Strengthening the Value Chain for Indigenous and Community Forestry Operations Through Increased Investment and Use of Technical Assistance

Rebecca Butterfield, Rolando Fortin, Trinidad Hernandez, and Manuel Manzanero

Rainforest Alliance

Cover photos: In our work with three diverse Latin American community enterprises, the Rainforest Alliance's TREES program has had remarkable success increasing employment opportunities for women, stimulating investments in community forestry operations and enhancing community incomes.

Learn more at: www.rainforest-alliance.org/resources.cfm?id=research_analyses

Strengthening the Value Chain for Indigenous and Community Forestry Operations Through Increased Investment and Use of Technical Assistance

By Rebecca Butterfield, Rolando Fortin, Trinidad Hernandez, and Manuel Manzanero

E-mail and mailing addresses of the main author: rbutterfield@ra.org,
118 Varnum St. NW, Washington, D.C. USA 20011.
Keywords: SME, economic viability, investment, FSC certification

ABSTRACT:
The paper builds the case for increased investments in community and indigenous small- and medium-sized forestry enterprises and provision of technical assistance for value-added processing. Experiences and data from Rainforest Alliance's TREES program are used to highlight changes in three community enterprises, from a medium-large indigenous enterprise in Mexico producing pine lumber to a dozen smaller tropical community concessions in the Maya Biosphere Reserve in Guatemala, to fledging cooperatives in the Rio Plátano Biosphere Reserve in Honduras. Remarkable success in increasing employment opportunities for women, augmenting community incomes, and stimulating investments in community forestry operations is documented. Areas highlighted include:

- Improved competitiveness for community operations through improvements in primary processing that lower production costs while increasing product quality;
- Expansion of product mixes to include non-timber forest products to boast revenues and employment, especially for women;
- Development of secondary-level, community-owned businesses to aggregate supply, provide value-added processing, and attract buyers; and
- Facilitation of strategic alliances for product marketing and development of new value added products.

In Mexico, with an investment of $1.1 million over three years, the operation increased sawmilling efficiencies and lowered production costs by 43% without sacrificing jobs. A greater focus on secondary processing and investment in their business led to a change in annual profits from minus $561,646 to plus $1.7 million.

In Guatemala FSC certified community concessions increased their revenues by 209% to $5.8 million. Improved saw milling efficiencies and higher grades of mahogany along with FSC certified mahogany price increases drove the increase in revenues as did the addition of a FSC certified non-timber product. Employment increased for women though value added processing for non-timber products. Investments by communities themselves have been modest but donor investments in training and technical assistance have probably exceeded $10 million.

In Honduras, cooperatives banded together to provide semi-processed mahogany for export to certified markets, changing their production chain and adopting sustainable forest management practices. With only a 19% increase in volume harvested revenues have increased by 128% to $579,375. Actual production costs rose 40% from 2006 to 2008, due to increased costs of forest management and taxes, as well as the extra care needed to produce quality mahogany grades. The cooperatives have invested over $113,000 in simple machinery.

By presenting successes in SME strengthening, we hope to motivate community forestry operations to increase investments and use technical assistance to become more competitive. These factors

will lead to increased incomes, more sustainable business models and, where secondary processing is developed, more employment for women.

INTRODUCTION

As more forest land is devolved to communities for management and protection, it becomes increasingly imperative that we learn how to provide support to community forest operations to support them to become environmentally sustainable and economically viable. Forest Trends (Molnar et al 2004) estimates that 22% of developing countries forests are owned or administered by communities. This trend is likely to increase as indigenous groups successfully assert their rights to traditional territories and central governments devolve rights to municipal and community levels.

The work of the Rainforest Alliance in the forestry sector provides an environmentally sustainable platform from which to facilitate economic development and increased investments in community-based forestry and small and medium enterprises (SMEs). In 2001, the TRaining, Extension, Enterprises and Sourcing (TREES) program was created to provide additional support to these producers and to help them gain greater benefits from forest certification. TREES discovered that many FSC certified community and indigenous forestry operations suffered from out-dated or defunct processing equipment and a lack of investment in their processing plants and were not competitive in regional or international markets.

