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**ECONOMIC DEVELOPMENT IN THE  
PHILIPPINE UPLANDS: WHO WINS,  
WHO LOSES?**

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**Economic Development in the Philippine Uplands:  
Who Wins, Who Loses?**

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**ABSTRACT**

Both trade liberalization and decentralization hastened economic development in the uplands. Upland dwellers are seen to be increasingly integrated in crop and labor markets. But this economic encroachment on peoples' way of lives has differential impacts on various groups of people in the uplands. This paper examines those differential impacts. By using the data from surveys of the SANREM-CRSP Project based in Bukidnon, we find that, in general, the older members of the population and the females are negatively affected by economic development. Social policies at the local level of governance should be in place to secure safety nets for these vulnerable groups. Livelihood opportunities for women and the ageing population could minimize the inequities that economic development brings.

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# **Economic Development In the Philippine Uplands: Who Wins, Who Loses?<sup>1</sup>**

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## **I. Introduction**

Several theories characterize economic development. A prominent one is the structural change model (Todaro, 1989) manifested by a change from a subsistence economy to a market-oriented one; from a predominantly agricultural economy to a mixed system of agriculture, commerce, and industry; and the increasing share of the non-agriculture sector as a source of household income. In this model, both domestic and international constraints influence development. The domestic constraints include the country's natural and human resources, as well as government policies and objectives. The international constraints to development include access to external capital and international trade, among others.

In the Philippines today, two types of constraints served as drivers in economic development. One is trade liberalization and, as a result, the country is increasingly being integrated in the international markets. The other is change in domestic governance structure where local governments have a significant role to play in making resource allocation decisions. These conditions were indeed the trigger that transformed the economy, including those of the uplands.

In the uplands of Bukidnon, for instance, agribusiness firms were enticed by the tax holidays declared by the provincial officials in 1998. The area became an exciting place to conduct business. These firms have flourished as a result of increasing demand for the products in both local and international markets. The province also boasts of a plentiful water supply and relatively fertile soils that are suited to plantation agriculture. The wide expanse of the areas in the province also became a come-on to commercial livestock (swine and poultry) growers. Local governments, in turn, have generated enough revenues to afford, for instance, building new infrastructure and roads. While it is enough regard to observe the new structures as a result of the economic boom, it is likewise legitimate to ask who are favored and who are marginalized by this modernization.

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This paper will provide answers to this question using the results of the end-of-phase survey for the project called Sustainable Agriculture and Natural Resources Management –Collaborative Research Support Program (SANREM CRSP) in Southeast Asia. This project is being conducted in Lantapan, Bukidnon, an upland municipality and host to the headwaters of the Manupali and Muleta rivers. The project which started fieldwork in 1994, has been ongoing until 2004. When researchers started working in the area in 1994, the town was a sleepy one, with agriculture as the source of income of about 76% of the people (MOL, 1994). A survey done in late 2002 aimed to understand the differential effects of development on the various categories of people in Lantapan.

## **II. Differential Effects of Economic Development: A Framework of Analysis**

Economic development means different things to different people. Traditionally, economic development is equated with increased income and wealth. During the 1970s, economic development came to be redefined in terms of reduction or elimination of poverty, inequality, and unemployment within the context of a growing economy. Development is seen to have at least these three objectives (Todaro, 1989): 1. to increase the availability and widen the distribution of basic-life-sustaining goods such as food, shelter, health, and protection; 2. to raise levels of living, including the provision of more jobs, better education, and greater attention to cultural and humanistic values; and 3. to expand the range of economic and social choices available to individuals.

Economic development then is not just improved financial capital but increased welfare, in terms of general satisfaction about life in general, food security, and health security. However, economic development also incurs social costs in terms of harm to the environment, as a result of pollution-generating activities. A side effect is increasing urbanization and thus, a fierce competition for area services, including health and employment.

The framework of analysis for this case study consists of an understanding of the differential effects of economic development indicators on various categories of people inhabiting the community. The categories proposed are ethnicity, security of tenure, age, gender, location in the watershed, and, in some instances, practice of soil conservation technologies in agricultural production. The indicators include welfare variables in terms of feeling of general satisfaction, food security, health status, natural capital, and traditional measures--- household income and wealth. Analysis of changes in income distribution patterns for the various categories, for the last five years (1998-2002) is also conducted to understand the equity impacts of the development in the study site.

### III. The Industrializing Lantapan: An Overview

Lantapan is a land-locked plateau, situated between the Kalatungan and Kitanglad ranges in northern Mindanao. The place was named after the word “Lantapan” which means the “level on top.” It was formerly a barrio of Malaybalay. In 1968, it became a separate municipality and classified as 6<sup>th</sup> class, the lowest class in terms of income (MOL, 2001). It was reclassified into a 4<sup>th</sup> class municipality in 1995 (NSO, 1995) and has not been reclassified since.

The municipality is contained wholly within the Upper Manupali River watershed, which runs west from a point about 15 km south of Malaybalay City along the southern boundary of the Mount Kitanglad Range Nature Park. Lantapan's landscape climbs from river flats (300-600 m) through a rolling middle section (600-1100 m) to high-altitude, steeply sloped mountainsides (1100-2900 m). Soils and rainfall patterns are typical of Mindanao uplands. The municipality consists of several sub-watersheds draining south or southeast from the Mt. Kitanglad Range to the Manupali River. In the lower part of the municipality, the river runs into a dam which diverts flow into a network of canals comprising the Manupali River Irrigation System (MANRIS), a 4,000-ha system constructed by the National Irrigation Authority in 1987. The entire system ultimately drains into the Pulangi River, one of the major waterways of Mindanao Island, about 50 km upstream from the Pulangi IV hydroelectric power generation facility, one of the six largest hydro power-generating plants in the country.

As in other upland areas of the country, Lantapan's population has risen since 1980 at an annual average of 4%, much higher than the Philippine average of 2.4%. In spite of rapid growth in recent decades, agriculture continues to dominate the economy of the municipality and of the province. In 1988, 71% of provincial employment was in agriculture, 5% in industry, and 23% in services; agriculture provides the primary income source for 68% of Bukidnon households (NSO, 1990).

