From little things, big things grow - The Business for a PNG Community Forest Enterprise

A step towards making the 'wokabaut somil'[1] more financially attractive, and worthy of local people's effort and commitment.

Report for the Foundation for People and Community Development Incorporated

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[1] PNG Tok Pisin for portable sawmill

1. Introduction

Development for rural community enterprises

Development is complex and risky. Some USD$135 billion is spent on aid per annum, and its effectiveness is hotly contested. [2]

Globally, 90 per cent of the poorest people rely on forests for subsistence and income.[3]

This paper looks at how this income can be increased based on existing community forestry activities and interest in Papua New Guinea.

It is written from the commercial perspective, by an author with expertise in:

- Entrepreneurship
- Small and medium sized enterprises
- Commercialisation of wood products

Community forest enterprises (CFEs) in PNG are in their infancy. It is estimated that rural enterprises (including forest enterprises) can take between three and five decades to become viable – even with the assistance of NGOs, government agencies and the like. The literature indicates that there is poor understanding of the long term commitment required to secure the viability of these enterprises and the pitfalls along the way.[4]

The long duration of this development process is an obstacle in itself, hence the need to find viable shortcuts.

Purpose

The purpose of this paper is to consider the viability of PNG community forest enterprises, and to suggest 'fast forward' actions that increase their income.

It proposes incremental steps, rather than over-ambitious actions to increase output and revenue, and to reduce the arduous nature of operating a portable sawmill, within the framework of ecological sustainability.

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[2] Organisation for Economic Cooperation and Development (OECD) data found at http://www.oecd.org/dac/stats/

[3] Donovan J., Stoian D., Macqueen D., Grouwels S., *The business side of sustainable forest management: Small and medium forest enterprise development for poverty reduction* (ODI Natural Resource Perspective 104, December 2006).

[4] Donovan J., Stoian D., Poole N., *Global review of rural community enterprises*, Rural Enterprise Development Collection No. 2, 2008, p.32.

It is written from the perspective of the needs of the community forest enterprise and local buyers for rough sawn timber. The needs of export buyers are not relevant, since the field research demonstrates that the complexities and volume required for overseas orders is beyond the supply capacities of most CFEs.

Methodology

This paper has been developed based on five days field research, a literature review of global rural community enterprises and the author's previous research on the economics of community forestry enterprises in PNG.

Field interviews were held with timber traders, timber yard managers, community leaders, NGO staff, microcredit and bank staff, and community members with existing small forest enterprises.

Investigative focus

This study's focus is a community or clan that has a portable sawmill, or is free hand cutting logs with a chain saw (there are many examples of this where a 36" chainsaw is used, and in some cases the operator also has a 28" chainsaw for felling and crosscutting).

Communities are milling selected logs into green boards, yielding approximately 35% recovery, grading, and transporting premium grade boards to large towns, where they are sold to builders for the construction of new homes, or to timber merchants who may value add (via further milling, planning, sanding and moulding).

Second or B grade boards are sold to local buyers in the immediate vicinity – their price does not warrant transportation to a large nearby town.

2. Background

The history of portable sawmills in Papua New Guinea

Small scale sawmilling in Papua New Guinea commenced in the mid 1970s when church groups situated in remote areas used them to provide communities with building materials. By the early 1980s, portable sawmills that could be carried into the forest by four men had been designed. Subsequently, there was rapid growth in the number of mills in use, with subsidies from development agencies or funding provided by government for communities to purchase mills.

Portable sawmills have been proposed as a potential alternative to large scale timber harvesting by many participants in the debate over the management of Papua New Guinea's forests. They are seen as way of providing a greater share of income from the utilisation of forest resources to the forest owners, engaging them more in forest production, and minimising the impact of timber harvesting operations on other forest values.