Through pilot projects in Mexico (Durango, then Oaxaca), Guatemala, and Honduras TREES provided technical assistance to certified community operations to help them improve competitiveness, increase production of value added products, and improve their participation within the FSC supply chain. In Honduras, TREES began working with agroforestry cooperatives who were harvesting wood without permits or management plans to help them move towards sustainable forest management and eventual FSC certification. The technical assistance was indispensable in helping communities attract funds and resources from national government programs to improve their businesses and to convince the community operations to invest their own funds to update their processing abilities. From 2004 to 2007 TREES helped communities sell $9.7 million in new certified forestry products and facilitated over $8.2 million in investments in the community operations. Based on these experiences we have put together a technical toolkit which includes modules on business plans, marketing plans, indicators for sustainability, costing and pricing tools, and efficiencies in value-added processing.

Government agencies (Pronacom in Guatemala, CONAFOR in Mexico, FIDE in Honduras), multi-lateral agencies (World Bank, IFC) and other donors are increasingly focused on improving competitiveness of SMEs, expanding access to financial services and increasing incomes, especially among poor and indigenous communities. Increased investment in SMEs is a necessary prerequisite for creating more competitive SMEs, and if investments in SMEs in the forestry sector are to be increased, there needs to be better information on what the potential returns of that investment could be and examples of models that have been successful. Lenders and borrowers alike need to be convinced that increased lending will lead to outcomes such as increased income, improved employment opportunities and protection of the environment. By carefully documenting and quantifying the experiences of Rainforest Alliance's TREES program in Mexico, Guatemala, and Honduras we feel that we can reach and motivate a much larger number of community and indigenous forestry operations to seek increased investment in their forest product businesses.

With support from the multi-donor Program on Forests (PROFOR) of the World Bank, Rainforest Alliance has developed three cases studies which provide clear examples for organizing and analyzing data (pre- and post-investment) to illustrate community decision making and changes while providing motivation and ideas for strengthening supply chains and business management practices.

The paper builds the case for increased investments in community and indigenous small- and medium-sized forestry enterprises (SMEs), and provision of technical assistance for value-added processing. Experiences and data from Rainforest Alliance's TREES program are used to highlight changes in three different community enterprises, from a medium-large indigenous enterprise in Northern Mexico producing pine lumber to a dozen smaller tropical community concessions in the Maya Biosphere Reserve in Guatemala, to fledging cooperatives in the Rio Plátano Biosphere Reserve in Honduras. Remarkable success in increasing employment opportunities for women, augmenting community incomes, and stimulating investments in community forestry operations is documented. Areas highlighted include:

- Improved competitiveness for community forest operations through improvements in primary processing that lower production costs while increasing product quality;
- Expansion of product mixes to include non-timber forest products to boast revenues and employment, especially for women;
- Development of secondary-level, community-owned businesses to aggregate supply, provide value-added processing, and attract buyers: and
- Facilitation of strategic alliances for product marketing and development of new value added products.

MATERIALS AND METHODS

TREES has worked with over 30 community forestry operations in Latin America. We wished to select three of them for the in-depth research which would reflect various levels of business development for a community forestry operation, thus we chose one each from Mexico, Guatemala and Honduras. Communities in northern and central Mexico have generally been managing their forest resources since the 1970s, providing the oldest and perhaps most sophisticated organization structure. They also have pine as their primary commercial species, with large volumes harvested per hectare (in comparison with the much smaller volumes extracted from tropical operations). In the Petén region of Guatemala, communities have been managing their forest resources since the 1990s with large amounts of donor support. While forestry operations are not fledgling, they are still under development. Their main commercial species is mahogany with some use of other lesser known species. The Rio Plátano Region of Honduras provides an example of incipient forestry enterprises, where communities are just learning about forest management. Their only product at the moment is pit sawed mahogany.

