,000.45
Bridge	Kidapawan Market Bridge	R12	North Cot	Moderate	16,491,032.55	33.44	2.56	52,529,050.58	33.44	16,491,032.55
Bridge	Lamba Footbridge Construction	R12	SouthCot	High	2,499,869.65	39.07	3.01	7,560,779.03	39.07	2,499,869.65
Bridge	Sinunuc Bridge	R9	Zamboanga	Moderate	3,170,681.09	14.72	1.16	26,878,619.33	14.72	3,170,681.09
Road	Buluan Fish Landing Road	ARMM	Maguindanao	Moderate	13,842,858.55	47.58	3.53	39,906,916.41	47.58	13,842,858.55
Road	Bumbaran Road	ARMM	LanaoSur	High	16,531,257.97	16.72	1.29	101,753,675.55	16.72	16,531,257.97
Road	Jolo Market Road	ARMM	Sulu	Moderate	7,710,396.29	17.02	1.31	45,673,806.05	17.02	7,710,396.29

Sub-Project	Project	Region I	Location	Level	At 12%			At 3%		
					NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Road	Shariff Aguak Sapakan Road Upgrading - Maganoy and Tuka, Shariff Aguak, Mamasapano Rajah Buayan	ARMM	Maguindanao	High	120,242,501.10	58.48	4.35	334,238,858.48	58.48	120,242,501.10
Road	Kilangan-Kibayao Road	R12	North Cot	Moderate	97,363,934.63	40.20	2.97	292,207,867.60	0.40	97,363,934.63
Road	Pikit (Boliok) Road Upgrading	R12	North Cot	Moderate	130,192,377.18	58.19	4.33	362,164,511.83	58.19	130,192,377.18
Road	Masiu Circumferential Road Connecting Lake Lanao	ARMM	Lanao Sur	High	26,490,783.73	18.07	1.37	140,283,071.40	18.07	26,490,783.73

Table 65: NPVs, EIRRs and BCRs of BIP Projects

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
BL	Hawilian Boat Landing	AgusanSur	2,770,966.85	35.09	2.69	8,671,810.52	35.09	4.96
BL	Kaumpurnah Boat Landing	Basilan	1,723,941.96	26.13	1.99	6,205,689.84	26.13	3.67
BL	Sitio Tupay Boat Landing Upgrading - Barangay Tabuk	Basilan	708,550.61	16.12	1.26	4,763,901.56	16.12	2.33
BL	Balatanay Boat Landing	Basilan	2,642,719.97	26.07	1.99	9,526,841.11	26.07	3.66
BL	Carbon Boat Landing	Basilan	1,275,698.83	19.17	1.48	6,160,517.97	19.17	2.72
BL	Buluan River Boat Landing - Poblacion	Maguindanao	1,974,333.04	26.61	1.97	6,906,660.51	26.61	3.54
BL	Datu Piang Boat Landing - Poblacion	Maguindanao	6,035,322.70	61.28	4.28	15,927,716.42	61.28	7.47
BL	Libungan Torreta Boat Landing Construction - Matilac	NorthCot	3,850,207.73	32.07	2.35	12,203,518.39	32.07	4.20
BL	Kalanganan 2 Boat Landing	NorthCot	(1,475,120.67)	-	0.23	(1,461,738.26)	-	0.43

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
BL	Juluano Boat Landing	Sarangani	1,657,761.68	23.71	1.69	6,094,275.69	23.71	2.90
BL	Paril Boat Landing	SK	289,085.48	14.03	1.15	3,363,065.27	14.03	2.27
BL	North Laud Boat Landing Rehab - Barangay North Laud	Sulu	2,889,858.35	25.13	1.92	10,674,055.14	25.13	3.53
BL	Burboanan Boat Landing Construction	SurigaoSur	(337,291.51)	9.85	0.87	2,188,489.64	9.85	1.61
BL	Karungdung Boat Landing Rehab - Karungdung	Tawi-tawi	489,235.96	14.89	1.18	4,223,833.84	14.89	2.18
BL	Bato-bato Proper Boat Landing - Bato-bato	Tawi-tawi	1,829,235.10	23.45	1.79	7,118,456.95	23.45	3.30
BL	Pob Alicia Boat Landing Upgrading - Barangay Poblacion	ZamboSi	1,523,328.33	33.40	2.56	4,854,243.88	33.40	4.71
BL	Poblacion Malangas Boat Landing Construction	ZamboSi	4,958,524.23	44.69	2.80	13,024,472.15	44.69	4.54
BL	Liangan Landing Construction - Barangay Poblacion	ZamboSur	(197,539.72)	9.66	0.86	1,143,622.24	9.66	1.59
BL	Tunngol Boat Landing	Maguindanao	1,966,163.36	28.33	2.05	6,559,159.45	28.33	3.63

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
	Rehabilitation - Tunggol							
BL	Sirawai Proper Boat Landing Construction	ZamboNorte	2,207,836.12	36.77	2.82	6,801,915.16	36.77	5.21
Bridge	New Visayas Brgy Bridge Construction	AgusanSur	3,313,713.27	26.21	2.00	11,906,358.22	26.21	3.68
Bridge	Spillway Construction Tabon Tabon	AgusanSur	2,206,881.60	23.72	1.75	7,951,320.29	23.72	3.07
Bridge	Sumagdang Box Culvert Construction - Barangay Sumagdang	Basilan	1,293,295.81	35.94	2.76	4,014,336.35	35.94	5.08
Bridge	Sengal Footbridge Construction - Barangay Sengal - Matibay	Basilan	614,959.44	14.50	1.16	5,918,835.05	14.50	2.13
Bridge	Tampalan FootBridge	Basilan	1,621,855.26	29.63	2.17	5,077,033.89	29.63	3.81
Bridge	Zone 2 - Zone 3 Kaumpurnah Pedestrian Footbridge Construction - Barangay Kaumpurnah	Basilan	1,280,715.35	26.21	1.93	4,295,380.65	26.21	3.38
Bridge	Sitio Santol Spillway (overflow) Construction	ComVal	8,092,029.59	44.99	3.32	21,971,350.19	44.99	5.83

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Mainit Overflow Structure (Spillway) Construction	ComVal	1,611,716.29	27.73	2.11	5,599,863.02	27.73	3.90
Bridge	North Ulip Footbridge Monkayo	ComVal	4,251,672.90	32.15	2.46	13,756,919.43	32.15	4.53
Bridge	Esperanza Suspension Footbridge	LanaoNorte	3,419,633.94	27.89	2.13	11,843,173.78	27.89	3.92
Bridge	Cabuyao Footbridge Construction	LanaoNorte	2,863,249.10	25.48	1.94	10,476,872.57	25.48	3.58
Bridge	Big Banisilon Slab Footbridge	LanaoNorte	6,079,332.11	49.15	3.64	16,197,695.55	49.15	6.38
Bridge	Olango Box Culvert Construction	LanaoNorte	2,382,670.91	37.34	2.87	7,305,013.22	37.34	5.29
Bridge	Poona Kapatagan Box Culvert	LanaoNorte	3,422,899.43	37.91	2.91	10,445,506.37	37.91	5.37
Bridge	Sulo Pipe Culvert Construction	LanaoNorte	527,862.42	26.96	2.05	1,863,860.42	26.96	3.79
Bridge	Tambo Cadayunan Footbridge Construction	LanaoNorte	2,906,334.77	27.16	2.07	10,218,754.60	27.16	3.82
Bridge	Inasagan Brgy Bridge Construction	LanaoNorte	3,172,813.09	46.23	3.58	9,201,122.00	46.23	6.59

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Bulod-San Antonio Box Culvert Construction	LanaoNorte	(884,457.27)	-	0.36	(613,811.34)	-	0.67
Bridge	Batangan Box Culvert Construction	LanaoNorte	2,321,490.31	26.13	1.99	8,355,904.51	26.13	3.67
Bridge	Upper Bagumbayan Slab Bridge Construction	LanaoNorte	329,528.04	13.73	1.11	4,264,966.28	13.73	2.04
Bridge	Debalayan-Ilian Slab Bridge Construction	LanaoSur	2,214,394.03	28.69	2.10	7,047,112.86	28.69	3.69
Bridge	Bubong Barangay Bridge Construction	LanaoSur	(348,907.34)	10.00	0.88	2,486,625.44	10.00	1.63
Bridge	Linogaoan River Box Culvert	LanaoSur	2,276,668.11	25.89	1.97	8,243,966.91	25.89	3.64
Bridge	Gubar-Sawer Footbridge Construction	LanaoSur	1,290,845.42	26.03	1.98	4,657,470.03	26.03	3.66
Bridge	Bolao Borocot Bridge Approach	LanaoSur	3,280,874.14	21.39	1.64	13,890,351.08	21.39	3.02
Bridge	Paglat Pipe Culvert Construction - Poblacion	Maguindanao	3,274,314.26	33.78	2.59	10,389,667.92	33.78	4.77
Bridge	Karim Piers Footbridge Construction - Karim Buldon, Shariff kabunsuan	Maguindanao	3,193,132.63	31.97	2.44	10,355,604.53	31.97	4.51

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Damakling Footbridge	Maguindanao	4,594,957.68	39.61	2.46	11,871,269.04	39.61	3.88
Bridge	Kanibong Box Culvert Construction - Kalumanga	Maguindanao	3,809,975.46	47.41	3.67	10,989,660.50	47.41	6.77
Bridge	Datu Odin Sinsuat Box Culvert Construction - Poblacion	Maguindanao	2,272,252.67	36.31	2.67	6,547,916.12	36.31	4.68
Bridge	Katalupak Slab Bridge Construction - Blensong	Maguindanao	2,363,047.82	28.28	2.08	7,577,756.49	28.28	3.64
Bridge	Manindolo Barangay Bridge Construction	Maguindanao	2,513,038.91	29.11	2.22	8,508,274.57	29.11	4.10
Bridge	Shariff Aguak Box Culvert Construction - Poblacion	Maguindanao	4,694,082.32	44.30	3.42	13,743,262.87	44.30	6.31
Bridge	Sepaka Barangay Bridge Construction	Maguindanao	1,011,028.73	21.39	1.59	4,003,333.60	21.39	2.79
Bridge	Bugwak Overflow Bridge Construction – Malangag	NorthCot	3,071,371.66	28.04	2.06	9,895,276.08	28.04	3.61
Bridge	Dungos Pipe Culvert Construction	NorthCot	1,290,845.42	26.03	1.98	4,657,470.03	26.03	3.66

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Sarayan Barangay Bridge Construction	NorthCot	3,624,375.01	27.27	2.08	12,712,029.92	27.27	3.83
Bridge	Maunlad Pipe Culvert Construction	NorthCot	1,284,150.08	35.84	2.75	3,989,687.67	35.84	5.07
Bridge	Batiocan – Demapaco Footbridge	NorthCot	2,875,596.23	24.98	1.90	10,667,636.47	24.98	3.51
Bridge	New Pandan Pipe Culvert Construction	NorthCot	380,235.68	18.78	1.45	1,892,124.65	18.78	2.67
Bridge	Cabpangi Box Culvert Construction	NorthCot	2,652,818.18	27.32	2.01	8,674,120.60	27.32	3.52
Bridge	Ulamian Barangay Bridge Construction	NorthCot	2,502,021.14	26.25	2.00	8,979,421.65	26.25	3.69
Bridge	Don Mariano Marcos Box Culvert Construction	Sarangani	1,670,750.59	28.77	2.19	5,690,863.64	28.77	4.05
Bridge	Kindap Box Culvert Construction	Sarangani	1,354,389.36	32.23	2.46	4,377,926.32	32.23	4.54
Bridge	Patag Box Culvert Construction	Sarangani	888,989.28	21.13	1.62	3,812,971.15	21.13	2.98
Bridge	Purok 2 Slab Bridge Construction	Sarangani	991,931.38	19.48	1.50	4,686,210.86	19.48	2.76
Bridge	Libi Footbridge	Sarangani	612,424.86	16.55	1.29	3,860,966.52	16.55	2.38

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Kabulunan Footbridge	SK	2,512,993.31	26.81	2.04	8,903,968.66	26.81	3.77
Bridge	Poblacion Kalamansig, Pag-asa (Market Site) Box Culvert Construction	SK	1,854,999.40	28.07	2.14	6,401,485.15	28.07	3.95
Bridge	Mangilala Slab Bridge Construction – Bual	SK	3,809,627.87	26.99	2.06	13,442,821.54	26.99	3.79
Bridge	Marguez Baranagay Bridge Construction	SK	1,984,180.77	29.76	2.27	6,645,262.44	29.76	4.19
Bridge	Nanas Box Culvert Construction - Malisbong	SK	2,871,341.52	42.52	3.28	8,490,008.24	42.52	6.05
Bridge	Bai Saripinang Box Culvert Construction	SK	6,811,041.04	43.05	3.32	20,077,331.69	43.05	6.13
Bridge	Sucob Box Culvert Construction	SK	2,294,646.74	40.69	3.13	6,862,360.12	40.69	5.78
Bridge	Impao Footbridge	SK	1,580,537.02	26.40	2.01	5,652,081.20	26.40	3.71
Bridge	Sitio Nabot Box Culvert Construction	SoSot	614,172.62	21.93	1.68	2,536,791.04	21.93	3.09
Bridge	Sumbakil Box Culvert Construction	SoSot	4,058,466.10	45.39	3.51	11,816,670.42	45.39	6.47

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Danlag Pedestrian Footbridge Construction	SoSot	(620,762.72)	-	0.36	(433,678.64)	-	0.67
Bridge	Lumakil Box Culvert Construction	SoSot	1,782,041.72	32.01	2.45	5,776,313.35	32.01	4.51
Bridge	Purok 2, Tupi, Box Culvert Construction	SoSot	939,053.26	22.09	1.69	3,852,354.69	22.09	3.11
Bridge	Bus-bus Pedestrian Footbridge Construction - Barangay Bus-bus	Sulu	1,672,492.56	26.09	2.16	5,991,134.78	26.09	4.58
Bridge	Subah Buaya Footbridge Upgrading - Barangay Subah Buaya	Sulu	832,842.05	16.13	1.25	5,244,836.84	16.13	2.18
Bridge	Anislagan Box Culvert Construction	SurigaoNorte	150,427.32	12.78	1.05	3,899,223.75	12.78	1.93
Bridge	Mahanub Box Culvert Construction	SurigaoNorte	3,279,964.06	52.26	4.06	9,285,394.48	52.26	7.48
Bridge	Togonan Bridge Construction	SurigaoNorte	361,731.71	14.40	1.15	3,597,453.67	14.40	2.12
Bridge	Bislig Burboanan Footbridge Construction	SurigaoSur	(1,805,061.97)	1.18	0.47	(578,915.04)	1.18	0.87
Bridge	Vitali Footbridge Construction	ZamboCT	3,688,136.83	36.48	2.80	11,391,961.57	36.48	5.16

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Bridge	Lapas Culvert Construction	ZamboCT	1,817,502.38	30.38	2.32	6,027,811.56	30.38	4.28
Bridge	Balacbaan Box Culvert Construction - Balacbaan, Tampilisan	ZamboNorte	(1,364,510.68)	-	0.47	(601,501.37)	-	0.82
Bridge	Disakan Box Culvert Construction - Disakan	ZamboNorte	2,316,768.46	30.34	2.23	7,169,668.02	30.34	3.90
Bridge	Sitio Mamongol Pedestrian Footbridge Construction	ZamboNorte	3,074,549.75	35.64	2.62	8,915,920.04	35.64	4.59
Bridge	Tilubog Barangay Bridge Construction - Tilubog	ZamboNorte	1,549,834.27	22.30	1.65	5,890,144.82	22.30	2.90
Bridge	Purok Makugihon Barangay Bridge Construction - Barangay Poblacion	ZamboSi	2,540,379.59	25.56	1.95	9,276,838.12	25.56	3.59
Bridge	Tiras Box Culvert Construction - Barangay San Pedro	ZamboSi	1,795,444.25	26.28	2.00	6,439,576.77	26.28	3.69
Bridge	Matim Overflow Structure Rehab - Barangay Matim	ZamboSi	1,245,967.30	18.76	1.45	6,212,131.12	18.76	2.67
Bridge	Balimbing Suspension Footbridge Construction -	ZamboSi	4,461,242.30	29.24	2.23	15,070,823.12	29.24	4.11