Most CFEs struggle to advance beyond the start up stage of business development, exhibiting low levels of output, recoverable yield and value adding.[5]

There is little data on the number of portable sawmills in operation, or their production levels. These operations are generally ignored by government, except when the operators intend to export products (in which case they require an export licence and timber permit). In 1993, a nationwide survey of three hundred and fifty of the estimated fifteen hundred portable sawmills were surveyed. It found that operators were harvesting an average of three to four trees per week and were employing seven people.[6]

Portable sawmills usually, but not always, operate near existing roads, often in areas where industrial logging has taken place and existing logging roads and tracks can be used to access the resource and transport sawn boards to market. These operations process both standing trees and logs that have been felled, yet rejected by loggers.

[5] Donovan J., Stoian D., Macqueen D., Grouwels S., *The business side of sustainable forest management: Small and medium forest enterprise development for poverty reduction* (ODI Natural Resource Perspective 104, December 2006).

[6] Hunt, C., Marketing Eco-Timber in Papua New Guinea, contained in Proceedings from an international Symposium held in Kuranda, Australia 9-13 January 2000 (Developing Policies to encourage small scale forestry). P. 150

Eco – Forestry in Papua New Guinea

There are an estimated 110 landowner groups practicing ecologically sustainable forestry or 'eco – forestry' in PNG.[7] They are engaged in the milling and sale of green timber or rough sawn boards from their own forests for the supply of building materials to their community, to earn cash to pay workers and meet the needs of the community or clan e.g. payment of school fees.[8]

Some communities selectively harvest their forest according to a forest management plan in the interest of ecological sustainability. This plan is developed in partnership with an NGO (e.g. Foundation for People and Community Development, FORCERT) and is based on the principles of the Forest Stewardship Council, the PNG logging code of practice and other forestry and environmental practices considered to be best practice.

A Forest Management Plan indicates the annual harvest that can be sourced from the forest over a fifty year natural regeneration cycle. An example is the Sogi forest area, located 80 kilometres south east of Madang - comprising 45,000 hectares, 20,000 of which are primary forest, with kwila being a dominant species. The annual allowable harvest is estimated at 9,424m³ per annum. A maximum of 612 hectares can be harvested each year, with each hectare yielding a maximum of 30.8m³. This equates to 51 hectares that can be harvested monthly. At a recovery rate of 50%, the maximum potential sawn timber volume will be 750m³ per month or 9,000m³ per annum.[9] With most portable sawmill operations harvesting up to 20-30m³ per annum, the ecological sustainability of this operation is evident.

Communities remain unregistered and unregulated by the state because they process small quantities, often less than 50m³ of logs per annum. If a community is capable of processing more than 500m³ logs annually, they are legally obligated to gain a government Timber Authority permit to harvest their forest.

[7] Hunt, C., Economics of Eco-forestry in Papua New Guinea, contained in Proceedings from an international Symposium held in Kuranda, Australia 9-13 January 2000 (Developing Policies to encourage small scale forestry). P. 137

[8] ibid., p. 140

[9] Village Development Trust, Sustainable Forest Management Plan, Sogi Medium scale Eco-Forestry Project, March 2008.

From the perspective of eco forestry NGOs, the main difficulties they face when working with community forest enterprises are:[10]

1. NGOs do not have sufficient financial and technical capacity to train the communities, conduct forest surveys, establish forest management plans etc. The cost to commence the application process for certification is estimated at $US13,510.[11]

2. Communities have a low level of capacity and hence require significant training and assistance.

3. Communities can find the complexity of certification daunting and highly administrative in nature. While there is local demand for green boards, there appears to be an absence of local markets for environmentally certified timber.

4. Time and distance to access communities, often found in remote and / or hard to access locations.

Some NGOs find the complex demands, process and substantial costs, coupled with uncertain rewards of certification can make it hard to justify.[12]

Environmental certification for export versus the local market

A number of organisations have supported the development of small scale sawmills, environmental certification and timber export to developed countries, particularly to Australia. For example FORCERT (www.forcert.org.pg) is a Papua New Guinea based, not-for-profit company that promotes sustainable forest management through providing certification and marketing services of forests and their products for local small scale producers.