In Mexico, we selected one community for analysis: **San Bernardino de Milpillas, Durango, Mexico.** With a total area of 159,925 ha, they manage 123,142 ha of mixed pine-oak forests. The indigenous community of San Bernardino de Milpillas contains the largest forest resource of the three studies. Their annual commercial harvest averages 40,000 m3 of pine. They began direct management of their forest resources in 1969 when they had 639 community members. In 1972, a local processor, Forestal Alfa SA de CV, transferred a sawmill to the community to be paid for through lumber sales to the company. Through a combination of federal subsidies and their own financing the community purchased extraction equipment and additional sawmills. In 2004 they achieved FSC certification. By 2006, they had 1,151 community members and four sawmills. Rainforest Alliance provided technical assistance to them from 2006 through 2008, thus the data presented here covers three years.

In Guatemala and Honduras, we selected two umbrella organizations and their member communities for the analysis. **FORESCOM, Petén, Guatemala**: The Maya Biosphere Reserve in Northeastern Guatemala was formed in 1990 with 11 community forest concessions and two industrial concessions in the multiple use zone. As a requirement of the concession, all became FSC certified between 1994 and 2001 (Hughell and Butterfield 2008, Nittler and Tschinkel 2005). Initially to reduce certification costs and fees an umbrella organization, FORESCOM, was formed with support from USAID in 2003. However, besides serving the function of group certification manager, FORESCOM has also taken on additional roles such as: 1) aggregate supplies of lesser known species for value added processing, 2) market lesser known species, and 3) provide extraction equipment for member communities. Most of the members of FORESCOM market their own mahogany, usually as green lumber. Exceptions are CUSTOSEL and Laborantes del Bosque, who have their own furniture factory and sell to the national market. Rainforest Alliance has provided technical assistance to the FSC certified concessions and FORESCOM since 2001.

Union of Agroforestry Cooperatives of the Rio Plátano Biosphere Reserve, Honduras (UNICAF-BRP) and its 12 cooperatives are the focus of the Honduras case study. UNICAF-BRP has only existed for two years and has 555 associate members from the 12 cooperatives. Initially it was established to function as the manager for FSC group certification. However during its formation additional objectives were added to its mandate, namely: 1) serve as the FSC group certification manager; 2) provide advocacy on behalf of the membership to state and federal entities related to forestry laws, regulations, policies and resolutions; 3) promote responsible community forest management to neighboring communities within the Rio Plátano Biosphere Reserve;

4) promote and implement economic projects and activities within the Biosphere Reserve; and 5) support timber and non-timber product processing and marketing for their members. The 12 cooperative members were formed from 1992 to 2006 with the objective to manage forest resources. By June 2005, 11 cooperatives had forest management plans with an emphasis on mahogany and Spanish cedar extraction, cut into blanks for local intermediaries. In 2008 the annual allowable cut for the 12 cooperatives combined was 37,175 m3 of which 4,032 m3 was mahogany. However, the Honduran government will only grant permits for 200m3 per year per cooperative. RA provided technical assistance to UNICAF-BRP and its members from 2006 to 2008, thus data covers three years.

Variables to be measured were kept as constant as possible with some variation depending on the case studies. Using project and community records we were able to compile data for five categories as outlined below and in Table 1.

1) Forest harvest indicators (what percentage of annual allowable cut was actually harvested, and in the case of tropical operations, percentages broken down by species);

2) Wood processing indicators, such as sawmilling yields, board foot per cubed meter (bf/m3), percentage of wood produced in different grade classes, and daily production (bf/person day);

3) Business capacity, as measured by number of workers, number of work days generated, specialized positions, timely deliveries and investments; and

4) Sales data, such as percent of sales to FSC buyers, average income per board foot and product mix.

5) Technical assistance, write ups on type of assistance and role in achieving results.

Table 1: Generic variables for data collection in the case studies.