Lantapan has had a significant growth of business establishments (**Table 1**). From the available data, these establishments number 252 in 1999 but have since grown by 185 in 2001. Plantation agriculture and commercial hogs and poultry came into the town after 1998, the year that the province has passed an ordinance declaring a tax holiday for agribusiness firms' establishment in the area. In 2001, additional establishments included 2 banana plantations, 2 commercial piggeries, 3 commercial poultry, and 12 corn mills.<sup>3</sup> Nonfarm incomes have also become a sizable source of income beginning 1998 (**Table 2**). Agricultural wage rate is not competitive with the nonfarm wage rates, especially those from the banana plantations (**Table 3**). Thus, the popularity of these plantations as employers overshadows the potential social costs of the agribusiness operations (Rola et al. 2003, Calderon and Rola, 2003).

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<sup>3</sup>Key information however mentioned of the existence of some of these corn mills for a long time, but was only officially registered in 2001.

Land use data in Lantapan from 1994 to 2001 reveal a constant figure for agriculture at 53% of the total land area (**Table 4**). Farming has remained a dominant economic activity among the Lantapanons. At present, the production of cereals (corn) is expected to decrease due to increase in the area devoted to sugar plantations and the establishment of two banana plantations (MOL 2001). Cabbage and potato are also major crops, especially in the upper watershed. Table 4 also reveals that the proportion of forest areas has decreased by about 4%, and the built-up areas increased by about 6%. This is an indication of a still ongoing conversion of buffer zone areas into agriculture and the seeming increase in the areas for commercial, residential and related establishments, converted from agriculture.

#### **IV. The End of Phase (2002) Survey in Lantapan, Bukidnon**

SANREM CRSP<sup>3</sup> researchers have kept records of a sample of farmers in the area in terms of land use, production technologies, practice of soil conservation measures, and price expectations, as well as demographic characteristics. These surveys have run every year since 1994. Results of the several surveys are reported in a number of publications (Coxhead, 1995; Rola and Tagarino, 1996; Coxhead et. al. 2001; Rola and Coxhead, 2001, 2002).

In October 2002, the household survey included questions on incomes and general welfare, basically to answer the question: Have people become better off with the industrializing economy of Lantapan?

A total of 109 household respondents from eight barangays of Lantapan were interviewed. These households were a part of the panel data source of the economic team of SANREM CRSP. Characteristics of the respondents and the survey sampling procedure are explained in Coxhead (1995).

For the foregoing analysis, the respondents are grouped into several categories to generate differential impacts of development. The first category is ethnicity, where respondents are classified as to whether they belong to the Talaandig tribe, the most dominant indigenous tribe in the town or whether they are migrants (or non-Talaandigs). It is expected that indigenous tribe members are not as fully mainstreamed to the economy, and hence, could be marginalized by the development process.

Respondents are also grouped according to security of tenure. Development is said to have positive effect on the people with more secured tenure---their land can be a collateral to business transactions. Development could likewise have differential effects on age groups. Younger people are more likely to be mainstreamed to the economy because of their skills and high education. The older ones are more at a disadvantage. Gender was also a category, where males are assumed to be more active in the economy

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<sup>3</sup>SANREM-CRSP SEA Phase I report of activities is contained in Coxhead and Buenavista, (2001).

than females. The location in the watershed will also matter in terms of access to non-farm income opportunities and state of physical resources or what can also be termed as natural capital.

In the analysis of the state of natural capital, an additional category was included--the ones practicing and not practicing soil conservation measures. It would be interesting to note the perceptions of these two types of people in assessing the quality of natural resource during the process of development.

These classifications and the number of respondents are shown in **Table 5**.

## **V. Results and Discussion**

### **V.1 General Welfare**

#### *1. By ethnicity*

In terms of general welfare, respondents were asked about their satisfaction in life in general, whether they have greater food security now and whether there is more prevalence of illnesses now than 5 years ago. A greater proportion of the Talaandigs said that they were satisfied with their life right now than 5 years ago (**Table 6**). The reason for this feeling of satisfaction was that about 57% of the Talaandig respondents have access to jobs, both off-farm and nonfarm. About a quarter of those who were satisfied with life cited household food security as a reason. Most non-Talaandigs said that income is not enough for daily needs. A slightly higher proportion of non-Talaandigs said that they have experienced hunger, but not as frequent as the Talaandigs who have experienced the same. This means that the poorest Talaandigs experienced extreme depths of hunger. In terms of illnesses, the responses of both groups were similar. Most respondents cited the change in weather as the cause of illnesses. Some, however, mentioned the increasing use of chemicals in agriculture as a cause.

#### *2. By security of tenure*

This feeling of satisfaction was also shared by both the landed and the landless. Our data also showed that the landed had lesser proportion of respondents who experienced hunger, but then those who did were frequently experiencing this. These are the segments of the population who rented out their farms to the plantations. The cause of the frequent hunger was the fact that no harvest was expected at the end of the season. The income from the nonfarm jobs was not enough to take these families through food security status all-year-round. The landless experienced hunger less frequently inasmuch as they could get off-farm and nonfarm jobs. Landed households depended so much on the promise of jobs by the plantations and were not scampering for other off-farm work. It also did not seem to follow the norm, inasmuch as households with land did not usually go out for off-farm work. In terms of health, households with no land perceived greater incidence of illnesses now than 5 years ago.

### ***3. By age group***

Older persons say that they were satisfied with life now than 5 years ago. The younger ones also experienced food insecurity, but not with the same degree as did the older members of the population. Younger persons also observed illnesses to be more prevalent now than 5 years ago.

### ***4. By gender***

About half of the male respondents and only 40% of the female respondents were satisfied with their lives currently. More males experienced food insecurity and they also experienced this more frequently. However, the prevalence of illness was seen to be more by women. The more frequent illnesses observed by women were illnesses among children.

### ***5. By location***

More respondents in the upper part of the watershed felt satisfied with their lives. This could be due to the high incomes obtained from vegetable growing and other off-farm income sources that are available. Vegetable is a labor-using activity. A lesser proportion of respondents from the lower watershed mentioned episodes of food insecurity, but those who reported these have been experiencing hunger more frequently. A similar proportion of the respondents in both the upper and the lower parts of the watershed mentioned that illnesses were more prevalent now than 5 years ago.

