J. ISSAAS Vol. 15, No. 2:93-106 (2009)

THE PHILIPPINES' REGULATORY POLICY ON COCONUT CUTTING: AN ASSESSMENT INCORPORATING ENVIRONMENTAL CONSIDERATION

Isabelita M. Pabuayon[1], Simplicio M. Medina[2], Cynthia M. Medina[2] and Erlene C. Manohar[3]

[1] Department of Agricultural Economics, College of Economics and Management
University of the Philippines Los Banos (UPLB)
College, Laguna 4031 Philippines
[2] Agricultural Systems Cluster, College of Agriculture, UPLB
[3] Philippine Coconut Authority
Diliman, Quezon City, Philippines

(Received: September 2, 2009; Accepted: November 2009)

ABSTRACT

This paper investigates the environmental issues associated with the cutting of coconut trees in the Philippines with the end in view of identifying possible revisions in the current regulatory policy. The analysis is based on primary and secondary data gathered from case coconut farms, farmer leaders, and community development officers of the coconut government agency in Quezon province, the largest coconut producing area in the country.

A policy to regulate the cutting of coconut trees in the Philippines is currently implemented to ensure a sustainable resource base for the coconut industry. However, indiscriminate and illegal cutting of coconut trees has continued. This has raised serious concerns not only on the economic viability of the industry but also on possible adverse impact on the environment since many coconut farms are in the sloping and mountainous areas. Findings reveal that farmers do not consider the environmental threat as serious in their coconut farms even as they admit illegal cutting of coconut trees happening in their areas. However, there are already erosion incidents in some sloping farms. Moreover, the community development officers and even some farmers agree that the environmental threat could be real if uncontrolled cutting without replanting and unsustainable farm management practices in the uplands persists. A prudent course of action requires a more effective implementation and revisions of the policy to address the following: (a) environmental clearance for sloping and critical areas in issuing cutting permits, (b) concentrating coconut replanting in flatlands and less critical slopes, (c) planting of denuded coconut plantations in critical areas with appropriate forest species, and (d) capacity building through farmers' training on ecological awareness and demonstration of appropriate farming systems and production possibilities that address both ecological and economic concerns.

Key words: Environment, sloping coconut farms

INTRODUCTION

Due to the scarcity of wood in the Philippines, cutting of coconut trees for commercial sale of coco lumber (coco wood) or coconut logging has become widespread (Pabuayon and Medina 2007). This has raised sustainability concerns both on the economic viability and competitiveness of the coconut industry and the environment considering that an estimated 30% of the coconut lands in the country are in mountainous areas (Manalo, no date). Such concerns are valid because the coconut industry is significant to the Philippine economy as a major provider of income, employment and foreign exchange. Any problem, whether economic or environmental, can bring about hardships

particularly to dependent impoverished coconut communities. Pabuayon, et al. (2009) argued that market development through value-addition and improved marketing system could help alleviate poverty among coconut farmers. As shown by Aragon (2008), the proportion of poor households in selected coconut communities has remained high at 52% even after the implementation of the government's poverty reduction program.

This paper focuses on the environmental considerations affecting the coconut industry. Environmental risks in the uplands are associated with the loss of the soils' water-holding capacity particularly during persistent torrential rains when trees are cut on large scale basis. A study in Quezon province, the largest coconut-producing area in the Philippines, showed that although erosion rate is lower in coconut plantation farms compared to other cases such as coconut with corn intercrop, bare area and fallow area, it generally increases with slope in all cases (Josue 1999). Cutting of coconut trees without replanting exposes the soils to adverse weather conditions and makes them vulnerable to erosion. In extreme cases, soil erosion in hilly and sloping areas causes landslides and flashfloods.[1] Medina (2005) estimated that, taking into account the economic and ecological contributions of coconut, the net environmental benefit of coconut logging without replanting over a 10-year period is negative PhP416,722 per hectare.

Cutting of coconut trees in the Philippines is generally prohibited, and allowed only under certain conditions, after payment of mandatory fees and planting of replenishment seedlings, in which case a permit-to-cut (PTC) is issued by the authorized government agency. However, indiscriminate and illegal cutting of coconut trees continues in many areas (Medina 2005, Aranas 2006 and Esguerra 2007). While the policy also aims "to promote the growth of the national industry by embarking on a sustainable and efficient replanting program", success rate of the program is limited. The main question is whether or not there is scope and urgency to revise the regulatory policy for cutting coconut trees based on environmental considerations.

This paper (1) analyzes the coconut cutting regulatory policy in the Philippines in terms of specific guidelines and extent of implementation, (2) provides evidence on the environmental situation in selected coconut areas, and (3) recommends possible revision of the coconut regulatory policy to take into account environmental consideration.