No.	Theme	No.	Sub-theme
1	Forest Harvest Indicators	1	Percent of annual allowable cut achieved (% AAC)
2	Production Indicators	1	Primary sawmilling yield (bf/m³),
		2	Sawmill productivity (bf/person/day) (except Guatemala)
		3	Production quality (% of production in different grade classes)
		4	Transportation costs ($/bf) (Except Mexico)
		5	Transportation efficiencies ($/bf) (Except Mexico)
		6	Sales revenue ($US)
3	Business Management Indicators	1	Employment (# of work days)
		2	Specialized positions (# of positions)
		3	Transparency (Except Mexico)
		4	Timely delivery
		5	Investments and source of financing
		6	Business relations
4	Sales	1	Average production costs ($/bf)
		2	Average sales ($/bf)
		3	Product mix (Except Honduras)
		4	Sales to FSC certified buyers (as % of total sales)
5	Technical Assistance	1	Types of technical assistance
		2	Role of technical assistance

More detailed is contained in the individual case studies. This paper summarizes larger impact effects emphasizing: 1) changes in income (and how it was achieved); 2) levels and types of investment; and 3) the role of technical assistance in bringing investments to their full potential.

RESULTS AND DISCUSSION

Mexico

San Bernardino de Milpillas in 2005 had a net negative income of -US$561,646. The loss was masked by advanced payment for timber provided by local companies which allowed the community to start each year's harvest. By 2008, Milpillas achieved a startling turnaround with a net profit of US$1,785,025. The change is due to many small adjustments and investments coupled with technical assistance to improve business operations and build skilled personnel. The largest changes are listed in Table 2 below.

Table 2: Major changes at San Bernardino Milpillas, Durango, Mexico (2005-2008)

CHANGE	BEFORE & AFTER DATA	INVESTMENT AND TECHNICAL ASSISTANCE (TA)
15% gain in percentage of annual allowable cut achieved	from 65% of AAC to 80% of AAC	TA for personnel to lower stumps, improve field volume measurements, increase field controls on commercial trees
60% increase in production efficiencies	from 187 bf/person/day to 310 bf/person/day	Investment in light mechanization, including debarkers and carriages to load logs. TA to reduce workforce by 13 workers (sent to another area of production), specialize more positions within the mill, kept and posted daily production figures, kept saws sharpened and maintained for fewer idle saw hours.
43% decrease in production costs	From US$0.69/bf to US$0.40/bf	Linked to increased production efficiencies as well as to reduced costs in extraction.
Increased product quality (5% increase in top quality lumber and 9% decrease in worst quality timber and 6% decrease in shorts)	#2 and better pine lumber changed from 10% of total production to 15% of total production. #5 pine lumber changed from 41% of total production to 32% Shorts changed from 11% of total production to only 5%	TA in improved skills for mill workers and more specialized positions within the mill
19% increase in average sales price (overall price changes over this period account for 8%)	From US$0.59/bf to US$0.70/bf	Linked to improved quality above. More high quality products were produced and sold (higher grades of lumber, plus increased saw milling efficiencies reduced wood sold as logs and 10% more logs were processed).
No net loss of jobs 22% increase in specialized positions 92% increase in jobs for women	From a total of 360 to 375 jobs From 7 positions to 38 From 13 to 25 women employed	TA for training and identifying more specialized and responsible posts from field extraction coordinators to wood classifiers to sawmill foremen. Workers laid off from primary processing moved to other posts such as pallet construction or resawing of shorts.

From 2006 through 2008, Milpillas made US$1,131,839 in investments with 46% of the funds coming from the community operation and the remainder from federal and state programs. It is important to emphasize that investments were part of a longer-term business plan to add more value to wood products and diversify products and markets. The investments made in 2008 for value adding processing are not yet reflected in the income figures presented above. Table 3 presents a list of investments.

Table 3: Investments made by San Bernardino Milpillas, Durango, Mexico 2006-2008.

