Australian Government
Australian Centre for International Agricultural Research

Final Report

project

Facilitating the establishment of charcoal producer groups in Papua New Guinea

project number	FST/2011/058
date published	28 September 2013
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final report number	FR2014-07
ISBN	978 1 925133 13 4
published by	ACIAR GPO Box 1571 Canberra ACT 2601 Australia

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1 Acknowledgments

The authors acknowledge and are very grateful to the following people:

- Natalie Moxham of *Clear Horizon* (http://clearhorizon.com.au/) who assisted in the development of the program logic followed.
- Gabriel Iso of *Results PNG* who lead the community development and micro-business training workshops.
- Agnes Sumareke and Maman Tavune, FRI foresters who led the training of Short Rotation Coppice species nursery techniques.
- Rob M. Brook, University of Bangor UK, as primary supervisor of Ben Robinson who used the survey work in this project as his Masters project.

Acronyms used in this report

ATCDI	Appropriate Technology and Community Development Institute
CBO	Community Based Organisations
EU	European Union
FRI	Forest Research Institute
ILG	Integrated Land Group
IPA	Investment Promotion Authority
KCG	Komani Clan Group
MYG	Muddy Youth Group
NARI	National Agricultural Research Institute
NCD	National Capital District
NGO	Non Government Organisation
PARD	Peoples Action for Rural Development
PGK	Papua New Guinea Kina
PNGFA	Papua New Guinea Forest Authority
SME	Small and/or Medium Enterprise
SSI	Semi Structured Interview
SRC	Short Rotation Coppicing
TOT	Transfer Of Technology
VWBP	Village Women's Banking Program

2 Executive summary

Charcoal is not widely used in PNG but it offers a healthy smoke-free alternative to fuelwood and an opportunity for small business in the forestry sector. The goal of this small research activity was understand the structures and processes required to facilitate the establishment of effective and sustainable charcoal producer groups. It sought to establish charcoal producer-vendor groups in Mt Hagen and Lae in an effort to understand appropriate collective small-business structures for this sector.

It employed action research methods and participative community engagement over an 18 month period facilitating the establishment of 2 producer groups in Mt Hagen and 7 in Lae. Participants also engaged in training activities of small business planning, charcoal production, charcoal stove construction and nursery techniques of short-rotation coppicing fuelwood species suitable for charcoal production.

There was a parallel survey to discover what models of collective engagement are current and feasible in PNG. This activity entailed 41 semi-structured interviews with individuals involved in community and rural development with particular focus on group business and community forestry. Interviews were completed in Mt. Hagen, Lae and Port Moresby and the majority of interviewees were employed by government departments, independent NGOs, private businesses or academia.

From the community engagement and training it was learnt there is no one-size-fits-all model for collective business structures. In Mt Hagen, the household-level "Lead Charcoal Producer" was found to be the best way to facilitate successful charcoal businesses. In contrast, the experiment in Lae resulted in a socially broader-based "Charcoal Wantok Group" consisting of several distinct smaller business entities. This model is similar to that from the Investment Promotion Authority Group Business Model.

In both locations producer groups needed access to micro-financing to establish themselves. It was also found that charcoal production and sales cannot be separated from production and sales of charcoal stoves, and persistent demonstration of the value of charcoal use in the market place. Training in all aspects of the charcoal value chain is necessary as is the involvement of entrepreneurs in the development of their own business plans. The 18 months of engagement and monitoring followed in this project is probably a bare minimum period for this kind of work.

Some specific recommendations for future action are:

1. Further low level monitoring of progress of the charcoal groups to identify the characteristics of longer term business sustainability;
2. Further study of the Lae groups, involving personal and social profiling of successful groups and choice modelling of energy products, should be undertaken before attempting to facilitate similar groups in NCD;
3. Establishing a sustained and long term charcoal awareness program, ideally under the office of FRI or NARI;
4. Transfer of knowledge and institutional capacity developed in this project into cognate ACIAR projects in PNG, such as the new Community Forestry project.

There is also a series of general recommendations for facilitating small businesses associated with forestry and other natural resource management under the categories of: business mentality, traditional structures, land tenure, gender, church, governance, extension, capacity and participation.

