



# Can small sawmills save the forests? A Vanuatu case study

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Small sawmills have been promoted in Vanuatu since 1989 as a means of maintaining the forest environment and providing for rural development. This effort, along with others in Papua New Guinea and the Solomon Islands, has encountered some difficulties associated with the introduction of new technologies and approaches. However, the experience in Vanuatu indicates that small sawmills can be successful business ventures and help to maintain the forest environment, if they are developed in appropriate ways.

In the Melanesian countries of Papua New Guinea, Solomon Islands and Vanuatu forests represent important natural capital. They support business and generate revenue, but also provide the daily requirements for many people living traditional lifestyles. These forests are a major source of tropical timbers, with Papua New Guinea expected to export over 2 million cubic metres of logs during 1993. It is generally agreed that current rates of logging in Papua New Guinea and Solomon Islands are unsustainable, and this has led to concerns about the future of these forests, and of the economies and

lifestyles that are dependent upon them. Over the last decade or so small sawmilling has been suggested as a means of meeting the desire for development, saving tropical forests by allowing them to be logged in an environmentally friendly way.

Many South Pacific countries have initiated programs to investigate or promote portable sawmills. Common objectives for these programs include

- encouraging rural development by using small sawmills in rural forest areas to convert timber at site, thereby creating additional employment, producing a higher value product, and providing timber products for local requirements
- reducing levels of forest harvesting by enabling landowners and communities to meet their income needs with small area/high value sawmilling replacing large area/low value logging
- promoting sustainable long-term forest management by giving forest owners an increased appreciation of the value of their forests, and providing a way of effective management of these forests.

While some of these objectives have

been met in some of the projects undertaken in the Pacific, portable sawmill programs in general have not achieved all their aims. The experience in Vanuatu indicates that community involvement, training and follow-up services are the keys to successful small sawmill enterprises.

### **Small sawmills—technology and training**

Portable sawmills used in Vanuatu, and elsewhere in Melanesia and the South Pacific, are designed to cut good quality timber at a site in or near the forest. Locating the sawmill close to the trees reduces the need for expensive movement of large logs; instead only the smaller, higher value sawn timber needs to be transported long distances. This in turn reduces or removes the need for heavy logging machinery and roads and the large capital input that this entails.

Portable sawmills range in size from standard chainsaws to large machines that must be transported by truck. They can be divided into three basic types.

- A chainsawmill which involves a chainsaw mounted on a light frame, and is easily carried from tree to tree.
- A small sawmill, powered by a small petrol or diesel engine, which can be carried by hand and either relocated at each tree felled, or kept at one site for a short time while nearby logs are brought to it using hand powered winches.
- A relocatable sawmill which requires trucks to move it from site to site, and will usually involve the use of heavy machinery to bring logs to the site.

### **Experience in Vanuatu**

Experience with small sawmills in Vanuatu dates from 1989 when the small sawmill

program was initiated by the Vanuatu Department of Forestry and the Foundation for the Peoples of the South Pacific to provide training and support for ni-Vanuatu. Sawmill purchasers have included individuals, partnerships and communities, and are located in a number of islands throughout the country. During 1993 the Department took full responsibility for training and supervision of small sawmills, with the Foundation for the Peoples of the South Pacific providing chainsawmill services and addressing other forest and environment issues.

Both the Wokabout Somil from Papua New Guinea and the Timbersaw from New Zealand have been used in Vanuatu by purchasers of small sawmills. Both sawmills comprise two small circular saws (40 cm and 60 cm) and an 18 horsepower petrol engine, mounted on a frame that allows the saws to move along the length of a log. The two saws are mounted so that the two cuts meet at right angles, enabling the mill to produce a length of accurately cut sawn timber each time it passes along the log. The sawmill is equally suitable for both hardwoods and softwoods (although the former are slower to cut), and is appropriate for working in tropical forests where there is a wide variety of tree species.

As a result of experience in Papua New Guinea where approximately half of the 600 Wokabout Somils produced were non-operational, the Vanuatu program began with the premise that training was possibly the most important element. New sawmill operators in Vanuatu were provided with a short, intensive training course covering not only how to cut timber but also how to carry out routine maintenance and how to conduct the business aspects of their enterprise. As the goals of the program included the development of sustainable forestry, all sawmill operators also received training in the basic principles of forest management. Equally important was the need to follow-up initial training with

support services. This included ensuring that sawmillers in outer islands could obtain access to spare parts when necessary, and visits by extension staff to solve on-site problems and to provide extra training or advice.