2006	2007	2008
Wood classification table	Fork lift	Automatic double chisel
Light sawmill mechanization	Wood dryer	New electrical system and substation
Routers	Debarker	Foot router
	New sawmill	Chainsaws
	Work truck	Filing machine
	2 sided sander, calibrator, multi saw	Moulder
	Industrial structure	Finger joint machine

Guatemala

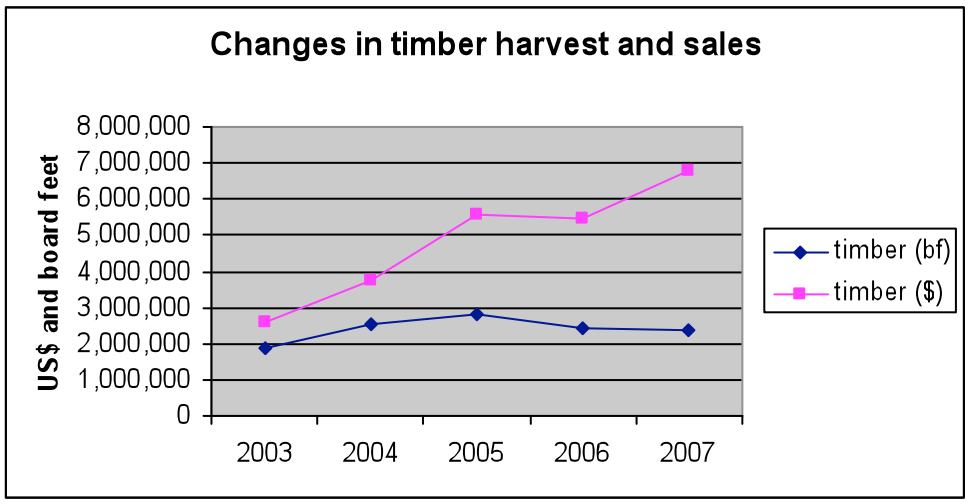
In the forestry concessions of the Maya Biosphere Reserve, total revenues increased 209% from 2003 to 2008 (from US$2,8 million to $5.8 million). While timber harvest levels remained relatively flat, increases in prices for mahogany and improved production yields and quality lead to significant price increases along with a robust demand for FSC certified mahogany. At the same time, communities started to sell FSC certified xate (*Chamaedorea oblongata)*, a non timber forest palm leaf, eliminating middlemen and packers to export the leaves themselves. The addition of this new certified good into the product mix, has contributed to both revenue and growth in employment, especially for women. The largest changes are listed in Table 4 below.

Table 4: Major changes for Forest Concessions in Maya Biosphere Reserve, Petén, Guatemala (2003-2008)

CHANGE	**BEFORE & AFTER DATA**	**INVESTMENT AND TECHNICAL ASSISTANCE (TA)**
127% increase in community revenue from timber sales	From US$2,036,702 in 2003 to $4,629,675 in 2007	In comparison industry revenue from the 2 industrial concessions grew 236% in the same time period (from US$759,037 to $2,554,563). FORESCOM's total revenue in 2008 was just $173,462
3% increase in sawmill efficiencies for mahogany	From 225 bf/m3 in 2005 to 238 bf/m3 in 2008.	TA in sawmilling, saw filing, sawmill adjustments and maintenance, record keeping. Investments in appropriate sawing equipment.
9% increase percentage of production in highest wood class	From 45% in 2003 to 54% in 2007 of total production in FAS and Select class.	Same as above. Plus facilitated access to buyers paying a large premium for FAS and Select class, requires operations to classify wood and not sell as mill run.
62% increase in prices for FSC certified mahogany	From US$1.96/bf in 2003 to $3.18 bf in 2007. During same time frame prices for secondary species rose 287% from $0.67/bf to $1.92/bf.	Demand for FSC certified mahogany is larger than supply. Demand for FSC certified tropical hardwoods is also larger than supply leading to price increase for other species and a willingness of brokers to try new tropical hardwoods.
	Data sets not complete enough to determine changes	The addition of certified xate as a supplemental product has increased total work days and especially for women who are the primary sorters and packers of the leaves which is done in each community. TA in xate management, collection, sorting and packing. Investments in sorting sheds and refrigerated storage.