A community's decision to produce timber will determine their selection of species, sizes, quality and the level of financial capital required to purchase equipment and begin processing. This decision is again influenced by whether a community will apply for certification that verifies the sustainability of their operation.

[10] Institute for Global Environmental Strategies, Forest Certification in PNG: Progress, Prospects and Challenges, Paper No. 1 October 2007, p. 13

[11] Institute for Global Environmental Strategies, Forest Certification in PNG: Progress, Prospects and Challenges, Paper No. 1 October 2007, p. 15

[12] Hunt., Production, Privatisation and Preservation in Papua New Guinea forestry, International Institute for Environment and Development, 2002, p. 77.

Some non-government aid organisations find the complex demands and substantial costs, coupled with uncertain rewards of certification can make it hard to justify.[13] International markets offer only a small premium for certified material.[14]

Forest certification is usually not required by local buyers, who are prepared to accept smaller volumes and lower grades of timber. Export markets by contrast demand large volumes of particular species at specific sizes and quality.

Export markets are difficult for communities because they need to select only well known species that are free of defects and meet precise specifications. Buyers accord more importance to the quality of the product than its certification credentials. Hence it may not be commercially viable, nor may it be ecologically sustainable for a community to cut solely for the export market. Anecdotal evidence indicates only a small number of shipping containers with timber from community operations has been exported, either via FORCERT or local timber traders.

[13] Hunt., Production, Privatisation and Preservation in Papua New Guinea forestry, International Institute for Environment and Development, 2002, p. 77.
[14] Peter Mussett, *The Woodage Pty Ltd* indicated that a 5% premium would be paid.

3. Operating a portable sawmill in Papua New Guinea

Selection, felling and milling of trees in PNG

PNG is estimated to have up to 1200 tree species, of which only approximately 200 have been classified for their properties.[15] Trees vary considerably by not only species, yet also log size, shape and type of defects (from a production perspective). Hence the volume of marketable timber that can be extracted from each tree varies from thirty five to fifty percent of the log volume (dependent on tree selection, how the log is felled and the effectiveness of milling).

Once a tree has been felled to the ground, the log is then 'milled' or processed by the portable sawmill into boards that are often referred to as 'green boards', meaning that the boards have a high percentage of water. Timber 'drying' can occur in the open air or undertaken in a drying kiln which is an enclosed chamber that regulates temperature and moisture. The local market in PNG has a demand for green boards, which are used directly in housing construction.

To add value to green boards, further milling often occurs, cutting large boards into sizes demanded by local buyers. Green boards can de 'dried' to reduce their water content, and can be 'dressed', meaning it can be shaped and its surfaces sanded and smoothed. This 'drying' and 'dressing' of timber are the principal value adding activities that can occur – the capital and skill required for this is often beyond the reach of communities.

The University of Divine Word in Madang, PNG has a timber yard where green boards purchased from CFEs are further milled, dressed and sanded for making furniture.

Constraints in 'wokabaut somil' operations

Approximately $K80-90,000 is needed to operate a portable saw mill kit. An eight inch Lucas mill is valued at $K62,000 and a chainsaw, winches, cutting blades, initial oil and fuel, footwear and protective clothing are needed to operate a Lucas mill.

The internal obstacles to a community operating a portable sawmill are many.

1. *The means of production* – the inability to access or purchase a portable sawmill is a major constraint i.e. communities do not have savings or other sources of income to purchase a Lucas mill

[15] Discussion with the PNG Forest Authority and CSIRO's Dr Hugo Ilic, ex CSIRO Forestry Division

2. *Low output*. For those communities already operating a sawmill, output tends to be low (i.e. up to 20 m3 of green boards per annum), and they are hamstrung in increasing production due to the labour intensive nature of portable sawmills, geographic and weather conditions.