METHODOLOGY

This paper forms part of the 2008 research project "Economic and Environmental Concerns in Philippine Upland Coconut Farms: An Analysis of Policy, Farming Systems and Socioeconomic Issues" funded by the Economy and Environment Program for Southeast Asia (EEPSEA) under the International Development Research Centre (IDRC). The study used both primary and secondary data. Primary data include information about the environmental situation in the case coconut farms and implementation of the coconut cutting regulatory policy in Quezon province. Secondary data cover the extent of coconut cutting and policy guidelines.

Data were collected through (a) field visits and ocular observations in 15 case coconut farms in three municipalities, namely, Mauban, Tayabas and San Antonio; (b) focus group discussions (FGDs) with the case coconut farm owners, farmer leaders and other community members; (c) key informant interviews (KIIs) with coconut development officers (CDOs) of the Philippine Coconut

[1] The Philippines experienced massive destruction of lives and properties from natural catastrophes (land/mudslides and flashfloods due to strong typhoons) in Ormoc, Leyte (1991), Southern Leyte and Surigao (2003), and Aurora and Quezon (2004) which are all coconut-producing areas. Nevertheless, cutting of coconut trees was not singled out as the main cause.

Authority (PCA); and (d) photo documentation of the bio-physical characteristics of the coconut farms. Data were analyzed using descriptive statistics (means, totals and percentages) and presented in tabular and graphical forms.

RESULTS AND DISCUSSION

Coconut Cutting Regulatory Policy

Enabling Laws and Policy Guidelines

The government's objective is to maintain a sustainable coconut resource base in order to ensure an adequate supply of raw materials and products for the coconut industry. This is supported by four enabling laws. The first is Republic Act (RA) 8048 or the Coconut Preservation Act of 1995 and its Implementing Rules and Regulations as defined in PCA Administrative Order 02 Series of 2005. The policy provides for the regulation of the cutting of coconut trees as well as growth of the national industry by embarking on a sustainable and efficient replanting program. The second is Executive Order (EO) 213 of 2000 constituting the National Enforcement Task Force or NETFORCE on Coconut Tree Conservation whose main function is to formulate and execute action plans to control the rampant cutting of coconut trees. It supports RA 8048 by ensuring an effective and timely coordination among the concerned agencies, local government units (LGUs) and private sector in implementing its provisions. The third is Executive Order (EO) 015 Series of 2007 of the Office of Quezon Provincial Governor which reconstituted the Quezon Coconut Industry Development Council. It is a provincial ordinance specifying the creation of a Task Force that would monitor the illegal cutting of coconut trees pursuant to RA 8048. The fourth is Memorandum Circular (MC) 02 Series of 2008 or the Moratorium on the Issuance of Permit to Cut Coconut Trees. It is a national directive from PCA stating that "all issuances of permit to cut coconut trees and the corresponding transport/transshipment clearances are suspended nationwide except on a limited exception and under certain circumstances". It was issued to arrest the ever-increasing and unabated incidence of illegal cutting of coconut trees.

Under RA 8048, the cutting of coconut trees is prohibited except under certain requisites where cutting is allowed based on a permit issued by PCA. Among others, these requisites include (1) existence of a valid ground which could be any of the following: (a) the tree is 60 years old or more; (b) the tree is no longer economically productive; (c) the tree is severely disease-infected and/or pest-infested; (d) the tree is damaged by typhoon or lightning; (e) the coconut land shall have been approved for conversion into residential, commercial or industrial areas; (f) the coconut land shall be converted into other agricultural-related activities; and (g) the tree would cause hazard to life and property; and (2) planting of the required equivalent number of coconut seedlings. However, RA 8048 is silent on whether cutting may be disallowed if the removal of coconut trees in a given area, whether partial or clear cutting, could potentially bring about environmental problems. Such problems are likely to occur when trees are cut large scale in sloping and marginalized areas without guarantee of replanting, reforestation, or soil conservation measures. As shown below, cutting is done both in upland and lowland coconut farms. Topography of the area is not considered in evaluating cutting applications.

Since replanting is part of the process, theoretically, every tree cut is to be replaced. However this is not the case for those involving land conversions wherein seed nuts are simply certified as being available for distribution to farmers. Whether they are actually planted elsewhere or not is not fully monitored. Spot checking of actual cutting operations is not compulsory and post-cutting report is not required. After issuance of the PTC, transport monitoring rests with the police agency.