Revenue growth was due to changes in prices for FSC certified wood, improved product quality, and better sawmilling yields with insignificant changes in harvested volumes (Figure 1).

Figure 1: Changes in timber harvest volumes and sales income by forest concessions in the Maya Biosphere Reserve, Petén, Guatemala (2003-2007)



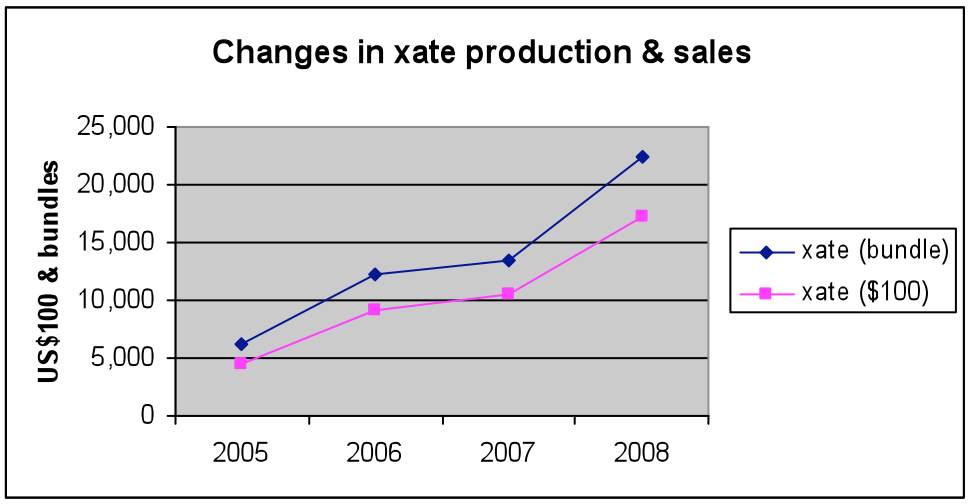
Community dependence on mahogany as their primary species remained unchanged or slightly more dependent despite the creation of FORESCOM to help market lesser known species. In 2003 both communities and industries derived 90% and 94%, respectively, of their revenues from mahogany and Spanish cedar sales[1]. In 2007, industry reduced their dependence on these two species to 87% of revenue while communities increased it to 98% of revenues. Despite the rise in prices for lesser known species, there is still a 60% price difference between them and mahogany. Many of the lesser known species have higher costs of production due to denser wood (more costly to fell, transport and process) so they continue to be a lower priority for the forestry operations.

However, some communities have increased revenue from xate sales and this continues to grow. Data from the five communities[2] most involved in the xate trade show a 60% increase from 2005 to 2008 in timber revenue and a 213% increase in xate revenue. This changes the percentage of income derived from timber and non-timber products. In 2005, 73% of total revenue from the four communities was from timber, while in 2008 that declined to 52% of total revenue. Figure 2 shows the growth in xate production and sales.

[1] Although up to 67 species are extracted from the forest concessions, by far the dominant species is mahogany (*Sweitenia macrophylla)*, comprising 49% of total wood extracted from 2002 to 2008. The next most harvested species are Santa Maria (16% of total volume-*Calophyllum brasiliensis*), Manchiche (13%- *Lonchocarpus castilloi*), Pucte (6% -*Bucida buceras*) and Spanish Cedar (6%- *Cedrela odorata*).

[2] AFISAP, Uaxactun, Carmelita, La Pasadita, and El Esfuerzo.

Figure 2: Changes in xate production and sales for five communities in the Maya Biosphere Reserve, Petén, Guatemala (2005-2008).



