CHAPTER FOUR

THE REFORESTATION VALUE CHAIN FOR THE PHILIPPINES

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ABSTRACT

The Philippines has almost one hundred years of reforestation experience. In spite of this long history, reforestation efforts in the country have not reaped much success. In this paper, we propose that a more holistic and sustainable strategy be adopted for reforestation in the Philippines. We propose that a chain of key activities that add value to the whole reforestation be identified right at the start. This reforestation value chain can then be used as a guide for reforestation projects, from design to implementation to evaluation. Our main thesis is that the success of a reforestation project should take into account each of the components of the value chain right from the very beginning. The reforestation value chain has several implications. First, reforestation efforts that address only part of the chain are likely to be unsustainable. In other words, each component of the value chain should be well thought of from the outset of a reforestation project. Second, policy makers and stakeholders will be better informed on where in the chain they could contribute best.

INTRODUCTION

The Philippines has almost one hundred years of reforestation experience. In spite of this long history, reforestation efforts in the country have not reaped much success (Carandang et al. 2005; Pasicolan et al. 1997). Glowing statistics on paper of vast areas supposedly reforested hardly matches what is on the ground. It is therefore timely to ask, how can we reverse this track record?

The main objective of this paper is to propose a more holistic approach to reforestation and tree planting in the Philippines by adopting the value chain approach first developed for business enterprises by Porter in 1985 and subsequently applied from the firm level all the way to global industry level (Kaplinksky and Morris 2005; Kaplinksy et al. 2003; Elloumi 2004; Sturgeon 2001). For the first time, this paper explores the application of this approach to reforestation. Here, I show how the use of value chain analysis could provide a more long term and holistic perspective to reforestation in the Philippines which will help address the often myopic efforts at present. The term reforestation is used generically to include all tree planting activities including agroforestry, whether for environmental protection and/or economic gain.

DEFORESTATION AND REFORESTATION IN THE PHILIPPINES

Deforestation rate

When the Spanish colonizers first set foot in the Philippines in 1521, 90 percent of the country

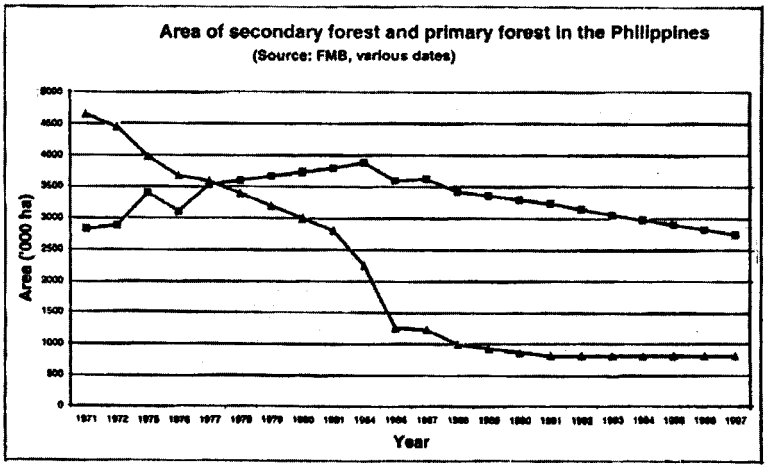
was covered with lush tropical rainforest (ca. 27 million ha out of 30 million total land area). By the year 1900, there were still 70 percent or 21 million ha of forest cover (Garrity et al. 1993; Liu et al. 1993). However, by 1996 there were only 6.1 million ha (20 percent) of forest remaining. Thus, in last century alone, the Philippines lost 14.9 million ha of tropical forests.

Historically, the most important driving forces in the conversion of primary forests to secondary forests were logging activities by big companies (Kummer 1992). The main tenure instrument for commercial logging was the Timber License Agreement (TLA). At the height of the logging activities in the 1970s, there were 471 TLA holders in the Philippines controlling an aggregated area of more than 10 million ha, a staggering one third of the total land area of the country. At that time, a few companies (and families) controlled much of the country's natural resources. Since the mid 1980s the number of TLAs has steadily declined and by 1997 there were only twenty-six TLAs covering an area of 1.31 million ha (FMB 1998).