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
	Barangay FL Peña							
Bridge	Limason Box Culvert Construction - Limason	ZamboSur	1,122,392.10	20.57	1.58	4,957,464.07	20.57	2.91
Bridge	Nemeno Box Culvert	ZamboSur	2,392,923.42	28.22	2.15	8,234,420.63	28.22	3.97
Bridge	Man-ilan Barangay Bridge Construction - Barangay Manilan	ZamboSur	2,505,268.68	25.66	1.96	9,124,322.87	25.66	3.61
Bridge	Old Labangan Footbridge Construction - Old Labangan	ZamboSur	2,335,369.22	37.85	2.78	6,640,442.74	37.85	4.88
Bridge	Purok San Francisco Box Culvert, Barangay Alindahaw	ZamboSur	1,561,127.48	20.06	1.50	6,649,195.03	20.06	2.63
GSD	Buluan Grains Solar Dryer - Poblacion	Maguindanao	550,295.44	31.91	1.95	1,421,668.33	31.91	3.09
GSD	Bangayan Grains Solar Dryer	AgusanNorte	410,539.77	31.33	1.97	1,069,635.48	31.33	3.06
GSD	Christamonte Grains Solar Dryer	AgusanSur	1,680,462.89	49.10	2.85	3,787,532.85	49.10	4.30
GSD	Colonia Grains Solar Drier - Barangay Colonia	Basilan	879,447.03	41.83	2.47	2,062,283.84	41.83	3.72

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
GSD	Sundig A Punod Grains Solar Dryer	LanaoNorte	745,468.46	29.24	1.86	2,010,294.31	29.24	2.89
GSD	Bulacon Grains Solar Drier	LanaoNorte	168,195.49	15.48	1.15	1,038,266.76	15.48	1.74
GSD	Curvada Grains Solar Dryer	LanaoNorte	64,949.59	14.54	1.11	505,753.30	14.54	1.67
GSD	Pangi Grains Solar Dryer	LanaoNorte	356,180.50	24.68	1.59	1,070,322.57	24.68	2.39
GSD	Pendulunan Kapai Grains Solar Drier	LanaoSur	926,643.60	38.15	2.27	2,234,697.39	38.15	3.43
GSD	Dado Grains Solar Dryer - Macabiso	Maguindanao	983,926.97	27.00	1.70	2,778,966.64	27.00	2.57
GSD	Kiludan Grains Solar Dryer - Dalamusay	Maguindanao	535,849.32	22.83	1.52	1,718,331.34	22.83	2.36
GSD	Limbuan Grains Solar Dryer - Madida	Maguindanao	1,129,510.61	58.80	3.49	2,460,083.91	58.80	5.43
GSD	Macabiso Grains Solar Dryer	Maguindanao	1,569,607.97	69.47	4.09	3,335,752.71	69.47	6.35
GSD	Sitio Dalamasak Grains Solar Dryer Construction - Sugadol	Maguindanao	448,212.39	26.14	1.66	1,292,774.66	26.14	2.50
GSD	North Binangga Gains Solar Dryer	Maguindanao	1,479,785.63	44.93	2.63	3,405,055.32	44.93	3.97

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
GSD	Kayupo Grains Solar Dryer	Maguindanao	1,162,088.51	58.49	3.35	2,533,230.29	58.49	5.05
GSD	Midtimbang Grains Solar Dryer - Midtimbang	Maguindanao	1,068,354.88	25.52	1.63	3,132,492.49	25.52	2.46
GSD	Purok Pomelo Grains Solar Dryer – Grebona	NorthCot	633,533.40	38.23	2.28	1,526,767.51	38.23	3.44
GSD	Barangiran Grains Solar Dryer	NorthCot	1,513,337.56	63.63	3.77	3,255,624.23	63.63	5.85
GSD	Macabasa Grains Solar Dryer – Dado	NorthCot	650,822.90	36.16	2.23	1,598,645.38	36.16	3.47
GSD	Inas Grains Solar Dryer	NorthCot	138,631.45	17.37	1.24	641,192.48	17.37	1.87
GSD	Kapinpilan Grains Solar Dryer	NorthCot	315,710.03	18.83	1.30	1,270,215.76	18.83	1.97
GSD	Bayangan Grains Solar Dryer – Galidan	NorthCot	776,574.20	44.08	2.66	1,795,546.90	44.08	4.12
GSD	Lamuak Grains and Solar Dryer – Katilacan	NorthCot	888,315.75	26.99	1.74	2,509,317.08	26.99	2.70
GSD	Sebastian Grains Solar Dryer Construction	NorthCot	448,402.49	25.49	1.63	1,315,860.65	25.49	2.45
GSD	Bagudato Grains Solar Drier	Sarangani	646,014.20	27.20	1.75	1,815,942.31	27.20	2.72

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
GSD	Purok 10 Grains Solar Dryer - Dansuli	SK	697,020.17	32.06	1.96	1,797,050.37	32.06	2.95
GSD	Maligaya Grains Solar Dryer	SK	742,801.51	38.63	2.30	1,784,126.92	38.63	3.47
GSD	Kigulao Grains Solar Dryer	SK	139,357.29	15.10	1.13	934,099.14	15.10	1.71
GSD	Pasandalan Grains Solar Dryer	SK	579,580.26	33.13	2.01	1,473,040.46	33.13	3.04
GSD	Kapaya Grains Solar Dryer	SK	754,053.74	37.82	2.26	1,823,684.01	37.82	3.40
GSD	Abdullah Grains Solar Dryer	SoSot	784,467.36	41.96	2.47	1,837,987.52	41.96	3.73
GSD	Manisan Solar Dryer	SoSot	964,863.04	59.96	3.56	2,094,763.34	59.96	5.53
GSD	Silop Grains Solar Dryer	SurigaoNorte	916,285.63	57.87	3.44	2,000,985.26	57.87	5.35
GSD	Sipanik Grains Solar Dryer	ZamboNorte	719,654.08	48.36	2.91	1,627,411.34	48.36	4.52
GSD	Sitio Pukay Grains Solar Drier - Canacol	ZamboNorte	401,525.17	23.85	1.54	1,239,771.94	23.85	2.33
GSD	Sitio Imelda Grains Solar	ZamboSi	813,360.01	32.50	1.98	2,084,463.49	32.50	2.99

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
GSD	Bombil Grains Solar Drier - Gango, RT Lim	ZamboSi	831,130.16	33.66	2.04	2,098,450.83	33.66	3.08
GSD	Gawil Grains Solar Drier - Gawil	ZamboSur	810,859.13	40.78	2.41	1,915,437.84	40.78	3.64
GSD	Diplo Grains Solar Drier - Barangay Diplo	ZamboSur	55,435.37	13.43	1.06	690,591.14	13.43	1.60
GSD	Matinabangon Grains Solar Drier - Barangay Anonang	ZamboSur	677,536.92	42.32	2.57	1,583,681.46	42.32	4.00
Road	Tulay Rockcauseway Upgrading - Zone III, Barangay Tulay	Sulu	1,064,328.03	23.25	1.73	4,173,069.16	23.25	3.04
Road	Lanipao/Cabasagan Road Rehab	LanaoNorte	7,373,062.25	26.50	1.96	26,320,272.46	26.50	3.45
Road	Tuburan-Guiawon Road Rehabilitation	LanaoNorte	10,391,845.33	76.28	5.98	27,941,066.59	76.28	11.03
Road	Rebucon Matampay Road Upgrading	LanaoNorte	9,248,316.95	68.38	5.10	25,172,335.49	68.38	8.96
Road	Marambuaya Road Rehabilitation	LanaoSur	7,180,056.05	32.24	2.38	23,213,513.40	32.24	4.18
Road	Guimba Road Rehabilitation	LanaoSur	11,051,920.39	29.12	2.15	37,424,750.99	29.12	3.78

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
Road	Marguez Road Upgrade	Maguindanao	3,484,352.22	34.52	2.55	10,972,099.81	34.52	4.48
Road	New Alimudian - Migkuan Road Upgrading	NorthCot	7,846,117.75	59.31	4.41	21,764,315.85	59.31	7.76
Road	Batulawan – Barongis Road Rehabilitation	NorthCot	10,495,405.13	70.96	5.29	28,442,854.50	70.96	9.31
Road	Kityan Road Rehabilitation	Sarangani	8,633,202.15	53.69	3.99	24,329,380.99	53.69	7.01
Road	Baranagay Proper Sitio Libon Road Upgrading – Makat	SK	10,180,380.66	57.69	4.27	28,349,922.99	57.69	7.51
Road	Purok I, Sitio Opong Road Upgrading	SoCot	97,363,934.63	40.20	2.97	292,207,867.60	40.20	5.23
Road	Busbus-Gandusul Bypass Road concreting - Busbus-Gandusul	Sulu	843,206.16	19.51	1.47	3,979,202.97	19.51	2.59
Road	Sitio Interior - Magsaggao Road Rehab - Magsaggao	Tawi-tawi	8,607,987.44	34.96	2.58	26,981,997.45	34.96	4.54
Road	Biayon - San Jose Road Rehab -San Jose	ZamboNorte	5,656,331.37	29.95	2.21	18,894,329.17	29.95	3.89
Road	San Vicente Road Rehab - Barangay San	ZamboSi	5,894,579.71	37.78	2.86	18,062,906.34	37.78	5.24

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
	Vicente							
Road	Datu Tumanggong Road Rehabilitation, Tungawan	ZamboSi	4,596,720.55	42.99	3.18	13,557,778.59	42.99	5.60
Road	Ulame Road Rehab - Barangay Ulame	Basilan	2,951,862.14	25.86	1.91	10,692,916.98	25.86	3.36
TC	Cuyago Trading Center Construction	AgusanNorte	1,095,420.71	33.72	2.10	2,791,650.70	33.72	3.21
TC	Buenavista Trading Center	AgusanNorte	366,425.56	16.68	1.27	1,937,044.15	16.68	2.14
TC	Barangay Marketside Trading	Basilan	205,649.06	16.10	1.18	1,139,721.26	16.10	1.81
TC	Lamitan Trading Center, POblacion	Basilan	298,357.70	15.32	1.14	1,906,301.11	15.32	1.73
TC	Kapatagan Trading Center Construction	LanaoNorte	591,316.50	20.37	1.39	2,155,150.91	20.37	2.14
TC	Lala Trading Center (Maranding)	LanaoNorte	150,930.72	13.98	1.08	1,434,580.06	13.98	1.64
TC	Poblacion Matungao Trading Center	LanaoNorte	(99,906.47)	10.81	0.95	1,117,864.16	10.81	1.44
TC	Nuro Trading Center - Nuro	Maguindanao	185,092.21	14.58	1.12	1,449,793.80	14.58	1.76

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
TC	Datu Paglas Trading Center - Poblacion	Maguindanao	(430,748.67)	7.37	0.81	686,171.22	7.37	1.24
TC	Bunawan Trading Center	Maguindanao	(139,194.15)	10.34	0.93	1,054,298.27	10.34	1.43
TC	Awang Trading Center Awang Datu Odin Sinsuat, Shariff Kabunsuan	Maguindanao	(549,207.75)	5.28	0.70	313,722.91	5.28	1.13
TC	Bulod Training Center	Maguindanao	(770,778.29)	4.36	0.66	233,836.25	4.36	1.08
TC	Tulunan Trading Center – Poblacion	NorthCot	(343,442.27)	9.10	0.88	1,217,213.16	9.10	1.33
TC	Makilala Trading Center – Poblacion	NorthCot	528,490.65	21.32	1.50	1,869,420.93	21.32	2.41
TC	Manaulanan Trading Center	NorthCot	(549,322.76)	5.05	0.70	274,324.06	5.05	1.12
TC	Glan Trading Center	Sarangani	701,849.54	24.16	1.56	2,144,468.35	24.16	2.35
TC	Maitum Trading Center Construction	Sarangani	(319,476.88)	6.16	0.76	291,912.67	6.16	1.18
TC	Busok Trading Center Construction	SK	(236,459.67)	5.63	0.74	164,322.03	5.63	1.14
TC	Dansuli Trading Center	SK	(335,045.57)	7.39	0.82	535,394.69	7.39	1.23

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
TC	Tupi Trading Center	SoSot	189,847.07	16.00	1.19	1,068,322.75	16.00	1.85
TC	Siasi Trading Center	Sulu	336,694.46	16.86	1.21	1,659,351.96	16.86	1.83
TC	Campo Islam Trading Center - Barangay Campo Islam	Sulu	(754,415.12)	-	0.42	(595,583.03)	-	0.64
TC	Mahanub Proper (Purok 3) Trading Center	SurigaoNorte	608,986.57	19.80	1.39	2,330,818.06	19.80	2.19
TC	Hayanggabon Trading center	SurigaoNorte	159,242.20	13.76	1.08	1,664,243.10	13.76	1.62
TC	Bato-bato Trading Center - Barangay Batu-batu	Tawi-tawi	(475,754.53)	7.28	0.79	741,558.04	7.28	1.26
TC	Taytay Manobo Trading Center - Barangay Taytay Manobo	ZamboSi	(1,006,149.53)	-	0.41	(681,408.62)	-	0.68
TC	Poblacion Kamalarang Trading Center, Barangay Poblacion	ZamboSur	300,454.14	14.71	1.12	2,230,219.48	14.71	1.69
TC	Kabatan Trading Center	ZamboSur	(790,827.86)	0.85	0.60	(249,285.26)	0.85	0.90
TC	Alibangbang Trading Center	ZamboSi	(1,034,629.35)	-	0.47	(725,430.57)	-	0.70

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
WSD	Kosga Seaweed Warehouse & Solar Dryer	LanaoNorte	626,855.52	20.98	1.43	2,188,700.24	20.98	2.22
WSD	Big Banisilon Solar Dryer/Warehouse	LanaoNorte	966,049.31	39.18	2.33	2,309,802.07	39.18	3.51
WSD	Calimodan Grains Warehouse & Solar Dryer	LanaoNorte	357,256.82	16.45	1.35	1,863,504.87	16.45	1.93
WSD	Camp Jakarta Grains Warehouse & Solar Drier	LanaoSur	545,753.20	20.08	1.36	2,008,676.33	20.08	2.06
WSD	Kibleg Grains Warehouse and Solar Dryer - Upi	Maguindanao	516,930.83	18.18	1.27	2,201,056.77	18.18	1.92
WSD	Kuden Grains Warehouse and Solar Dryer Construction - Kuden	Maguindanao	1,112,075.21	28.36	2.22	3,085,272.14	28.36	3.36
WSD	Binibiran Grains Warehouse and Solar Dryer - Salman	Maguindanao	1,595,769.87	40.54	2.47	3,776,145.93	40.54	3.83
WSD	Pagagawan Proper Grains Warehouse and Solar Dryer Construction	Maguindanao	1,263,798.67	44.19	2.59	2,920,313.24	44.19	3.91

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
WSD	Madidis Grains Warehouse and Solar Dryer	Maguindanao	584,102.40	19.12	1.33	2,295,857.47	19.12	2.07
WSD	Malala Grains Warehouse and Solar Dryer	Maguindanao	844,515.17	26.54	1.68	2,411,253.37	26.54	2.53
WSD	Mateo Grains Warehouse and Solar Dryer - Kibayao	NorthCot	757,357.00	24.83	1.59	2,265,683.61	24.83	2.40
WSD	Tibao Grains Warehouse Construction (formerly with Solar Dryer.	NorthCot	(261,270.36)	-	0.52	(132,537.62)	-	0.80
WSD	Kitulaan Grains Warehouse and Solar Dryer	NorthCot	1,041,929.60	33.27	2.02	2,643,616.06	33.27	3.05
WSD	Kilabon Grains Warehouse and Solar Dryer	SK	924,878.50	28.84	1.79	2,512,722.96	28.84	2.71
WSD	Bintana Grains warehouse and Solar Dryer	SK	1,186,831.88	40.07	2.37	2,818,124.91	40.07	3.58
WSD	Bual Grains Warehouse and Solar Dryer	SK	1,144,954.24	52.24	3.13	2,547,633.12	52.24	4.86

Sub Project	Project	Region	12%			3%		
			NPV	EIRR (%)	B/C	NPV	EIRR (%)	B/C
WSD	Purok 7 Grains Warehouse and Solar Dryer	SoSot	556,212.75	20.22	1.37	2,028,611.52	20.22	2.07
WSD	Lanawan Grains Warehouse and Solar Drier - Lanawan	ZamboNorte	(765,501.42)	3.33	0.67	48,218.43	3.33	1.02
WSD	Upper Campo Islam Grains Warehouse and Solar Drier - Upper Campo Islam	ZamboSur	273,271.26	14.71	1.12	2,027,286.48	14.71	1.75
WSD	Bagong Silang Grains Warehouse and Solar Drier - Bulani	ZamboSur	592,814.10	18.49	1.30	2,453,662.87	18.49	2.03