## **V.2 Wealth Status**

### ***1. By ethnicity***

The Talaandigs were relatively competitive with the non-Talaandigs in terms of wealth status (**Tables 7-9**). The former have a fewer number of head of animals kept than the non-Talaandigs. More non-Talaandigs own television and motor vehicles than the Talaandigs, where these were acquired during the past 5 years. However, about 40% of the Talaandigs and only 25% of the non-Talaandigs had home improvements during the past 5 years. This could be the outcome of the good income in vegetables in the upper slopes, as well as the income from land rentals by the plantations. Both groups of respondents had very low proportion of people who save in the bank (**Table 9**).

### ***2. By security of tenure***

Both the landed and the landless had almost the same number of head of cattle, but the value of the cattle owned by the landed was significantly higher than that of the landless. Landed households owned bigger animals and hence were more valuable. Also, as expected, more landed households owned television sets and motorcycles. Also more landed households had home improvements during the past 5 years. But it is the less

secured households who have money in the bank. Landless households in Lantapan then were not as poor as a typical landless household. This again indicates that the Lantapan economy is getting to be a cash economy and persons, even without land, would have enough cash, and this enables them to save.

### ***3. By age groups***

Younger persons had more animals raised and had more value for these animals than older persons. Older persons did not usually own television sets and no one owned any motorcycles. A slightly higher number of older persons had home improvements during the last 5 years compared with younger persons. However, none of the older respondents had money in the bank. While this may mean a high feeling of insecurity, especially during emergencies and when children are living far away, older persons in rural areas did not have a culture of saving in the banks. They would have money tacked in their house posts, or in other places not easily discernible. But interviewing the older respondents in Lantapan gave the impression that they depended so much on their children for all their needs. This was a problem when children live farther away.

### ***4. By gender***

Women, being the holders of livestock, were seen more prominently in this survey. Females hold twice as much livestock as males, but the value was not as much because women kept only the small ones such as chickens and ducks. Males owned the bigger animals such as carabaos and cows. As also expected, males owned the household appliances, and in more significant numbers than the females. Only 3% and 1% of the female respondents owned television sets and motorcycles, respectively. In terms of home improvement, more male-headed households were able to do improvements during the past 5 years than the female-headed households. Also, it was revealed that slightly more males saved in the bank than females.

### ***5. By location***

Respondents in the lower part of the watershed had more animals than those in the upper watershed. This variation could also be attributed to climate, where livestock do not thrive so well in high-elevation areas. However, more respondents in the upper watershed had television sets, while more respondents in the lower watershed had motorcycles. More respondents in the lower watershed also had made home improvements during the last 5 years. Both types of respondents had some money in the bank, but as in the previous categories, these were just a low proportion. However, this finding showed that some upland farmers were also net savers (**Table 9**).

## **V.3 Natural Capital**

Natural capital was expressed in terms of quality of soil and water. It was observed that intensive agriculture, brought about by economic development, would negatively affect the quality of these natural resources. The respondents were asked,

among others, their perceptions of the changes in quality of these, as expressed by the declines in agricultural productivity (for soil quality) and in the color of water (for water quality). Furthermore, respondents were asked whether they perceive people in the community as being aware of water and soil conservation programs in the area, and the fact that government programs are supported by taxes. Respondents were asked whether they were willing to pay additional taxes for water and soil conservation programs.

### *1. By ethnicity*

A high proportion of the respondents belonging to both Talaandigs and outside the tribe observed that soil quality was declining; on the other hand, 60% of the Talaandigs compared with only 31% of the non-Talaandigs mentioned that water quality was also degrading (**Table 10**). Talaandigs cited as reason the increasing acidity of the soil, as well as the increasing use of fertilizer. Non-Talaandigs who observed an increase in the soil quality mentioned the practice of contour plowing as a probable cause.

Furthermore, the Talaandigs also mentioned that the use of surface water for gardening as well as erosion had contributed to the eroding quality of surface water in the area. A high proportion of respondents for both ethnic groups perceived that people were aware of environmental conservation programs and that government programs were supported by taxes. Ninety-one percent of the Talaandigs and only 76% of the non Talaandigs were willing to pay additional taxes for soil conservation measures (**Table 11**). Being their ancestral domain, Talaandigs valued their environment more than did the migrants.

### *2. By security of tenure*

A bigger proportion of the landed respondents observed a decline in both soil and water quality. Their reasons were that the soils were overexploited and had become acidic. Soil erosion and water use in the gardens were seen to cause surface water degradation. In the same vein, a higher proportion of respondents with more secure tenure mentioned that people were aware of conservation programs, that they were also aware that government spends for these programs, and that they were willing to pay extra taxes for water and soil conservation programs. Most of these respondents were also natives, hence, the answers were consistent with those given by the ethnic tribe.

### *3. By age group*

Eighty-seven percent of the older respondents observed a decline in the soil quality. But these could be a function of time that they spent farming. Older respondents said that they spent more on fertilizers now than before, thus, the seeming decline in soil quality. A similar proportion of both categories of respondents observed the decline in water quality, mostly as a result of soil erosion. More of the younger respondents perceived that people in the area were aware of the conservation programs. A similar proportion mentioned that government programs were supported by taxes. More of the younger respondents were willing to pay additional taxes for soil and water conservation

programs. This is just so because younger people would benefit more from these programs than the older ones.

#### ***4. By gender***

A greater proportion of female respondents observed declines in both soil and water quality. Respondents had the same reasons as above-- i.e., overexploited and acidic soils and highly eroded soils that cause water quality degradation. More male respondents perceived that people were aware of the ongoing conservation programs in the area. A similar proportion in both categories was also aware that these programs were funded by governments through taxes, and they said they were willing to pay additional taxes for soil and water conservation programs.