3 Introduction

This Small Research Activity follows on from the ACIAR Project "Promoting Diverse Fuelwood Production Systems in PNG" (FST/2006/088). The 4-year Fuelwood Project yielded these outcomes: a survey of fuelwood-stress regions quantifying the importance of fuelwood in both urban and rural populations; appropriate species and silviculture for short-rotation coppicing (SRC) fuelwood production systems; information on the burning quality of candidate fuelwood species and charcoals produced from these species; user-acceptance information of candidate fuelwoods and production systems; a platform for the dissemination of fuelwood information; training of key agency and NGO personnel in charcoal production.

An important realisation from the Fuelwood Project was that it may not be feasible to grow SRC fuelwood just to sell it directly as fuelwood. The fuelwood does not look like conventionally collected fuelwood so there is a natural consumer resistance to the product. This is despite the fact that its burning characteristics were generally as good as normal fuelwood. In the course of the extension activity associated with this project, we demonstrated the use of charcoal stoves at the Highlands Cultural Show (Mt Hagen) and the Morobe Agricultural and Cultural Show (Lae). The charcoal stoves were received very positively with many requests for purchase. The response was highly encouraging and was the genesis of this Small Research Activity.

Charcoal is not widely used in PNG. There was an attempt in the 1980s to introduce charcoal into the domestic energy economy in Port Moresby. However this failed apparently due to the unreliability of charcoal supply and inadequacy of extension processes (Gamser et al. 1983). Currently there are a few scattered charcoal producers (e.g. around Lae) who produce it irregularly for a very small group of customers who are familiar with its use (e.g Asian ex-pats). Charcoal production is an enterprise which will be very difficult for a sole-operator. It involves requiring access to land and trees, the ability to harvest wood and process charcoal, the resources to package, transport, and market the product. It also requires ancillary support of charcoal stoves for sale and provision of knowledge of how to use them. It is likely to only succeed as a group enterprise.

As ACIAR begins to invest in Community Forestry in PNG it is important to understand the best processes and structures for engaging community and facilitating community managed small businesses. It is fair to say that it is difficult to work with communities in PNG. About 97% of the land is under customary tenure, and even when this tenure is not contested it is not always easy to get the collective ownership to agree to its use; especially when that use extends beyond traditional practices.

The **aim of this Small Research Activity** was to facilitate the establishment of small community-based enterprises around charcoal. In so doing, we have learnt much about the structures and processes required to establish small community-based enterprises in the forestry sector.

This structure of this report is as follows. Section 4 outlines the logic, vision and methods followed in the project. This project followed an action research process which incorporated participative engagement with community groups to develop and implement charcoal business plans. The exercise was 'seeded' with a vision of what a community based charcoal enterprise may look like. The exercise was supported by a survey of appropriate business structures, and training in business planning and charcoal production.

Section 5 presents the results of the survey of appropriate structures and process in community enterprises in PNG undertaken by Ben Robinson.

Section 6 presents the training and community development activity organised largely by Jessie Abiuda-Mitir, with workshops led by Gabriel Iso. There was training in community development, developing business plans for micro enterprise, charcoal production, nursery techniques for SRC fuelwood species, constructing charcoal stoves

Section 7 reports on the process of developing and testing charcoal business models at the Mt Hagen and Lae sites. Randall Manapangkec was the key facilitator at Mt Hagen while Jessie Abiuda-Mitir facilitated the Lae groups.

Section 8 reports activity and lessons learnt from the microfinance work with charcoal producer groups at Mt Hagen overseen by Joseph Pumai.

Section 9 is a review and overarching evaluation of all project activity. It assesses the extent to which the project logic was followed, and reasons for divergence, and the extent to which the project vision matches reality. The success of this project is not in the extent to which vision matches reality, but on the basis of what has been learnt from this exercise.

These lessons are then summarised Section 10 along with recommendations for further work.

4 Project logic, vision and methods

4.1 Project logic

The overarching goal of this project was to understand the structures and processes required to facilitate the establishment of effective and sustainable charcoal producer groups in Mt Hagen and Lae. This knowledge will be developed by monitoring the process of establishing charcoal producer groups to the point of independent viability a year after establishment. To the extent that the groups are not successfully established, the project highlights the factors or activities that impede this development.