The number of small sawmills in Vanuatu (about 12) is much lower than in Papua New Guinea (over 600), but almost all are operational. This can be attributed, at least in part, to the training and support processes. Even so, experiences in Vanuatu indicate some problems, and the need for further work on approaches to small sawmilling.

## Business aspects

The current price of a Timbersaw in Vanuatu is approximately 1,800,000 vatu (US\$15,000), including tools, supply of spare parts and other establishment and initial operating costs. Various sawmill purchasers have raised this from personal or family assets, community funds, or through funding from the Development Bank of Vanuatu. In the latter case, the Bank has accepted timber resources as the purchaser's equity in the project, in addition to other assets such as a vehicle. The sawmill requires between 4 and 8 operators, and is capable of producing up to 2 cubic metres of sawn timber a day. However, total timber production from the 9 small sawmill businesses in Vanuatu is under 2,000 cubic metres per annum, and is mainly sold on local island markets. Actual production rates, labour, and other expenses are highly variable, depending on factors such as timber conditions, worker skill and experience, and the number of days the sawmill works each week.

Estimates of the profitability of small sawmills varies greatly. Some promotional material for Wokabaut Somils suggests that the price of the Somil could be repaid in less than a year. USAID (1993) estimated a

profit of US\$5,400 per year, while others have given an annual profit range from about US\$500 to over US\$100,000, depending upon the mill's efficiency. Anecdotally, some sawmills in Vanuatu are mechanically operational, and have adequate supplies of labour, fuel, markets and forests, and yet are working at very low rates. This could indicate that in the operator's view, the profit is insufficient to compensate for their work.

Business management is a recurrent issue for most sawmills in Vanuatu. Much of Vanuatu operates on a non-cash economy, and many sawmill owners have no experience in organising a business. Workers usually come from a rural workforce and are not used to working a specified number of hours each day, and repeating the same industrial work each day, and each week. Training programs can and do include basic skills such as work practices, pricing and income/expenditure control, but this cannot hope to produce experienced managers in a matter of weeks, or even months. This issue is not limited to small sawmills, but is present in many rural business enterprises.

However, observations of the successful small sawmills indicate that they can be profitable, using either a Western business basis, or a more Melanesian approach. The most successful small sawmills, however, have supervision by people with some business or management experience, either as the manager or owner, or as part of a committee overseeing the operation. Identifying these people, and ensuring that they are involved in management, is necessary if a new small sawmill is to be effective.

The second essential factor in assisting small sawmills to become and remain profitable is the availability of support services. This includes access to spare parts, especially when urgently required; access to additional training to help develop further skills; and access to advice on matters as diverse as marketing,

mechanical problems and community relations. Generally, in Vanuatu, these services can only be found in Port Vila, and so an extension service is necessary to make support available and accessible to operators on remote islands.

Given some of the difficulties in achieving profitable small sawmilling, and the need and expense of training and support services, some observers take the view that small sawmilling is neither efficient nor effective, and that timber production should be retained by more technically and economically efficient large sawmills. However, the social and environmental effects of such operations, especially in Melanesia, are increasingly seen as unacceptable. Many observers believe that there are unaccounted costs, such as loss of traditional food sources; degradation of forest, soil and water resources; and social disruption. The goals of small sawmilling, as outlined above, attempt to provide an alternative to this. Small sawmills should therefore be viewed as a way of reducing the extent of large-scale logging (and the reliance upon it in some economies), rather than as a complete replacement.

### **Forest management and small sawmills**

The introduction of small sawmills into communities and forests should be accompanied by an understanding of the forest and how it can be managed to produce timber, income and other forest products sustainably. However, methods of providing short trainings in sustainable forest management are less developed than methods for short intensive technical or business training. Several reviews (Wells and Siwatibau 1992, USAID 1993) have noted that further training in the environmental and forest management aspects of small sawmills is required if programs are to meet their objectives.

Difficulties with forest management arise from a large number of sources, and several can be dealt with here. Land ownership is central to all forest issues in Vanuatu. All land is held under customary, or traditional ownership in Vanuatu, usually by individuals but sometimes by families or tribes/clans. There are strict limitations on how this land can be transferred, and leases are limited to a maximum of 75 years. This is regarded by some as a major impediment to development, although it also gives the indigenous people a greater degree of control over activities on the land than is possible in some other parts of the world. However, it does act as a barrier to government or other agencies, restricting, for example, the Department of Forestry from taking an active and direct role in forest management.