#### ***5. By location***

Expectedly, more respondents in the upper watershed observed the decline in soil quality. A slightly higher proportion of the upper watershed respondents also observed the decline in water quality. This was because farmers in the upper watershed did not usually use fertilizers, but the intensive cultivation makes the soils acidic and overexploited. Traditionally, upland farmers would have a long fallow period. But the integration to the markets now induced them to continuously crop the same areas. More respondents in the upper watershed perceived that residents were aware of soil and water conservation programs. Almost all respondents in the upper watershed were aware that soil and water conservation programs were government-funded. However, only about 91% of the upper watershed respondents were willing to pay taxes to fund these conservation programs. In contrast, only 73% of respondents in the lower watershed were willing to pay additional taxes for environmental conservation purposes.

#### ***6. By soil conservation practice***

Analysis of natural capital also looked at replies of respondents who practiced soil conservation measures. A greater proportion of respondents who practiced soil conservation measures observed a decline in soil quality. A similar proportion, however, of both respondents believed that there was likewise a decline in water quality. Soil acidity, soil erosion, and non-application of fertilizers were the reasons for the decline in soil quality. Soil erosion was the primary culprit in the change in color of surface water.

### **V.4 Household Income**

Monthly incomes of households were also analyzed according to different categories. The sources of household incomes are varied: farm, off-farm, and nonfarm.

**Table 12** describes the income patterns of various categories of respondents from 1998 to 2002. The mean current income in 1998 was PhP 3244 per month. The mean current income in 2002 was estimated to be PhP 7441 per month. Table 12 also indicates the percent movements of these figures from the annual mean. This analysis can give us

some indication of whether people in any category have become better off or worse off during the 5 years under study. The subsequent figures also present the income distribution per category of respondents. These figures are called Lorenz curves and they imply that the farther away the curve is from the diagonal line, the more unequal is the income distribution for the period for the particular category of respondents.

### **1. *By ethnicity***

The results show that migrants had indeed captured the benefits of development, given the increase in their monthly incomes during the 5-year period. In terms of income distribution, Talaandig tribe members had slightly better income distribution in 2002 than in 1998 (Fig. 1). On the other hand, the non-Talaandigs were better off in 1998 than in 2002 (Fig. 2). While the mean incomes increased for this group, the distribution seems to indicate that the members were differentially affected.

### **2. *By security of tenure***

The landless had more income per month than the landed. This amount grew substantially in 2002. The reasons for this may be obvious: these migrants (the landless) were skilled to do nonfarm work. They also were active in off-farm work, and hence they had better opportunities. The income distribution of persons with security of tenure compared with those without showed similar patterns for both years under study (Figs. 5 and 6).

Landless persons were mostly migrants and younger persons. They would have enough skills for nonfarm work.

### **3. *By age group***

The older people actually fared a little bit better in 2002, compared with 1998, though the absolute figure was still below the mean. The income distribution in terms of age groups revealed very distinctly that the older members of the population were hardest hit by the consequences of economic development processes. This may be true in general because older persons would not have the skills to be employed in poultry farms or the plantations. Rural social policies have to address the needs of this group. In the olden times, the norm was that older persons were fully dependent on their children for their survival. However, in the modern times, children usually live far from the villages. The safety net was thus not as tight. Children living in villages with their parents would usually have fulltime jobs, and the grandparents are relegated to become babysitters. Since this is a form of economic activity, grandparents also earned their non-monetary incomes in this sense.

#### **4. *By gender***

Expectedly, females were worse off than males and they have also been getting worse off through time. The older females who were landless were observed to be the ones so marginalized in this economic development process.

#### **5. *By location***

Respondents in the upper watershed became worse off in 2002 than in 1998, while those in the lower watershed portion were observed to be a lot better off. This can be explained by the many nonfarm job opportunities existing in the lower watershed villages.

#### **6. *By soil conservation practice***

Interestingly, the respondents who were not practicing soil conservation measures had higher incomes than respondents who were practicing these soil conservation measures. Apparently, farmers who were older were the ones doing soil conservation practices (Rola and Coxhead, 2002), and did not have other sources of incomes. On the other hand, persons who have the better skills to do work in plantations and other nonfarm activities would not have the time to do labor-intensive soil conservation practices.

## **VI. Conclusions**

Our analysis reveals that economic development has differential impacts on different groups of people. The hardest hit seems to be females and older persons, the traditional special groups deemed vulnerable to outside shocks. To cushion the impacts of development, social policy could address some particular concerns. Among these are the security of the older persons and special programs for small enterprises that especially target women.

Currently, there is no social security for farmers in general, and for older farmers in particular. Unlike government employees who would have pensions, albeit measly, and health care, the rural folks have no facility to have these benefits. While it is a common saying that farmers don't retire, they just fade away, the current times seem to suggest that older farmers now need social security. Farmers as a group could be enticed to be members of the Social Security System. The really older ones may be taken care of by local government units (LGUs) in terms of free health care. Old people are also alone and lonely, given that children live far away and far between. Senior citizen organizations are active in other areas of the country, especially in the urban centers. In the study site, senior citizen organizations are present, but not all older people are members. A community-based organization that takes care especially of old people living alone is needed.

In the study site, the local government has initiated a program consisting of micro credit. Most of the applicants are women. LGUs can be encouraged to pay particular attention to the needs of these women, especially the older ones. Credit can be given to enable them to raise animals. Swine and poultry are the two popular kinds of animals raised by women in the area. Given the advent of the livestock revolution (Delgado et al., 1999), women can be integrated to the markets and have sustained incomes. They can also be provided technical and other support to make their operations sustainable. These programs can also provide women more capacities in other spheres of life.

Economic development is good, but the fruits of development will only be meaningful if the people will be better off, with no one getting worse off. It is thus imperative for policymakers to understand these differential impacts on the different target groups.

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**Table 1. Number of registered commercial establishments in Lantapan, Bukidnon, 1999 and 2001.**

Type of establishment	1999	2001 <sup>a</sup>
Agricultural supplies	4	-
Hardware (motorparts)	1	2
School supplies	1	-
Sari-sari stores	227	154
Bakery	4	2
Transport services	4	1
Drug store	1	1
Buy and sell	5	3
Tailoring	2	-
Electrical shop	3	-
Videoke	2	3
Poultry	-	3
Corn mill	-	12
Piggery	-	2
Banana plantation	-	2
Total	254	185 <sup>a</sup>

<sup>a</sup> New entrants in 2001.