The Objectives presented here generally follow the program logic illustrated in Appendix 2, and expressed here as in the project proposal

4.1.1 Objectives and activities

Objective 1: To establish two charcoal groups that can operate profitably, ethically and with good community development practice

This is the primary objective to which other objectives are sub-ordinate. Specific tasks relating only to this objective are:

- Activity 3.2.1 ***Action Research Meetings***. Action research methods ensure flexibility and ability to adapt other activities in and uncertain environment
- Activity 3.2.5 ***Field staff attracts and initiate charcoal producer groups.*** It is important to get the right participants. So this activity will require prior training and a critical appraisal of potential participants.
- Activity 3.2.8 ***Regular meetings with charcoal groups.*** The project will support the group with partial financial subsidy as the group enters the charcoal marketplace. The project will also provide technical support and facilitate group decision making through this 6 month period.
- Activity 3.2.4 ***Community Development Training.*** The field staff will undergo training in participative community development processes
- Activity 3.2.7 ***Training charcoal producer-vendor groups***. The group members will receive training in how to make charcoal, how to grow firewood (for charcoal production) in short-rotation coppicing systems, and if necessary small business management skills.

Objective 2: To generate and share knowledge about community enterprise models within PNG

In the process of gathering and assimilating knowledge about community models that already exist in PNG the project can inform relevant actors in this and other projects that may have an interest in the project outcome. This objective is specifically met by these activities:

- Activity 3.2.1 ***Action Research Meetings # 2 and #5.*** In these meetings some key stakeholders in community forestry will be invited to attend.
- Activity 3.2.2 ***Developing the business model for charcoal producer-vendor groups.*** This is a desktop activity using information from the Fuelwood Project and other contextual and commercial details to be gathered.
- Activity 3.2.3 ***Semi-Structured Interviews of stakeholders***. This is a survey to record what is already known and attitudes to community cooperatives in PNG

Objective 3: To monitor groups' progress for adaptive management and final evaluation of success.

Once the charcoal groups are established their activity needs to be monitored so

- Activity 3.2.6 ***Developing monitoring format for field staff***. This is done in parallel with the participatory design of each charcoal groups operating structure (Activity 3.2.5).
- Activity 3.2.9 ***Field staff monitors charcoal groups***. This is done in parallel with the regular workshops with the producer groups (Activity 3.2.8).
- Activity 3.2.10 ***Evaluation***. This will occur immediately at the end of the trial period of 6 months group operation and later after 6 months of unsupported operation.

4.1.2 The Vision

The core elements of a successful charcoal producer-vendor group are:

1. It is producing and selling charcoal on a regular basis;
2. It has a management structure that efficiently and equitably distributes profits generated from the business;
3. It is likely to remain in business well beyond project closure.

These are the measures against which the success of a group should be measured. The following 'vision' of a charcoal producer-vendor group (Box 1) was developed to guide the project team and participants. Figure 1 is a graphic representation of the vision. The success of the group should not necessarily be measured against the extent to which it matches this vision.

Box 1 The Vision of Charcoal Producer-Vendor Groups

1. There will be a permanent selling point, staffed daily, in the central market.

On sale will be:

food cooked on a charcoal stove	= Demonstration business
bagged charcoal	= Core business
charcoal stoves	= Support business

2. Members will be involved with some or all of the following activities:

- growing SRC fuelwood (at beginning the group will also use collected fuelwood, but ideally there will be a commitment to grow SRC wood if the member has the land)
- making and bagging charcoal
- transporting charcoal to central market
- staffing the central sales point
- making charcoal stoves
- keeping records and other self-management activities

3. Members must buy into the group so there is proper ownership and commitment.

- Buying into the group will be facilitated through micro-credit facilities.
- Members can determine their level of involvement which will be reflected in the income and other benefits they receive.

4. The group should be structured so that members are truly working co-operatively and not competitively.

- How this structure emerges must come from the founding members themselves in a facilitated process of participatory design.