While logging operations were supposed to be sustainable through the application of the Philippine selective logging system, in many cases commercial logging sets into motion a process that eventually led to deforestation and severe degradation of forest lands (Kummer 1992). That is, logging roads facilitated establishment of communities inside the forest area leading to other activities such as shifting cultivation and further cutting (often illegal). For example, Liu et al. (1993) have shown using GIS analysis the strong correlation between the development of road networks in the Philippines and the formation of highly degraded secondary forests and ultimately to the destruction of these forests resulting to denuded grassland areas. While the area of secondary forests remains more or less the same from 1971 to the present, the area of primary forests declined steeply from more then 4.5 million ha to less than 1 million ha (figure 1). The difference between the two is the area deforested during the same period or roughly 140,000 ha per year of deforestation.

The ultimate driving forces of secondary forest formation (from primary forests) and their eventual destruction (deforestation) are more complex than simply blaming loggers and shifting cultivators. As Kummer (1992) rightly pointed out, deforestation in the Philippines is tied up to the larger issues of corruption, poverty, high population density, and migration to upland areas.

Figure 1: Change in area of primary and secondary forests in the Philippines (Lasco et al. 2001)

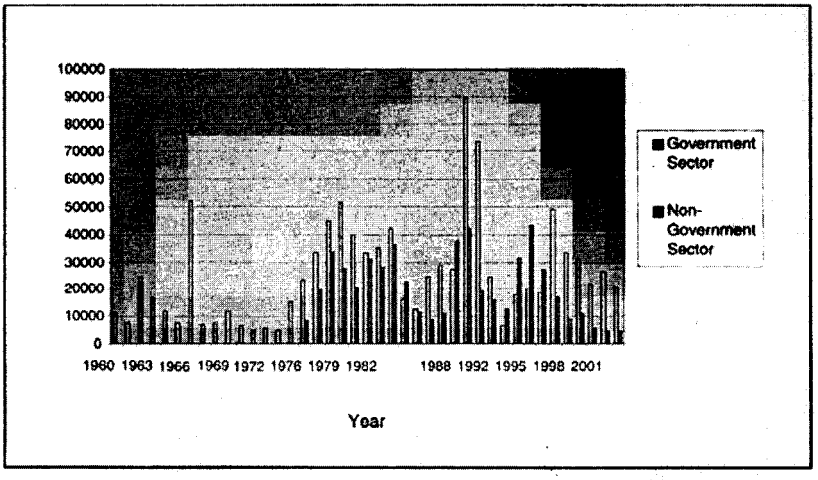


Reforestation efforts

Reforestation work in the Philippine started during the first decade of the twentieth century. A recent review of reforestation in the Philippines showed that reforestation rate significantly lagged behind deforestation rate (Carandang et al. 2004). From 1960 to 2002, the annual average area planted is about 41,000 ha per year (figure 2) which is less than 50 percent of the annual deforestation rate for the same period. More importantly, the actual success rate of the reforestation effort could be less than 30 percent in many cases. Official statistics report the area planted for the year but do not track what portion still exists. This is validated by the fact that available maps do not show where the reforested areas are.

Reforestation is not cheap. Just between 1988 and 1992 the Asian Development Bank (ADB), the World Bank, and the Japanese government lent US$ 731 million for forestry projects in the Philippines (Korten 1995). With such a low rate of success, much of these funds have been wasted. In the future, reforestation of the country's 8.4 million hectares of denuded forests could cost the government some PhP. 361 billion (US$ 6.6 billion).

Figure 2: Annual area planted by the government and non-government sectors in the Philippines from 1960 to 2002 (Carandang et al. 2004)



THE REFORESTATION VALUE CHAIN APPROACH

One of the main reasons for the failure of reforestation projects in the Philippines is the short term planning and implementation of a great majority of projects. Tree planting projects typically last for three years from seedling propagation to planting and maintenance. After the three-year period, most of the trees planted eventually die or are cut. Thus, in the long term, areas reforested revert back to grasslands or brush lands. Many reasons can be cited why trees do no survive after the project is over. One common reason is that the reforested land is often claimed by farmers. After project staff leaves, the farmer cuts the trees and resumes farming activity. In other cases, the open access nature of reforested land coupled with the high demand for fuel wood results to cutting of trees. It is also not unknown for local people to intentionally burn reforested lands because of real or imagined injustices.

Above, reforestation is viewed as a mere tree planting activity without regard to the other factors that are essential to the long term sustainability of tree planting. For example, many tree planting projects do not have a well-thought out plan for what to do after tree establishment (e.g. marketing).