**Table 2. Distribution of dry- season employment, by household members over 15 years old, 1996-2000.**

Year	Observations (no.)	Primary employment sector (% of observations)		
		On- farm	Off- farm	Nonfarm
Mainly corn-growing areas				
1996	120	60	20	20
1998	103	35	20	45
1999	113	27	21	51
2000	126	33	25	41
Mainly vegetable-growing areas				
1996	158	66	5	29
1998	121	52	17	30
1999	142	30	29	41
2000	117	42	14	44

Source: SANREM survey data (1996-2000).

**Table 3. Average daily wages by occupation and location (PhP/day), Lantapan, Bukidnon, 1998-2000.**

Type of employment	Upper watershed villages			Lower watershed villages		
	1998	1999	2000	1998	1999	2000
Nonfarm work						
Office employment	141	136	-	148	182	182
Small-scale enterprise	94	110	96	32	93	111
Construction work	150	60	40	175	69	-
Household help	55	50	53	62	45	74
Sales lady/helper	70	61	63	137	114	136
Nonfarm average	102	83	63	111	101	125
Off-farm average		128	148		128	148
Farm average	59	78	68	49	79	94

Source: SANREM survey data (1998-2000)

**Table 4. Land use pattern, Lantapan, Bukidnon, 1994 and 2001.**

Classification	1994	2001
	(%)	(%)
Agriculture	53.42	53.83
Forestal (pasture, grasslands and forest lands)	40.90	36.96
Built-up areas (commercial, residential, agro-industrial)	5.68	11.35
Others	-	3.53
Total	100	105.67
Total (ha)	31,820	32,971

Source: Municipal Annual Reports, Lantapan, Bukidnon, 1994, 2001.

**Table 5. Distribution of respondents, by category, Lantapan survey, 2002.**

<b>Category</b>	<b>No.</b>	<b>%</b>
By ethnicity		
Talaandig	58	53
Non-Talaandig	51	47
Total	109	100
By security of tenure <sup>a</sup>		
More secured	127	78
Less secured	35	22
Total	162	100
By age group		
Less than 60 years old	94	86
More than 60 years old	15	14
Total	109	100
By gender		
Male	99	91
Female	10	9
Total	109	100
By location		
Lower watershed	41	38
Upper watershed	68	62
Total	109	100
By soil conservation practice <sup>b</sup>		
Practicing soil conservation	89	66
Not practicing soil conservation	45	34
Total	134	100

<sup>a</sup> Expressed in number of parcels. More secure tenure: private title, shared ownership, tax declared, CLT, stewardship. Less secure tenure: tenant, cash rental, mortgaged, leased.

<sup>b</sup> Expressed in number of parcels.

**Table 6. Distribution of respondent responses on assessment of their welfare, Lantapan, Bukidnon, 2002 (in %).**

<b>Category</b>	<b>More satisfied with life now than 5 years ago</b>	<b>Status of food insecurity <sup>a</sup></b>	<b>More frequent Occurrence of hunger now <sup>b</sup></b>	<b>More prevalent occurrence of Illnesses now</b>
By ethnicity				
Talaandig	64	22	85	57
Non-Talaandig	37	27	64	59
By security of tenure				
More secured	52	19	83	52
Less secured	51	23	63	69
By age group				
Less than 60 years old	50	28	73	62
More than 60 years old	60	7	100	40
By gender				
Male	53	25	76	58
Female	40	20	50	70
By location				
Lower watershed	34	17	86	59
Upper watershed	62	29	70	59

<sup>a</sup> Responses to whether respondents experienced hunger during the last 5 years. <sup>b</sup> For those who experienced hunger, responses of whether they experienced hunger more frequently now than 5 years ago.

**Table 7. Mean number of animals raised and their imputed value, by various categories, Lantapan survey, 2002.**

<b>Category</b>	<b>Mean number of head <sup>a</sup></b>	<b>Value (2002 PhP)</b>
By ethnicity		
Talaandig	10	13,866
Non-Talaandig	16	14,272
By security of tenure		
More secured	13	18,444
Less secured	12	11,997
By age group		
Less than 60 years old	14	15,049
More than 60 years old	9	7,830
By gender		
Male	12	14,008
Female	25	14,530
By location		
Lower watershed	20	16,957
Upper watershed	9	12,307

<sup>a</sup> *Animals included cows, carabaos, horses, goats, poultry, and pigs.*

**Table 8. Proportion of sample respondents owning television and motorcycles, Lantapan survey, 2002.**

<b>Category</b>	<b>Television owner (%)</b>	<b>Motorcycle owner (%)</b>
By ethnicity		
Talaandig	15	3
Non-Talaandig	28	9
By security of tenure		
More secured	54	16
Less secured	18	6
By age group		
Less than 60 yrs old	39	12
More than 60 years old	4	
By gender		
Male	40	11
Female	3	1
By location		
Lower watershed	17	7
Upper watershed	26	5

**Table 9. Distribution of respondents who had home improvements in the last 5 years and who currently own bank accounts, Lantapan survey, 2002.**

Category	Had home improvement <sup>a</sup>	Currently maintaining
	done during last 5 years	bank account
	(%)	(%)
By ethnicity		
Talaandig	40	12
Non-Talaandig	25	14
By security of tenure		
More secured	34	10
Less secured	14	14
By age group		
Less than 60 years old	31	15
More than 60 years old	33	0
By gender		
Male	32	13
Female	20	10
By location		
Lower watershed	34	15
Upper watershed	29	12

<sup>a</sup> Includes repair/construction of house, comfort room, veranda, roof, wall and kitchen.