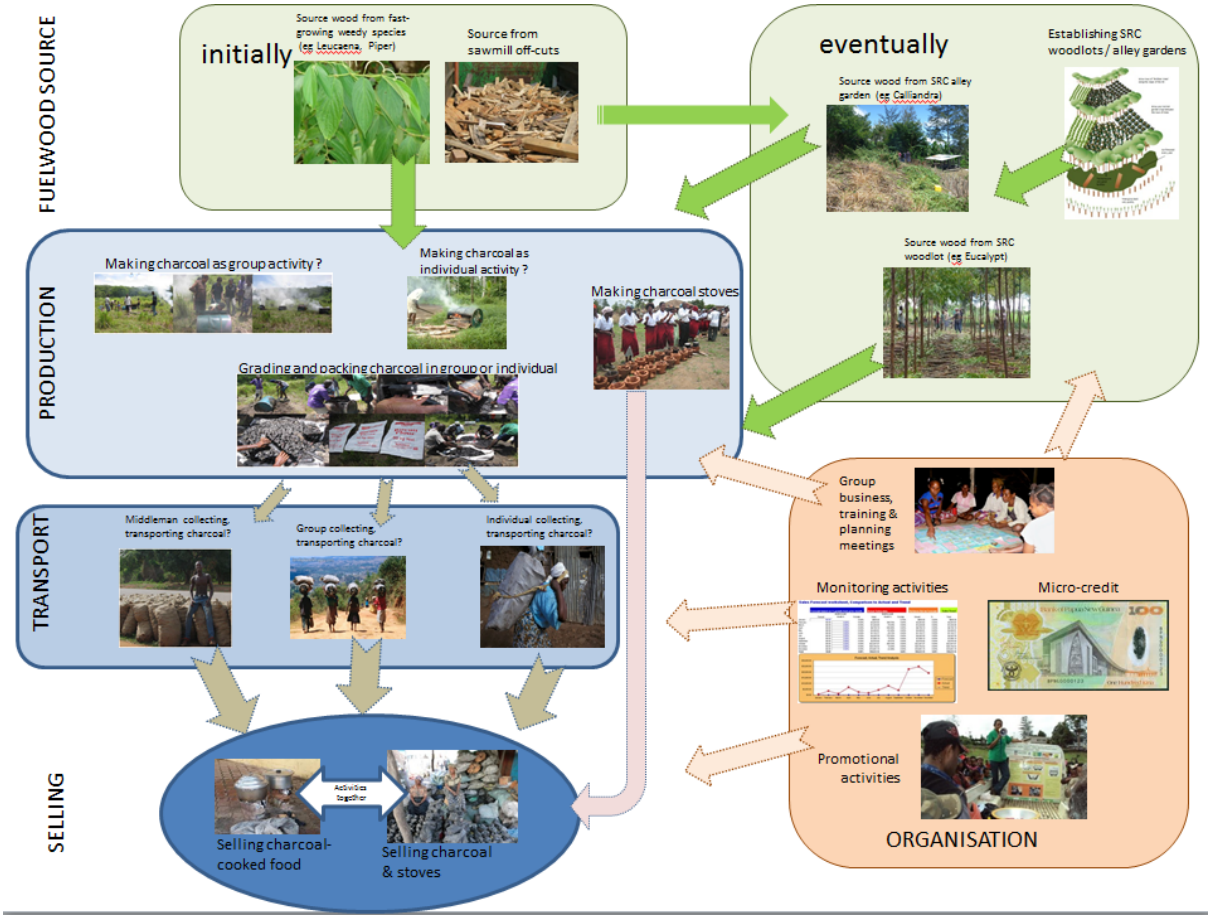


Figure 1 Potential charcoal producer-vendor system (ref: 2012_2)

4.2 Methods

The project followed an action research framework, within which were:

1. cycles of project team action research planning;
2. cycles of participatory engagement with producer groups which involved monitoring and adaptive management;
3. detailed survey of stakeholder views on appropriate models for engaging small business in PNG;
4. training and community development activities;
5. developing a charcoal business model;
6. evaluation.

The actual methods followed are detailed as part of the deliberations in following chapters. This section briefly describes in essence how these activities were carried out. As activity groups 3, 4 and 5 above relate to project outputs, the results of those activities are described in Chapters 5, 6 and 7 respectively. An overall review and evaluation of all project activity is given in Chapter 9.

4.2.1 Action Research meetings

The project was driven by a sequence of 4 team meetings (not 5 as originally planned) following action research principles. The deviation from plan occurred because Jessie

was on compassionate leave all of June 2012 and her project activities started later than scheduled. The preliminary meeting started later than scheduled while all meetings were rescheduled in the Action Plan and were not as scheduled in the Gantt chart. The approach followed the action research method and was flexible.

