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木材伐出業の木材生産構造に及ぼす影響：  
フィリピン・ミンダナオ島を事例として(生物生産学  
科)

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# The Influence of the logging industries in timber production structure: case study in Mindanao Island, Philippines\*

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**Key words** : Timber production structure of public forest, logging industries, timber license agreement, selective logging system, forest destruction

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## Summary

The study defines how timber production is conducted by the logging industries (TLA holders) and how it affects the timber production structure of the public forest (State forest) of Mindanao island. Licenses, in the form of a timber license agreement, are issued by the Philippine government to the logging industries for the cutting and gathering of timber using the selective logging system, which are mostly concentrated in Mindanao. Logging industries in the region were greater in number, covered a larger area, had a bigger annual allowable cut, higher log production, employed more manpower, and had larger investment. Logging industries contributed too much in promoting the social and economic situation. Nevertheless, logging industries are constrained by socio-economic, environmental, and technical consideration. There is a clear indication that selective logging is not practiced on a sustained yield basis despite the series of policies and legislations, thus resulting in the reduction of forest area and volume of timber reserves causing environmental and ecological disasters. It follows that the logging industries coexisted with producing timber with little regard of the negative effects it created. As a result they have provided positive and negative influences on the production structure of the public forest of Mindanao.

## I . Introduction

Conservation and establishment of tropical forest and measures to ensure its sustainable use are getting world wide attention. This is also particularly true in the Philippines where the forest area at present comprised to only

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about 20% of the total land area of 30 million hectares<sup>4)</sup>. Because of the prevailing importance in the management of this forest, this study is intended to define how timber production is conducted by the logging industries (timber license agreement holders) and how it affects the timber production structure of the public forest (State forest) of Mindanao island, Philippines. It examines the current industry structure; provides a brief account of the current system of production, as well as the governing laws, rules, and regulations; and likewise, looks at the different problems and prospects associated with the process of producing timber.

## II. Logging industry structure

To regulate the cutting and gathering of timber, the government, through the Department of Environment and Natural Resources (DENR), issue licenses to qualified individuals or corporations. There are several types of licenses, but the most commonly issued is the timber license agreement (TLA). TLA is a long term license which has a duration of 25 years, renewable for another 25 years. However, it is also subject to review at least once every 5 years to ascertain compliance with the terms and adjust such terms according to major policy changes<sup>9)</sup>. Other form of licenses include those issued by the government concerning utilization of minor and other forest products within a short period of time. These include pulpwood license, provisional timber license, land grant timber license, and others. The periodic number of TLAs is given in table 1. It can be seen from this table that Mindanao has the most number of TLA holders even from the time the issuances attained its peak in 1977. During this period TLA holders in Mindanao accounted for about 66% of the total TLA holders in the country. Forest area resources of these TLAs accounted for the largest recorded at roughly 53% of the total 8.3 million ha under TLA management, and is about 33% of the 13.0 million ha total forest cover.

Table 1. Number of Timber License Agreement (TLA) by major geographical regions *a/*

Year	Philippines			Luzon			Visayas*			Mindanao		
	TLA	Others	Total	TLA	Others	Total	TLA	Others	Total	TLA	Others	Total
1977	230	146	376	90	64	154	25	9	34	115	73	188
1981	184	66	250	62	25	87	21	1	22	101	40	141
1985	148	17	165	43	8	51	11	—	11	94	9	103
1989	99	14	113	36	1	37	6	—	6	57	13	70
1990	75	21	96	32	3	35	1	—	1	42	18	60
1991	69	12	81	30	1	31	1	—	1	38	11	49
1992b/	40	NA	NA	15	NA	NA	—	—	—	25	NA	NA

NA - Not available.

Visayas\* is the term given to the group of islands in the central part of the Philippines consisting, for instance, of Cebu, Samar, Panay, Masbate, Negros and Bohol islands.