As customary landowners are both the traditional and legal managers of the forests, it is necessary for outside agencies to work with them, rather than to impose an external set of rules designed to protect the environment. Landowners also have a wealth of knowledge about the forest, are concerned about it, and, equally importantly, are available on site to carry out management activities. Local knowledge, however, is by no means complete, frequently lacking information on the importance of interactions between components of the forest ecosystem, and of the possible effects of new technologies. If this information can be provided, it is possible for landowners to help small sawmills fulfil both environmental and financial objectives.

Inadequate forest knowledge is also a problem in other respects. Forest management agencies still require further research and information about the forest and the environment. For example, Vanuatu has a newly completed, computerised forest inventory, but very little information on forest growth rates. However, there is now more information

available than at any time in the past, and the important decisions are not just what additional information is required, but how information can best be used, both by agencies and landowners.

In some small sawmills in Vanuatu there is a conflict between the desire to maximise the financial returns from the sawmill, and the interest in maintaining the condition of the forest. This can lead to excessive felling of trees, failure to replant, and lack of concern for the effects on the environment. It can also cause a division between the owners of the sawmill and the individuals or community owning the forest. The former are seen as reaping all the benefits of the business, while the latter receive little, and yet their forests are damaged.

The solution seems to lie in the traditional Melanesian approach to consensus and consultation. Sawmills that have been set up as community projects, such as that in Aneityum, or are operated in close conjunction with the landowners, are more successful than those operating more independently. Community involvement and oversight of the operations of the sawmill can therefore assist in maintaining both the environment and the social structure of the community. In this way the community itself provides the regulation and arbitration that the Department of Forestry would usually provide for larger logging operations.

### **Planning for successful small sawmills**

The introduction of small sawmills into Vanuatu has benefited from experiences of similar projects in Papua New Guinea and Solomon Islands, and has proceeded at a slower pace, emphasising the development of training and support structures. This appears to have led to a greater proportion of sawmills operating successfully, although the actual numbers are quite

small. However, Vanuatu has also experienced difficulties in areas such as profitability, effective training, and sustainable forest management. This last issue is particularly important as two of the goals of small sawmill goals are aimed at maintaining the forest environment.

The experiences in Vanuatu point to a number of requirements if small sawmills are to be successful in meeting their goals.

- Small sawmill owners (either individuals or groups) should have some experience in both timber cutting and in business management. Many prospective owners may balk at this requirement, however all indications are that if this is not met, then the business will not succeed. This experience is probably best gained by operating a smaller chainsawmill business, with lower requirements, production rates and overheads.
- Initial planning for a small sawmill must fully involve the local community so as to pre-empt possible misunderstandings or conflicts at later stages. A local committee, or chiefly authority, may be an appropriate vehicle for monitoring the activities of the sawmill so as to maintain environmental standards and ensure a positive presence in the community. Planning should also address the requirements of the owners and community of the forests, and how these can be met.
- Training must be provided to cover all aspects of use of the small sawmill—operational, maintenance, business and environmental. In most cases this will require refresher and follow-up work, and training can be designed with this in mind. Follow-up training must also be matched with support services, especially the supply of spare parts and trouble-shooting.
- Environmental and forestry education should be provided to communities affected by the small sawmill. This should assist in reducing environmental problems, whether they arise from the sawmill or from other issues.



The formation of a community group concerned with issues such as tree planting, forestry or the environment can greatly assist in both community education, and in monitoring the work of the small sawmill. Government and non-government agencies can provide valuable support and assistance at this level.

- Management of the forest needs to be addressed through deliberate planning. This requires additional information about the forest, effective presentation and use of this information, and the involvement of the landowners. With training and support, it is likely that forest owners will be able to carry out most of the activities involved in forest planning and management. Outside agencies are then free to concentrate on advisory and technical support roles, rather than taking primary responsibility for a number of small operations in many locations.

### **Can small sawmills save the forests?**

Small sawmills have occasionally been promoted as a miracle solution to over-exploitation of Melanesian forests. They have also been condemned for not meeting these objectives. The reality is that small sawmills are just a tool, and they may be applied in one fashion to achieve a desired

goal, or used in other ways to effect the opposite results. Small sawmills definitely have a role to play in the forests and rural communities of Vanuatu. However, as with any new industry, technology or development program, there is a need for an appropriate introduction, and this is not usually a rapid process. The requirements outlined here are drawn from experience in Vanuatu and elsewhere, and are aimed at ensuring small sawmill programs achieve their goals.

The short answer to the question is that small sawmills alone cannot save the forest, but that with appropriate development, they can be a tool to help maintain the forest environment.

### **References**

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