1 Preliminary team meeting

The preliminary team meeting at FRI on 31/05/2012 allowed all partners to go through the project objectives and deliverables and plan activities. During the meeting the team developed its Action Plan, selection criteria to engage charcoal producer groups, and a monitoring form to assist field staff to monitor producer groups. (refs 2012_3, 2012_4, 2012_8)

2 Reflection and learning meeting with broader actors

Engagement with stakeholders such as PNGFRI, ATCDI, and PNG Biomass project, Lae City Authority was through presentations and individual meetings. The engagement with stakeholders at Mt Hagen was more of the nature of discussions with fuelwood vendors. The specific engagements at Lae were:

Community Groups

Ten different community, family and clan groups in Lae shared their experiences on other agricultural businesses, their success and failures were willing to undertake trainings under the charcoal project to venture in to charcoal production business. (ref 2012_14)

PNG Forest Authority

The project received technical assistance from PNGFRI through SRC nursery techniques (Fuelwood project scientists), seed supply (National Tree Seed Centre - NTSC), *E.pellita* wood billets (NTSC), sawdust (Umi Forestry Station).

Appropriate Technology and Community Development Institute

The project purchased charcoal stoves and manuals on charcoal and charcoal stove production, stove making mould and borrowed literature on fuelwood from their library.

PNG Biomass Project

Jessie met with Deputy Biomass Project Team Lead at Oil Search Ltd (PNG) Francis Kabano and PNG Biomass Project General Manager Sustainability, Michael Henson and discussed potential fuelwood and biomass establishment in Morobe Province and the prospect of sharing information. The PNG Biomass Project is a joint venture between Oil Search Limited and Aligned Energy Limited. The project has planted about 50, 000 fuelwood trees in the Markham valley.

Lae City Authority

A formal letter was sent to the Lae City Authority Manager Nick Kuman regarding the project activities and the potential of setting up market spot at the Lae Main Market. Jessie followed up and was informed that the letter was approved and sent down to the market coordinator, however there was no response. Jessie followed up with Lae Main Market vendors and was told that she could approach the Market councilor and request space on a daily business and be charged a fee between K3.00/day to K15.00/week depending on the type of product sold. (ref 2012_15)

3 Meeting before the producer groups start

The second project team meeting was held in Mt Hagen on 1/08/2012. The purpose of this meeting was to reflect on the preliminary action plan, the recent activities undertaken by the project officers in their locale, discuss progress and setbacks, provide solutions and take action.

The meeting reviewed the status of activities since the inception meeting in June 2012 which included charcoal training, business training, stove construction training and SRC training; Action Plan and objectives of the project, the consultation of Gabriel Iso of Result PNG and Budget

4 Mid-term meeting

The third action research meeting was held in Lae on the 19/12/ 2012. The purpose of the meeting was to reflect on the project review and discuss the progress and setbacks on activities in both Mt Hagen and Lae. (ref: 2012_24)

This included:

1. Brian's visit and review form
2. Comparison of the steps taken to attract groups in Mt Hagen and Lae.
3. Completed versions of Monitoring Form
4. Improving Your Business training.
5. Improving the Business Model;
6. Stove construction training;
7. Improving the Monitoring form
8. Gabi's involvement re improve your business
9. Ian's review form including 27 questions
10. Future Reports

5 End meeting

The fourth action research meeting was held in Lae at the PNG Forest Research Institute on the 28/06/2013. The meeting included Lae community groups who discussed issues about charcoal production and the opportunities for their sustainability through appropriate schemes and linkages after the project life. This included:

1. Review of trainings
2. Charcoal production and sales
3. Stove construction and sales
4. SRC training,
5. Market spots; and
6. Micro financing
7. Sustainability of the charcoal business

4.2.2 Engagement with producer groups

Field staff attract and initiate charcoal producer-vendor groups

After the relevant training the field staff determined the most appropriate strategy for attracting potential participants, either as individuals or existing groups. This could be in public displays of charcoal use, church meetings, individual discussion, print and broadcast media; whatever is appropriate for the local context.

It was vitally important to attract the right participants. The 'wrong' participants are those who are linked to the field NGOs by clan or family relations, or expect to get project handouts à la 'cargo cult'. It would be too much to expect a group of unrelated individuals to come together in a group that requires trust, long-term commitment, accountability and

mutual responsibility. So the focus was on attracting existing groups which exhibit cohesion and, ideally, responsible governance.