3. *Customary land tenure*. This has a strong influence in decision making and how the proceeds from forestry are distributed. Disputes between clans regarding the ownership of specific resources and the distribution of income often arise.

4. *Business skills*. Lack of business development and money management skills among the community. There are few service providers that can offer business and financial services designed to assist communities to develop and expand their operation.

5. *Community motivation*. Felling and milling logs is physically strenuous, dangerous and repetitive work. It is hard to keep workers interested. Green boards often need to be moved by hand over great distances to get them to a road for transport by a truck. Some communities need to move green boards along a river by lashing canoes together. This can be prohibitive, even for the most motivated and fit members of a community.

6. *Transport of product to buyers*. The cost and difficulty of arranging transport of the timber from a remote location to a buyer. During the wet season, trucks can only access roads that have crushed rock – tracks may only be accessible by four wheel drive trucks or a tractor. Often communities will have boards stockpiled, as the road becomes impassable. Literature indicates that less than 20% of sampled rural community enterprises have year round road access.[16] Communities in the Madang region hire two and five ton trucks and a driver at the cost of K400 per day (two ton truck) and K900 per day for a five ton vehicle.

7. *Ecological sustainability*. Communities are reliant on third parties or NGOs to devise a Forest Management Plan that will guide how to sustainably harvest their resource. This can cost up to $K50,000 and take up to 18 months to complete. Many communities do not have a Forest Management Plan.

Of these factors, the physical strength and stamina needed, money management and transport of the boards to a road junction are key factors which lead to disillusionment and many communities stopping production.[17]

[16] Donovan J., Stoian D., Poole N., *Global review of rural community enterprises*, Rural Enterprise Development Collection No. 2, 2008.

[17] Hunt, C., Organisation of eco forestry in in Papua New Guinea, contained in Proceedings from an international Symposium held in Kuranda, Australia 9-13 January 2000 (Developing Policies to encourage small scale forestry). P. 141

The main external obstacles to a community operating a portable sawmill include the following.

1. *Financial capital*. Accessing affordable capital to buy the kit and commence operations[18]. Interest rates in PNG can range up to 18% per annum, and lending institutions require significant security before they will lend (20-30% cash and the balance in fixed assets at 70% of their market value). Observations indicate that CFEs appear to be highly undercapitalised, irrespective of their size. Individuals and clans can be found freehand milling with a 36" chainsaw, unable to get the financial capital to purchase a portable mill.

2. *Payment.* Locating buyers and getting paid on delivery. Communities complained that buyers often did not pay until some time after delivery. Business development support, providing advice and assistance could turn the tables on payment terms.

3. *Parts and service*. Portable mills require significant investment in terms of training for the community (e.g. how to operate, sharpen blades, breakdown and carry etc.). Only one supplier of spare parts could be identified, based in Lae, meaning significant travel is often required to place an order and then return to pick up parts. Communities found that this supplier had little inventory, meaning lengthy order times before parts arrived – resulting in downtime and lost productivity. Finding the money to purchase parts is a further complication. There appear to be 'saw doctors' (those who sharpen blades), or equivalent in larger towns able to service and repair mills.

4. *Technical and business service providers are rare.* Technical services are focused on the production and grading of green boards. There appear to be few, if any, service providers who can support a community with money management, negotiating with buyers, accessing affordable finance etc.

[18] International Tropical Timber Organisation, Tropical Forest Update, Volume 17, Number 4, 2007 p. 2.

Revenue potential of a portable sawmill operation

The literature is replete with studies assessing the profitability and rates of return from 'wokabaut somils'. Communities in PNG however do not view portable sawmills through the prism of an entrepreneurial business enterprise driven by economic imperatives – logs are milled at certain times to earn income for specific purposes e.g. paying of school fees. The tropical climate, steep topography and onerous nature of the work are a discouragement. Moreover, communities in PNG, in most cases, do not have the capital, expertise and management to establish and run a CFE. Few communities keep records of their income and their expenses.