ANNEX **B**

Sensitivity Analysis
All Projects

Table 66: Sensitivity Analysis, RIP Projects

SubProject	Project	Region	12%	3%	10% Increase in Cost		10% Decrease in Benefits	
					NPV at 3%	NPV at 12%	NPV at 3%	NPV at 12%
Airport	Sanga-sanga Airport	ARMM	468,458,188.52	1,142,514,862.14	813,230,373.12	310,685,957.55	726,554,531.43	276,401,186.39
BoatLanding	Bongao Port	ARMM	73,956,247.33	269,254,989.57	259,581,669.02	66,712,855.51	232,656,170.06	59,317,230.78
BoatLanding	Bauno Garing - Panglima Sugala	ARMM	6,695,045.15	20,455,439.21	19,985,178.01	6,342,913.11	17,939,634.09	5,673,408.59
BoatLanding	Pahut Boat Landing- Panglima Sugala	ARMM	1,883,986.79	6,810,146.38	6,552,926.60	1,691,380.37	5,871,911.96	1,502,981.69
Boatlanding	Siasi Port	ARMM	76,467,656.02	248,274,682.72	241,168,591.57	71,146,608.07	216,341,123.30	63,499,842.47
BoatLanding	Port Lamitan (Ro-Ro Rampt)	ARMM	76,756,102.32	228,657,267.10	223,816,398.97	73,131,255.56	200,950,672.26	65,455,645.33
Boatlanding	Maluso Port Upgrading - Maluso	ARMM	74,018,507.10	250,999,312.49	240,450,539.24	66,119,575.44	215,350,607.99	58,717,724.73
Bridge	Sitio Sarmiento Bridge - Langkong	ARMM	40,024,778.32	140,094,659.79	135,173,383.23	36,339,721.65	121,163,917.25	32,337,243.82
Bridge	Pigkalagan Bridge	ARMM	14,765,286.09	56,996,997.31	53,922,786.37	12,412,583.32	48,223,086.64	10,936,054.71
Bridge	Dawamoto Bridge	ARMM	23,032,043.61	68,650,211.39	66,543,224.27	21,419,560.11	59,678,203.13	19,116,355.75
Bridge	Matuber 2 Bridge Construction - Upi	ARMM	8,262,602.04	47,525,780.99	43,731,184.78	5,358,586.28	38,978,606.68	4,532,326.07

SubProject	Project	Region	12%	3%	10% Increase in Cost		10% Decrease in Benefits	
					NPV at 3%	NPV at 12%	NPV at 3%	NPV at 12%
Bridge	Campo Bridge Construction, Campo and Ramco, Paglat and SK Pendatun	ARMM	14,342,849.56	38,534,077.53	37,781,582.13	13,766,962.60	33,928,174.38	12,332,677.64
Bridge	Busay Bridge	ARMM	6,917,638.65	19,051,387.55	18,812,445.14	6,738,718.34	16,907,306.38	6,046,954.48
Bridge	Baños Bridge - Lantawan	ARMM	7,779,000.45	26,969,235.11	26,969,235.11	7,779,000.45	23,343,127.72	6,305,326.61
Bridge	Kidapawan Market Bridge	R12	16,491,032.55	52,529,050.58	51,116,691.08	15,433,456.39	45,863,786.02	13,784,353.14
Bridge	Lamba Footbridge Construction	R12	2,499,869.65	7,560,779.03	7,394,323.20	2,375,227.36	6,638,245.30	2,125,240.40
Bridge	Sinunuc Bridge	R9	3,170,681.09	26,878,619.33	24,275,742.92	1,178,692.04	21,587,880.99	861,623.93
Road	Buluan Fish Landing Road	ARMM	13,842,858.55	39,906,916.41	39,140,025.08	13,295,150.29	35,149,333.44	11,910,864.43
Road	Bumbaran Road	ARMM	16,531,257.97	101,753,675.55	93,707,853.15	10,784,989.57	83,532,485.60	9,131,863.78
Road	Jolo Market Road	ARMM	7,710,396.29	45,673,806.05	42,156,453.05	5,198,328.12	37,589,072.45	4,427,288.49
Road	Shariff Aguak Sapakan Road Upgrading - Maganoy and Tuka, Shariff Aguak, Mamasapano Rajah Buayan	ARMM	120,242,501.10	334,238,858.48	329,212,118.52	116,652,439.63	295,788,232.67	104,628,189.52
Road	Kilangan-Kibayao Road	R12	97,363,934.63	292,207,867.60	285,295,307.85	92,427,034.25	256,074,521.09	82,690,640.79

SubProject	Project	Region	12%	3%	10% Increase in Cost		10% Decrease in Benefits	
					NPV at 3%	NPV at 12%	NPV at 3%	NPV at 12%
Road	Pikit (Boliok) Road Upgrading	R12	130,192,377.18	362,164,511.83	356,686,505.09	126,280,024.23	320,470,053.91	113,260,786.51
Road	Masiu Circumferential Road Connecting Lake Lanao	ARMM	26,490,783.73	140,283,071.40	130,391,526.11	19,426,313.34	116,363,218.97	16,777,234.96

Table 67: Sensitivity Analysis, BIP Projects

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
					NPV at 3%	NPV at 12%	NPV at 3%	NPV at 12%
BL	Hawilian Boat Landing	AgusanSur	2,770,966.85	8,671,810.52	8,452,809.78	2,606,978.88	7,585,628.73	2,329,882.20
BL	Kaumpurnah Boat Landing	Basilan	1,723,941.96	6,205,689.84	5,973,393.87	1,549,998.51	5,388,130.08	1,407,463.43
BL	Sitio Tupay Boat Landing Upgrading - Barangay Tabuk	Basilan	708,550.61	4,763,901.56	4,406,165.77	440,677.70	3,929,775.61	369,822.64
BL	Balatanay Boat Landing	Basilan	2,642,719.97	9,526,841.11	9,169,105.31	2,374,847.06	8,216,421.20	2,110,575.06
BL	Carbon Boat Landing	Basilan	1,275,698.83	6,160,517.97	5,802,782.18	1,007,825.92	5,186,730.38	880,256.04
BL	Buluan River Boat Landing - Poblacion	Maguindanao	1,974,333.04	6,906,660.51	6,634,413.12	1,770,473.93	5,943,747.07	1,573,040.62
BL	Datu Piang Boat Landing - Poblacion	Maguindanao	6,035,322.70	15,927,716.42	15,681,639.26	5,851,059.88	14,088,867.62	5,247,527.61
BL	Libungan Torreta Boat Landing Construction - Matilac	NorthCot	3,850,207.73	12,203,518.39	11,821,699.55	3,564,301.40	10,601,347.71	3,179,280.63
BL	Kalanganan 2 Boat	NorthCot	(1,475,120.67)	(1,461,738.26)	(1,718,958.04)	(1,667,727.09)	(1,572,784.21)	(1,520,215.02)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
	Landing							
BL	Juluano Boat Landing	Sarangani	1,657,761.68	6,094,275.69	5,773,712.52	1,417,723.66	5,164,284.95	1,251,947.49
BL	Paril Boat Landing	SK	289,085.48	3,363,065.27	3,098,545.01	91,012.45	2,762,238.49	62,103.90
BL	North Laud Boat Landing Rehab - Barangay North Laud	Sulu	2,889,858.35	10,674,055.14	10,252,496.18	2,574,194.59	9,185,090.67	2,285,208.76
BL	Burboanan Boat Landing Construction	SurigaoSur	(337,291.51)	2,188,489.64	1,830,753.85	(605,164.42)	1,611,904.88	(571,435.27)
BL	Karungdung Boat Landing Rehab - Karungdung	Tawi-tawi	489,235.96	4,223,833.84	3,866,098.04	221,363.05	3,443,714.66	172,439.45
BL	Bato-bato Proper Boat Landing - Bato-bato	Tawi-tawi	1,829,235.10	7,118,456.95	6,808,728.99	1,597,310.50	6,096,883.29	1,414,386.99
BL	Pob Alicia Boat Landing Upgrading - Barangay Poblacion	ZamboSi	1,523,328.33	4,854,243.88	4,723,546.27	1,425,461.83	4,238,121.88	1,273,129.00
BL	Poblacion Malangas Boat Landing Construction	ZamboSi	4,958,524.23	13,024,472.15	12,656,935.79	4,683,312.64	11,354,488.57	4,187,460.22
BL	Liangan Landing Construction - Barangay Poblacion	ZamboSur	(197,539.72)	1,143,622.24	950,472.59	(342,170.36)	1,143,622.24	(197,539.72)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
BL	Tunggol Boat Landing Rehabilitation - Tunggol	Maguindanao	1,966,163.36	6,559,159.45	6,309,443.76	1,779,176.01	5,653,527.82	1,582,559.67
BL	Sirawai Proper Boat Landing Construction	ZamboNorte	2,207,836.12	6,801,915.16	6,640,166.32	2,086,718.43	5,959,974.80	1,865,934.82
Bridge	New Visayas Brgy Bridge Construction	AgusanSur	3,313,713.27	11,906,358.22	11,462,457.66	2,981,320.09	10,271,821.84	2,649,948.77
Bridge	Spillway Construction Tabon Tabon	AgusanSur	2,206,881.60	7,951,320.29	7,567,172.52	1,912,892.17	6,772,040.49	1,692,204.01
Bridge	Sumagdang Box Culvert Construction - Barangay Sumagdang	Basilan	1,293,295.81	4,014,336.35	3,916,039.92	1,219,691.35	3,514,606.28	1,090,361.77
Bridge	Sengal Footbridge Construction - Barangay Sengal - Matibay	Basilan	614,959.44	5,918,835.05	5,396,940.34	224,164.18	4,805,056.83	162,668.23
Bridge	Tampalan FootBridge	Basilan	1,621,855.26	5,077,033.89	4,896,434.99	1,483,642.39	4,388,731.60	1,321,456.86
Bridge	Zone 2 - Zone 3 Kaumpurnah Pedestrian Footbridge Construction - Barangay Kaumpurnah	Basilan	1,280,715.35	4,295,380.65	4,114,781.75	1,142,502.48	3,685,243.69	1,014,430.94
Bridge	Sitio Santol Spillway (overflow) Construction	ComVal	8,092,029.59	21,971,350.19	21,516,150.67	7,743,664.04	19,319,015.65	6,934,461.08

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Bridge	Mainit Overflow Structure (Spillway) Construction	ComVal	1,611,716.29	5,599,863.02	5,406,606.33	1,467,005.48	4,846,620.03	1,305,833.85
Bridge	North Ulip Footbridge Monkayo	ComVal	4,251,672.90	13,756,919.43	13,367,428.78	3,960,021.92	11,991,736.84	3,534,854.63
Bridge	Esperanza Suspension Footbridge	LanaoNorte	3,419,633.94	11,843,173.78	11,437,666.51	3,115,989.70	10,253,349.14	2,774,026.31
Bridge	Cabuyao Footbridge Construction	LanaoNorte	2,863,249.10	10,476,872.57	10,070,913.84	2,559,266.81	9,023,226.58	2,272,941.90
Bridge	Big Banisilon Slab Footbridge	LanaoNorte	6,079,332.11	16,197,695.55	15,896,697.39	5,848,977.32	14,276,927.83	5,241,044.11
Bridge	Olango Box Culvert Construction	LanaoNorte	2,382,670.91	7,305,013.22	7,134,666.25	2,255,114.94	6,404,164.93	2,016,847.85
Bridge	Poona Kapatagan Box Culvert	LanaoNorte	3,422,899.43	10,445,506.37	10,206,563.96	3,243,979.12	9,162,013.32	2,901,689.18
Bridge	Sulo Pipe Culvert Construction	LanaoNorte	527,862.42	1,863,860.42	1,797,032.72	477,821.77	1,610,646.68	425,035.53
Bridge	Tambo Cadayunan Footbridge Construction	LanaoNorte	2,906,334.77	10,218,754.60	9,855,952.62	2,634,668.30	8,834,077.16	2,344,034.82
Bridge	Inasagan Brgy Bridge Construction	LanaoNorte	3,172,813.09	9,201,122.00	9,036,656.45	3,049,661.13	8,116,544.25	2,732,379.82

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Bridge	Bulod-San Antonio Box Culvert Construction	LanaoNorte	(884,457.27)	(613,811.34)	(799,154.49)	(1,023,242.40)	8,116,544.25	2,732,379.82
Bridge	Batangan Box Culvert Construction	LanaoNorte	2,321,490.31	8,355,904.51	8,043,183.80	2,087,324.75	7,207,593.35	1,855,175.71
Bridge	Upper Bagumbayan Slab Bridge Construction	LanaoNorte	329,528.04	4,264,966.28	3,855,755.66	23,110.72	3,429,259.03	(9,842.08)
Bridge	Debalayan-Ilian Slab Bridge Construction	LanaoSur	2,214,394.03	7,047,112.86	6,785,244.46	2,013,985.37	6,080,533.17	1,792,545.96
Bridge	Bubong Barangay Bridge Construction	LanaoSur	(348,907.34)	2,486,625.44	2,090,173.65	(645,770.83)	1,841,511.10	(610,880.09)
Bridge	Linogoan River Box Culvert	LanaoNorte	2,276,668.11	8,243,966.91	7,931,431.27	2,042,641.12	7,107,034.58	1,814,974.30
Bridge	Gubar-Sawer Footbridge Construction	LanaoSur	1,290,845.42	4,657,470.03	7,748,135.72	1,103,070.67	6,919,119.76	952,176.80
Bridge	Bolao Borocot Bridge Approach	LanaoSur	3,280,874.14	13,890,351.08	13,201,781.69	2,765,272.71	11,812,746.58	2,437,185.29
Bridge	Paglat Pipe Culvert Construction - Poblacion	Maguindanao	3,274,314.26	10,389,667.92	10,113,986.42	3,067,883.68	9,075,019.63	2,740,452.26
Bridge	Karim Piers Footbridge Construction - Karim Buldon, Shariff	Maguindanao	3,193,132.63	10,355,604.53	10,060,271.37	2,971,986.88	9,024,710.91	2,652,673.61

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
	kabunsuan							
Bridge	Damakling Footbridge	Maguindanao	4,594,957.68	11,871,269.04	11,459,706.43	4,279,987.59	10,272,579.52	3,820,491.82
Bridge	Kanibong Box Culvert Construction - Kalumanga	Maguindanao	3,809,975.46	10,989,660.50	10,799,184.78	3,667,347.05	9,700,218.73	3,286,349.51
Bridge	Datu Odin Sinsuat Box Culvert Construction - Poblacion	Maguindanao	2,272,252.67	6,547,916.12	6,369,888.05	2,136,007.25	5,715,096.44	1,908,781.99
Bridge	Katalupak Slab Bridge Construction - Blensong	Maguindanao	2,363,047.82	7,577,756.49	7,290,669.23	2,143,339.09	6,532,893.58	1,907,034.31
Bridge	Manindolo Barangay Bridge Construction	Maguindanao	2,513,038.91	8,508,274.57	8,233,391.00	2,307,205.83	7,382,563.54	2,055,901.94
Bridge	Shariff Aguak Box Culvert Construction - Poblacion	Maguindanao	4,694,082.32	13,743,262.87	13,484,480.51	4,500,305.84	12,110,154.22	4,030,897.61
Bridge	Sepaka Barangay Bridge Construction	Maguindanao	1,011,028.73	4,003,333.60	3,779,487.29	839,718.48	3,379,153.93	738,615.61
Bridge	Bugwak Overflow Bridge Construction – Malangag	NorthCot	3,071,371.66	9,895,276.08	9,516,018.39	2,781,124.63	8,526,490.79	2,473,987.46
Bridge	Dungos Pipe Culvert Construction	NorthCot	1,290,845.42	4,657,470.03	4,482,252.58	1,159,642.43	4,016,505.58	1,030,557.89

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Bridge	Sarayan Barangay Bridge Construction	NorthCot	3,624,375.01	12,712,029.92	12,263,311.54	3,288,374.25	10,992,108.54	2,925,936.75
Bridge	Maunlad Pipe Culvert Construction	NorthCot	1,284,150.08	3,989,687.67	3,891,643.28	1,210,734.35	3,492,674.51	1,082,319.34
Bridge	Batiocan – Demapaco Footbridge	NorthCot	2,875,596.23	10,667,636.47	10,242,676.55	2,557,385.82	9,175,912.90	2,269,826.20
Bridge	New Pandan Pipe Culvert Construction	NorthCot	380,235.68	1,892,124.65	1,778,872.04	295,432.01	1,589,659.58	257,408.45
Bridge	Cabpangi Box Culvert Construction	NorthCot	2,652,818.18	8,674,120.60	8,329,648.81	2,389,192.90	7,462,236.75	2,123,911.08
Bridge	Ulamian Barangay Bridge Construction	NorthCot	2,502,021.14	8,979,421.65	8,645,496.19	2,251,977.44	7,747,554.02	2,001,775.32
Bridge	Don Mariano Marcos Box Culvert Construction	Sarangani	1,670,750.59	5,690,863.64	5,504,049.68	1,530,864.11	4,934,963.31	1,363,789.05
Bridge	Kindap Box Culvert Construction	Sarangani	1,354,389.36	4,377,926.32	4,254,373.90	1,261,873.19	3,816,581.27	1,126,434.25
Bridge	Patag Box Culvert Construction	Sarangani	888,989.28	3,812,971.15	3,620,562.73	744,913.67	3,239,265.61	656,014.74
Bridge	Purok 2 Slab Bridge Construction	Sarangani	991,931.38	4,686,210.86	4,420,368.10	792,868.06	3,951,747.01	693,674.92
Bridge	Libi Footbridge	Sarangani	612,424.86	3,860,966.52	3,582,172.64	403,663.73	3,196,075.98	342,421.24