**Table 10. Respondents' distribution of responses in assessing soil and water quality, Lantapan, Bukidnon, 2002 (in %).**

<b>Category</b>	<b>Decline in soil quality <sup>a</sup></b>	<b>Decline in water quality <sup>b</sup></b>
By ethnicity		
Talaandig	69	60
Non-Talaandig	69	31
By security of tenure		
More secured	73	52
Less secured	69	37
By age group		
Less than 60 years old	66	47
More than 60 years old	87	47
By gender		
Male	68	46
Female	80	50
By location		
Lower watershed	66	44
Upper watershed	71	49
By soil conservation practice		
Practicing soil conservation	79	48
Not practicing soil conservation	69	44

<sup>a</sup> Measured in terms of decrease in agricultural productivity. <sup>b</sup> Measured in terms of darker color of water.

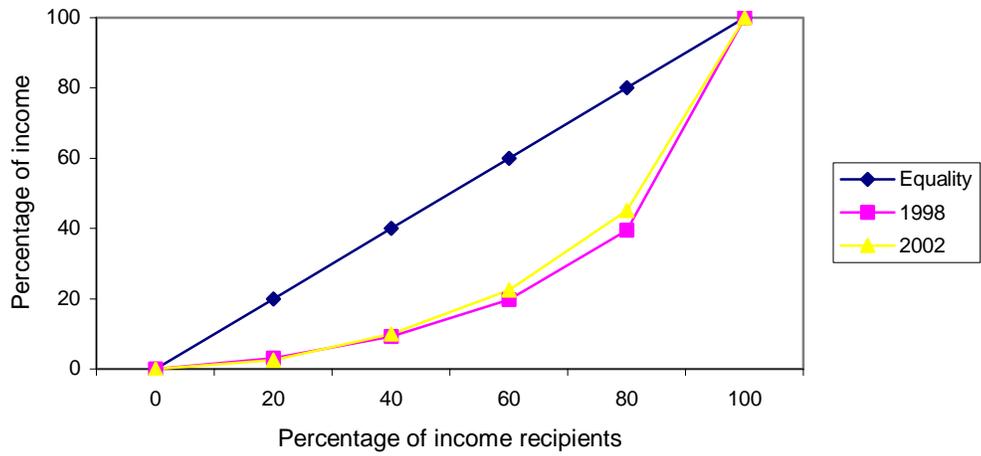
**Table 11. Awareness of environmental conservation programs and respondents willingness to pay for these programs, Lantapan, Bukidnon, 2002.**

<b>Category</b>	<b>% of respondents who perceive that people are aware of water and soil conservation programs</b>	<b>% of respondents who are aware that government programs are supported by taxes</b>	<b>% of respondents who are willing to pay additional taxes for water and soil conservation programs</b>
By ethnicity			
Talaandig	88	97	91
Non-Talaandig	73	86	76
By security of tenure			
More secured	85	94	89
Less secured	66	77	71
By age group			
Less than 60 yrs old	80	91	85
More than 60 years old	87	93	80
By gender			
Male	82	92	85
Female	70	90	80
By location			
Lower watershed	76	80	73
Upper watershed	84	99	91

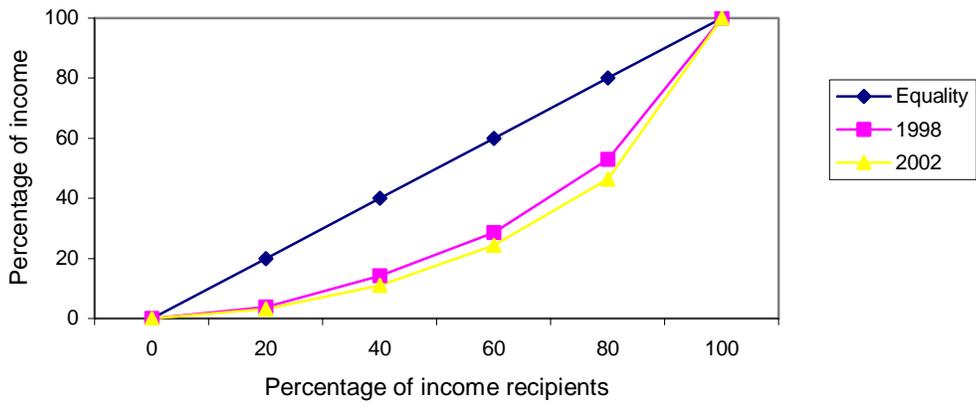
**Table 12. Mean incomes, by various categories, 1998 and 2002, Lantapan survey, 2002.**

Category	1998 <sup>a</sup>		2002 <sup>b</sup>	
	Mean	% from mean	Mean	% from mean
By ethnicity				
Talaandig	3,242.80	-0.05	5,193.47	-30.20
Non-Talaandig	3,631.62	11.94	9,996.47	34.34
By age group				
Less than 60 years old	3,467.08	6.87	7,513.74	0.98
More than 60 years old	2,085.65	-35.71	6,983.29	-6.15
By security of tenure				
More secured	3,252.66	0.26	7,732.75	3.92
Less secured	5,252.36	61.90	13,789.62	85.32
By gender				
Male	3,622.86	11.67	7,671.44	3.10
Female	2,840.44	-12.45	5,156.87	-30.70
By location				
Lower watershed	3,302.08	1.78	11,715.81	57.45
Upper watershed	3,196.66	-1.47	4,863.13	-34.64
By soil conservation practice				
Practicing soil conservation	3,735.10	15.13	8,249.35	10.86
Not practicing soil conservation	4,172.46	28.61	11,401.81	53.23

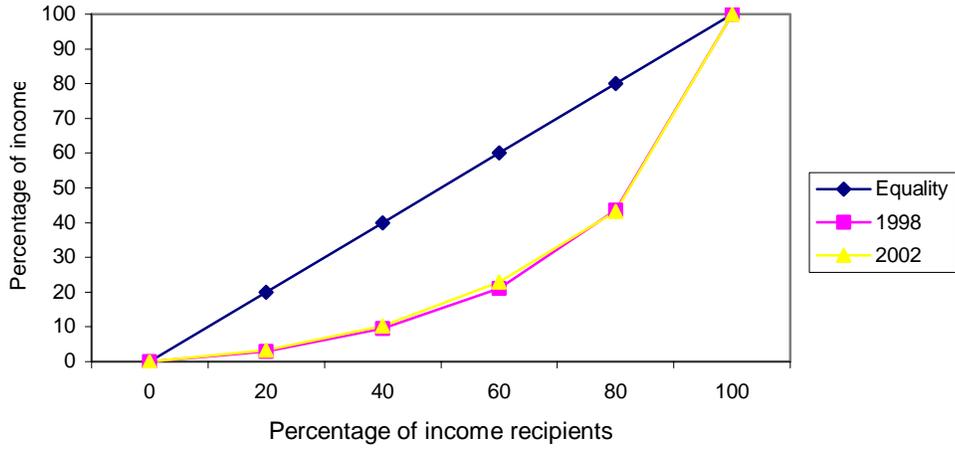
<sup>a</sup> Mean income for 1998: PhP3,244.27. <sup>b</sup> Mean income for 2002: PhP7,441.