The income potential from a portable sawmill is sensitive to the following factors.

1. *The price buyers are willing to pay*. Economic conditions drive timber prices. Timber prices decline and rise in sync with the economic cycle, particularly demand from local builders. One cubic metre of premium or A grade kwila can earn K1200.

2. *Mill productivity*. This is the rate limiting factor for a CFE. Operators have indicated that with mechanisation (tractor and skidder) and dedicated staff, production could be up to 3m³ per day.

3. *Recovery rate*. By careful selection and felling of logs, a greater percentage of merchantable timber and less waste can be extracted during the milling process.

4. *Value adding*. Proper drying followed by dressing of merchantable grades can double the sale price. Communities do not have the deep technical knowledge to air dry, nor the electricity supply / machinery combination to machine and dress timber.

To maximise the revenue potential, both technical matters (tree selection, felling, milling, grading & transport) and business matters (high sales price, payment on delivery, money management, workers motivation and financing) need to be optimised. This is often very difficult to achieve for clans with little education, who are remotely located and have difficulty in accessing technical and business support support services.

4. Good development practice for PNG

Local development entrepreneurs critical to drive change

Development is not simple. The process of change is unpredictable, and cannot be externally driven. Implementing a donor's rigid agenda will most likely lead to failure.

Successful development is endogenous and cumulative, where the players involved need to be committed to an active learning process, adapting their approach to experience and events. Donors need to nurture local led development, being patient and comfortable with its ambiguity.[19]

The complexities of PNG mean that only a well resourced, locally led, iterative problem solving approach has the best chance of achieving positive development impacts. Research conclusively indicates that a development agenda must be locally led if it is to succeed – only motivated local actors who have the experience, tacit knowledge and are trusted insiders can chart a course through the complexities of a particular change.[20]

Detailed development programmes designed by donors and where local organisations implement and deliver outcomes can kill the ability and motivation of local actors to lead change – the aid money becomes the primary motivator of what is done. Donors need to engage with leaders who are motivated to apply their knowledge, relationships and seek out solutions, which may not be the targeted solution desired by the donor. These local 'searchers' are development entrepreneurs looking for the outcomes with the highest utility, problem solving in a stepwise manner, and without the pressure to spend aid money in a prescribed time period. The Asia Foundation calls these individuals 'development entrepreneurs' – highly committed and skilled individuals committed to achieving successful outcomes.[21]

A review of seven development projects that were locally led, focused on iterative problem solving and stepwise learning found that the factors that would kill successful outcomes for these projects would be: [22]

- A requirement at the outset to write a 'business case' setting out options and assessing their relative value for money, based on a theory of change that fails adequately to capture complexity and unpredictability
- Conducting a diagnostic analysis to define the conditionalities attached to a large loan

[19] Booth D. & Unsworth S., Politically Smart, Locally Led Development (Overseas Development Institute Discussion Paper, September 2014), p. 1
[20] Ibid., p. 16
[21] Ibid., p. 22
[22] Ibid., p. 23

- Setting spending targets rather than allowing funding requirements to emerge
- Requiring regular progress reports against predetermined targets
- Banning funding to politically connected individuals and organisations
- Placing ceilings on the share of administrative costs in project budgets
- Tolerating high staff turnover.

Finding 'development entrepreneurs' who have the intangible skills, aptitude and motivation to operate and drive development outcomes is at the heart of achieving outcomes, particularly in a complex country like PNG.

Foundation for People and Community Development

The Foundation for People and Community Development Inc (FPCD) was founded in 1993 as a non government, not-for-profit organisation. FPCD's mission is to improve the livelihoods of communities through sustainable forestry practices, encouraging landowners to harvest and sell their own timber according to a forest management plan. It achieves this by working with communities interested in sustainable forestry management practices, Forest Stewardship Council requirements and training in forestry and portable sawmill operation.