Data from five communities in the Maya Biosphere Reserve show a total investment of US$1,048,785 from 2003-2008. This averages to $34,959 per year per community. Investments include infrastructure, extraction equipment, processing equipment and vehicles. Investments by donors over the last 14 years have exceeded millions of dollars with USAID Guatemala alone contributing US$8.9 million from 1996 to 2003 (Nittler and Tschinkel 2005) and have supported equipment and infrastructure but the largest share has gone to technical assistance and training. Table 5 summarizes the series of technical assistance providers and the types of assistance given.

Table 5: Technical assistance support to forest concession in Maya Biosphere Reserve, Petén, Guatemala (1994-2008)

NGOs	Forest Concessions	Year	Type of Technical Assistance
Pro-Petén/CI	Carmelita	1995-2002	Development and implementation of integrated forest management plan, environmental impact studies. Administrative manuals, community organizational strengthening, environmental education, socio-economic and financial studies.
CATIE/OLAFO y Centro Maya	San Miguel	1994-1998	
Naturaleza para la Vida	Suchitecos	1996-2000	
	Laborantes del Bosque		
	El Esfuerzo		
	CUSTOSEL		
	UAXACTÚN		
NPV y ACODES	Árbol Verde	1998 - 2000	
Centro Maya	La Colorada		
	Cruce a la Colorada	1998-2000	
Rainforest Alliance SmartWood Program	All	1996-2008	Training in FSC certification, FSC assessments and audits
Biofor Project	FORESCOM & members	2001-2004	Establishment of FORESCOM, sawmilling efficiencies, improved saw mills, extraction equipment
Rainforest Alliance TREES Program	FORESCOM & members, FSC certified concessions	2001-2009	Facilitate links to FSC markets and buyers, capacity building for FORESCOM, new product development, xate management, buyers and organization of xate suppliers.

Honduras

From 2005 to 2008 the six cooperatives exporting mahogany through UNICAF-BRP increased their income by 128% from US$254,295 to US$579,375. Part of the increase is due to a 19% increase in volume harvested (from 1,021 m3 to 1,214 m3) and the rest is due to changes in product quality, increased prices and demand for mahogany. Actual production costs rose 40% from 2006 to 2008, mostly due to increased costs of forest management and forest taxes, as well as the extra care needed in sawing for high quality mahogany grades. The largest changes are listed in Table 6 below.

Table 6: Major changes at UNICAF-BRP, Rio Plátano, Honduras (2005-2008)

CHANGE	BEFORE & AFTER DATA	INVESTMENT AND TECHNICAL ASSISTANCE (TA)
19% increase in harvest volumes	From 18% of AAC (1,021 m3) to 30% of AAC (1,214 m3). AAC was lower in 2008.	TA and investments in forest management plans and permits.
12% increase in sawing yields	From 170bf/m3 to 190bf/m3	TA in saw milling to maintain quality and musical instrument standards
30% reduction in rejected products	From 40% rejected to 10% rejected	Training local members in quality checks and providing feedbacks to sawyers, located local market for the rejects.
Improved product quality 34% decrease in lowest quality wood (increase in medium quality)	From 83% of total production in lowest quality category in 2005 to 49% in 2008 (price is 100% higher).	Investment in simple equipment and training for felling, pit sawing and product finishing.
34% price increase in highest grades for export 16% increase in medium grades for national markets	From US$4.03/bf to $5.41bf From US$2.10/bf to $2.43bf	TA by broker to saw blanks to musical instrument specifications. TA by RA to engage buyers of highest quality wood. Market demand is high for certified and legal mahogany. TA to locate national buyers.
193% increase (volume) in sales to national markets 223% increase (in value) in sales to national markets	From 4,074 bf in 2005 to 82,503 bf in 2008 From $8,588 in 2005 to $200,245 in 2008.	TA to locate national buyers to purchase medium quality wood not exported. Includes furniture makers and others who transform wood into products for national and international markets, several are becoming FSC certified.
14% increase in employment 44% increase in specialized jobs More employment for women	From 1,975 work days in 2006 to 2,261 work days in 2008 From 36 to 52 positions From zero positions for women to 35 positions in machining and packing	TA for training and identifying more specialized and responsible posts from forest technicians to product packers.