Despite the existence of the NETFORCE, effective implementation of the coconut cutting policy remains a problem suggesting a structural weakness in the policy. One key informant from PCA indicates the following problems: (a) the agency is only involved in the farm-level implementation and not in the trading aspect of coco lumber, (b) it has no police powers to track down violators, and (c) approval of land conversion involving large scale cutting of coconut trees rests with other agencies. One observation is the seeming indirect role of the Department of Environment and Natural Resources (DENR). This role is largely in the monitoring of logs and lumber being transported rather than in ensuring that the environmental aspect of cutting coconut trees in the uplands and mountainous areas is taken into account. In fact, the DENR is not mentioned in RA 8048 and in its implementing rules and regulations.

Extent of Implementation

Since the implementation of the cutting policy in 1995, the number of coconut trees cut based on the permits issued by PCA until 2007 totaled 8,136,413 or an average of 625,878 trees per year. Cutting rose sharply by more than three times from 230,830 trees in 1995 to 982,713 trees the following year. It further increased to 1,088,896 trees in 1997, the highest ever during the last 13 years, before it showed a downward trend reaching a low level of 257,690 trees in 2005. Cutting increased again in the following two years which could partly be due to the large number of trees blown down by the destructive typhoon in 2006. Although showing great year-on-year variability, the number of trees cut grew at an average of 27% per year. Heaviest cutting occurred in the large coconut producing regions, notably Region 4A where Quezon province belongs.

Previous surveys reveal extensive cutting in Quezon (Medina 2005 and Pabuayon and Medina 2007). Among the case farmers interviewed in June-August 2008, 12 had cut their trees in the past at an average of 63 trees per farm. While more cutting was reported in Mauban, "clear cutting" (with PCA permit) was done in San Antonio in 2004 due to predominance of unproductive, low-yielding and old trees. A total of 693,024 trees were cut from 1995 until September of 2007 in Quezon 1 where Tayabas, Mauban and San Antonio belong. By topography, cutting is greater in sloping than in flat coconut farms, even though there were more flat *barangays* than sloping ones covered by the permits issued in 2006-2007 in Tayabas and Mauban (Table 1).

Table 1. Cutting and replanting in coconut *barangays* by topography, Tayabas and Mauban, Quezon, March 2006-2007.

Item	Tayabas		Mauban		Both	
	No.	**%**	**No.**	**%**	**No.**	**%**
Total number of *barangays* covered by permits issued[a]						
Sloping	15	38	13	45	28	41
Flat	25	62	16	55	41	59
Total	40	100	29	100	69	100
Total number of cut trees						
Sloping	12,498	55	16,499	53	28,997	54
Flat	10,402	45	14,594	47	24,996	46
Total	22,900	100	31,093	100	53,993	100
Total number of replanted trees						
Sloping	13,799	56	16,693	52	30,492	54
Flat	10,869	44	15,239	48	26,108	46
Total	24,668	100	31,932	100	56,600	100

[a] Topography of *barangays* was identified by PCA Coconut Development Officers (CDOs)
Source: PCA Provincial Office, Quezon

While the policy is to replant every tree that is cut, the national replanting rate is only 61.67% in the period 1995-2007 based on PCA data. Nevertheless, replanting rate has been increasing over time, from only 17.31% in 1997 (none recorded for 1995-1996) to as high as 93.56% in 2002. The number of replanted trees even exceeded those cut in 2005 (Figure 1). Replanting data however do not reflect actual survival rate since no post-cutting evaluation is being done by PCA. Moreover, illegally cut trees are not reflected in the data.

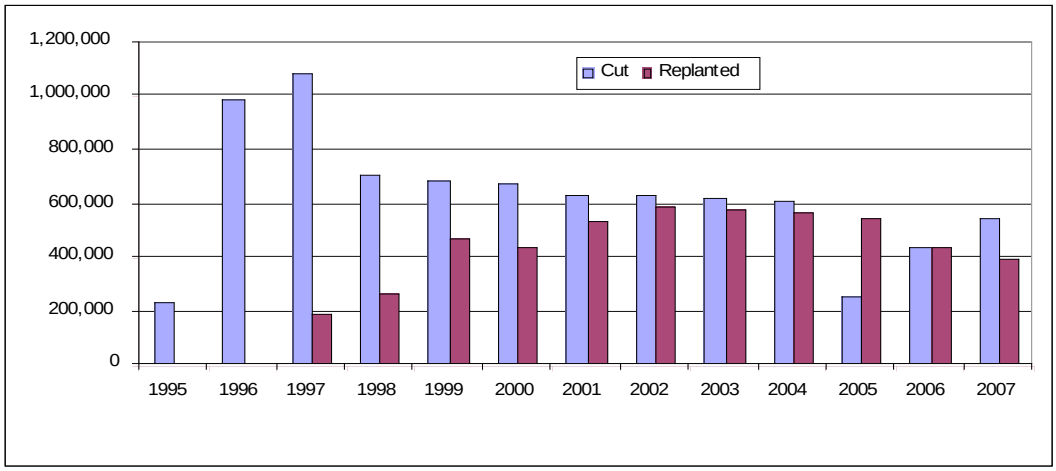

Fig. 1. Number of cut and replanted trees, Philippines, 1995-2007

Aside from inadequate replanting, the most common form of violation is cutting without PCA permit. For the period 1997-2008, the number of cases filed in Quezon totaled 76 with the highest in Tayabas, Sariaya and Mauban. More than half of these were filed in 2007 and 2008 when the moratorium of issuing cutting permits began to be implemented. According to key informants, however, conviction rate for the filed cases has been very low.

