

## SUSTAINABLE FOREST MANAGEMENT AND REDUCED IMPACT LOGGING:

### LABOR-BASED HARVESTING <sup>1</sup>

Sustainable forest management (SFM) is a long-term goal. Reduced impact logging (RIL) comprises a set of short and medium-term activities that contribute to attainment of that goal. But in the process of moving toward a long-term goal and promoting RIL methods, it is crucial to consider the immediate objectives that influence the decisions of forest harvesting practitioners. Foremost among these objectives are (i) the financial viability of harvesting operations, and (ii) the ability to meet production targets.

Achieving financial viability and meeting production targets are intimately-related challenges. Unfortunately, the measures taken by harvesting practitioners to address these challenges often put them on a collision course with other sectors such as farmers living downstream who experience negative impacts on irrigation water supplies, non-government organizations active in forest conservation, government forestry officers and others. The concerns of these sectors, and the immediate objectives of harvesting practitioners are both legitimate. At this meeting, participants have the opportunity to explore options for resolving (or at least minimizing) conflicts between two legitimate intentions.

Given the variety of forest conditions, it not realistic to assume that a standard approach to conflict resolution can be applied in all situations. This paper will discuss experiences of a forest concession company (PATIC<sup>2</sup>) that operated from the late 1950's to the late 1970's in the province of Negros Oriental, Philippines. The PATIC concession area was characterized by: (i) evergreen forests (principally Dipterocarps), (ii) high population density (around 260 person per square kilometer), (iii) widespread rural poverty, and (iv) the constant threat of slash-and-burn farming. These conditions prevail throughout much of the tropical zone. Thus, the PATIC experience described in this paper may be relevant to conditions that many participants at this meeting encounter in their work.

---

<sup>1</sup> Paper submitted by Patrick C. Dugan to the “*International Expert Meeting on the Development and Implementation of National Codes of Practice for Forest Harvesting*” Issues and Options” in Chiba, Japan on Nov. 17-20, 2003. The author is a senior forestry expert of the Japan Overseas Forestry Consultants Association (JOFCA) and Project Coordinator of FAO Project GCS/RAS/192/JPN – “*Enhancing Sustainable Forest Harvesting in Asia*”.

<sup>2</sup> PATIC is the acronym for Philippine American Timber Company, Inc.

PATIC was recognized as a diligent practitioner of sustained yield management. **Forestry universities and** colleges sent their students to this concession to fulfill the practicum requirements of their courses. The company received national awards from the government for its accomplishments in forest protection and conservation.

PATIC practiced equipment-intensive methods; i.e. yarders, bulldozers and rubber-tired skidders. However, when the prices of oil, lubricants, spare parts and machinery increased dramatically in the early 1970's, the company faced a dilemma. To achieve financial viability, the company opted to increase production targets. This entailed additional investments in heavy machinery, with correspondingly higher outlays for fuel, lubricants, tires, spare parts and other equipment maintenance costs.

Production increased. But a careful cost analysis by competent accountants revealed that more than fifty percent (50%) of gross income was merely passing through the company, and then turned over to suppliers of fuel, spare parts for equipment and to banks for servicing of loans obtained to finance operations. Clearly, much of the company's efforts were supporting other entities. At least half of gross income was flowing out of the community and out of the country. Furthermore, these external expenses were being met at the expense of the forest. More trees had to be cut to pay the costs of operations.

Meanwhile, population pressure and poverty were pushing more and more landless people into the mountains. Forest protection costs soared and forest protection became more difficult and risky. Company forest guards were constantly threatened by desperately poor people who relied on slash-and burn farming to feed their families.

The combination of all these factors forced a re-thinking of company strategy. Fortunately, at about the same time, the forestry department of the Government of the Philippines and the International Labour Organization (ILO) were concluding the last phase of a study on the application of labor-intensive harvesting methods in forest plantations.<sup>3</sup> The forestry department and ILO conducted a seminar to present results of the study. PATIC management was invited to attend.

---

<sup>3</sup> See "Forest Harvesting Case Study No. 9". Food and Agriculture Organization. RAP Publication 1997/41.

The social, environmental and financial analyses contained in the study were impressive and convincing. Labor-intensive operations provided jobs for people who would otherwise practice slash-and-burn farming. Buffalo (carabao) and bullocks were used to extract logs. Thus, damage to young tree seedlings, residuals and forest soil were much less than damage caused by tractor skidding and mechanized yarding. Production costs per cubic meter were lower than costs incurred using mechanized harvesting methods. Bow saws for felling was found to be a more cost-effective and profitable alternative than the use of chainsaws.

Taking results of the ILO into consideration, PATIC decided to adopt the methods for application in natural forests where trees are larger than plantation grown timber. The first phase of this shift to revised operational strategies was actually a revival of traditional methods and practices. Labor-intensive methods were applied in the pilot phase of road construction. This proved to be cost-effective and provided jobs for people who would normally have been involved in slash-and burn farming. The next phase of this strategic shift was the most significant in terms of SFM and RIL. Labor-based methods and animal skidding were applied in the extraction of large diameter logs.

To appreciate how large diameter timber can be harvested without the extensive use of heavy machinery, it is useful to consider what happens at each phase of forest operations from stump to processing. In machine-based harvesting, large logs are yarded or skidded to the log landing with powerful equipment. Then a crane or front-end loader places these logs on big trucks to be hauled from the woods to a processing mill over roads constructed with heavy equipment. Once inside the mill, the logs are broken down on a large head rig powered by a big engine into small, relatively-light pieces.