FPCD is a team of foresters. They have built a level of trust after twenty years in operation with seven communities that they have certified under a group certification scheme. They have successfully trained and supported communities in forest management, felling and milling using 'wokabaut somil'.

They have succeeded because they are motivated, knowledgeable of the local context and hence can identify the opportunities and obstacles to achieve their goals. They have a vision for the type of changes they have successfully supported. The individuals behind the FPCD are 'development entrepreneurs' - committed and skilled individuals, adapting to changing circumstances and committed to forestry outcomes.

However the challenge for FPCD and for most NGOs working in economic development is that they generally struggle to understand the drivers of business or 'profit making', simply because they are non-profit organisations. NGO staff tend not to have experience working in business. They are often technical specialists and not business generalists who can combine and coordinate the many disparate functions that make up a profitable enterprise.

5. Recommendations

Business models for community forest enterprises in PNG

A business model is a recipe. It describes how an organisation combines human and physical resources to create a product or service, deliver 'value' to customers and generate revenue above the cost of production. Business models are used by profit and not for profit enterprises, producer associations and collectives.

The literature is replete with diverse definitions of a business model, which are often used to detail a business's strategy. Business models often describe a company's value proposition, target customers, distribution channels, cost structure, revenue model and more.

In the case of a community forest enterprise in PNG, devising a business model assumes the following four pre-conditions exist:

- A community or clan is motivated to create a profitable business (or at least sufficient to achieve their short to medium term economic needs if that is their motivation, as appears to be the case in PNG).
- They have the expertise, or with outside assistance, can devise a business model 'recipe' that is likely to create a profitable business.
- Are confident of securing the means of production to produce goods – in this case, at least one portable sawmill, working capital for fuel and wages and some mechanisation (e.g. tractor, truck or skidder) to achieve a minimum level of viable production.
- Customers that will buy the quantities of green boards that will be produced at a certain price (and the communities can readily transport their boards to where the customers are located).

Few, if any, community forest enterprises in PNG can meet these four conditions. Even if a community has motivation, management skills, a portable sawmill and buyers, the key rate limiting factor is they cannot 'break out' of a very low level of production of green boards. All things going well, and assuming motivated staff, a portable sawmill can only produce approximately one cubic metre of green boards per day.

Hence any discussion regarding appropriate business models for community forest enterprises in PNG is irrelevant – they are at best, nascent new enterprises.

Community forest enterprises in PNG are focused on income generation *and* how to reduce the strenuous nature of felling and milling logs. Reducing the arduous nature of milling *may* increase motivation that could lead to increased production. Field discussions indicate there are motivated clans keen to increase production with the right input combination – portable mill, tractor with trailer, skidder, truck, working capital and support services.

Rural community enterprises as businesses

The international literature on rural community enterprises indicates that only very few rural community enterprises can be considered fully fledged businesses with clear economic objectives – they pursue a blend of social, economic and environmental objectives.[23] The literature and observations from field research indicate that this is no different for CFEs in PNG.

Whereas there are advanced community forest enterprises in Mexico working on a 'business footing', this is not the case in PNG.[24] NGOs and government agencies could provide support and facilitation for income generation as the first step on the path to establishing a nascent business enterprise, if communities have the interest and motivation to do so.

International experience indicates that rural community enterprises can take between thirty to fifty years to achieve a self sustaining level of output and profitability[25] – the significant support and resources needed from NGOs and government agencies to achieve self sufficiency, over a long period of time means viable shortcuts and interventions are needed to compress this window.

Recommendation 1: FPCD expands to include Business Development Services

The Harvard Business Review in 1972 published an article, *Evolution and Revolution as Organisations Grow* by Larry Greiner, charting how an organisation grows in successive phases of slow growth (evolution) followed by periods of rapid change and advancement (revolution).

It is an anthropological analysis of the phases charted by new enterprises that succeeded in becoming larger.