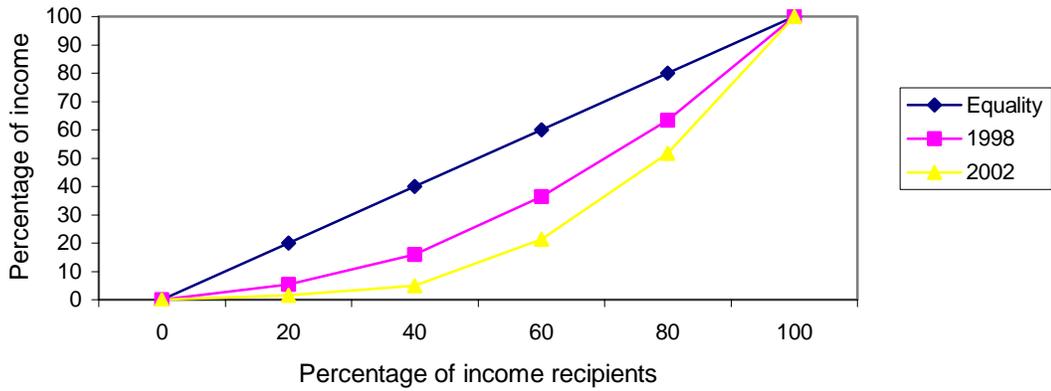
**Fig.1. Lorenz curve for Talaandigs.**



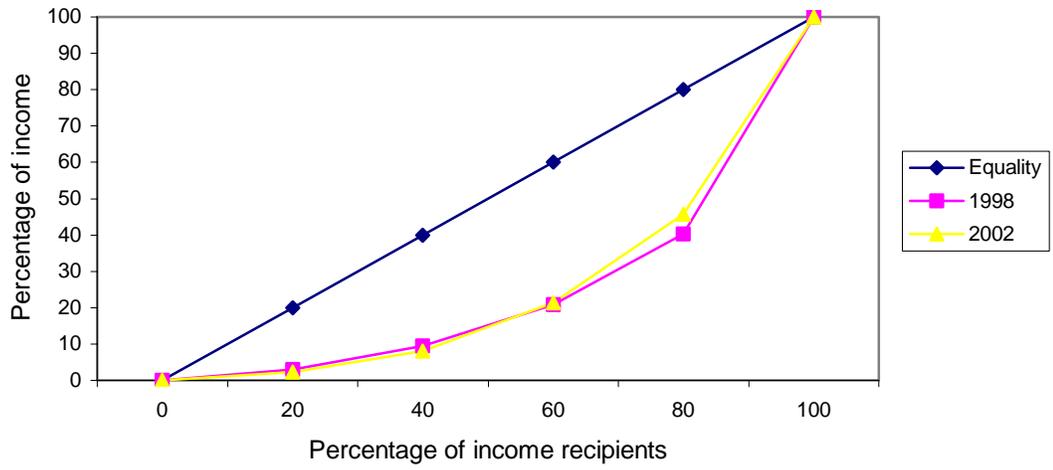
**Fig.2. Lorenz curve for Non-Talaandigs.**



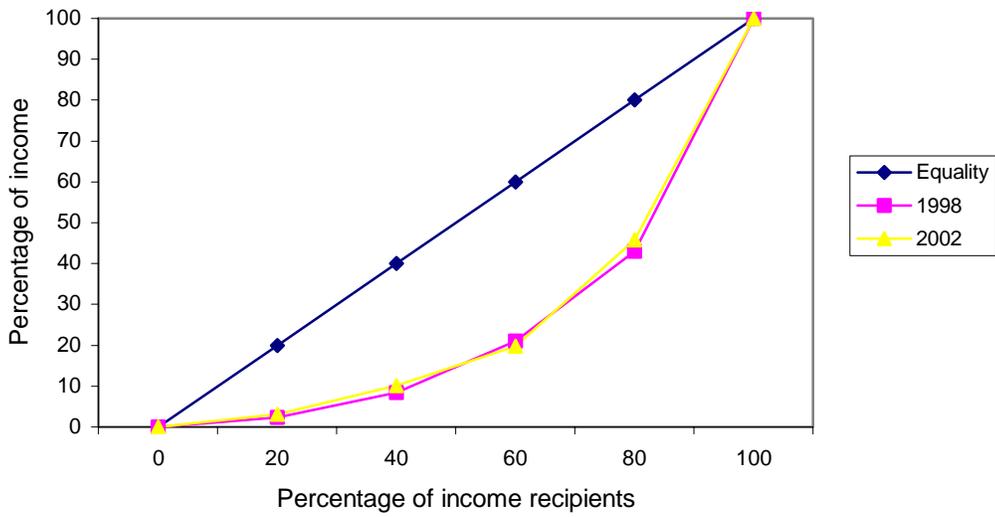
**Fig.3. Lorenz curve for less than 60 age group.**