In this paper, I propose that a more holistic and sustainable strategy be adopted for reforestation in the Philippines based on the value chain approach originally conceptualized by Porter (1985) to enhance the competitive advantage of business enterprises. A "value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use" (Kaplinsky and Morris 2005). While value chain analysis has been

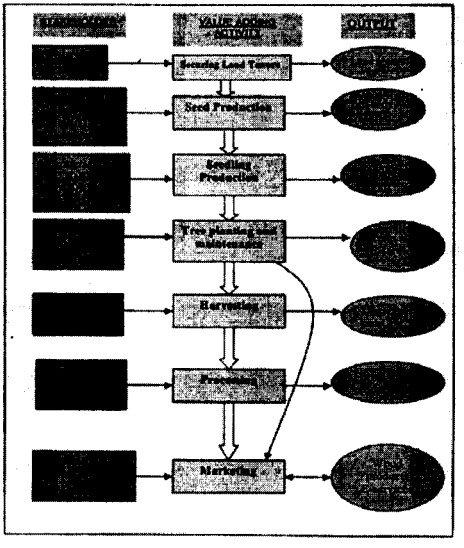
applied in different types of industries and at various scales from firm to nations (Kaplinksy et al. 2003; Elloumi 2004; Sturgeon 2001), it has not been applied to reforestation viewed as an enterprise.

Porter (1985) distinguished between two general types of activities, primary and secondary activities. Primary activities are directly concerned with the creation or delivery of a product or a service (Recklies 2001). On the other hand, support activities facilitate primary activities such as human resources management, infrastructure, and research.

The whole series of activities in a reforestation project can be viewed as a chain similar to any enterprise. The difference being that here the output is not a commercial product or service but environmental rehabilitation and socioeconomic improvement through tree planting. Thus, it is proposed that a chain of key activities that add value to the whole reforestation be identified right at the very beginning of the project. This can then be used as a guide for reforestation projects, from design to implementation to evaluation.

Figure 3 shows the generic reforestation value chain for Philippine reforestation projects. The middle boxes are the key activities that add value to the reforestation process. These correspond to the primary activities under Porter's value chain approach. The left boxes show the key stakeholders who should be involved in each of the value-adding activity (middle boxes). The right boxes show the outputs that emanate to each value adding activity. The key inputs for each of the value-adding activity are shown in table 1.

Figure 3: Generic reforestation value chain for the Philippines



Legend: SCU: State Colleges and Universities; DENR: Department of Environment and Natural Resources; DA: Department of Agriculture; DBP: Development Bank of the Philippines.

Table 1: Inputs for the reforestation value chain

Inputs	Value-adding activity
Mother trees Seed orchards Seed suppliers	Seed production
Quality seeds Nurseries	Seedling production
Quality seedlings	Tree planting and maintenance
Technology	Harvesting
Technology	Processing
Markets marketing system	Marketing

1. Land tenure

Legally, upland areas which are the target of reforestation projects are owned by the government. In reality, there are perhaps up to 20 million people in these areas (Cruz and Zosa-Feranil 1988). In 1995, community-based forest management was adopted as the national strategy for sustainable forestry and social equity. The different programs and projects that were implemented in the last two decades were integrated and unified into one umbrella program, known as the Community-Based Forest Management (CBFM) program. A key component of this program was the granting of land tenure to farmers who participate in the government's tree planting program such as reforestation and agroforestry. The main premise of these programs is that a secure tenure is a prerequisite for meaningful participation of local farmers. To date, close to 6 million ha of forest lands are under some form of community forest management. Of these, about 4.7 million ha have been issued with various forms of land tenure instruments including around 1.57 million ha issued with Community Based Forest Management Agreement (CBFMA) (FMB 2004).

Thus as a first step, the reforestation value chain recognizes the need to ensure that the land tenure arrangement is clear before the start of any reforestation activity. If there is any conflict over land, then chances are the reforestation activity will not succeed. This is borne out of experience. For example, trees planted by government personnel or contractors on land claimed by farmers are eventually destroyed by the latter.