Once a group had agreed with the idea, its 'initiation' proceeds with a facilitated workshop where the business model was presented and then the group determined the business structure that suits them. Associated with this activity was the arrangement of micro-credit loan opportunities. This was supposed to happen in both Mt Hagen and Lae, but eventually only occurred in Mt Hagen.

The project also primed the groups' activity with some initial basic funding; e.g. initial charcoal kilns and stoves.

Regular meetings and monitoring of charcoal producer-vendor groups

Once the groups were established field staff regularly met with them to discuss progress. The role of the staff member must always remain that of a facilitator of group decision-making, not that of a director or source of extra money.

The process of how the progress of the charcoal producer-vendor groups was monitored as part of the participative design process

4.2.3 Developing a charcoal business model

The development of the charcoal business model was initiated on the vision expressed in Box 1. The aim for the project was determining a fair market price for charcoal given the labour and costs in its production and transport.

A framework the charcoal business model was developed at a project team training workshops led by consultant Gabriel Iso. The Mt Hagen training was held from 6 – 10th August 2012 at the Lutheran Guest House, while the Lae training was held at the PNG Forest Research Institute from 3 – 7th September 2012.

Some of the primary information for this activity was extracted from the Fuelwood Project (FST/2006/088). However, further specific contextual and commercial information was gathered by the teams at both sites. This information was used as a basis for working with candidate producer groups.

4.2.4 Training and Community development.

As the field staff needed to attract, engage, and eventually support and monitor the charcoal producer-vendor groups, they themselves needed training in participatory community development. The report of this activity in Section 6.1 indicates that this training was not as successful as it could have been.

Nevertheless the field staff did recognise and follow the fundamental processes of participative community development. As expected the structures of the Mt Hagen and Lae groups were very different; reflecting cultural, social and commercial differences between the regions. The participative process of engagement ensured that group members truly own and were responsible to their group.

Training charcoal producer-vendor groups

The participating group members needed small-business skills such as bookkeeping and marketing, and sales point service. This training was delivered by Gabrial Iso (Section 6.2).

The key team members from PARD and FRI have already been trained in the process of charcoal production as part of the Fuelwood Project. They applied these skills in training the members of the charcoal producer-vendor groups (Section 6.3). They also provided information on the silviculture of short-rotation coppicing systems as developed in the Fuelwood Project (FST/2006/088). The field staff also assisted group members in the growing of fuelwood seedlings and their establishment in SRC systems (Section 6.4).

4.2.5 Semi-Structured Interviews of stakeholders

This was a foundation activity to understand what is actually known and what attitudes surround the concept of community cooperatives in PNG. One problem of the Fuelwood Project was that, despite the best intentions to engage community groups, especially those with women ownership, all participating landholders were individual men. This may be an intractable feature of PNG culture or it may just be that the conventional approach to attracting participants and engaging landholders is wrong.

This process of Semi-Structured Interviews (SSIs) explored what community models are already working and are culturally appropriate. Could it be community cooperatives, large cooperatives (coffee model), church groups, women's groups, individual family enterprises, NGO enterprises? How did these models arise? What formal or informal support exists for community groups, especially in small business? What structural and cultural impediments are there to establishing community-based, small-business groups or 'social enterprises'? The SSIs were requested from individuals in public service, politics, academia and research, NGOs, business and community development sectors.

The SSIs (reported in Chapter 5) were undertaken by Ben Robinson, a student in the Masters of Environmental Forestry from University of Bangor, UK, under the co-supervision of Dr IK Nuberg (University of Adelaide) and Dr RM Brook (University of Bangor).

4.2.6 Evaluation

There were two periods of evaluation:

1] Immediately at the end of the trial period (December 2012). This evaluation based on the data collected during the monitoring period was undertaken by Brian Gunn. It is reported in document ref: 2012_26.

2] About 6 months after the trial period (June 2013). This is dealt with in Chapter 9.

5 How to engage small charcoal business in PNG

Ben Robinson

Adapted from Ref: 2012_13

This report summarises the research, analysis and conclusions made from a study completed in May-July 2012 into appropriate structures and process in community enterprises in PNG. Its aim was to inform the partners so their activity will have wider relevance and impact on the development community of PNG. While business group structures and process were the main focus of the data collection, research was completed into the factors and enablers of successful community business enterprise. This was completed in order to inform the project and the research and interested stakeholders in the findings so that a more realistic and applicable model could be formed.