Source : Philippine Forestry Statistics 1977, 1981, 1985, 1989, 1990, 1991 *a/* and Vitug, 1993, in *The Politics of Logging : Power from the Forest b/*

In terms of annual allowable cut (AAC), Mindanao TLAs were awarded the biggest volume equivalent to 10.2 million cu.m which is approximately 65% of the total 15.9 million cu.m<sup>5)</sup>. After 1977, however, TLA holders have rapidly declined, and in 1992 settled to as few as 25 TLAs or about 62% of the total in the country. This decrease in number is equivalent to an average of about 33% annually from 1985. This resulted from changes in policies governing the issuances of timber license during the period<sup>6)</sup>. Timber licenses covering small timber land areas were encouraged to merge. The objective is to support wood processing plants on a sustained

basis. Another reason for the decrease was the implementation of the total log export ban in August, 1986<sup>15)</sup>. Accordingly, with the decrease in number, forest resources of TLAs also decreased. As of 1992, forest resources under TLA management comprised of only 1.6 million ha or about 27% of the total forest area of 6.0 million hectares. Nevertheless, Mindanao TLAs still has bigger forest resources compared to other regions as given in table 2. As of 1992, Mindanao TLAs covered an aggregate area of 1.09 million ha, which is equivalent to about 18% of the total forest area in the country, a reduction of 15% from 1977. Likewise, they were awarded an

Table 2. Estimated total area covered and annual allowable cut along with forest area and growing stock by major geographical regions as of 1992.

Location	No. of TLA	Area covered by TLA (in ha.)	Annual Allowable cut of TLA (in cu.m.)	Total forest area (in ha.)	Growing Stock (in 1,000 cu.m.)
Luzon	15	548,820	177,307	3,311,100	391,994
Visayas	—	—	—	438,700	57,093
Mindanao	25	1,094,387	700,960	2,265,700	223,579
Total	40	1,643,207	878,267	6,015,400	672,666

Source : Vitug, 1993, in *The Politics of Logging : Power from the Forest*

approved AAC of 0.7 million cu.m or 80% of the total granted by the government.

The data presented so far clearly shows that forest in Mindanao has more abundant productive timber resource base compared to other regions. Despite Luzon's larger area and bigger volume of standing timber, there is an indication that logging operations are concentrated in Mindanao. This might be particularly true because according to the DENR as given in table 3 the region supplied the bulk of the log production in the country. Mindanao produced an average of about 68% of the total log production since the early part of the 1970's.

In the particular case of logging, the extent to which this operation develops depends, of course, on the availability of manpower and investment. It is estimated in table 4 that Mindanao employs more manpower in logging operations. For instance, in 1990, logging operations in Mindanao

employed 11,989 workers or about 63% of the total 19,184 employees in the logging industry in the country. Similarly, according to the report of the Philippines Best 1000 Corporations<sup>12)</sup>, logging operations in Mindanao are investing more in its timber production with an average total assets of roughly P590 million or USD (\$) 24 million (P=Phil Peso, 1USD=P25). Furthermore, a report in 1988, for instance, by the National Statistics Office

Table 3. Periodic production of round logs by major geographical region in cubic meter

Year	Total Production (1,000)	Production by geographical region		
		Luzon (1,000)	Visayas (1,000)	Mindanao (1,000)
FY 1973-74	10,190	2,277	862	7,051
1974-75	7,292	1,403	603	5,286
CY 1977	7,873	1,619	586	5,668
1981	5,400	1,483	396	3,521
1985	2,982	941	212	1,829
1989	3,169	947	96	2,126
1990	2,503	839	32	1,632

FY indicates fiscal year (June to May), while CY indicates calendar year (January to December)

Source : Philippine Forestry Statistics, 1974, 1975, 1977, 1981, 1985, 1989, and 1990.

Table 4. Periodic number of employees in the logging industries by major geographical region

Geographical region	Year			
	1981	1985	1989	1990
Luzon	18,324	5,717	7,194	6,995
Visayas	3,910	1,287	1,199	200
Mindanao	23,236	14,937	14,188	11,989
Total	45,470	21,937	22,581	19,184

Source : Philippine Forestry Statistics, 1981, 1985, 1989, and 1990.

estimated that logging industries paid an amount of about P304 million in compensation to logging employees<sup>6)</sup>. Thus, a clear indication that the present logging structure in Mindanao has the full capacity to produce timber at any rate.