Since its inception in 1993, the FPCD has been operating as a forestry NGO. It has successfully guided communities towards sustainable forestry practices and the operation of portable sawmills. It now has the opportunity to expand its offering beyond forestry services and include business development capabilities – skills in money management, locating buyers, negotiating prices, accessing mechanisation, accessing parts and saw doctor services, funding etc. - all focused on substantially increasing production, reducing impediments, building skills and confidence.

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[23] Donovan J., Stoian D., Poole N., *Global review of rural community enterprises*, Rural Enterprise Development Collection No. 2, 2008.

[24] Antinori C., & Bray D. B*., Community Forest Enterprises as Entrepreneurial Firms: Economic and Institutional Perspectives from Mexico.* World Development Vol. 33, No. 9, pp.1529-1543

[25] Ibid.,

To succeed, FPCD should be encouraged to hire someone with business development experience, who also has a heart for supporting communities. This would fill a gap in the market place where there are few government agencies and NGOs providing business development services to entrepreneurs, small and medium sized enterprises or rural community enterprises in PNG.

The FPCD has successfully worked with communities in devising forest management plans, FSC certification and training. They can now evolve their organisation to build the business skills and income generation capacities of forestry communities by hiring a development entrepreneur, skilled in business and committed to work for the benefit of communities.

To attract the best candidate, FPCD will need to avoid the trap of supporting existing forestry staff in a new project and look outside the organisation, taking into consideration the following:

- A high level of remuneration that includes health, housing in Madang and a vehicle.
- Initial two year contract, with option to extend if progress can be demonstrated.
- Setting a focused goal of working with communities to substantially increase production and income within the community's forest management plan and letting the business development professional define how this will be achieved.
- Monthly short reporting to monitor progress e.g. number of engagements with communities, actions to increase production via 4WD tractor / trailer or other combination etc.
- FPCD, in liaison with the donor, to consider terminating contract if good progress cannot be demonstrated and / or the motivation, spirit is lacking after the first 6-9 months, and progressively.

Finding the right 'development entrepreneurs' committed to business development in the interest of communities could take up to 12 months to locate, contract and begin work.

Recommendation 2: Mechanisation to increase green board production

Forestry is a low value, high volume game. Without some mechanisation, community operated portable sawmills will in most instances be 'turned on and off' when there is a cash requirement.

Communities have indicated that the most powerful intervention FPCD can offer is a 4WD tractor with trailer. This can be used to:

- Move the mill intact, saving valuable time and the energy of four men needed to breakdown, move and re-assemble the mill close to felled logs – a considerable saving in time and energy.
- Drag felled logs to a central point where the mill is located – saving in time and human effort in manually levering logs into position for milling
- Transport boards from the portable mill location to a roadside for truck pick up. During the wet season, boards could be transported along muddy trucks to a point accessible by a 4WD truck. No more manual transporting of boards by people or buffalo would be needed.

The community may also gain considerable benefit from using the tractor to plow agricultural fields, move materials around the village etc.

Communities indicated that with a 4WD tractor / trailer combination, production could increase to up to two cubic metres per day. Equally, by reducing the physicality of the work, it may improve the motivation to work, generate more income and perhaps some clans may then wish to explore the greater business potential of 'wokabaut somils'.

It is important to note that there was no pressing requirement for a truck. Communities indicated that a range of trucks could be hired, with a driver on a daily basis. The limiting factor was the wet season creating inaccessible roads and tracks. A 4WD tractor / trailer combination could move boards to accessible roads during the wet season, allowing communities to sell boards and generate cash year round.

There was confidence that tractor drivers could be located in the larger towns and servicing and repairs would be available.

FPCD's Business Development Manager would take responsibility for coordinating with communities for use of the tractor for a defined time and purpose, and a community would pay (potentially in kind or by deferred payment) for the use of the tractor e.g. to move green boards. The Business Development Manager would organise a tractor driver, or preferably take the initiative and learn themselve how to operate a 4WD tractor.