5.1 Data Pool Characteristics

In total 41 semi-structured interviews were completed with individuals involved in community and rural development with particular focus on group business and community forestry. Interviews were completed in Mt. Hagen, Lae and Port Moresby and the majority of interviewees were employed by government departments, independent NGOs, private businesses or were academics. The following charts illustrate the breakdown in make-up and characteristics of all those interviewed as part of the study.

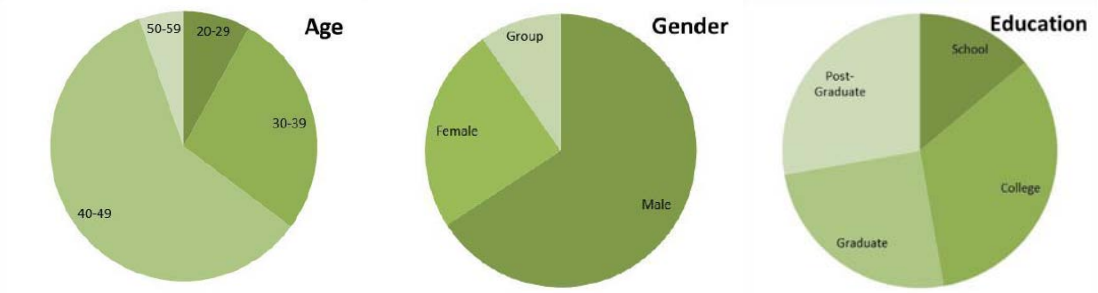


Figure 2 Age, gender and education characteristics of interviewees

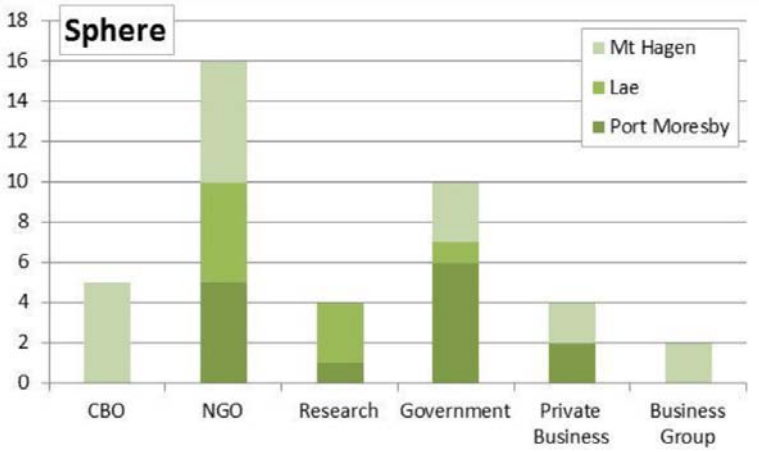


Figure 3 Sphere of engagement of interviewees

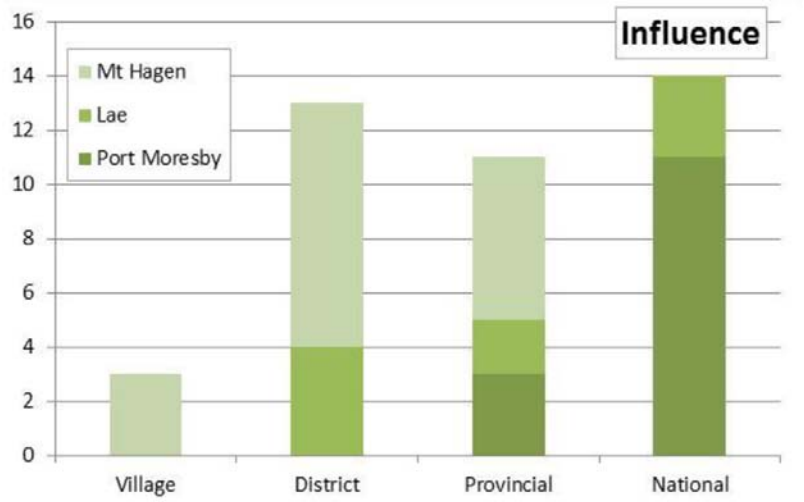


Figure 4 Area of influence of interviewees

Sphere refers to occupation or area of work with relation to community and rural development, whereas **Experience** is the level and scale of exposure in terms of individual lifetime field or theoretical experience.