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Bridge	Kabulunan Footbridge	SK	2,512,993.31	8,903,968.66	8,582,185.32	2,272,041.63	7,691,788.45	2,020,742.30
Bridge	Poblacion Kalamansig, Pag-asa (Market Site) Box Culvert Construction	SK	1,854,999.40	6,401,485.15	6,184,230.15	1,692,318.65	5,544,081.63	1,506,818.71
Bridge	Mangilala Slab Bridge Construction – Bual	SK	3,809,627.87	13,442,821.54	12,961,565.10	3,449,262.58	11,617,282.95	3,068,299.80
Bridge	Marguez Baranagay Bridge Construction	SK	1,984,180.77	6,645,262.44	6,436,815.53	1,828,095.52	5,772,289.28	1,629,677.44
Bridge	Nanas Box Culvert Construction - Malisbong	SK	2,871,341.52	8,490,008.24	8,321,837.77	2,745,415.31	7,472,836.94	2,458,281.15
Bridge	Bai Saripinang Box Culvert Construction	SK	6,811,041.04	20,077,331.69	19,685,719.40	6,517,801.37	17,677,986.23	5,836,697.27
Bridge	Sucob Box Culvert Construction	SK	2,294,646.74	6,862,360.12	6,718,779.41	2,187,133.37	6,032,543.40	1,957,668.69
Bridge	Impao Footbridge	SK	1,580,537.02	5,652,081.20	5,443,539.32	1,424,380.67	4,878,331.20	1,266,326.96
Bridge	Sitio Nabot Box Culvert Construction	SoCot	614,172.62	2,536,791.04	2,415,410.98	523,283.11	2,161,731.87	461,865.85
Bridge	Sumbakil Box Culvert Construction	SoCot	4,058,466.10	11,816,670.42	11,600,707.64	3,896,752.97	10,419,040.60	3,490,906.36
Bridge	Danlag Pedestrian	SoCot	(620,762.72)	(433,678.64)	(563,422.91)	(717,915.35)	(520,055.05)	(655,839.08)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
	Footbridge Construction							
Bridge	Lumakil Box Culvert Construction	SoCot	1,782,041.72	5,776,313.35	5,611,847.80	1,658,889.76	5,034,216.47	1,480,685.59
Bridge	Purok 2, Tupi, Box Culvert Construction	SoCot	939,053.26	3,852,354.69	3,669,887.75	802,421.84	3,284,652.28	708,516.51
Bridge	Bus-bus Pedestrian Footbridge Construction - Barangay Bus-bus	Sulu	1,672,492.56	5,991,134.78	5,823,598.38	1,528,415.03	5,224,484.91	1,361,165.77
Bridge	Subah Buaya Footbridge Upgrading - Barangay Subah Buaya	Sulu	832,842.05	5,244,836.84	4,802,052.18	493,977.63	4,277,568.49	410,693.43
Bridge	Anislagan Box Culvert Construction	SurigaoNorte	150,427.32	3,899,223.75	3,481,091.00	(162,670.89)	3,091,168.63	(177,713.62)
Bridge	Mahanub Box Culvert Construction	SurigaoNorte	3,279,964.06	9,285,394.48	9,142,208.79	3,172,746.48	8,213,669.35	2,844,750.07
Bridge	Togonan Bridge Construction	SurigaoNorte	361,731.71	3,597,453.67	3,276,734.44	121,576.83	2,916,989.07	85,403.66
Bridge	Bislig Burboanan Footbridge Construction	SurigaoSur	(1,805,061.97)	(578,915.04)	(1,037,015.24)	(2,148,087.84)	(979,123.74)	(1,967,581.65)
Bridge	Vitali Footbridge Construction	ZamboCT	3,688,136.83	11,391,961.57	11,118,265.35	3,483,192.83	9,979,069.19	3,114,379.15

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Bridge	Lapas Culvert Construction	ZamboCT	1,817,502.38	6,027,811.56	5,843,892.58	1,679,783.67	5,241,111.42	1,498,033.43
Bridge	Balacbaan Box Culvert Construction - Balacbaan, Tampilisan	ZamboNorte	(1,364,510.68)	(601,501.37)	(936,587.57)	(1,620,953.15)	(876,437.44)	(1,484,502.08)
Bridge	Disakan Box Culvert Construction - Disakan	ZamboNorte	2,316,768.46	7,169,668.02	6,922,664.87	2,127,736.21	6,205,698.07	1,896,059.36
Bridge	Sitio Mamongol Pedestrian Footbridge Construction	ZamboNorte	3,074,549.75	8,915,920.04	8,667,596.56	2,884,507.05	7,776,004.56	2,577,052.08
Bridge	Tilubog Barangay Bridge Construction - Tilubog	ZamboNorte	1,549,834.27	5,890,144.82	5,579,740.47	1,312,280.90	4,990,725.99	1,157,297.47
Bridge	Purok Makugihon Barangay Bridge Construction - Barangay Poblacion	ZamboSi	2,540,379.59	9,276,838.12	8,918,863.84	2,272,328.10	7,991,180.03	2,018,290.14
Bridge	Tiras Box Culvert Construction - Barangay San Pedro	ZamboSi	1,795,444.25	6,439,576.77	6,200,430.70	1,616,371.44	5,556,473.02	1,436,827.01
Bridge	Matim Overflow Structure Rehab - Barangay Matim	ZamboSi	1,245,967.30	6,212,131.12	5,839,604.27	967,018.83	5,218,391.15	842,422.10
Bridge	Balimbing Suspension Footbridge	ZamboSi	4,461,242.30	15,070,823.12	14,586,795.75	4,098,802.13	13,079,713.44	3,652,677.90

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
	Construction - Barangay FL Peña							
Bridge	Limason Box Culvert Construction - Limason	ZamboSur	1,122,392.10	4,957,464.07	4,697,547.03	927,765.97	4,201,800.62	815,526.76
Bridge	Nemeno Box Culvert	ZamboSur	2,392,923.42	8,234,420.63	7,956,938.14	2,185,144.27	7,133,496.08	1,945,851.92
Bridge	Man-ilan Barangay Bridge Construction - Barangay Manilan	ZamboSur	2,505,268.68	9,124,322.87	8,774,175.41	2,243,077.92	7,861,743.13	1,992,551.05
Bridge	Old Labangan Footbridge Construction - Old Labangan	ZamboSur	2,335,369.22	6,640,442.74	6,469,327.69	2,204,414.36	5,805,283.42	1,970,877.44
Bridge	Purok San Francisco Box Culvert, Barangay Alindahaw	ZamboSur	1,561,127.48	6,649,195.03	6,241,493.02	1,249,111.93	5,576,573.52	1,092,999.18
GSD	Buluan Grains Solar Dryer - Poblacion	Maguindanao	550,295.44	1,421,668.33	1,348,488.72	492,337.61	1,206,321.89	437,308.06
GSD	Bangayan Grains Solar Dryer	AgusanNorte	410,539.77	1,069,635.48	1,017,824.49	368,288.36	910,849.35	327,228.30
GSD	Christamonte Grains Solar Dryer	AgusanSur	1,680,462.89	3,787,532.85	3,672,774.22	1,589,574.70	3,294,020.93	1,421,528.42
GSD	Colonia Grains Solar Drier - Barangay	Basilan	879,447.03	2,062,283.84	1,986,498.79	819,425.71	1,780,270.41	731,481.00

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
	Colonia							
GSD	Sundig A Punod Grains Solar Dryer	LanaoNorte	745,468.46	2,010,294.31	1,903,942.08	658,739.14	1,702,875.09	584,172.59
GSD	Bulacon Grains Solar Drier	LanaoNorte	168,195.49	1,038,266.76	897,400.54	56,630.25	793,573.86	39,810.70
GSD	Curvada Grains Solar Dryer	LanaoNorte	64,949.59	505,753.30	430,783.28	5,573.76	380,207.95	(921.20)
GSD	Pangi Grains Solar Dryer	LanaoNorte	356,180.50	1,070,322.57	993,487.45	295,327.52	886,455.19	259,709.47
GSD	Pendulunan Kapai Grains Solar Drier	LanaoSur	926,643.60	2,234,697.39	2,142,727.48	853,803.95	1,919,257.74	761,139.59
GSD	Dado Grains Solar Dryer - Macabiso	Maguindanao	983,926.97	2,778,966.64	2,601,599.14	843,452.91	2,323,702.48	745,060.22
GSD	Kiludan Grains Solar Dryer - Dalamusay	Maguindanao	535,849.32	1,718,331.34	1,592,489.69	433,226.55	1,419,689.79	379,158.89
GSD	Limbulan Grains Solar Dryer - Madida	Maguindanao	1,129,510.61	2,460,083.91	2,404,639.74	1,084,296.37	2,158,506.18	971,279.63
GSD	Macabiso Grains Solar Dryer	Maguindanao	1,569,607.97	3,335,752.71	3,273,656.13	1,518,968.75	2,939,830.51	1,361,876.61
GSD	Sitio Dalamasak Grains Solar Dryer Construction - Sugadol	Maguindanao	448,212.39	1,292,774.66	1,206,705.68	380,046.25	1,077,428.22	335,225.01

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
GSD	North Binangga Gains Solar Dryer	Maguindanao	1,479,785.63	3,405,055.32	3,290,296.69	1,388,897.45	2,949,791.15	1,240,918.88
GSD	Kayupo Grains Solar Dryer	Maguindanao	1,162,088.51	2,533,230.29	2,470,742.78	1,112,598.76	2,217,419.75	996,389.90
GSD	Midtimbang Grains Solar Dryer - Midtimbang	Maguindanao	1,068,354.88	3,132,492.49	2,917,320.05	897,939.54	2,604,070.80	791,104.05
GSD	Purok Pomelo Grains Solar Dryer – Grebona	NorthCot	633,533.40	1,526,767.51	1,464,097.82	583,899.36	1,311,421.07	520,546.02
GSD	Barangiran Grains Solar Dryer	NorthCot	1,513,337.56	3,255,624.23	3,188,634.89	1,458,708.34	2,862,947.30	1,307,308.90
GSD	Macabasa Grains Solar Dryer – Dado	NorthCot	650,822.90	1,598,645.38	1,534,016.47	598,118.59	1,374,026.75	532,970.62
GSD	Inas Grains Solar Dryer	NorthCot	138,631.45	641,192.48	567,202.57	80,031.86	503,083.32	66,168.71
GSD	Kapinpilan Grains Solar Dryer	NorthCot	315,710.03	1,270,215.76	1,139,007.05	211,793.48	1,011,985.47	180,222.48
GSD	Bayangan Grains Solar Dryer – Galidan	NorthCot	776,574.20	1,795,546.90	1,738,584.22	730,121.63	1,558,449.47	652,174.57
GSD	Lamuak Grains and Solar Dryer – Katilacan	NorthCot	888,315.75	2,509,317.08	2,362,052.59	768,222.84	2,110,845.03	679,246.54
GSD	Sebastian Grains Solar Dryer Construction	NorthCot	448,402.49	1,315,860.65	1,225,331.58	376,703.98	1,093,745.51	331,863.73

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
GSD	Bagudato Grains Solar Drier	Sarangani	646,014.20	1,815,942.31	1,710,455.86	559,990.91	1,528,736.45	495,323.82
GSD	Purok 10 Grains Solar Dryer - Dansuli	SK	697,020.17	1,797,050.37	1,705,080.46	624,180.52	1,525,375.42	554,478.50
GSD	Maligaya Grains Solar Dryer	SK	742,801.51	1,784,126.92	1,711,819.79	685,534.68	1,533,407.10	611,254.53
GSD	Kigulao Grains Solar Dryer	SK	139,357.29	934,099.14	802,890.43	35,440.74	709,480.51	21,505.01
GSD	Pasandalan Grains Solar Dryer	SK	579,580.26	1,473,040.46	1,400,732.86	522,313.05	1,253,428.81	464,355.03
GSD	Kapaya Grains Solar Dryer	SK	754,053.74	1,823,684.01	1,747,822.12	693,971.56	1,565,453.72	618,566.18
GSD	Abdullah Grains Solar Dryer	SoSot	784,467.36	1,837,987.52	1,770,695.57	731,172.51	1,586,896.82	652,725.78
GSD	Manisan Solar Dryer	SoSot	964,863.04	2,094,763.34	2,048,613.02	927,227.85	1,839,036.55	830,689.01
GSD	Silop Grains Solar Dryer	SurigaoNorte	916,285.63	2,000,985.26	1,955,050.13	878,825.93	1,754,901.54	787,171.10
GSD	Sipanik Grains Solar Dryer	ZamboNorte	719,654.08	1,627,411.34	1,581,261.02	682,018.90	1,418,478.16	610,031.60
GSD	Sitio Pukay Grains Solar Drier - Canacol	ZamboNorte	401,525.17	1,239,771.94	1,146,640.98	327,765.98	1,022,663.78	287,613.46

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
GSD	Sitio Imelda Grains Solar	ZamboSi	813,360.01	2,084,463.49	1,979,602.78	730,310.93	1,771,156.44	648,974.93
GSD	Bombil Grains Solar Drier - Gango, RT Lim	ZamboSi	831,130.16	2,098,450.83	1,997,492.35	751,171.62	1,787,647.27	668,058.61
GSD	Gawil Grains Solar Drier - Gawil	ZamboSur	810,859.13	1,915,437.84	1,842,817.15	753,343.95	1,651,273.36	672,258.04
GSD	Diplo Grains Solar Drier - Barangay Diplo	ZamboSur	55,435.37	690,591.14	575,782.88	(35,492.12)	506,723.76	(41,035.66)
GSD	Matinabangon Grains Solar Drier - Barangay Anonang	ZamboSur	677,536.92	1,583,681.46	1,530,938.23	634,525.28	1,372,507.50	566,738.75
Road	Tulay Rockcauseway Upgrading - Zone III, Barangay Tulay	Sulu	1,064,328.03	4,173,069.16	3,968,495.57	918,223.04	3,551,188.65	811,790.24
Road	Lanipao/Cabasagan Road Rehab	LanaoNorte	7,373,062.25	26,320,272.46	25,244,255.67	6,604,578.81	22,612,228.43	5,867,272.58
Road	Tuburan-Guiawon Road Rehabilitation	LanaoNorte	10,391,845.33	27,941,066.59	27,662,505.31	10,183,258.37	24,868,398.65	9,144,073.84
Road	Rebucon Matampay Road Upgrading	LanaoNorte	9,248,316.95	25,172,335.49	24,856,258.89	9,022,577.33	22,339,025.34	8,097,745.63
Road	Marambuaya Road Rehabilitation	LanaoSur	7,180,056.05	23,213,513.40	22,484,328.89	6,659,277.73	20,162,977.55	5,941,272.12

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Road	Guimba Road Rehabilitation	LanaoSur	11,051,920.39	37,424,750.99	36,079,173.98	10,090,918.98	32,336,698.89	8,985,726.95
Road	Marguez Road Upgrade	Maguindanao	3,484,352.22	10,972,099.81	10,656,857.64	3,259,208.53	9,559,647.66	2,910,773.31
Road	New Alimudian - Migkuan Road Upgrading	NorthCot	7,846,117.75	21,764,315.85	21,442,317.37	7,616,148.76	19,265,885.79	6,831,536.98
Road	Batulawan – Barongis Road Rehabilitation	NorthCot	10,495,405.13	28,442,854.50	28,100,479.08	10,250,883.07	25,256,193.63	9,201,342.56
Road	Kityan Road Rehabilitation	Sarangani	8,633,202.15	24,329,380.99	23,924,762.74	8,344,226.71	21,491,824.64	7,480,906.49
Road	Baranagay Proper Sitio Libon Road Upgrading – Makat	SK	10,180,380.66	28,349,922.99	27,914,216.03	9,869,201.88	25,079,223.73	8,851,163.82
Road	Purok 1, Sitio Opong Road Upgrading	SoCot	97,363,934.63	292,207,867.60	6,484,757.72	1,507,764.20	5,803,069.78	1,333,267.89
Road	Busbus-Gandusul Bypass Road concreting - Busbus-Gandusul	Sulu	843,206.16	3,979,202.97	3,728,412.98	664,093.75	3,330,492.68	579,773.13
Road	Sitio Interior - Magsaggao Road Rehab - Magsaggao	Tawi-tawi	8,607,987.44	26,981,997.45	26,219,576.86	8,063,472.15	23,521,377.12	7,202,673.40
Road	Biayon - San Jose Road Rehab -San Jose	ZamboNorte	5,656,331.37	18,894,329.17	18,239,872.73	5,188,923.29	16,350,439.82	4,623,290.16