Additionally, they would actively offer a range of business development services focused on growing the communities' income, skills and confidence.

Recommendation 3: A commercial / donor partnership

The best prospect of acquiring a 4WD tractor with trailer is to attract an investor from the PNG forestry sector. In the recent past, a number of PNG saw millers have expressed interest in buying regular quantities of green boards from communities. For example, one saw miller suggested they would consider acquiring a coastal barge to support transport of timber from communities interested to supply that sawmill.

A PNG champion could assist in the approach to specified saw millers. For example, Rob de Fegely, former Chairman of Cloudy Bay Timbers and now President, Institute of Foresters of Australia has a strong interest in supporting forestry communities in PNG and has good connections to saw millers, who may be interested in this arrangement.

The saw miller interested in increasing their supply could be approached to offer, in kind, a 4WD tractor and driver (or similar) to communities in the Madang region for a one year trial. The communities could assist with contributions to the payment of the driver and fuel.

The conditions for offering this machinery and driver to interested communities for defined short periods include:

- Ownership remains vested with the saw miller, responsible for the maintenance, care and repair of the tractor (or like).
- The cost of operating the tractor (operator, fuel, oil etc.) would be borne by the community and the saw miller.
- The tractor would be offered to each of FPCDs seven communities for short, specified periods during the initial year e.g. three times per year for three days
- The saw miller would be the buyer of the green boards, priced at a slight discount.

The saw miller is both the 'investor' and buyer of the communities' timber. This model lowers the investment threshold because no transfer of funds is required, an existing machinery asset can be utilised and the saw miller has first right to purchase the green boards.

To make this trial work, it is vital that the saw miller views this project as an experiment to unblock the factor, mechanisation, which is inhibiting increased production. The saw miller needs to enter into such an arrangement with an open mind. It will not work if it is viewed purely as a commercial arrangement. If the trial proves successful, trust increases between the saw miller and FPCD, and there is the potential to expand this arrangement.

Concurrently, the FPCD can prepare a funding proposal to a donor to secure the funds to support a Business Development Manager for a 3-year trial period. Securing the interest of a saw miller to provide a tractor in kind would help in attracting the interest of a donor to support a Business Development Manager.

This tri-partite arrangement, with FPCD placed at the centre, could achieve a number of valuable outcomes.

- Spreads the risk between the three parties (saw miller, FPCD & donor)
- Mechanisation unblocks the primary constraint on production among communities
- The saw miller's investment is existing machinery and contribution to running costs
- The Business Development Manager has a platform to assist communities to ramp up production and transfer vital business development and management skills.

Conclusion: Local Leadership, Passion and Ambiguity

Development proceeds mostly in an incremental, step wise fashion.

Development effectiveness relies on local development entrepreneurs, in this instance locals with passion to improve the livelihood of forestry communities.

Because forest enterprises often can take between three and five decades to become viable, even with the assistance of NGOs and the like, long term commitment is needed from NGOs and donors.

This study attempts to find viable shortcuts to the long duration of this development process.

It suggests there is an opportunity for the Foundation for People and Community Development to evolve beyond providing forestry and technical services. After more than 20 years working with community forest enterprises, the FPCD has the required trust and access to now offer communities business development services, skills and enthusiasm to grow their milling operation.

This study confirms previous findings from the field that community portable sawmilling operations are used largely when cash is required. The arduous nature of the work, topography, tropical weather and limited, if any, proper footwear and protective equipment are significant disincentives for anyone, including the exceptionally strong Papua New Guinean men, from operating a portable mill.

Wood products are low in value. Volume is required and hence mechanisation is needed to increase output, reduce the burdens and improve livelihoods from higher income. This can occur comfortably within the ecological sustainability principles of a community's Forest Management Plan.

Investing in the search for the right high performance business development person with the motivation, skills and passion to assist communities has the potential to be a worthy investment.