2. Seed production

The aim of this activity is to produce quality seeds. There are a series of activities under this starting from mother tree selection to seed treatments to seed storage. A value chain can in fact be constructed for seed production. In the Philippines, technology for seed production is more commonly available for exotic species than for indigenous species (Tolentino this volume). The establishment of seed production areas is still in its infancy in the Philippines. There is no

nationwide system of seed certification. In many cases, the seeds are simply collected from any seed-bearing trees without regards to phenotypic or genotypic characteristics.

Globally, restricted availability of good quality tree germplasm at the farm, village and municipal level has been identified as a major constraint to the development and scaling-up of improved agroforestry systems in many tropical countries (Cooper and Denning 1999). This is especially true in the Philippines (Gunasena and Roshetko 2000). In view of this, seed production is one of the weak links in the reforestation value chain that needs to be addressed to enhance the chances of success of reforestation in the country.

3. Seedling production

With the rise of government reforestation projects in the Philippines, there is also a corresponding increase in small nursery operations throughout the country. There are no statistics available on the number and distribution of these nurseries. The government primarily the DENR also maintains a network of forest nurseries. The quality of seedlings coming out of private and government nurseries is largely unknown, partly because the seed sources are also of uncertain quality. Low quality planting materials lead to poor survival in the field.

4. Tree planting and maintenance

Reforestation projects in the Philippines use more or less similar methods of site preparation, planting and maintenance. The site is typically prepared for planting by ring clearing or strip clearing which are standard procedures for grassland areas (Weidelt 1975). In the former, grasses are cut in about 0.5 m radius patch. Afterwards, patches are cultivated and all rhizomes removed. Seedlings are planted in the center of these patches. In strip clearing, 1-2 m wide strips are cleared. Patches where seedlings will be planted could be cultivated before planting.

5. Harvesting

For natural forests, the Philippine government prescribes the Philippine selective logging method which includes very specific guidelines for each activity (Bureau of Forestry 1970; Weidelt and Banaag 1982). For community-based tree farms, there are no specific guidelines except that labor intensive methods are preferred. In reforestation projects designed mainly for watershed protection and rehabilitation no harvesting is allowed.

6. Processing

Processing of tree products is typically not included in the plans for reforestation projects. This is especially crucial in agroforestry farms where there could be a number of products from the farm, both wood and non-wood. Processing could really add value to farm outputs. However, in many cases farmers do not have access to even basic processing technology resulting to low prices for their outputs.

7. Marketing

Just like processing, marketing of forest products is typically not included in government reforestation programs. This is understandable considering that most projects last for only three years, much earlier than the time of harvesting which will take place ten or more years after planting. Aside from wood products, new markets have opened up for reforestation activities. For example, under the Clean Development Mechanism (CDM) of the Kyoto Protocol, reforestation projects in the Philippines may qualify (Lasco and Pulhin 2001). The absence of a market strategy in most reforestation projects in the Philippines denies farmers from capturing the true market value of the products and services they provide.

The reforestation value chain in project design

Using the aforementioned key components of the reforestation value chain it becomes clear why many reforestation projects fail in the Philippines. In a great majority of cases, the emphasis is given only on seedling production (but still seedlings are of doubtful quality), on actual planting, and to a lesser degree on maintenance for a couple of years. The rest of the value chain is largely ignored. For example, more emphasis should be given on the long-term maintenance of reforested areas. Key questions include: Who will pay for the cost of maintenance? What are the incentives for local farmers to maintain the trees planted? In addition, marketing should also be given more emphasis. The value of tree products could be enhanced greatly if the farmers can take advantage of the market. In reality, it is not uncommon for farmers to get a low price for their products (from middlemen) when the price of the commodity in urban centers is much higher.

In addition to the primary value adding activities described above, secondary activities that will facilitate them are also important including human resource development (e.g. for DENR, LGUs), institution building (e.g. local community organizing), research and technology development, and infrastructure development. For example, an organization like the World Agroforestry Centre (ICRAF) could assist in technology development as well as in local institution building. In the Philippines, the use of natural vegetative strips was developed by farmers and ICRAF scientists to help reduce soil erosion (Garrity 1995). In local institution building, ICRAF pioneered the use of the Landcare approach in community-based natural resources management (Mercado et al. 2000).

Of course, the reforestation value chain approach does not mean that all the components should be present in all reforestation projects. For example, a carbon sequestration project may not have harvesting and processing components. Each specific project should prepare its own reforestation value chain. In addition, the generic reforestation value chain presented here could be modified in terms of its key components depending on the specific project situation.