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
Road	San Vicente Road Rehab - Barangay San Vicente	ZamboSi	5,894,579.71	18,062,906.34	17,636,954.52	5,577,552.32	15,830,663.88	4,988,094.35
Road	Datu Tumanggong Road Rehabilitation, Tungawan	ZamboSi	4,596,720.55	13,557,778.59	13,262,775.26	4,386,031.30	11,906,997.40	3,926,359.24
Road	Ulame Road Rehab - Barangay Ulame	Basilan	2,951,862.14	10,692,916.98	10,239,507.03	2,628,698.52	9,170,215.34	2,333,512.31
TC	Cuyago Trading Center Construction	AgusanNorte	1,095,420.71	2,791,650.70	2,777,629.52	1,054,367.32	2,488,279.51	939,481.44
TC	Buenavista Trading Center	AgusanNorte	366,425.56	1,937,044.15	1,918,072.73	310,878.08	1,710,587.53	267,005.06
TC	Barangay Marketside Trading	Basilan	205,649.06	1,139,721.26	1,124,068.75	159,819.21	998,726.69	133,288.76
TC	Lamitan Trading Center, POblacion	Basilan	298,357.70	1,906,301.11	1,877,097.86	212,851.92	1,665,254.61	171,886.09
TC	Kapatagan Trading Center Construction	LanaoNorte	591,316.50	2,155,150.91	2,134,049.92	529,533.77	1,903,207.15	462,360.03
TC	Lala Trading Center (Maranding)	LanaoNorte	150,930.72	1,434,580.06	1,409,540.89	77,617.16	1,247,894.51	52,981.06
TC	Poblacion Matungao Trading Center	LanaoNorte	(99,906.47)	1,117,864.16	1,089,302.16	(183,534.73)	956,768.39	(184,429.75)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
TC	Nuro Trading Center - Nuro	Maguindanao	185,092.21	1,449,793.80	1,428,534.18	122,844.99	1,268,111.88	96,233.22
TC	Datu Paglas Trading Center - Poblacion	Maguindanao	(430,748.67)	686,171.22	654,612.65	(523,150.76)	563,071.48	(492,103.61)
TC	Bunawan Trading Center	Maguindanao	(139,194.15)	1,054,298.27	1,026,834.38	(219,607.18)	901,454.87	(216,154.91)
TC	Awang Trading Center Awang Datu Odin Sinsuat, Shariff Kabunsuan	Maguindanao	(549,207.75)	313,722.91	287,603.35	(625,684.63)	237,257.90	(580,718.64)
TC	Bulod Training Center	Maguindanao	(770,778.29)	233,836.25	202,357.52	(862,946.60)	156,107.84	(797,866.07)
TC	Tulunan Trading Center – Poblacion	NorthCot	(343,442.27)	1,217,213.16	1,176,348.71	(463,091.55)	1,024,943.58	(444,321.74)
TC	Makilala Trading Center – Poblacion	NorthCot	528,490.65	1,869,420.93	1,854,633.99	485,195.15	1,656,950.71	426,710.43
TC	Manualanan Trading Center	NorthCot	(549,322.76)	274,324.06	248,352.36	(625,366.75)	202,054.19	(580,332.91)
TC	Glan Trading Center	Sarangani	701,849.54	2,144,468.35	2,126,854.73	650,277.66	1,899,613.42	573,379.73
TC	Maitum Trading Center Construction	Sarangani	(319,476.88)	291,912.67	273,524.19	(373,317.52)	230,975.59	(348,378.12)
TC	Busok Trading Center Construction	SK	(236,459.67)	164,322.03	151,470.45	(274,088.53)	125,702.90	(255,340.61)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
TC	Dansuli Trading Center	SK	(335,045.57)	535,394.69	509,764.91	(410,088.43)	437,608.04	(386,352.00)
TC	Tupi Trading Center	SoSot	189,847.07	1,068,322.75	1,054,392.71	149,060.55	937,441.70	124,766.78
TC	Siasi Trading Center	Sulu	336,694.46	1,659,351.96	1,637,135.23	271,644.87	3,383,917.73	1,002,404.38
TC	Campo Islam Trading Center - Barangay Campo Islam	Sulu	(754,415.12)	(595,583.03)	(613,971.51)	(808,255.76)	(567,770.54)	(739,822.54)
TC	Mahanub Proper (Purok 3) Trading Center	SurigaoNorte	608,986.57	2,330,818.06	2,309,038.42	545,216.76	2,060,135.95	476,017.36
TC	Hayanggabon Trading center	SurigaoNorte	159,242.20	1,664,243.10	1,634,535.83	72,260.65	1,446,532.25	45,014.28
TC	Bato-bato Trading Center - Barangay Batu-batu	Tawi-tawi	(475,754.53)	741,558.04	709,388.68	(569,944.97)	611,865.15	(534,630.03)
TC	Taytay Manobo Trading Center - Barangay Taytay Manobo	ZamboSi	(1,006,149.53)	(681,408.62)	(705,255.36)	(1,075,971.73)	(654,436.70)	(984,445.34)
TC	Poblacion Kamalarang Trading Center, Barangay Poblacion	ZamboSur	300,454.14	2,230,219.48	2,194,031.77	194,498.14	1,944,723.19	150,660.73
TC	Kabatan Trading Center	ZamboSur	(790,827.86)	(249,285.26)	(482,046.79)	(1,003,331.57)	(456,538.18)	(921,506.86)
TC	Alibangbang Trading Center	ZamboSi	(1,034,629.35)	(725,430.57)	(818,940.03)	(1,149,092.88)	(486,494.79)	(943,115.43)

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
WSD	Kosga Seaweed Warehouse & Solar Dryer	LanaoNorte	626,855.52	2,188,700.24	2,009,374.07	480,616.59	2,188,700.24	626,855.52
WSD	Big Banisilon Solar Dryer/Warehouse	LanaoNorte	966,049.31	2,309,802.07	2,217,832.16	893,209.67	1,986,851.95	796,604.74
WSD	Calimodan Grains Warehouse & Solar Dryer	LanaoNorte	357,256.82	1,863,504.87	1,650,144.55	183,263.34	1,463,502.91	147,384.90
WSD	Camp Jakarta Grains Warehouse & Solar Drier	LanaoSur	545,753.20	2,008,676.33	1,818,582.38	395,199.88	1,617,714.75	340,624.56
WSD	Kibleg Grains Warehouse and Solar Dryer - Upi	Maguindanao	516,930.83	2,201,056.77	1,962,421.21	327,932.83	1,742,315.53	276,239.75
WSD	Kuden Grains Warehouse and Solar Dryer Construction - Kuden	Maguindanao	1,112,075.21	3,085,272.14	2,953,746.93	1,004,904.75	2,634,366.21	888,311.12
WSD	Binibiran Grains Warehouse and Solar Dryer - Salman	Maguindanao	1,595,769.87	3,776,145.93	3,643,591.13	1,487,672.58	3,265,248.67	1,327,713.70
WSD	Pagagawan Proper Grains Warehouse and Solar Dryer Construction	Maguindanao	1,263,798.67	2,920,313.24	2,819,899.44	1,184,271.51	2,527,868.11	1,057,891.64

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
WSD	Madidis Grains Warehouse and Solar Dryer	Maguindanao	584,102.40	2,295,857.47	2,082,497.15	410,108.91	1,852,183.54	351,316.78
WSD	Malala Grains Warehouse and Solar Dryer	Maguindanao	844,515.17	2,411,253.37	2,253,906.66	719,897.47	2,012,781.33	635,445.95
WSD	Mateo Grains Warehouse and Solar Dryer - Kibayao	NorthCot	757,357.00	2,265,683.61	2,104,303.85	629,545.15	1,877,735.49	553,809.45
WSD	Tlbao Grains Warehouse Construction (formerly with Solar Dryer.	NorthCot	(261,270.36)	(132,537.62)	(198,466.66)	(315,034.91)	(185,574.51)	(289,097.60)
WSD	Kitulaan Grains Warehouse and Solar Dryer	NorthCot	1,041,929.60	2,643,616.06	2,514,512.60	939,680.40	2,250,150.99	835,487.44
WSD	Kilabon Grains Warehouse and Solar Dryer	SK	924,878.50	2,512,722.96	2,365,523.20	808,297.14	2,114,250.91	715,809.29
WSD	Bintana Grains warehouse and Solar Dryer	SK	1,186,831.88	2,818,124.91	2,708,975.82	1,100,386.42	2,427,163.33	981,703.23
WSD	Bual Grains Warehouse and Solar Dryer	SK	1,144,954.24	2,547,633.12	2,481,704.08	1,091,189.69	2,226,815.60	976,628.59

Sub-Project	Project	Region	12%	3%	SENSITIVITY ANALYSIS			
			NPV	NPV	10% Increase in Cost		10% Decrease in Benefits	
WSD	Purok 7 Grains Warehouse and Solar Dryer	SoSot	556,212.75	2,028,611.52	1,838,517.57	405,659.42	1,635,656.42	350,038.15
WSD	Lanawan Grains Warehouse and Solar Drier - Lanawan	ZamboNorte	(765,501.42)	48,218.43	(247,610.25)	(999,796.05)	(252,432.09)	(923,245.91)
WSD	Upper Campo Islam Grains Warehouse and Solar Drier - Upper Campo Islam	ZamboSur	273,271.26	2,027,286.48	1,755,497.74	51,629.92	1,552,550.73	24,188.22
WSD	Bagong Silang Grains Warehouse and Solar Drier - Bulani	ZamboSur	592,814.10	2,453,662.87	2,214,827.43	398,045.89	1,969,144.97	338,598.58

ANNEX

C

Results of the FGDs and KIIs

Results of Key Informant Interviews² (KIIs)

I. ARMM

Key Informants:

The total number of key informant interviews (KIIs) conducted in the Autonomous Region in Muslim Mindanao reached 214. From these interviews, there were only 28 (13%) females compared to 186 (87%) male informants. In terms of affiliation, 135 (63%) informants represented the barangay local government units (BLGU), 44 from the municipal local government units (MLGU) and the remaining 35 were from the religious, education and cooperative sectors. By geographical distribution, more than half of the informants came from the province of Maguindanao (109 or 51%). The other informants came from the following provinces: Lanao del Sur, 36; Tawi-Tawi, 26; Sulu, 25 and Basilan, 18.

Major Problems/Concerns of the Barangay/Municipality:

Among those interviewed for this survey, there were 49 (23%) informants who felt that the percentage of poor people in their area was about 80% of the population while another 43 (20%) informants believed that about 70% were poor. On the other hand, 58 (27%) informants had lesser estimates, which ranged from 40 to 10% of their community were considered poor.

Based on their understanding of what poor meant, the informants pointed out the following likely reasons: top on the list was lack of livelihood/income opportunities (68 responses), followed by people not having their own land to till (45 responses), lack of education and appropriate skills (35), high cost of farm inputs (34) and low-income/low-paying work (26 responses). Asked on the most common sources of income or types of work in their respective areas, the informants identified the following: vending (35 responses), farming (33 responses), fishing (31 responses), farm labor (21 responses) and working outside the barangay (14 responses).

Vending refers to “sari-sari” stores, which are actually home-based stores that sell basic consumer, day-to-day items. It also refers to women selling food items (viands and snacks). Farming refers to people who tend to their own lot/gardens and grow rice, vegetables, root crops, either for household consumption or for sale to the local markets. For coastal barangays or those living near lakes and rivers, fishing is also a source of income. Farm labor refers to people working for other farms, particularly during preparation for the planting of the crops or during harvesting. Other farm labor refers to people working for large-scale banana, pineapple, rubber, or oil palm plantations. Finally, those who are working outside of the barangay refer to people who found work in areas such as Cagayan del Oro and Iligan cities, where the construction industry is more active.

In classifying problems related to poverty, the informants came up with the following:

- Economic: The lack of livelihood and income opportunities (63 responses) was seen as a main determinant of poverty. People were willing to work, if only they could find work. The informants also thought that the lack of infrastructure facilities (29 responses) dampened their chances of earning a living. They would have to pay double for cargo handling, or their

² There were informants who gave multiple responses on some questions. In such cases, adding the responses exceeded the number of key informants conducted per region.

agricultural produce (particularly fruits and vegetables) would run a high risk of spoilage if these were not delivered to the market as soon as harvested. For those who were engaged in farming, the high cost of farm inputs was keeping them from maximizing the productivity of their soil and toil. They could not afford fertilizers or the technology to improve productivity.

- **Social:** Access to potable water (12 responses) was identified as the top social factor that contributed to poverty. They would have to walk far from to get water for drinking or domestic use. Without potable water and proper sanitation, the risk of diseases was high. Other available water was taken from deep-wells, but others were not safe for drinking. Informants also reported that the lack of power/electricity (7 responses) was also a major concern. Peace and order was also found to be a major factor to poverty, tempering the interest of the investors and tourists alike.
- **Political:** The informants believed that “political conflict” (17 responses) was also a factor to poverty. The patronage system still existed and only those who were favored by the local leaders were able to access support/services from the local government.

Impacts of the GEM Projects:

An overwhelming number of the informants answered “yes” (197 or 92%) when asked if the construction of the GEM infrastructure project in their area had improved their livelihood or income. For those informants who lived in an area provided with road projects, the main benefit felt was access (16 responses). Access for the informants meant that they were able to send their produce to the market; they were able to take advantage of the services/resources available at the other community/town center; members of cooperatives were now able to pay for their loans as they could travel to their destinations. Access also referred to mobilization – in cases of emergency, they were able to send their sick/dying to hospital. Access meant more types of vehicles could gain entry/exit to their barangays, at any given time. Other benefits gained from the road projects less transport cost (9 responses) and more time saving (7 responses).

From the construction of trading centers, the informants shared that their LGUs also attained an increase in local revenues (7 responses). In some areas, the project also served as venue for community activities/purpose (Kandoli or Kasalan and sports activities). Some informants said that having the trading center seemed to have signaled more businesses (6 responses) sprouting near the project. Many were going to the “tabo” (market day), as the buying/selling transactions had turned more orderly and comfortable.

The bridge projects were valued for “safety” (15 responses). In most cases, the informants shared their relief of being able to cross rivers and creeks more safely, compared to the dilapidated, rickety bamboo and wooden bridges that were their only options before. The bridges also meant access (9 responses) for them: people get to their destinations on the other side, such as children going to schools and farmers delivering their harvested produce to buyers/market. The informants also highlighted that with the bridge, the farmers avoided double-handling costs (8 responses). The products were brought from the farm to the market with only one type of transport. Before, they had to load and unload the products twice as they had to cross the river using boats. They were also noted fewer incidences of overflow (4 responses). Before the bridge projects were constructed, the people had to wait for the water in the rivers or creeks to subside before they could go across. Because it could take hours, the students would elect to skip classes on rainy days. The farmers, on the other hand, suffered spoilage if the products were not delivered immediately. Some of the informants noticed an increase in business activities (3 responses) because of the bridge projects.

Farmer-members of cooperatives and associations considered the solar dryer and/or grains warehouse to be a blessing. With it, the farmers experienced an increase in their income (9 responses), a result of their rice and corn (sometimes coconut too) being properly dried. The

informants also relayed that farmer-members now had lesser post-harvest losses (6 responses) as the grains and other products were dried using the right facility, compared to these being left under the sun on top of sacks and plastic mats left on the roadside. Informants also stated that the benefits of the dryers/warehouses were not confined among the members of the cooperatives or associations, as they also accommodated the grains of farmers from adjacent barangays (4 responses). The project also meant lesser cost for the farmers as they had a facility near to their farms/residences. Before the project, some of the farmers had to bring their grains to adjacent barangays, entailing more transport cost.

Boat landing projects seemed to have created more businesses (4 responses) according to the informants. It was also safer (3 responses) for them to embark/disembark from the boats. For those that operated/owned the boats, the landings made it more convenient in terms of docking their boats.

If the GEM projects were not constructed, the informants believed that there would have been more accidents and deaths, with people (especially children) falling over the dilapidated bridges/footbridges or vehicles skidded on bad, muddy roads. The flooding would have caused more damage on properties and crops. Market days would be chaotic and dangerous, while loading/unloading of cargoes to/from small boats would take long due to less space or decrepit facilities. Farmers would lose so much due to inappropriate drying, as they would be forced to sell their products cheaper. If contaminated by soil and sand, they would not also sell their grains for a good price.

Peace and Order:

From the 214 informants, 72 (29%) said that their area had been peaceful, even before the entry of GEM or the construction of the infrastructure projects. However, there were 101 (47%) responses related to conflict and violence. On top of the list were rido or clan wars with 37 responses, resulting from deaths to displacement to land grabbing. Second on the list were armed clashes between the government troops and MILF/NPA/bandits with 24 responses. Kidnapping cases were also disturbing peace, with 13 responses. The informants were also bitter about the all-out war that former President Joseph Estrada declared in 2000. The 2009 massacre in Maguindanao also placed the province in a bad light, which also affected the peace and security situation (4 responses).