The Case Coconut Farms

Bio-Physical Characteristics

In general, Tayabas has a slope ranging from 5% to 8% with some rolling terrain while Mauban is more sloping with a range of 15-50% (Fig. 2). Many farms are in mountainous areas. The soil type in Tayabas ranges from clayey to loamy while it is mostly sandy loam to sandy clay in Mauban and San Antonio. Both soil types are suitable for coconut planting which requires light to medium textured soils (Table 2). When internal soil drainage is considered, though, the lighter soil texture in Mauban is more suitable to coconut.

Average farm size is 6.4 hectares with small portions as separate parcels in Tayabas and Mauban that are planted to other crops. These crops are rice or other annuals like vegetables cultivated in open and flat areas with planted area averaging 0.4 hectare. They are usually for home consumption since harvests are quite small. The smallest farm is 1.5 hectares; the largest is 15 hectares. However, there are several farms that are relatively large at 8 to 14 hectares.

Table 2. Information on case coconut farms in selected municipalities in Quezon, 2008

Farm Information	Municipality			
	Tayabas	**Mauban**	**San Antonio**	**Average**
Average distance of farm from *barangay* road (km)	0.84	1.32	3.6	1.92
Access to farm				
Walking	□	□	□	
Animal ride	□	□	□	
Motorcycle	□	□	□	
Jeepney	□		□	
Topography (% of total farm area)				
Flatland	96	21	77	65
Sloping	4	79	23	35
Soil texture	clay loam	sandy loam	sandy loam	
Rainfall pattern	rainy May – December	rainy September – January	rainy June – August	
Land utilization (hectares)				
Ave. land/farm area	5.4	6.7	7	6.4
Ave. land area planted to coconut and intercrops	4.4	6.5	7	6.0
Ave. land area planted to other crops[a]	1.0	0.2	0	0.4

[a] Refers to separate parcels of land planted to other crops (not planted under coconut)

Fig. 2. Sloping and mountainous coconut farms in Mauban, Quezon (left) and slightly rolling farms in Tayabas, Quezon (right) (Photo by the study team, July 2008)

Average annual coconut yield for all farms was 4,912 kg per hectare or approximately 49 nuts per tree per year (Table 3). Except for monocrop, coconut yields are higher in flat areas than in sloping farms. The farmers explained that the lower yields in sloping farms are due to the trees being much older and poor land fertility resulting from erosion of top soil. The average age of coconut trees in the study sites is 46 years. Coconut trees without intercrops are relatively younger with average age of 37 years. At ages of 20-40 years, coconut canopy covers much of the ground resulting in little sunlight penetration, making the condition relatively unsuitable for most intercrops.

Table 3. Average coconut yield by cropping system, topography and age of coconut trees, Quezon, 2008.

Cropping System	Yield (kg/ha/year)			Age (years) of Coconut Tree
	Flat	Sloping	Both	
Coconut monocrop	1,350	4,703	2,018	37
Coconut + banana	5,265	1,977	3,621	59
Coconut + banana + cassava	8,550	-	8,550	70
Coconut + banana + cassava + fruit trees	7,200	-	7,200	15
Coconut + banana + fruit trees	6,000	2,000	4,000	60
Coconut + lanzones + coffee + cacao + black pepper	3,266	817	4,083	35
Average	5,272	2,374	4,912	46

Environmental Threat

The farmers in Tayabas stated that there is no observed occurrence or threat of erosion in their area. A visual observation of the surroundings did not reveal any occurrence of erosion such as rill, gully or landslide. In Mauban, however, while the farmers did not confirm any occurrence of erosion in their area, a reconnaissance made by the study team around the place revealed presence of some rills and gullies on the ground surface (Figure 3). The CDO confirmed the occurrence of landslide during a strong typhoon in 1995. Of the 12 key informant CDOs from Quezon, eight admitted to occurrence of erosion in their respective areas of responsibilities (Table 4).