REFORESTATION VALUE CHAIN ANALYSIS: EXAMPLES

In this section a couple of hypothetical examples are presented to show how the reforestation value chain can be used in a reforestation project. A typical tree planting project may have the value chain analysis shown in table 2 while a carbon sequestration project may have a value

chain analysis shown in table 3. The main difference between these two examples is that the former project allows for harvesting of trees while the former does not. These examples show how the reforestation value chain can be used to identify the essential stakeholders and their roles in the whole reforestation process from the very beginning rather than as afterthought. Absence of any key stakeholder could mean failure of the reforestation project. In addition, the reforestation value chain analysis could show the key inputs required and their cost.

Through the reforestation value chain, reforestation project managers are forced to plan ahead and anticipate the factors necessary for the success of the project. Moreover, the weaknesses of existing reforestation projects can also be identified. Remedial measures can then be developed to address these weaknesses. For example, if the first case above is already an existing reforestation project, it could be that reforestation value chain analysis will reveal that the markets for products are still uncertain. In such a case, efforts will be made to find markets for the expected tree products.

Table 2: Example of reforestation value chain analysis for a hypothetical reforestation project in the Philippines where harvesting is allowed

Stakeholders	Inputs	Value-adding activity	Cost	Output
Farmers DENR (issue to tenure instrument)		Land tenure		Tenure instrument
Farmers of *sitio* Isidro CENRO-DENR (technical assistance) Green Foundation (community organization) ADB (financing)	Seed orchards of narra	Seed production	PhP. 0.22 per seed	High quality narra seeds
Farmers of *sitio* Isidro CENRO-DENR (technical assistance) Green Foundation (community organization) ADB (financing)	Narra seeds (of superior germplasm)	Seedling production	PhP. 1.42 per seedling	Hardened seedlings for field planting (at least 30 cm tall)
Farmers of *sitio* Isidro CENRO DENR (technical assistance) Green Foundation (community organization) ADB (financing)	Narra seedlings hardened for planting	Tree planting and maintenance	PhP. 5.47 per tree	
Farmers Cutting contractors DENR (permits)	DENR permits	Harvesting	To be determined	Forest products income for farmers
Furniture company (processing) DBP (financing)	Harvested wood	Processing	To be determined	Furniture
Furniture company (marketing) DBP (financing)	Furniture	Marketing	To be determined	Income for furniture company

Table 3: Example of reforestation value chain analysis for a hypothetical reforestation project in the Philippines where environmental services (carbon) is the main product (harvesting is not allowed)

Stakeholders	Inputs	Value-Adding Activity	Cost	Output
Farmers DENR (issue tenure instrument)		Land tenure		Tenure instrument
Farmers of *sitio* Isidro CENRO-DENR (technical assistance) Green Foundation (community organization) World Bank (financing)	Seed orchards of indigenous species	Seed production	PhP. 0.22 per seed	High quality seeds
Farmers of *sitio* Isidro CENRO-DENR (technical assistance) Green Foundation (community organization) World Bank (financing)	Genetically superior seeds	Seedling production	PhP. 1.42 per seedling	Hardened seedlings for field planting (at least 30 cm tall)
Farmers of *sitio* Isidro CENRO-DENR (technical assistance) Green Foundation (community organization) WB (financing)	Hardened seedlings	Tree planting and maintenance	per tree PhP. 5.47	
Farmers ICRAF (carbon stocks measurement)	Carbon assessment methods	Carbon measurement and monitoring	To be determined	Amount of carbon sequestered
Farmers DBP (CDM financial intermediary) Japan Fund (carbon buyer)	Emissions Reductions Purchase Agreement (ERPA)	Marketing	To be determined	Carbon credits Income for farmers

CONCLUSIONS

With millions of hectares of degraded uplands, reforestation will continue to be a critical part in the Philippines environmental agenda. However, current efforts are beset by short-sighted planning and implementation. The reforestation value chain provides an analytical and planning tool that could help reforestation projects be more holistic and sustainable.