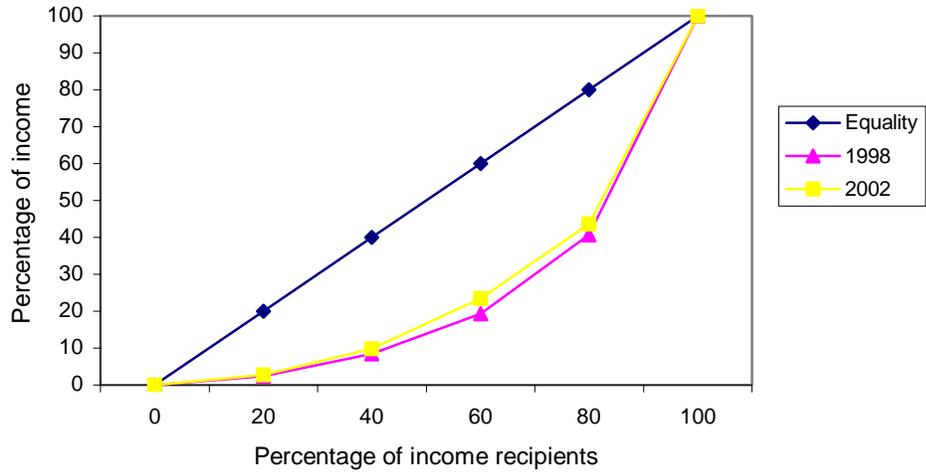
**Fig. 4. Lorenz curve for greater than 60 age group.**



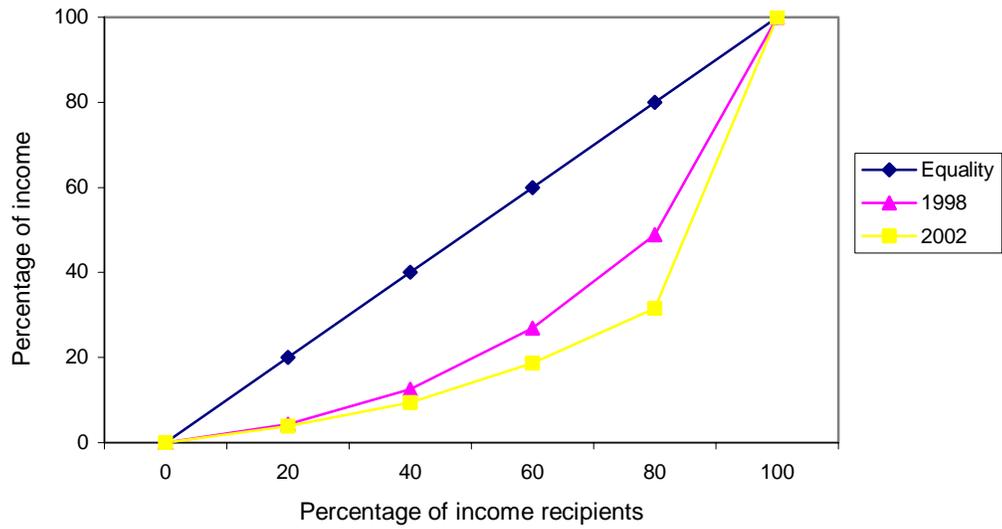
**Fig. 5. Lorenz curve for group with more secured tenure.**



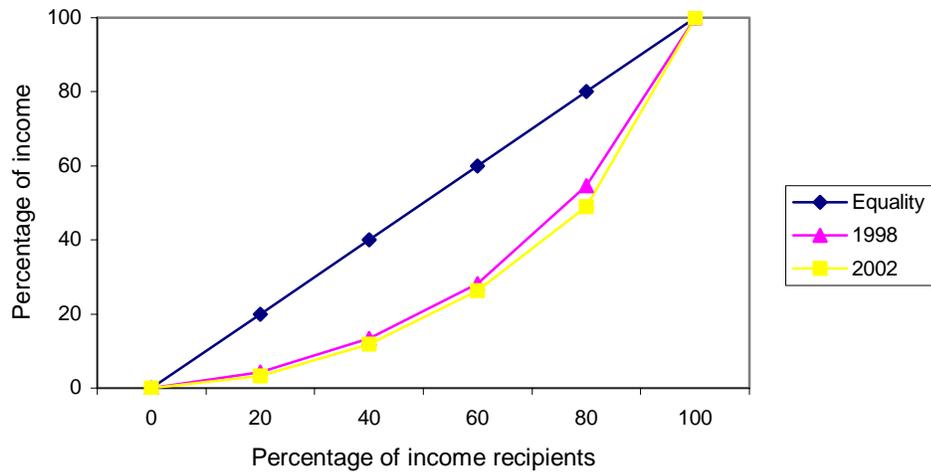
**Fig. 6. Lorenz curve for group with less secured tenure.**



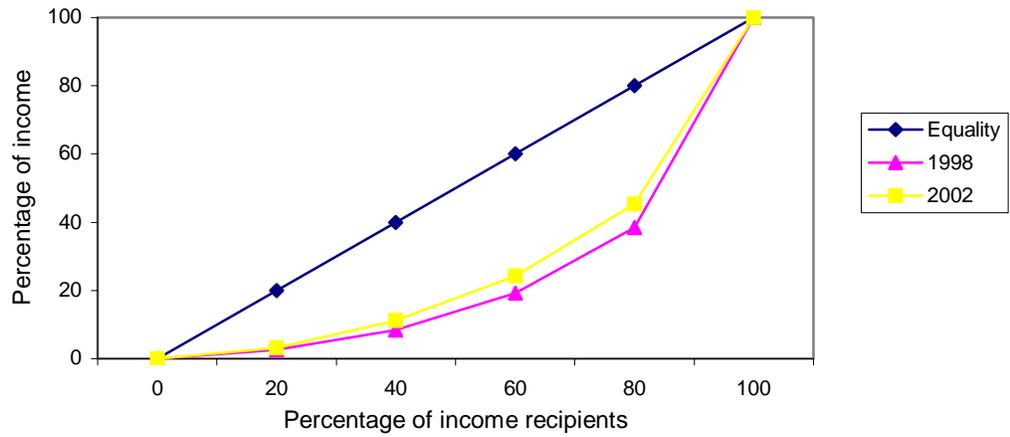
**Fig. 7. Lorenz curve for male respondents.**



**Fig. 8. Lorenz curve for female respondents.**



**Fig. 9. Lorenz curve for respondents in the lower watershed.**



**Fig. 10. Lorenz curve for respondents in the upper watershed.**