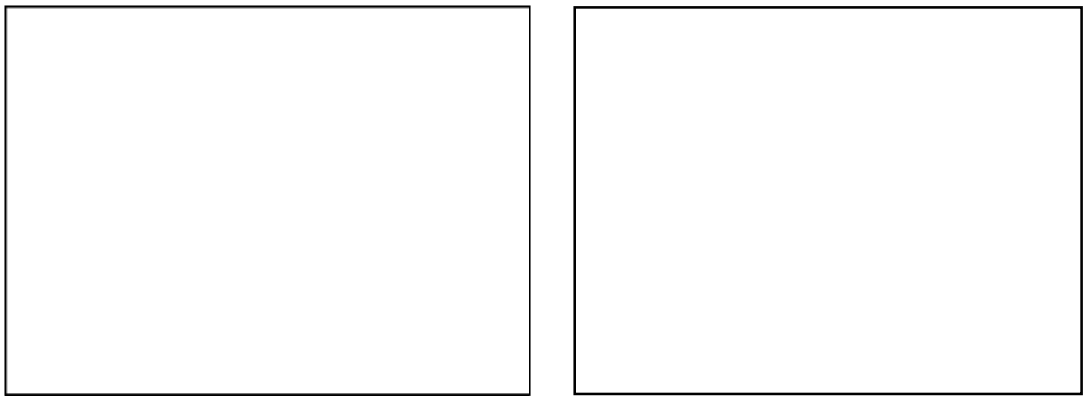

Fig. 3. Erosion (left) and logged-over coconut farms (right) in Mauban, Quezon (Photo by the study team, July 2008)

Considering the coconut agro-ecosystem in the sites, the more diverse and multi-storey type of canopy in Tayabas is more effective against any threat of erosion. The reason is that raindrop velocity and impact will be greatly reduced if it passes several layers of canopy before reaching the ground. In Mauban where coconut planting is denser, absence or fewer intercrops under coconut that intercept erosive raindrops allow a greater degree of vulnerability to erosion, considering its steeper slope. Except in the event of excessive rainfall brought about by strong typhoons, the amount of rainfall being received in Mauban and Tayabas (based on the number of rainy and dry months) may not be considered a major contributory factor to erosion. While Tayabas has more rainy months, its topography is not prone to erosion. On the other hand, while Mauban has a more sloping topography, it has lesser rain months presupposing less rainfall received in the area.

Table 4. Occurrence of soil erosion or environmental degradation according to PCA-CDOs, Quezon, 2008.

Municipality	Presence of Soil Erosion or Environmental Degradation	Type of Soil Erosion[a]	Date of Occurrence	No. of Farms Affected	No. of Barangays Affected
Burdeos/ Patnanungan	Yes	Gully erosion	June 2008	10	No knowledge
Candelaria	Yes	Rill erosion	During heavy downpours	No answer	Most of the *barangays*
Dolores	No	None	NA[b]	NA	NA
General Nakar/Jomalig	Yes	Landslide	2004	150	19
Infanta	Yes	Landslide	2004	No knowledge	No knowledge
Mauban	Yes	Landslide	1995	Minimal	4
Pagbilao	Yes	Rill erosion	Farms/ *barangays* not that affected	Farms/ *barangays* not that affected	Farms/ *barangays* not that affected
Panukulan/ Polillo	Yes	Rill erosion	2004	5	2
San Antonio	No	None	NA	NA	NA
Sariaya	Yes	Rill erosion and Landslide	Aug – Dec	No knowledge	5
Tayabas	No	None	NA	NA	NA
Tiaong	No	NA	NA	NA	NA

[a] Rill erosion refers to soil removal to form small but well-defined channels caused by surface run-off. Channels can be smoothed by normal tillage operations. Gully erosion is when surface channels have been eroded to the point that they cannot be smoothed over by normal tillage operations.

[b] NA means not applicable

The soil type in the sites could be considered not of the erodible type. The light to medium soil texture, sandy loam to sandy clay for Mauban and clayey to loamy for Tayabas have greater infiltration capacity which could reduce erosive surface runoff. However, a farmer in Mauban mentioned that the swaying of tall and old trees during typhoons accompanied by strong winds could trigger erosion. As the trees sway, the soil could loosen. The farmers were emphatic though that cutting of coconut trees without replanting is a major factor that could contribute to soil erosion. Given these considerations, the presence of coconuts (and other intercrops) with proper farming systems management, even under predisposing factors such as slope and other soil factors, can reduce the threat of soil erosion in the study sites.

Perceptions of the Different Stakeholders

On the Coconut Cutting and Replanting Guidelines

According to the LGU, the primary reason for the moratorium in issuing cutting permit is economic; the environmental concern is only secondary. Continuous cutting and inadequate replanting could lead to unsustainable supply of raw materials for the major coco-based industrial users such as oil mills and desiccated coconut processing plants in the province.