The use of the reforestation value chain has several practical implications. First, reforestation efforts that address only part of the chain are likely to be unsustainable. In other words, each component of the value chain should be well thought of from the outset of a reforestation project. Second, policy makers and stakeholders will be better informed on where in the chain they could contribute best. For example, external fund sources (e.g. ADB, World Bank, USAID) may be in a better position to assist in the early phases on the chain

since they have more resources. Local financial institutions, such as the DBP may be more effective in assisting in the marketing and processing activities. The reforestation value chain must be tested in an actual reforestation project and the results documented. The specific components could be refined depending on the objectives and resources of a reforestation project.

REFERENCES

Bureau of Forestry. 1970. *Handbook of selective logging*. Bureau of Forestry, Manila.

Carandang, A.P., J.M. Pulhin, R.T. Acosta, U. Chokalinggam, R.D. Lasco, R.A. Razal, M.Q. Natividad and R.J.J. Peras. 2004. *Forest rehabilitation initiatives in the Philippines: lessons learned*. Final report submitted to CIFOR. College.

Cooper, P. and G. Denning. 1999. *Scaling up the impact of agroforestry research*. International Centre for Research in Agroforestry, Nairobi.

Cruz, M.C. and I. Zosa-Feranil. 1988. *Policy implications of population pressure in the Philippines*. Paper prepared for the World Bank study on forestry, fisheries and agricultural resource management. University of the Philippines, Los Baños.

Elloumi, F. 2004. Value-chain analysis: a strategic approach to online learning. In *Theory and practice of online learning* edited by T. Anderson and F. Elloumi. Athabasca University. p. 61-92.

Forest Management Bureau (FMB). 1998. *Forestry Statistics (1997)*. Quezon City.

Garrity, D.P. 1996. *Conservation tillage: Southeast Asian perspective*. Paper presentation at conservation tillage workshop, Los Baños. 11-12 November 1996.

_____, D.M. Kummer and E.S. Guiang. 1993. *The upland ecosystem in the Philippines: alternatives for sustainable farming and forestry*. National Academy Press, Washington DC.

Gunasena, H. P. M. and J. M. Roshetko. 2000. *Tree domestication in Southeast Asia: results of a regional study on institutional capacity*. ICRAF, Bogor.

Kaplinsky, R. and M. Morris. 2005. *A handbook for value chain research*. The SEEP network. Washington DC. www.seepnetwork.org. Downloaded on 24 June 2005.

_____, O. Memedovic, M. Morris and J. Readman. 2003. *The global wood furniture value chain: what prospects for upgrading by developing countries. The case of South Africa*. United Nations Industrial Development Corporation, Vienna.

Korten, F. 1995. Environmental lending may be harmful to the environment. *PCDF Forum* Article No. 14. 10 July 1995.

Kummer, D.M. 1992. *Deforestation in the postwar Philippines*. Ateneo de Manila University Press.

Lasco, R.D. and F.B. Pulhin. 2001. Forestry mitigation options in the Philippines: application of the COMAP model. *Mitigation and Adaptation Strategies to Global Change* 6: p. 313-334.

_____, R.G. Visco, and J.M. Pulhin. 2001. Secondary forests in the Philippines: formation and transformation in the 20th century. *Journal of Tropical Forest Science*. 13: p. 652-670.

Liu, D.S., L.R. Iverson and S. Brown. 1993, Rates and patterns of deforestation in the Philippines: application of Geographic Information System analysis. *Forest Ecology and Management* 57. p. 1-16.

Mercado, A. Jr., D.P. Garrity and M. Patindol. 2000. *The Landcare experience in the Philippines: technical and institutional innovations for conservation farming*. Paper presented to the Landcare international conference held at Melbourne convention centre, Melbourne on 2-4 March 2000.

Pasicolan, P.N., H.A. Udo de Haes, and P. Saijse. 1997. Farm forestry: an alternative to government-driven reforestation in the Philippines. *Forestry Ecology and Management* 99: p. 261-274.

Porter, M. 1985. *Competitive advantage: creating and sustaining superior performance*. Free Press. New York.

Ricklies, D. 2005. *The value chain*. www.themanager.org. Downloaded on 24 June 2005.

Sturgeon, T.J. 2001. How do we define value chains and production networks. *IDS Bulletin* 23 (3). p. 1-10.

Weidelt, H.J. (compiler). 1975. *Manual of reforestation and erosion control for the Philippines*. Eschbon.

_____, and V.S. Banaag. 1982. *Aspects and management and silviculture of Philippine dipterocarp forests*. German Agency for Technical Cooperation, Eschbon.