The informants were asked whether they perceived conflict to be escalating in frequency or not, only 5 responded “yes, conflict was increasing”. On the other hand, there were 85 (or 40%) responses that said “decreasing” in frequency. There were also 39 responses remarking their areas had been peaceful since – with no incidence of conflict and violence before the GEM project was constructed and until today.

Majority (155 or 72%) of the informants said that the presence of GEM projects in their area contributed in lowering the incidence conflict and violence. There were 18 informants who said that the GEM projects had indirect positive effects on lowering conflict and violence, 13 responses on GEM projects not related to peace and order, and three (3) responses that said the project did not have any effect at all. Those who said it improved the peace and orders situation had given the following reasons: local people felt that these projects were an indication of the two governments’ concern over their socio-economic welfare, people now focused their attention on livelihood/economic activities, and people decided to unite and maximize the presence of the project. A few informants said that due to the project, the presence of military presence or the security measures were intensified.

Informants from ARMM said that they knew of former combatants (113 responses or 53%) living in their area while other informants were not aware (76 responses) of any former combatants who decided to lay down arms and joined the mainstream community.

2. Region 13 – CARAGA Region

Key Informants:

There were 43 respondents to the Key Informant Interviews (KIIs) in Region 13, 35 (81%) of whom were males and 30 (70%) were barangay officials or working with the barangay local government. In terms of geographical distribution, 13 (30%) were from Agusan del Sur and 11 (26%) from Agusan del Norte.

Major Problems/Concerns of the Barangay/Municipality:

Based on the informants' understanding of "poor", the respondents were asked to estimate the percentage of poor people in their barangay. A little over a third (15 responses or 35%) of the informants replied that around 26-50% of the people/households in their area were poor. There were 12 (or 28%) informants who said that more than three-fourths (76-90%) of the people were poor.

Unemployment, no land of their own, lack of education, big family and lack of farm-to-market roads were cited as reasons for being poor. According to the informants, most of the people in their area worked as laborer (21 or 49%) to other farms (particularly during harvest time) or to plantations (rubber and oil palm). Those who had land to till worked as farmers (11 or 26%). Communities along the coast had people working as fishermen (6 or 14%), those in the upland worked as wood gatherers (4) and those near the mine sites worked as miners (4).

The GEM project sites experienced a host of different, sometimes related problems. The lack of livelihood opportunities and unemployment (30 or 70%) was the most common concern in the region. The local economy in these project sites was considered sluggish due to the lack of infrastructure (23 or 33%), including farm-to-market roads and post harvest facilities. The informants also noted the lack of financial assistance (e.g. to farmers so they can afford farm inputs) and the low investment activities.

Social problems ranged from children who could not go to school – due to lack of classrooms and school buildings and the parents' inability to shoulder school-related expenses (20 or 47%). There were also areas that still did not have adequate water systems and sanitation facilities (7 responses). Other minor issues raised by the informants were peace and order (3), drainage (3), lack of medicines (3), and lack of health centers (2).

Impacts of the GEM Projects:

GEM projects were perceived to have positive impact on their host communities (36 or 84%). These positive impacts ranged from people being able to do the following: bring their products to the market, reduce post-harvest losses, display their products in better venues, to go other places and save time, additional revenues to the LGUs, and safe crossing/travel to their destinations.

Four (4 or 9%) informants preferred not to give comments, while three (3 or 7%) answered "no", citing that during rainy days, they would still experience flooding in their areas.

The informants appreciated the presence of GEM projects in their communities; otherwise, they imagined the old ways of drying their harvest on plastic mats and sacks, wading through river or

riding the unsafe bamboo rafts, taking a long time to travel or having to take a farther route, and being worried in crossing/using dilapidated bridge/structures. Without the GEM projects in their areas, the key informants admitted that they would still be struggling with their old, cumbersome, inconvenient, wasteful and costly practices and facilities.

Peace and Order:

Informants said that their respective areas had been peaceful (23 or 53%), before the GEM entered their communities and until today. Therefore, the projects had no direct influence on the state of peace or conflict in these GEM sites. There were three (3) reported armed clashes (between government and NPAs or bandits), particularly in Agusan del Sur and in Surigao del Norte. These were only two provinces where presence of former combatants was noted, but the informants did not equate the combatants' reasons for coming back to the fold as persuaded by GEM's projects.

3. Region 12

Key Informants:

Region 12 had 144 key informant interviews. From this number, only 31 (or 22%) were females and the rest were males (113 or 78%). There were ninety (90 or 63%) of the informants affiliated with the BLGUs, mostly barangay kagawads and purok leaders. There were also representatives from the MLGUs, numbering 30 (21%). Teachers, senior citizens, cooperative officers and those who represented the religious sector (Christian and Muslim) composed the remaining 24 (17%). Seven provinces were represented in the KIIIs: North Cotabato with 50 informants (35%), Sarangani with 33 (19%), South Cotabato with 27 (19%), Sultan Kudarat with 24 (17%) and Cotabato with 10 (7%).

Major Problems/Concerns of the Barangay/Municipality:

Based on the estimates of the 144 informants, only 28 (19%) said that the percentage of poor people in the region ranged from 40 to 10%. However, a bigger number (44 responses or 31%) said that at most, the poor people in their areas could be as many as 70% of the population, and the other 32 informants (22%) said it could be around 60% of the population. There were also informants who estimated that more than 80% of the population (30 responses or 21%) was poor.

According to the informants, the most eminent cause of poverty was people had no land of their own to till. This reason garnered 79 responses (55%) from the informants of Region 12. The informants also believed that without permanent job or source of income (52 responses or 36%), the people in their region remained rooted in poverty. Unemployment was the third highest score, with 45 responses (31%), followed closely by lack of capital (38 responses or 26%) and lack of education or appropriate skills (34 responses or 24%).

For those who had work/job, the most prevalent type was “farm labor”. This meant that people worked in other farms (98 responses or 86%), particularly during preparation of the fields or harvesting of the crops. This only supported the claim earlier that people would prefer to have a land of their own, since working as farm laborer could be temporary and usually paid with low wages. Driving (34 responses or 24%) was another source of income. Farming came up third in Region 12, with 31 responses. Some people work in plantation farms (24 responses), fishing (17 responses) and construction (13 responses).

In categorizing their communities’ main concerns/problems, the informants came up with the following:

- Economic: Lack of infrastructure (101 responses or 89%) was not helping the communities develop. In particular, the informants still demanded for more, if not better, roads and bridges, irrigation systems, post-harvest facilities, trading centers and drainage systems. They also thought that lack of employment/livelihood opportunities (85 responses or 59%) had made it difficult for the households to sustain their daily needs.
- Social: Either as causes or as symptoms, the lack of access to potable water (57 responses or 50%) was a nagging concern for the key informants. Other missing services from these communities were lack of medicines (28 responses), which the poor households could ill-afford, given their meager income and competing needs. The lack of educational facilities (26 responses) such as day care centers and classrooms for both elementary and high school levels were seen as a community concern.

Impacts of the GEM Projects:

Only one from among the 144 informants in Region 12 said that the GEM project had no impact in their community. The other 143 informants (99%) believed that the presence of GEM project in their communities had one way or another brought positive outcomes.

Farmers felt the biggest change in their daily activities, having been able to bring their agricultural produce to the market, even during rainy days. The farmers were able to save on the post-harvest losses, since soil and sand were prevented from contaminating the grains while drying. The farmers were able to improve the quality of their products, and with this, they were also able to ask for better prices. For parents, having a bridge constructed/upgraded in their areas meant that their children could safely cross rivers/creek and could attend school during rainy days. Comfort and order were introduced in projects such as the trading center and the boat landings. People were encouraged to sell and buy products on market days because of the dedicated and convenient space offered by the trading centers. Trading centers were also utilized for other community activities. Boat landings allowed more and bigger boats to dock safely, and making the loading/unloading more efficient. With the user fees from the trading center and boat landing facility, the LGUs also benefited from increased revenue.

Without the GEM projects in their midst, the informants agreed that they would still be wallowing in the backwardness of life in the countryside. Their precious grains would still be left drying by the roadside, vulnerable to contamination and elements of weather. When dried, they would have to store their grains inside their house until these would find buyers. There would be double-handling costs for farmers had to cross rivers and creeks in bringing their products to the market. For students, they would have to skip school when rivers/creeks overflow. LGUs would have to stretch their limited budget allocation to respond to the urgent and divergent needs of their constituents.

Peace and Order:

A hundred (100 or 69%) informants said that their communities never experienced conflict or violence. For those that did, they pointed out that these incidences were armed clashes between the government and the MILF or bandits (28 responses or 19%), kidnapping (4 responses) and one bombing.

Three informants said that the level of conflict and violence was increasing their in their area (they lived in Tampakan, South Cotabato). In areas where there were cases of conflict and violence, the incidences had been decreasing (41 responses or 28%).

When asked on their opinion whether the presence of GEM project in their community contributing to the lowering of conflict and violence, there were 92 responses (or 64%) that said “yes” (an agreement also shared by those informants who said there was no conflict or violence in their community).

On the presence of former combatants in their community, 37 informants said “yes”.

4. Region 11

Key Informants:

There were only nine (9) key informant interviews under Davao Region (Region 11). From this number, two (or 22% were females and seven or 78%) were males. In terms of affiliation, two represented the MLGUs, one a senior citizen chairman, one pastor and four from the BLGUs.

There were only two provinces from this region: three from Davao del Sur and six from Compostela Valley.

Major Problems/Concerns of the Barangay/Municipality:

One (1) informant said that 40% of the people in their area were poor. Other informants gave slightly higher (if not dire) estimates: three (3) said 80% of their population was poor, three (3) said 70%, and two (2) said 65%.

Reasons for poverty were low income, insufficient to sustain their daily needs. Key informants also believed that the lack of education and appropriate skills was a deterrent to landing a job. The farming technology was considered backward and the farmers could not afford to buy the needed farm inputs. Common jobs was farming or working for farms (8 responses), working for oil palm, rubber or coconut plantations (3 responses), and driving (one response). Access to potable water (7 responses) was the most common concern among the key informants from Davao Region. This was followed by lack of roads and bridges (5 responses) and lack of school buildings (5 responses).

The main economic reason for poverty was the lack of livelihood opportunities (6 responses or 67%). There were other causes such as land ownership, limited power supply and high unemployment rate. People were also poor because they did not have access to potable water (4 responses) and electrification (2 responses). Politically speaking, the peace and order, lack of government support and in-fighting among government officials and tribal leaders were also major concerns.

Impacts of the GEM Projects:

All (9 or 100%) of those interviewed from Davao Region said that the GEM infrastructure projects had benefited their communities. Among the benefits named were shorter travel time from farm to market, safe travel when crossing the rivers/creek, and increased in income. Without the GEM projects, it would take them longer to reach their destinations, it would not be safe to cross the river, product and social service deliveries would be delayed, and they would be stranded on the other side if the rivers/creeks would swell with flood/rain waters.

Peace and Order

In Davao Region, there was a case of armed clashes (in Davao del Sur) between the government and the NPAs, but it happened in 1995. After that, there were no more serious incidences. There was also one case of tribal war, as different tribal leaders claimed ownership over the same tract of land. The other six (6 or 67%) informants reported no incidences of violence or conflict. Four informants said the level of violence/conflict was decreasing, mainly because the project allowed the LGUs to monitor the areas. Three informants said they knew of former combatants who decided to stay in their locality.

5. Region 10

Key Informants:

Seventy-six (76) lent their time and opinion to the key informant interviews in Northern Mindanao. There were 14 females (18%) and 62 males (82%). These people represented the different BLGUs (48 informants or 63%) while the rest represented the MLGUs (13 informants). From the other sectors, 15 informants participated, represented the religious, education and the cooperatives/associations. All informants lived in Lanao del Norte.

Major Problems/Concerns of the Barangay/Municipality:

Based on their understanding on what it meant to be poor, most of the informants (31 or 41%) from the region believed that the percentage of poor was less than half of population (ranging from 40 to 30%). Twenty-eight informants (28 or 37%) estimated the percentage of poor people in their area to be more than 80%. The remaining 22 informants placed the poor in their community between 50 to 79%. The informants believed that poverty was caused by the following factors: low income jobs (26 responses), evacuation or displacement (22 responses), no land to till (18 responses), no education or lack of appropriate skills (15 responses) and no capital (12 responses).

The most common type of job/work in the region was a tie between farming (17 responses) and working outside of the barangay (17 responses). Workings as farm labor (13 responses) and as construction worker (11 responses) were other common source of income.

The region's informants all came from Lanao del Norte and their primary concern was war/armed clashes (25 responses). These were not only limited to rido and ambush attacks, but also animal rustling, carnapping and illegal drugs. Other concerns of the informants were:

- **Economics:**The lack of farm-to-market road (17 responses) was the top problem economically, as it affected the earnings of the farmers and small entrepreneurs. They were also concerned about the lack of income and livelihood, particularly to people or communities that had to evacuate to escape from clashes between military and other forces. Thus, forced to leave their properties (such as farm land) behind, these informants believed that having no land of their own (7 responses) and without capital (7 responses) made the members of their communities poor.
- **Social:** Apart from their safety concerns, the poor people also had to struggle with the lack of potable water (9 responses) in the areas where they chose to resettle. Understandably, these resettlement areas did not have sufficient basic services such educational facilities (8 responses) to accommodate the displaced students. The informants also expressed other concerns such as housing for the evacuees. Lastly, informants from Munai said that most households no longer had husbands/fathers, as they died during encounters.
- **Political:** Informants were concerned about the changes in leadership (3 responses), governance issues (3 responses) and that the project which the community proposed did not push through (3 responses)

Impacts of the GEM Projects

Sixty-nine (69) informants (or 91%) observed some positive impacts resulting from the construction of the GEM projects. The other 7(10%) did not provide any answer.

The benefits observed were dependent on the type of project provided to the community. For road projects, access was the critical benefit, as the projects connected the people to their destinations, whether these are markets, schools, hospitals or the seat of government. The informants also noticed the lowering of transport and labor costs due to better roads. They also noticed that roads were now safe to navigate even during rainy days. For bridge projects, farmers were able to save on

the handling costs and there were less damage from flooding or inundated rivers/creeks. Students were able to cross the rivers/creeks, without their parents worrying for their safety. For solar dryers and/or warehouse projects, the farmers now had dedicated facilities of their own. They were able to prevent post-harvest losses, as contamination from soil and sand was eliminated. The grains achieved better quality and fetched better prices at the market. The comfort, order and convenience of the trading centers seemed to have encouraged more people to transact business. The LGUs were now getting more revenues from the user fees collected from the trading centers. The centers also served as alternate venue for community activities.

Without the GEM projects in their areas, the informants believed that they would have to endure more hardships. Without the road projects, they surmised that they would have to continue losing a lot to the private dryers and traders. Bringing their products to dry to another barangay would be costly for them, and if they decide to dry the grains on roadsides, the quality would be affected and result to lower selling price. Without the roads, it would be difficult and costly to transport the products, not to mention the possible delays due to impassable condition on rainy days. Without the bridge and drainage, water would spill over to houses and farms and prevent students from attending schools. Informants could imagine how chaotic it would be during the trading center, particularly when the livestock dealers come to visit their areas. Creation and expansion of business would be slow, if not unlikely, considering there would be less money circulating in the local economy.

Peace and Order

Fifty-two (52 informants or 68%) said they have experienced conflict/violence in the last eight years. From this number, there were 35 responses on armed clashes and 17 responses on rido. There were also a few cases of crimes such as animal hustling, murder houses burning and kidnapping (4 responses).

Most agreed that the frequency or level of these conflict/violence happening was already decreasing (63 responses, directly experienced and observed by the informants). Three informants said their communities were already peaceful before the GEM project was constructed. Only one informant (from Matungao, Lanao del Sur) said that conflict/violence was increasing in their area.

Almost all of the informants agreed that the GEM helped in lowering (66 responses or 87%) the incidences of conflict/violence while five said it might have contributed indirectly. Another three informants said that the GEM project had no direct impact on the peace/order in their area, as it was already peaceful since.

Asked if they knew anyone in their community that was a former combatant, 19 informants said yes (six of them admitted they were former combatants and were encouraged to lay down arms because they wanted to support the development in their area). Thirty informants said they were not aware of any, while 27 chose not to give any answers.

6. Region 9

Key Informants:

The KII in Region 9 (Zamboanga Peninsula Region) had 89 informants. From this number 18 were females (20%) and 71 were males (80%). In terms of affiliation, 72 informants (81%) represented the BLGUs, holding different positions such as Barangay Chairman, Barangay Kagawad and Punong Barangay. Only three informants were from the MLGUs, representing the Municipal Planning and Development Office, a market supervisor and a municipal staff. The remaining 14 informants

represented the religious sector and cooperatives/associations. Geographically, Zamboanga Norte had the most number with 29 informants, closely followed by Zamboanga del Sur with 28 informants, and Zamboanga Sibugay with 24 informants. The least represented for this KII was Zamboanga City with two informants.