The PCA Regional Manager agrees that protection of the environment is secondary to the economic reason for the moratorium. This is so even when the CDOs believe that heavy cutting of coconut trees in at least two municipalities contributes to soil erosion (Table 5). While severe soil erosion in most coconut farms is not yet observed, the CDOs generally agree that further massive cutting of coconut trees particularly in sloping areas could be detrimental to the environment. Thus more than half of the CDOs stated that cutting should be stopped in sloping areas and there should be crop diversification using forest species and perennial crops.

Table 5. Causes of soil erosion and recommendations of the PCA-CDOs on its prevention, Quezon, 2008.

Item	Number Reporting[c]	Percent
Causes of soil erosion		
Heavy cutting of forest trees	6	50
Heavy cutting of coconut trees	2	17
Heavy rainfall	6	50
Intensive cultivation of coconut farms	1	8
Stone quarrying	1	8
Will continuous cutting of coconut trees result in soil erosion or other environmental problems?		
Yes, for the following reasons	9	75
Denudation of the area will occur	1	8
More surface run-off will occur due to absence of canopy and roots that will hold water	1	8
Trees planted in sloping areas have water holding capacity; if these are cut, flooding will occur	2	17
Heavy cutting results to landslide	1	8
Will not happen because there is always replanting of coconut trees	5	42
No response	2	17
Recommendations for the coconut farms in the sloping areas to avoid any possible environmental problem in the *barangays*		
No more cutting in sloping areas	7	58
Crop diversification		
Annuals		
Perennials[a]	5	42
Forest species[b]	10	83

[a] Perennials recommended include citrus, *lanzones, rambutan*, mangosteen, and *santo*l
[b] *Mahogany, narra, apitong, yakal, batino, antipolo, kamagong, mulawin, malapapaya* and other forest species
[c] Multiple responses

The CDOs are split about the effectiveness of the moratorium in controlling the cutting of coconut trees (Table 6). Indirectly, they agree that illegal cutting continues even with the moratorium and this manifests in the continuing sale of significant amounts of coco lumber in hardwares and retail outlets. Others explicitly stated that the moratorium is not effective in controlling illegal cutting of coconut trees. Instead they suggest that the moratorium be lifted but RA 8048 should be more effectively implemented. Since the CDOs cannot adequately monitor all the coconut areas assigned to them, the *barangay* officials should be stricter and ensure that illegal and indiscriminate cutting does not occur in their respective areas. If the moratorium will continue, they suggest that the same should apply in the trading operations for coco lumber. The argument is that controls, if to be used, should be imposed at all levels in the market chain of coco lumber.

Table 6. Responses of PCA-CDOs on the implementation of RA 8048 and moratorium, Quezon, 2008

Item	Number Reporting	Percent
Is the moratorium effective in preventing the cutting of coconut trees?		
Yes	6	50
No	6	50
Recommendations if moratorium is not effective		
Lift the moratorium and implement RA 8048 effectively with full force	2	33
Impose moratorium also on the buying/trading of coco lumber	1	17
Lift moratorium and do selective cutting of coconut trees only	1	17
Barangay officials in the area should not allow cutting	1	17
No response	1	17

Overall, there are more CDOs who believe that RA 8048 is already adequate for the preservation and development of the coconut farms in Quezon if it is effectively implemented (Table 7). In particular, the provision of issuing permits if the trees are already unproductive and/or diseased coupled with assurance of complete replanting is sound. Viable coconut-based farming and agroforestry systems should be promoted. To some, moratorium should be selective and implemented only in areas where rampant illegal cutting is uncontrolled. About one-third of the CDOs however believe that the moratorium should continue indefinitely coupled with effective replanting program. This is especially true in areas where it is considered necessary to control illegal cutting.

Table 7. Opinion of PCA-CDOs on the preservation and development of coconut farms, Quezon,

Item	Number Reporting [d]	Percent
Effectively implement RA 8048 and lift moratorium[a]	9	75
Continue moratorium indefinitely coupled with effective replanting program	4	33
Selective moratorium[b]	6	50
Promote viable coconut-based farming and agroforestry systems coupled with effective implementation of RA 8048 only[c]	6	50
Correct implementation of all the programs of the government	1	8

[a] Allow cutting unproductive/damaged/diseased trees and ensure complete replanting
[b] Only in provinces where there is rampant illegal cutting of coconut trees
[c] No moratorium
[d] Multiple responses

Farmers' Awareness and Suggestions

Not all coconut farmers who served as key informants are aware of the coconut cutting regulatory policy (Table 8). Only one farmer categorically said that the policy is effectively implemented. When asked about their knowledge regarding the form of violation against the policy, majority stated cutting without permit. This implies that farmers are aware of illegal cutting happening in their *barangays*. During informal discussions, they indicated that *barangay* officials allow them to cut their trees without a PCA permit. Although they are aware that violators are penalized through confiscation of illegally cut trees and power saws and payment of fines, two of them stated that cases filed are usually dismissed with no one eventually being convicted.