UNICAF-BRP and its member cooperatives have made US$113,000 in investments of which 90% were their own funds. This has mostly been invested in harvesting equipment (chainsaws), transportation (pick-up truck, mules and motor boat) and simple table saws. Technical assistance, which has been provided by donors, is more than double this investment. A market demanding FSC certified mahogany has provided adequate incentives to convince cooperatives to invest in

forest management activities and increase their capacity to produce for a highly selective international market.

CONCLUSIONS

In Mexico, with an investment of $1.1 million over three years the operation increased sawmilling efficiencies and lowered production costs by 43% without sacrificing jobs. A greater focus on secondary processing and investment in their business led to a change in annual profits from minus $561,646 to plus $1.7 million.

In Guatemala, over a five year period, FSC certified community concessions increased their revenues by 209% to $5.8 million. Improved saw milling efficiencies and higher grades of mahogany along with increases in prices for FSC certified mahogany drove the increase in revenues as well as the addition of a FSC certified non-timber product (xate) to the product mix. Employment increased for women. Investments by communities themselves have been modest (about $35,000 per year each) but donor investments in training and technical assistance over the last 14 years have probably exceeded $10 million.

In Honduras, cooperatives banded together to provide semi-processed mahogany for export to certified markets, completely changing their production chain and adopting sustainable forest management practices. With only a 19% increase in volume harvested (from 1,021 m3 to 1,214 m3) revenues have increased by 128% to $579,375. Actual production costs rose 40% from 2006 to 2008, mostly due to increased costs of forest management and forest taxes, as well as the extra care needed in sawing for high quality mahogany grades. The cooperatives have invested over $113,000 in simple machinery. Donor provided technical assistance has been double that amount.

Overall, we can see the accumulative effect of investing in many small improvements from more care and planning in forest extraction to light mechanization in saw mills and training of specialized personnel to classifying lumber which add up to significant changes in revenues and employment opportunities. The strategy of diversifying species use in Guatemala did not work in timber production as costs were too high compared to prices but diversifying to a non-timber product has had enormous impacts in both revenue and employment. In general, as more value is added, either to timber or non-timber products, more employment opportunities are generated for women.

Additionally, we have tried to emphasize that investments in machinery alone will not succeed. Training and technical assistance combined with appropriate investments are a key combination that helps community enterprises reach their full potential. Too often, when communities do invest in their business, they favor the hardware (machinery) over the software (human capacity building) when both are needed to succeed.

By presenting successes in SME strengthening, we hope to motivate and inspire community forestry operations to increase their investments and use technical assistance in order to become more competitive. In turn, these factors will lead to increased incomes, a more sustainable business model and, where secondary processing is developed, more employment opportunities for women.

ACKNOWLEDGEMENTS

Many thanks are extended to the communities participating in this research and their willingness to publicly share their production and financial data. More importantly, they serve as inspiration to other community forestry operations to embrace change and invest in their businesses, creating more employment and income while conserving forests for us all. Financial support for the case study analysis was provided by the multi-donor Program on Forests (PROFOR) of the World Bank. Rainforest Alliance activities in the three countries have been supported by numerous donors over the years including USAID, the Alcoa Foundation, and the Argidius Foundation.

REFERENCES

Hughell, D., and Butterfield, R. 2008. Impacto de la certificación FSC sobre la deforestación y la frecuencia de incendios forestales en la Reserva de la Biosfera Maya, Petén, Guatemala. Yu'am. Guatemala, diciembre 2008, Año 1, numero 2. pp 4-11.

Molnar, A., Scherr, S, and Khare, A. 2004. Who Conserves the World's Forests? A new assessment of conservation and investment trends. Forest Trends and Ecoagriculture Partners. Washington D.C. 83 p.

Nittler, J. and Tschinkel, H. 2005. Community Forest Management in the Maya Biosphere Reserve of Guatemala: Protection Through Profits. USAID. Washington D.C. 26 p.