Major Problems/Concerns of the Barangay/Municipality:

Twenty-nine (29 or 33%) informants estimated that the percentage of poor people/households in their areas was more than 80% of the total population. Another 25 informants placed the percentage of poor people between 70-79%, while 20 informants thought it was below 50%. Ten informants expected the percentage to be between 50-69%.

The informants were asked to list down the top five major problems in their community and they came up with the following: no land of their own (44 responses or 49%), no permanent job (29 responses or 32%), lack of livelihood/employment opportunities (28 responses or 31), idle/lazy (28 responses) and lack of education/appropriate skills (21 responses).

For those who had work, the common types of work were farm labor (18 responses or 21%), domestic helper (17 responses), farmer (10 responses), construction worker (8) and firewood gatherer (7 responses). For those that do farming, they admitted that they were still using the slash and burn method of farming (those who were residing in the upland areas). Women found job running errands for other families, although most of them had temporarily left their barangay to work lived-in as domestic helpers. One informant said that working as farm labor earned only as little as PhP 120 per day. Families with no permanent source of income asked money for their relatives or “landlords”.

According to the informants, the communities were greatly saddled by the lack of livelihood and income opportunities (45 responses) in their areas. Other problems experienced by these communities were:

Economic: Informants identified the lack of farm-to-market roads and bridges (26 responses) as a factor contributing to poverty. Farmers and even small entrepreneurs would make good in their activities if only they have access to capital or financing (21 responses).

Social: Lack of health facilities, medicines and medical services (16 responses) hampered the physical well-being of the poor people. Similarly, there were communities facing definite backlog on the number of classrooms and teachers, as well as educational materials.

Political: Peace and order was noted to be “fragile” during election time. There were also leaders who lack governance skills to be able to lead properly.

Impacts of the GEM Projects:

Almost all (84 or 94%) of the informants from Zamboanga Peninsula agreed that GEM infrastructure projects had positive impact on their lives and communities. The remaining five (5) informants did not provide any answer.

Informants experienced, gained or observed benefits, depending on the type of the infrastructure project. For road projects, access was most valued (11 responses), followed by the availability of year-round transport (9 responses). Roads allowed them to travel more because of the good condition and savings on time and cost (4 responses). They were glad to be able to bring their products directly and immediately to the market (3 responses). For the bridges, safe crossing (9 responses) had the biggest impact on the residents, particularly the students. They also believed it help in addressing peace and security in the area, as help could be mobilized easily. Double handling

was also eliminated because of the bridge (2 responses). For the solar dryer and/or warehouse projects, both the farmer benefited from the increased income (14 responses), with their well-dried grains fetching good selling price. Post-harvest losses were minimized and work was made easier. For trading centers, LGUs earned additional income from users fees, which was an additional resource they can use for their local projects. The trading centers were also used for community and recreational purposes.

Without the GEM projects, the informants believed development would hard to come by. Before GEM, they suffered damages wrought by flooding and inadequate drainage. There were accidents and deaths on the road and those falling over dilapidated bridges. It was worse for people having medical emergencies, as it would be difficult to move them to the nearest hospital, much less stranded on the other side of the river due to swelling of waters. Boat landings were chaotic and unsafe.

Peace and Order:

According to the informants, there were only few cases of violence and accidents in the last eight years in their areas. Others remembered the last incidence to be in the 1970s (2 responses), 1980s (3 responses) and the 1990s (2 responses).

Those that did experience conflict in the last eight years reported four (4) instances of rido two (2) cases of armed conflict, one kidnapping and one piracy/extortion.

Twenty-two (22) informants said that the incidence of conflict/violence decreased over the years, and only three said otherwise. Almost half (41 responses) commented that their communities had been peaceful even before the onset of the project, while 23 gave no answer.

Majority (47 responses or 53%) of the informants from the region declared that GEM contributed in lowering the incidences of conflict and violence because of accessibility. The people were also compelled to maximize the infrastructure provided. Nineteen (19) informants responded that the GEM projects in their areas had not direct influence on peace and order.

Only five informants were aware of any former combatants in their area, while 61 informants said they did not know anyone in their community who had been combatants before.

Results of Focus Group Discussions³ (FGDs)

I. Region 13

There were 14 Focus Group Discussions (FGDs) held in Region 13 (Caraga Region), spread over Agusan del Sur (5 or 36%), Agusan del Norte (7 or 50%) and Surigao City (2 or 14%).

Causes of Poverty

Ten (10) FGDs in the region estimated more than three-fourths (70% and above) of residents in their communities did not have work. In other four (4) FGDs, the participants estimated that unemployment affected almost half of the local population. Half of the elementary-level students in these communities were attending school, as revealed in seven (7) FGDs. However, attendance to higher education fell lower, with 7 FGDs estimated 50% or more of college-age students were not enrolled. The main reason was financial – as higher levels tended to cost more.

On land ownership, 50% of those engaged in farming owned the land they tilled, as revealed in five (5) FGDs. Yet in four project sites, only one fifth (20%) of those in the farming sector actually had titles on their farms. One community in Surigao gave a higher estimate, saying that 70% of the people engaged in farming owned their land.

In these FGD sites, most of the people were able to eat at least three times a day (9 FGDs). In Kitcharao, Agusan del Sur, the FGD participants said as many as 30% of the households could not eat three times a day. On work however, eight (8) FGDs revealed that most people were actually industrious and many would like to work if only they could secure employment/source of income (3 FGDs). Majority of these FGD sites (or 8 barangays) did not experience severe cases of violence and conflict that would have affected their agricultural production or other livelihood activities.

Majority of these FGDs (12 or 86%) concluded that unemployment was the key contributor to poverty. Other factors that prevented these communities from experiencing progress were lack of livelihood activities (2 sites), lack of infrastructure projects (1 site), lack of capital (1 site) and lack of access to potable water (1 site)

Major Sources of Income

Farming was the main source of income in 12 FGD sites (86%), although there were areas that depended also on large-scale plantations (3 FGDs) and mining (3 FGDs). These sources had not changed over the years, but while people still relied on these activities or livelihood, they all responded that life in general was getting harder.

Major Expenditure Items

According to the FGD participants, household income was spent on basic items such as food, education, clothing and education. In the last 10 years, little had changed on these priorities (only added expenses for communications), but the inflation had left them with very meager purchasing power. Enrolling their children to college was a luxury that most parents could not afford.

Major Problems of the Barangay/Municipality

³ There were FGD sites that gave multiple responses. In such cases, adding the responses exceeded the number of FGD sessions conducted per region.

Two major setbacks had profound effect on the development of the communities: lack of farm-to-market roads (7 FGD sites) and lack of access to potable water (7 FGD sites). The participants also stressed on the need to provide jobs and livelihood (6 FGDs) to the people. Education services emerged as secondary concern (4 FGDs), along with the lack of health facilities (2 FGDs).

In coping with their financial difficulties, the FGD participants shared how people in their communities struggled to finding multiple jobs if possible (4 FGDs). There were also instances that family members were compelled to work overseas due to the limited opportunities in their localities. They worked harder, helped one another (bayanihan), and tried not to dwell so much on their predicament.

Asked on what should be done to improve their situation, some of their responses ranged from seeking assistance from other organizations, starting a livelihood program and encouraging more investments to locate in their communities. Twelve (12) FGDs said that the GEM projects alleviated some of their problems, while two (2) FGD sites said GEM projects helped to a certain degree.

Impact of GEM Infrastructure on Barangay/Municipality

Thirteen (13 or 93%) FGD sites in the region were aware of GEM's presence in their communities and the same number of FGDs considered the GEM program as important to their livelihood and community. They considered the program as the bridge to development. Safety in crossing the river/creek and safety during travel was valued by the participants. They also said that GEM infrastructure projects made it easy for the government support to come in. Some areas noticed more people starting their own small businesses.

Peace and Order

There was no recent incidence of conflict and violence, but eight (8) FGD sites noticed the presence of military doing the patrol/monitoring in the areas. There were areas where military detachments were established, which could be considered a foil to possible incursions by bandits/rebels. Only two (2) FGD sites said that GEM's presence in the area played a big role on maintaining peace, since majority of the FGD sites in the region were peaceful for quite a time now.

Participants to all FGD sessions in this region bared their plans of not leaving their current communities, as they had invested their life and aspirations in these places. They hinted on the collective desire that more people should be empowered to engage in economic activities, such as cultivating their farms and establishing small business.

2. Region 12

Causes of Poverty

There were 74 FGD sessions conducted in Region 12 (or SOCCSKSARGEN Region).

In these sessions, 16 FGD sites (22%) declared that the working-age population were all working or engaged in productive work. Yet project barangays located in Malungon (Sarangani), Malapatan (Sarangani), Kalamansig (Sultan Kudarat), and Pikit (North Cotabato) reported that as many as 80% of the people were without jobs. Eighteen (18 or 24%) FGDs placed the estimate of adults without work between 40-60%.

School-age children and youth also displayed a familiar trend: more students were likely to be in school while taking elementary education, but the percentage of not-in-school tends to go higher as students step up to high school and college education. For this region, there were 15 FGD sites (20%) that had as many as 90% of their college-age students not in school and 37 FGD (50%) sites that had at least 20% of their high-school students not enrolled.

Adult literacy was considered better, where 22 FGDs (30%) only had 10% of the adults who could not read and write. Sarangani and South Cotabato implemented the Alternative Learning System (ALS), improving adult literacy. Yet in Tampakan, as many as 50% of the adult population could not read and write (this could be partly explained by the Blaan indigenous people population in the area).

The percentage of land ownership in these sites differed, but the biggest group was the 13 FGD sites (18%) that had 20% of the people owning the land they tilled. On one hand, four (4) FGD sites that disclosed 90-100% of the people engaged in farming owned the land they tilled and these sites were Banga in South Cotabato, Pres. Roxas and Pikit in North Cotabato and Kalamansig in Sultan Kudarat because of the Integrated Social Forestry. FGD sites which allegedly that had less than 10% land owners were in Alabel in Sarangani, Libugan in North Cotabato, Esperanza in Sultan Kudarat and Pikit in Northern Cotabato.

Thirty-eight (38 or 51%) FGD sites reported almost 90% of the families in their areas were able to eat three times a day. People in 64 (or 86%) FGD sites were considered hardworking and industrious, although not all times they had jobs that would earn them income.

The fragile peace and order situation had affected 17 FGD sites, with reasons ranging from people being harassed by the MILF troops (such as in Matalam, North Cotabato) or the evacuation in 2008 that forced people from Tulunan and Pigcawayan to leave their farm lands. Twenty-two (22) sites shared that their communities had been peaceful since and therefore, were able to proceed with their farming activities without any disruption. Not surprisingly, there were 29 sites that admitted people were becoming de-sensitized to the conflict/violence, or that the level of conflict/violence was not so severe to stop them from doing their daily routines.

Among the causes of poverty mentioned above, the FGD participants in 40 sites (54%) said “unemployment” was the most critical factor exacerbating poverty. They also identified “no land to till” (16 FGDs) as another factor, because by just working as farm laborers or tenants, they would only be paid daily or share certain percentage of the profit with the land owner.

Major Sources of Income

Farming is the primary source of income in the region, as validated by the 72 FGD sites (97%). Other sources of income were farm labor (19 sites), being employed (16 sites) and fishing (15 sites).

These sources of income did not change even in the last 10 years, although few FGD barangays revealed private companies (such as the mining firm based in Tampakan) have been creating jobs for the people.

Major Expenditure Items

Basic items such as food, clothing, shelter, medicines and educational needs were the main expenditures of the households. This had not changed in the last decade, but people asserted that the prices of basic commodities were spiraling while their income/salary range was on a standstill, if not falling.

The most common additional expense item was communications, with households allocating budget for mobile phone load and internet access.

Major Problems of the Barangay/Municipality

The lack or the “poor” condition of farm-to-market roads was common among 48 FGD sites (65%), only emphasizing how important it was for the farmers to connect their production sites to the market. Access to potable water (28 sites or 38%) was also elevated – one of the Millennium Development Goals that appeared to be a backlog for the region. In Maitum, Sarangani, the water that came out of pipes reported to be contaminated. The people also wanted to have better livelihood opportunities (28 sites) available in their communities.

Landing on the third spot was the peoples’ yearning to have appropriate and additional post-harvest facilities (27 FGD sites or 36%), ranging from dryer to warehouse. Other problems mentioned by the participants were the lack of education facilities (18 sites) and lack of medicines (18 sites).

Asked on how they were able to cope with these difficulties, the participants to the FGDs agreed on one answer: seek support from other organizations (mentioned in 61 FGD sites or 82%) such as the municipal and provincial governments, national government agencies and other international development agencies and programs such as the GEM.

The construction of GEM infrastructure in these barangays was considered to have alleviated the plight of the residents (54 FGD sites or 69%). In other seven sites, the participants only considered these projects’ contribution to their problem as “partial”, exerting that there were other factors to consider.

Impact of GEM Infrastructure on Barangay/Municipality

The participants were largely aware (64 FGD sites or 86%) of the GEM and USAID’s activities in their barangays. They learned of GEM/USAID activities through the site inspections, consultations, and project monitoring activities.

They valued GEM’s infrastructure projects because farmers now had the means to improve the quality of their products and sell these at a higher price, and have easy access to market and other destinations with time and cost savings. Traders now enjoyed comfort and order when transacting business. Residents (particularly the students) crossed the bridge safely, even during rainy days. They now had venues to conduct social activities weddings, birthdays, meetings and sport activities. Convenience and efficiency were also realized when loading and unloading of cargoes at the boat landings.

Participants in Malapatan noticed more people had settled into their sitio. Participants in Tampakan and Polomolok observed that more families had started to establish their own small businesses.

GEM infrastructure products were appreciated for their economic and social benefits.

Peace and Order

Armed clashes were positive in 27 FGD sites (36%), as people still remembered those encounters as far back as the 1970s to the 1980s. The most recent bombing incident happened in 2010 in Pikit, North Cotabato. However, in 2009, four other areas experienced this gruesome episode: Maitum In Sarangani, in Pikit and Kalamansi and Lebak in Sultan Kudarat. Three cases of kidnapping were reported in these sites: one in Columbio in 2001, one in Palimbang in 2003 and one in Pikit in 2004.

Forty-three (43 or 58%) FGD sites believed that the GEM contributed to maintaining peace, another there were four (4) sites that said the infrastructure project had no direct impact on peace and order. Nonetheless, 29 FGD sites (39%) said that the GEM projects helped in lowering the level of conflict and violence in their barangays.

More violence/conflict could be triggered by extreme poverty (13 sites) and land grabbing (5 sites).

Infrastructure and Insurgency

On the question if they knew of any former combatants in their areas, only 13 sites confirmed so. Some of the participants said the former combatants might have been influenced seeing that the GEM projects brought changes to their communities. These former combatants may have been convinced that the government was listening to them.

Participants from 56 sites (or 76%) vowed to stay in their community because their livelihood was there, and they wanted to contribute in improving the barangay.

3. Region II

Causes of Poverty

For Davao Region, three FGDs were conducted: two in Compostela Valley and one in Davao del Sur. The participants in these FGDs 65-75% of the people in their area had no work and about 65 – 70% of school-age children/youth who were not in school. On basic literacy, the participants placed about one-third (30-35%) of the adult population could not read and write.

In these sites, only 20% of the people engaged in farming owned their farms, while the other 80% were tenants. Fortunately, almost all (97%) of the people in the community were able to eat three times a day. People were good workers, only that there were not enough opportunities for them to be engaged in work through the whole year.

One barangay in Monkayo reported that they only handled land dispute.

Major Sources of Income

Farming was the major economic activity in three FGD sites. People earned from planting rice, banana, and corn. Coconut was also widely grown, where its by-product, copra, regularly provided income for the people. Planting falcatta, wood specie, was also practiced and later sold to plywood/lumber companies in the region. Finally, small-scale mining provided employment for other households as well.

Major Expenditure Items

Food, clothing, education and medicine had been the major expenditures of the people in these sites, and these priorities had not changed in the last decade. The people worried over the rising cost of living, pointing in particular how the transportation fare and prices of basic products had been escalating, yet the price of their agricultural products had not.

Major Problems of the Barangay/Municipality

Common concerns expressed by the participants was the lack of livelihood and income opportunities for the people, lack of the farm to market roads and scant agricultural support from the government. Other pressing concerns of the people were water system, funds for preparing the side of the bridge that was slowly eroded/scoured by water (Monkayo), and lack of classrooms.

When asked how they were coping as a community, the participants responded that they usually asked support from the local government units and other Non-Government Organizations (NGOs) in the area. In Davao del Sur, they reported of barangay officials pooling of resources to meet some of the needs of the constituents.