Except for two farmers who believe that total log ban (including forest species) should be implemented, the general perception is that the cutting regulatory policy is favorable but there is a need for proper implementation particularly the provision on replanting (Table 9). They believe that as long as only unproductive, diseased and damaged trees are cut and these are adequately replaced through new plantings, the coconut resource base will be sustainable. The PCA should coordinate closely with the *barangay* officials and violators should be penalized.

Table 8. Farmers' awareness of the Cutting Regulatory Policy, Quezon, 2008.

Item	Number Reporting	Percent
Aware of Republic Act 8048		
Yes	9	60
No	6	40
Source of Information		
Seminars by PCA/DA/LGU	6	40
Other farmers	3	20
Knowledge on RA 8048[a]		
Coconut rehabilitation	1	7
No permit no cutting	5	33
Penalty if cutting without permit	2	13
No cutting of trees below 60 yrs old	2	13
Policy is/was effective		
Yes	1	7
No	4	27
No response	7	47
Form of violations known		
Cutting without permit	13	87
Awareness on penalized violators [a]		
Confiscation of illegally cut trees	4	27
Confiscation of power saw	1	7
Payment of fine	1	7
Cased were filed but dismissed/no one was convicted	2	13

[a] Multiple responses

On the moratorium of issuing cutting permits, majority believe that it is being effectively implemented. Others think it is not effective since illegal cutting continues and thus should be lifted. Most farmers however understand that the moratorium was imposed due to rampant illegal cutting which could eventually lead to income loss among farmers. Some farmers even realize now that they

should not have cut their coconut trees since at the time of the field visits, coconut prices are favorable. They said that if they have more harvests (that is, if no cutting was done and more replanting was undertaken in the past), then their income would be much higher.

Table 9. Perceptions of farmers and suggestions on the Cutting Regulatory Policy, Quezon, 2008

Item	Number Reporting	Percent
On Coconut Preservation Act of 1995 (RA 8048)[a]		
The policy is good	3	20
Proper implementation of the policy	4	27
Coordination with the *barangay* LGU	2	13
Violators should be penalized	3	20
Total log ban	2	13
Strict implementation of coconut replanting	3	20
Creation of other livelihood programs	1	7
On moratorium of issuing cutting permits (MC 02)		
Moratorium is effective	8	53
Moratorium is not effective	2	13
Moratorium should be lifted	1	7
Reasons for the moratorium		
Illegal cutting was very rampant	2	13
Loss of income if coconut trees will be cut	7	47

[a] Multiple responses

The main reasons reported by those who have cut their trees in the past (before the moratorium) are those stated in the law since these are the conditions under which they were issued permits by the PCA (Table 10). A key motivation for not cutting the coconut trees is the good income coconut farming could provide to farmers. None mentioned about the environmental aspect of cutting the coconut trees until it was brought up by the research team during the FGDs. This is because none of the farmers present has experienced serious soil erosion in his coconut farm. In Tayabas where lands are mostly flat, farmers do not consider soil erosion as an environmental threat. Even in Mauban where most coconut farms are in the sloping areas, they appear silent about the soil erosion problem. Although they admitted having experienced flooding and landslides some time in the past, this was not attributed to soil erosion resulting from cutting of coconut trees. Rather, they claimed that this was due to unusually heavy downpour brought about by the typhoons in 2006.

Table 10. Farmers' Reasons for Cutting/Not cutting their coconut trees, Quezon, 2008.

Item	Number Reporting [a]	Percent
Reason for cutting		
Old and unproductive	5	42
Damaged by typhoon/lightning	4	33
Coco lumber is a good source of income	1	8
Ordered by the landowner	2	17
Land conversion	1	8
Reason for not cutting		
Good coconut production/high yields	2	17
Coconut is a good and stable source of income	2	17
Favorable price of copra especially at present	2	17

[a] Multiple responses

A revealing observation made during the FGDs that supports the cutting of unproductive old trees is the fact that these tall and slender trees if left uncut could actually trigger soil erosion when they are swayed and eventually uprooted by strong winds and typhoons. This is likely to occur in upland areas and especially when there is no crop cover or intercrops that could protect the soil from the heavy torrential rains and strong winds associated with destructive typhoons. In fact, if the old trees are cut with a portion of the base left intact, these could still hold the soil even while waiting for the full protection to be provided by the growing replanted coconut trees. Maintaining the old unproductive coconut trees is also not economically beneficial due to the high cost and difficulty of harvesting the few nuts of tall trees and then transporting them to the market.