In a labor-based operation, the first phase of processing is done in the woods. This is what PATIC practiced and it is only a slight modification of what forest dependent communities have done for generations. Breakdown in the woods followed the same procedures applied by a master sawyer. After carefully examining the log, a master sawyer will cut it into pieces that facilitate optimum recovery or conversion. Thus, the log is first converted into cants, quarter-sawn timber and slabs. These are forwarded to the edger or other equipment for further breakdown.

Primary breakdown in the woods is supervised by an employee competent to apply the same common sense a master sawyer will use when examining the log. Breakdown into slabs, quarter-sawn wood or cants is done along lines marked clearly by the responsible employee with a lumber crayon on the face of the log. Then laborers use two-man manual saws to produce the slabs, quarter-sawn **pieces or** cants following the marks. Once reduced from whole log to smaller pieces, the wood can be hauled to landings by animal power.

In traditional hand-sawing, the timber is usually cut into square or rectangular fitches. Much of the log volume is wasted. Waste is further exacerbated if this is done with chainsaws due to the wide kerf of the saw chain. Even more waste is created when chainsaws are used to cut logs into boards. This wasteful practice is commonly observed in illegal logging as the producers rush to convert the log into saleable dimensions and remove the pieces from the woods before being apprehended by forest guards or police.

By shifting to labor-based methods, PATIC reduced costs, increased profits and provided more employment for erstwhile slash-and-burn farmers. Post-logging status of the forest was much better than the status in areas that were harvested with heavy machinery. Consequently, post-logging rehabilitation costs were significantly lower. In most cases, no planting was required since there was minimal damage to the residual stand and seedlings.

In brief, the PATIC experience demonstrated that the basic principles tested in the ILO study for harvesting of plantations can be applied profitably and successfully when harvesting large diameter in the natural forests.

Unfortunately, the PATIC experience was short-lived. In 1979 the government cancelled all timber concessions in Negros Oriental. This was followed by a huge influx of landless rural poor into the mountains. Forest destruction due to slash-and-burn increased to more than 1,000 hectares per year.

A few years thereafter, in 1983, the former PATIC concession was chosen as the site for implementation of a community forestry project financed by the World Bank (WB).<sup>4</sup> Labor-based harvesting operations resumed, managed by organized groups of forest dwellers. The positive results achieved in the PATIC experience were repeated. Increased employment, minimal forest damage and healthy residual stands.

---

<sup>4</sup> The Central Visayas Regional Project, Phase I (CVRP-I)

But the WB project coincided with a rapid increase in the number of non-government organizations (NGOs) focusing on environmental problems and lobbying for a total nationwide logging ban. Although based on questionable grounds from a technical perspective, this advocacy encouraged the imposition of a moratorium on harvesting at the site. This moratorium is still in effect now – almost twenty years later. With few other livelihood options available, people resumed slash-and-burn farming. From 14,000 hectares in 1979, the forested area has been reduced to less than 2,000 hectares today- an 86% loss in forest cover.

Results of the PATIC and WB experiences are relevant to SFM and RIL in many respects. First, it provides evidence that a shift away from machine-intensive harvesting operations can be profitable. The financial viability objectives of harvesting practitioners cannot merely be satisfied. Financial viability can be improved. Second, the status of logged-over forests is much better, thus helping ensure that both environmental and economic services can be sustained. Third, and very significantly, forestry can become a powerful tool in the alleviation of rural poverty and job generation.

Forest harvesting is often a controversial subject, and advocacies promoting a total ban on harvesting have grown strong. This is easy to understand when one observes the damage caused by heavy machinery in fragile tropical forest ecosystems. It is essential to demonstrate that there are alternative forest harvesting methods compatible with sustainable forest management goals. Unless this can be achieved, forest harvesting will continue to be a source of conflict. This has and will most likely continue to result in ill-advised decisions that in the long run lead to the conversion of forests into slash-and-burn farms, and eventually into wastelands dominated by *Imperata cylindrica* and associated fire-prone vegetation.

Promotion of labor-based harvesting should be an important component of initiatives to formulate and encourage adoption of forest harvesting codes. This is in fact, already underway in the Philippines. The International Labor Organization, in cooperation with the Food and Agriculture Organization, the Philippines Forest Management Bureau, and the Society of Filipino Foresters, are currently in the process of developing a Code of Harvesting Practices for Community Forestry.

Community forestry practitioners are intimately involved in the process. Through a series of consultations, these practitioners are given the opportunity to review, critique and revise the Code as it moves through the various phases of development. It is intended that this Code may eventually provide a framework or model for similar Codes elsewhere in Asia and other parts of the world where community forestry is gaining ground.

There are of course numerous constraints that need to be addressed in the promotion of labor-based methods. One constraint is the resistance to change that normally accompanies any innovation. This was demonstrated in the experiences mentioned above. Government foresters insisted on the application of log scaling rules that were designed for mechanized, whole-log operations. This may seem to be a minor issue, but it is in fact a major impediment. Scaling of small pieces is different from scaling of whole logs. And yet, this takes place every day in lumber-yards all over the world. It is therefore difficult to understand the resistance to development and legalization of appropriate scaling methods. But experience validates that the resistance exists.

Another problem is the perception that labor-based methods are primitive whereas mechanized operations are modern and therefore superior. This perception fails to recognize that labor-intensive methods require a larger input of brain power and planning, in contrast with mechanized operations where the emphasis is often on horse-power rather than brain power. The modernity challenges in labor-based harvesting relate to the sophistication and organizational skills required to interact effectively with people rather than machines.

And finally, forest harvesting practitioners may fear that a change in methods will result in loss of financial viability. The PATIC and World Bank project experiences cited above may not be universally applicable. Nonetheless, it will be useful for practitioners to analyze their costs and determine (as PATIC did) how much of their time and effort is devoted to creating profits for oil producers and machinery companies, instead of improving the financial status of their own organizations and creating employment opportunities in their areas of operations.