Impact of GEM Infrastructure on Barangay/Municipality

With GEM's spillway project in Monkayo, people were able to use the bridge in crossing to the other side. A few of the participants considered this infrastructure as "heaven sent", making the transport of agricultural products to the market faster, easier and cheaper. In the past, there were

accidents of vehicles carrying grains being overturned when passing the old route and therefore, deducted from the farmers' income. Gone also were the days that they were forced to stock their produce on the other side of the river and wait for an appropriate transport.

Peace and Order

The barangay has been peaceful since – they did not experience bombings and kidnappings. It also helped that the Armed Forces of the Philippines came in 2010 and trained locals to strengthen the barangay defense system. In Jose Abad Santos, participants reported of the MILF causing some disturbance in area.

In Monkayo, the participants said their barangays would be in worse condition if the project (spillway) were not constructed. In Jose Abad Santos, the infrastructure project also made it faster for the police to respond to emergencies.

Infrastructure and Insurgency

With the three barangays being peaceful, the construction of GEM project was valued more for its economic impact rather than its influence in keeping peace in the barangay.

The people had no plans to leaving their communities.

4. Region 10

Twenty (20) FGDs were conducted in Region 10 or Northern Mindanao, specifically in the 20 barangays under the province of Lanao del Norte.

Causes of Poverty

Based on the 20 FGD sessions, majority of the people in these barangays had different means to earning an income. Only two FGD sites reported of unemployment and the percentage ranged from 5% to 10%. The combined estimates of school-age children not in school also varied, but usually the percentage got bigger as the children progressed in age. For elementary, as many as 90% children in the community were attending primary schools, but the percentage tapered to 65% for the high-school students. Adult literacy was as high as 95% in six FGD sites, while it was only half of the adult population in two sites.

Land ownership was concentrated on at least 15% of the population (in 11 FGD sites or 55%). The tenants, who were estimated to be as many as 85% of the farming population in these sites, earned income by crop-sharing arrangement. In other sites, they farmed on public lands. Other people held rights to the land they used, as they were located in resettlement areas.

Twelve (12 or 60%) FGD sites shared that people in their communities were able to eat three times a day. However, in barangays located in Salvador, Poona Piagao and Pantas Ragat, people were fortunate to have a meal in the morning and another one towards evening. Since rice and corn were getting expensive, these poor households would eat cassava, ubi, camote and banana as substitutes.

Majority of the people in these locations (14 FGD sites or 70%) have positive attitude towards work – especially if there were enough opportunities to do so. Take the case of farmers who had to work from sunrise to sundown, and harder still when it was harvest time. There were income sources

that depended on season, such as fishermen. Those who were “lazy” were partly defeated by the lack of job opportunities and lack of skills/education to qualify in other job/work openings.

Thirteen (13 or 42%) FGD sites were affected by the sporadic conflict and violence, not only those happening in their barangays but also those happening in the adjacent areas. Armed clashes triggered evacuation in four sites with people forced to leave their properties and their farms behind. Cattle hustling occurred in two FGD sites, while crimes such as murder, carnapping, hold-ups and illegal drug addiction were posing serious threats to safety and property in six FGD sites. People needed to go home early to avoid falling prey to such crimes. When asked on the critical causes of the conflict/violence, the people in the FGD sessions responded “fragility” of the peace and order situation.

Major Sources of Income

Farming was a major source of income in 18 (or 90%) FGD sites. Farmers were engaged in rice, corn, bananas, coconut, vegetables and root crops. Fishing, timber poaching and other services were mentioned as secondary sources of income. While these sources did not change in the last 10 years, the soil was no longer as fertile as before. Back in the old days, they could get good harvest without applying fertilizers. Today, this was no longer possible. They had to purchase the fertilizers to coach more productivity from their soil. In an FGD session in Iligan City, the participants mentioned their farm activities were being affected by the change in temperature due to denudation of the forest.

Major Expenditure Items

Food was the primary expenses of the households in the 20 FGD sites. Education, clothing, health and housing emerged as secondary expenditures. These expenditures did not change so much in the last 10 years. One FGD site (Tangcal) added loan payments and “luxury” such as mobile phone loads as additional and regular expense.

Major Problems of the Barangay/Municipality

Peace and order was the top concern as identified by 10 FGD sites. Illegal drugs addiction surfaced as a second concern, suspected to lead in the commission of crimes such as hold-up, carnapping and murder. Access roads were also a concern in six (6) FGD sites. The FGD in Wao reported that the Wao-Marambuaya road that was rehabilitated by GEM was now in need of new repair. Access to potable water, sanitation, health and education facilities also needs to be addressed.

People believed that keeping peace and order in these areas would slowly alleviate these problems. At the first indication of arm clash, people would want to evacuate immediately.

If the infrastructure projects helped in solving the problems of the barangay, nine FGDs said “yes”, while the other FGD sites did not offer any responses.

Impact of GEM Infrastructure on Barangay/Municipality

Sixteen (16 or 80%) FGD sites were aware of the GEM/USAID. They knew what particular project was provided by GEM program. The participants to the FGDs declared GEM as an important intervention due to the “improved economic activities and increased family income”. In specific terms, these projects allowed the farmers to save on post-harvest costs. They also pointed out that there was now a minimal manipulation on the trading activities. Children could now attend school

with lesser risk of falling on waters. Hauling fees were reduced. Incidences of flooding were minimized. Quality of the products was improved.

They have noticed an increased number of commercial and non-commercial establishments. LGUs were appreciative of the additional revenues from the trading centers.

Peace and Order

Seventeen (17 or 85%) FGD sites reported of armed clashes, some as recent as 2009. In Brgy. Dalama, Tubod, the FGD participants said this was reason why they seemed to be always starting all over again, their farming activities aborted due to armed clashes. For bombing, three FGD sites reported such cases, while kidnapping also happened in three FGD sites.

The participants in 13 (or 65%) FGD sites also shared that the conflict/violence had gotten worse, adding that the government/law enforcers were having a hard time controlling the insurgency/crimes from happening.

The participants were divided on the possible situation if GEM did not construct a project in their barangay. In 13 FGD sites, they said that their situation could be worst if GEM project was not present in their community. Five FGD sites said that the project had no direct impact on peace and order.

Lack of intervention/attention, lack of vigilance and worsening financial situation could trigger more violence and conflict in these areas.

If they had to choose between staying put or moving to another location, people in 11 FGDs (55%) would be staying in their barangay. They wanted to enhance what they had started, and they figured that other barangays would have the same economic/social situation. They wanted peace so they would focus more on their livelihood.

5. Region 9

Causes of Poverty

There were 36 FGD sessions held in Region 9 (Zamboanga Peninsula).

One-fourth of these sites (9 barangays) had as many as 70% of its working population without work. On the other hand, two sites (Olutanga in Zamboanga Sibugay and Labangan in Zamboanga del Sur) had as many as 90% of its working population without proper source of living. In 14 FGD sites (39%), the participants estimated that as many as 90% of the children were in school. But for a barangay in Zamboanga Sibugay, about 60% of the school-age children were not enrolled in school. On adult literacy, 15 FGD sites (or 42%) estimated 60% of their adult population could not read or write.

Land ownership varied between 20% to 50% of the people engaged in farming. However, this could go high, but 16 FGD sites were not able to provide estimates that were more definite. In Tungawan, 80% was said to be owners of the land. Thirteen (13) FGD sites reported that 90% of their household population was able to eat three square meals a day; yet, they eat only root crops during noon time. In Salug, Zamboanga City, residents only eat lunch and dinner while in RT Lim, Zamboanga Sibugay, people would eat even with only rice (without viand).

People had positive attitude about work – they were hardworking and industrious (29 sites or 81%). As much as they would like to focus on their livelihood, the cases of conflict and violence would affect their activities. Six FGD sites reported of piracy and extortion preventing the fishermen to fully maximize the resources of the sea. The majority of the sites (21) declared that their livelihood was never disrupted, as they were enjoying peace and order for a long time now.

Unemployment and the lack of livelihood opportunities were thought to be the most critical factors that drove poverty. Farmers and farm laborers realized that what they earned hardly provide them decent living.

Major Sources of Income

Farming was undoubtedly the main source of income in these areas (30 FGD sites or 83%). Fishing only came as second, voted an important livelihood in 18 FGD sites. On the question if these sources had changed in the past 10 years, 22 FGD sites (61%) said “yes”. Some were slowly moving to other jobs, as farm inputs were getting too expensive and the farmlands losing productivity. There were men who turned to driving motorcycles and tricycles, especially in areas where the bridge connected their barangay to the more affluent places in their municipalities. For some fishermen, they were still battling the unresolved problem of “ice-ice and algal epiphytes” which affected the production of seaweeds. They also blamed natural calamity as a factor that made them consider other sources of income.

Major Expenditure Items

People spent their hard-earned income on basic needs – food, shelter, clothing and medicines. They were also spending for education and electricity. Nothing had changed much in their expenditure items, only that the prices of the basic commodities had been increasing sharply (17 FGD sites or 47%).

Major Problems of the Barangay/Municipality

Seriously hampering the growth of these GEM project sites was the lack of alternative or additional livelihood opportunities (21 sites or 58%). They were also worried about the lack of health services, facilities and supplies (10 FGD sites) and lack of educational facilities and services (9 FGD sites). In order to cope with these difficulties, the residents would strive hard, engage in small business and foster partnership with other organizations. They wanted to ask for more financial and technical assistance from their LGUs, non-government organizations and national government agencies.

Twenty-nine (29 or 81%) FGD sites confirmed that the presence of the GEM infrastructure project in their communities resolved some concerns of the people.

Impact of GEM Infrastructure on Barangay/Municipality

Participants in 33 (or 85%) FGD sites were aware of GEM and the USAID. They perceived GEM as a “development” partner, and as such a very important collaborator that would bring improvement to their community. They credited GEM for the socio-economic impacts derived from the infrastructure projects.

Peace and Order

Only Salug (Zamboanga del Norte) reported of an armed encounter between the government and other groups, but this happened in the 1970s. Majority of the FGD sites (17) said that their areas had been peaceful ever since. No bombing or kidnapping incident happened in these sites. The threat that worried the residents most from these areas were piracy and extortion at sea.

Asked if the situation would have turned worse had it not for the presence of the GEM project, only four FGD sites said “yes”. Disunity and disarming of the residents could trigger more conflict and violence, as well as rido. Two FGD sites were anxious about the increasing cases of criminality and illegal drugs use.

Thirteen (13) FGD groups promised to stay in their community, as they wanted to work towards development and peace. But people only leave their place if the livelihood would not be as productive as before.

Infrastructure and Insurgency

Only three (3) FGD sites revealed that they had former combatants living in their communities. But they were not aware of the reasons why these combatants decided to lay down their arms.

6. ARMM

Causes of Poverty

There were 77 FGD sessions conducted in Autonomous Region in Muslim Mindanao.

On the percentage of people without jobs in their communities, 20 (or 30%) FGD sites supposed it could be 60% or more, while 29 (or 38%) FGD sites estimated it would be 40% or less. In a barangay located in North Upi, Maguindanao, there were as many as 90% of the people in their community without proper work. The other 26 FGD sites only answered “yes” to the question but did not give specifics. On children not in school, the most common estimate was 20% (13 FGD sites or 17%) of the school age children and youth were not in schools. In Paglat and in North Upi, about 85% of the children and youth were not enrolled in school. In some areas, the FGD participants said that these students were not in school because they recently transferred to the community. When not in school (because their parents could not afford to send them or the schools were just too far from their residences), these children had taken work to augment their parents’ income, while others seemed no longer interested.

On adult literacy, the answers of the participants were fairly distributed across percentage ranges, but the most prominent answer was as many as 70% (in 9 FGD sites) and less than 10% (in 8 FGD sites). In three (3) FGD sites, about 95% of the adult population could not read and write (two barangays in Paglat and one barangay in North Upi, Maguindanao).

Land ownership was a privilege only few farmers enjoyed. In 22 FGD sites (or 29%), only less than 30% of the farmers were landowners. Yet, there were 12 FGD sites revealed higher percentage of land owners – at 60% of those engaged in farming had titles on their land, although these were said to be small holdings (less than a hectare in some areas). People in 74 project sites (96%) considered themselves cooperative and hardworking. But when their places experienced conflict or violence, about 46 FGD sites (or 60%) said that livelihood activities were usually suspended due to fear of

being caught in middle of fights. Six FGD sites even shared they had to evacuate their residences and abandoned their farms.

Most of the people in the 36 FGD sites (or 47%) were able to eat three square meals a day. In other barangays, two meals a day were the best they could have, alternating rice with rootcrops and bananas.

ARMM FGD participants came up with 21 possible causes of poverty. What they considered to be the most critical as unemployment (13 FGD sites). Rido, family feuds or clan wars (10 FGD sites) were also blamed for the worsening poverty.

Major Sources of Income

People in 61 FGD sites (79%) largely relied on farming as a source of income. Farmers planted crops such as rice, corn, coconut and vegetables. The spirit of entrepreneurship was also high, where residents in 30 sites (or 39%) engaged in sari-sari stores, vending of food and buy-and-sell business. Working as an employee for the local government and local companies were the third most common source of income (27 FGD sites or 35%).

These income sources generally did not shift in 50 (65%) FGD sites, but in 20 (26%) other sites, more people had diversified to other livelihood/income sources because of entry of large corporations (Ramitex and San Miguel Corporation), the high profit promised by rubber plantation, their educated children getting more employment or working overseas, and proliferation of mobile phones and “load” businesses.

Major Expenditure Items

The major expenditure items were similar in all of the FGDs, which ranged from food, clothing, education and shelter. Secondary items were inputs for the farm, social activities, and health/medical needs. No major differences in the priorities were observed, except for those who were getting “affluent”, were able to purchase “luxury” items such as mobile phones, household appliances and computers.

Major Problems of the Barangay/Municipality

People considered lack of livelihood opportunities (40 FGD sites or 52%) as the most daunting challenge to development. People would have wanted to work, but there were not enough companies/organizations/people who could offer jobs or that people did not have the capital to start their own small livelihood activity.

With most of households dependent on agriculture, the presence and condition of farm-to-market road (38 FGD sites or 47%) was link to income. Bad roads delayed transport of harvested produce, cut them off from services or isolated them from other partner organizations. Third most pressing problem was lack of access to potable water (35 sites or 45%). Women and children bore the burden of getting water, usually from far and unsafe sources. Other issues that they had to contend with were lack of classrooms (18 sites), unemployment (10 sites), peace and order (9 sites), lack of capital (7 sites), and electricity (7 sites).

They often looked up at their municipal and provincial LGUs, national government agencies and donor agency (44 sites or 57%) for support in addressing these problems, offering counterpart arrangement. For issues like rido or kidnapping, they considered mediation as an important solution.

When asked if the GEM infrastructure project alleviated their situation, 52 (or 68%) FGD sites said “yes” and another five (5) sites said “partially/indirectly”.

Impact of GEM Infrastructure on Barangay/Municipality

People were generally aware (68 FGD sites or 88%) of GEM and USAID’s presence in their community, and they were also familiar on the project that was constructed in. From this number, 66 (or 86%) FGD sites recognized GEM’s role “very important” to their community and livelihood. They considered GEM/USAID as a partner in development, particularly in realizing improved access, triggered more trade and commercial activities, and easing the conflict/violence cases.

Peace and Order

The frequency of conflict and violence in ARMM would always threaten the tenuous peace and order situation of the region. Take the case of armed clashes, experienced in 54 FGD (70%) sites, and involved encounters between the government and the rebels and among clans. The participants could still remember encounters that happened in the 1970s and the most recent was what they called the “Isabela Seige” in 2010.

What struck hard in the collective memory of the participants were the “all-out” war declared by former President Joseph Estrada in 2000 as well as the sporadic eruption of rido/clan wars. Bombing also happened in 17 FGD sites – farthest they could remember was in 1970s, but the latest was only in 2009 following the infamous Maguindanao Massacre. Twelve kidnapping cases were also reported, the most recent was the kidnapping of a businessman in 2011 in North Upi.

Seventeen FGD sites believed that the violence could be worse if there was no GEM project in their area. Thus, 32 (or 42%) FGD sites attributed GEM’s role in reducing violence. But 19 FGD believed otherwise, since the people were now more conscious of being “united” in controlling the situation and maintaining peace were more dependent on the unity of the people and their commitment to progress.

What they believed to be triggers for more conflict and violence were the political feuds that inevitably happened in every election, presence of drug pushers and breakdown of the peace negotiation.

Participants were asked whether they plan to stay or relocate to other areas given the prevailing situation in their community. The answer was “staying put” by 61 (or 79%) FGD sites. The participants said it was their place of birth and they intend to stay there until their death. They felt strong connection to their current place – and relocating to a new site could not assure them of a better fate. Participants in two (2) FGD sites wanted to move out in search for better opportunities since there was no change in their area,

Infrastructure and Insurgency

Thirty-three (33) former combatants, affiliated with MNLF and MILF, had settled in these communities.