CONCLUSION AND RECOMMENDATIONS

The current coconut cutting regulatory policy does not consider the topography of the coconut farm and possible environmental impact of large scale cutting in steep slopes and mountainous areas in evaluating permit applications. As it is, policy implementation is ineffective as evidenced by the continuing indiscriminate cutting of coconut trees both in flat and sloping farms. Although severe soil erosion is not apparent and widespread at the moment in the study sites, there are already erosion incidents in certain areas. However, it appears that the possible adverse environmental impact is not well understood and not yet felt at least in the case farms even as the financial benefits of cutting coconut trees is appreciated by farmers. Nevertheless, the community development officers and even some farmers agree that the environmental threat could be real if uncontrolled cutting without replanting and unsustainable farm management practices in the uplands persists. In view of this, a prudent course of action is to enhance public awareness on the social benefits and costs of indiscriminate cutting of coconut trees vis-à-vis sustainable production and agroforestry systems in the upland coconut farms. From the policy point of view, the measures described below may be considered. Innovative ways of ensuring more effective implementation of policy should be a major consideration for PCA.

(1) Environmental clearance from the environment regulatory agency in sloping and critical areas as part of the permit issuance process. This requires effective coordination of PCA with the DENR as well as improvement of data base on coconut areas to reflect slope gradient, soil type and rainfall patterns and intensity for determining erosion threats of cutting.

(2) Concentrating coconut replanting in flatlands and less critical slopes since coconut cover alone in steep slopes may no be able to provide sufficient soil stability during heavy rains. Some scientists and farmers argue that during typhoons and strong winds, the tall coconut trees in the uplands are even more prone to swaying and uprooting and thus could trigger soil erosion.

(3) Planting of denuded coconut plantations in critical areas with appropriate forest species. Similarly, this necessitates coordination with the DENR and technical assistance and financial support to farmers to enable them to undertake investments in forest plantation and agroforestry development.

(4) Capacity-building through farmers' training on ecological awareness and demonstration of appropriate farming systems and other production possibilities that address both economic and environmental concerns. This should form part of a more revitalized extension program to be undertaken by PCA in coordination with the LGUs and farmers' groups.

ACKNOWLEDGEMENT

We wish to acknowledge the financial support provided by the Economy and Environment Program for Southeast Asia (EEPSEA) for our research entitled "Economic and Environmental Concerns in Philippine Upland Coconut Farms: An Analysis of Policy, Farming Systems and Socioeconomic Issues".

REFERENCES

Aragon, C.T. 2008. "Impact of the *Maunlad Na Niyugan Tugon sa Kahirapan* Program in Selected Communities in Batangas, Biliran, Davao City and Davao Oriental, Philippines". J. ISSAAS, Vol. 14, No. 2: 37-48.

Aranas, M. 2006. Agency intensifies crackdown vs. illegal cutting of coconut trees. SunStar Dumaguete.

Esguerra, M. 2006. Five nabbed for illegal cutting of coco trees. Mindanao Times.

Josue, D.S. 1999. Resources Appraisal Valuation and Productivity of the Upland Ecosystem in Bondoc Peninsula, Philippines. Unpublished Ph.D. Dissertation. University of the Philippines Los Baños.

Manalo, D. no date. River power and coconut fiber: the business of bringing light and life to poor coconut farmers in mountainous areas http://www.bidnetwork.org/artefact-15293-en.html#poster

Medina, C.M. 2005. Dynamics and Environmental Impacts of Coconut Logging in Quezon. Unpublished Ph.D. Dissertation. University of the Philippines Los Banos (UPLB), College, Laguna.

Pabuayon, I.M. and C.M. Medina. 2007. Policy Imperatives for Coconut-Based Communities in the Philippines: The Market, Poverty and Environment Nexus. UP Los Banos and UP Center for Integrative and Development Studies. Diliman, Quezon City, Philippines. 54 p.

Pabuayon, I.M., R.D. Cabahug, S.V.A. Castillo and M.D. Mendoza. 2009. Key Actors, Prices and Value Shares in the Philippine Coconut Market Chains: Implications for Poverty Reduction. J. ISSAAS 15(1) 52-62.

Pabuayon, I.M., S.M. Medina, C.M. Medina, E.C. Manohar and Jan Irish P. Villegas. 2008. Economic and Environmental Concerns in Philippine Upland Coconut Farms: An Analysis of Policy, Farming Systems and Socioeconomic Issues. A technical report submitted to the Economy and Environment Program for Southeast Asia. Singapore.