### III. Logging system and legislation

As a matter of national interest, it is the governing principle that the administration of the public forest shall be managed under the concept of multiple-use and sustained yield. Therefore, in any logging operation in production forests, selective logging shall be practised<sup>9,13)</sup>. Selective logging system (SLS) was actually developed and conducted in 1954 in the Southern Mindanao Island Province of Basilan<sup>7)</sup>.

In the final analysis, however, the success of selective logging was dependent on the survival, without damage, of the planned residual stands after logging and its subsequent growth. As prescribed in forestry laws<sup>9)</sup>, trees marked or designated for residual growing stock, seeding or protection which are cut, injured or destroyed shall be paid for at least four times the regular rate. Yet, despite these strict pieces of policies and legislations SLS practices are rarely applied<sup>3)</sup>, nor strictly observed<sup>14)</sup>. The extent of damage could already be observed after logging operations though a better view of what has happened could be seen after all the logs at the landings site had been hauled out. The logging set-up has no adequate healthy residual standing trees and is almost incapable of surviving for the next cutting cycle which is one of the primary objectives in the management of the public forest in the country.

### IV. Problems and prospects

The decision on which and what logging approaches should be adopted is necessarily constrained by such factors as socio-economic improvement, environment and ecological context of the situation. It is highly regarded that logging industries has contributed too much for the improvement of the socio-economic condition of the rural population<sup>7)</sup>. They also provide revenues to the government in the form of forest charges levied on logs cut and removed from the forest. Nevertheless, despite all these contributions, logging is blamed for the natural disasters that hit the country in general, which according to Metin and Paje<sup>11)</sup> was a result of the massive exploitation of the forest. Several studies<sup>3,7,8,14)</sup> also revealed that forest destruction by logging left the area practically bared of vegetation, resulted in the reduction of forest area and reduced volume of productive timber reserves. This situation invites erosion and flooding. Baconguis<sup>1)</sup> estimated that there is an aggregate of about 1.3 million ha susceptible to flooding nationwide. An extreme example was the case of a city in Northern Mindanao, where 3 times in the past the city was under water. Another great flood occurred in 1991, which claimed as many as 8,000 lives and damaged millions of property. It was the worst natural disaster to strike the country in years. In the aftermath of this flood, many were quick to blame logging operations for the devastation<sup>2,15)</sup>.

Some studies, as cited by Vitug<sup>15)</sup>, showed that although logging directly accounts for only 20% of

deforestation in developing countries, its overall impact is more insidious. It establishes access, encouraging farmers and ranchers to follow. This linkage by agents of forest destruction is very familiar and particularly true in the Philippines<sup>8)</sup>.

## V. Conclusion

Licenses, in the form of a timber license agreement, are issued by the Philippine government to the logging industries for the cutting and gathering of timber using the selective logging system. Logging industries, which are mostly concentrated in Mindanao, were greater in number, covered a larger area, had a bigger annual allowable cut, higher log production, employed more manpower, and had larger amount of investment. Logging industries contributed too much in promoting the social and economic situation in Mindanao. Yet, logging operations are still constrained by socio-economic, environmental, and technical situations. There is a clear indication that logging is not practiced on a sustained yield basis despite a series of policies and legislations, thus resulting in the reduction of forest area and causing environmental and ecological disasters. It follows that the logging industries coexisted with producing timber with little regard of the negative effects it created. As a result they have provided positive and negative influences on the production structure of the public forest in Mindanao. Hereafter, a sustainable timber production management approach is necessary for the development of the logging industry and the forest resources.

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## 木材伐出業の木材生産構造に及ぼす影響 —フィリピン・ミンダナオ島を事例として—

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### 要 約

この研究はミンダナオ島の公有林（国有林）で木材伐採権協定（長期木材伐採権，TLA）所有の木材伐出業（会社）によって木材生産がどのようにして行われ，木材生産構造にどのような影響を与えているかを明らかにしている。

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