5.2 Key Findings

Key areas of interest were subject to identification and analysis throughout the research and the following findings are arranged and addressed in this thematic way so that different issues and factors can be fully understood and discussed. Figure 5 outlines these themes and the regularity and location with which they were discussed. It should be noted whilst there is considerable variance in location this is due to a number of factors particularly interview technique and interviewee knowledge.

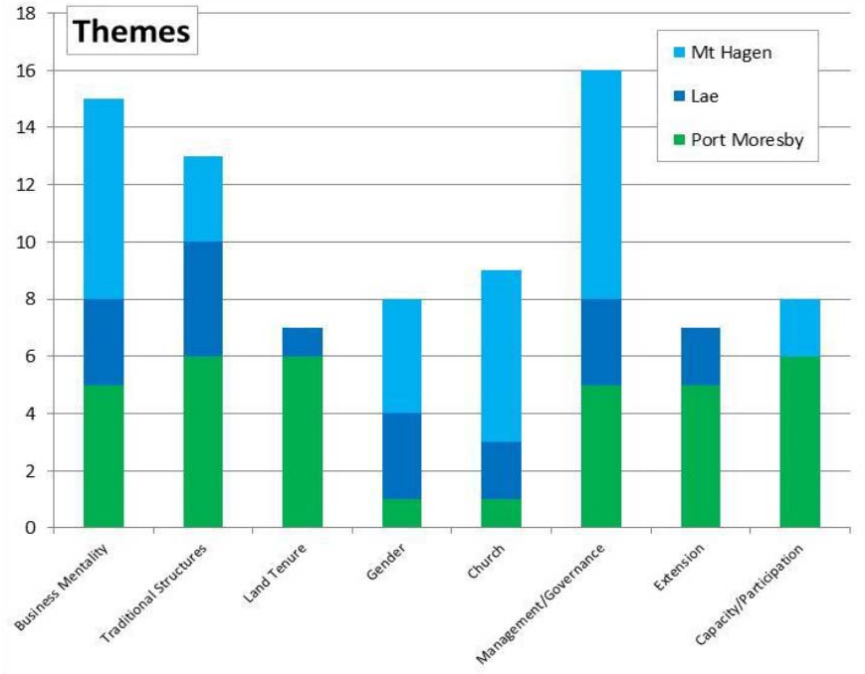


Figure 5 Themes of interest expressed in interviews

1. Business Mentality

An individual mentality towards business is appearing to strengthen as the economy grows, limiting the capacity for communal business enterprises. The increased mobility and access of money to individuals has led to deterioration in community living. However the number of registered interest groups and Associations are rising as people become more empowered to become involved in local and national issues indicating a willingness and capacity for cooperation.

People are reluctant to take out group loans because of the possibility of one person taking ownership of a project or finances (often through land tenure) which creates conflict and jealousy within a community. Also the risk of one member not meeting the repayments affects the other. Success is being found in individual loans being taken out and then informally underwritten by family members and friends through association in times of hardship and delayed repayment.

A reliance on customary land and Wantoks leads to a subsistence approach to business and an ethos of expected receivership can lead to lethargy in entrepreneurship. As status and material wealth is often more important than business success, annual profit is rarely reinvested into business development and spent in the community instead, which whilst not ideal can lead to an informal form of community development. The delay in profit from forestry business can be a major limiting factor in promotion within a subsistence economy.

2. Traditional Structures

Families are long-standing stable structures of power and decision-making with a clear hierarchy and division of labour. They are particularly favoured by government extension services however development in this area is often not promoted by donors as it theoretically limits ‘community’ benefits. Projects within traditional clan structures can bring a conflict of interest to business, as in strong social obligations can distract individuals however the system can also be used as a form leverage. The Wantok system puts considerable strain on new business enterprises and development projects but it is an informal form of wealth distribution and development within a closed group. Whilst Wantoks may be entitled to a share of financial revenue, clear separation of family and business finances does allow the business to function independently of Wantoks and subsequently survive.

Trust is an issue outside of the family sphere especially when in financial dealings. Inter-clan alliances can be difficult to facilitate effectively as jealousy and rivalry, particularly within governance structures can often lead to instability and breakdown. Village and church associations offer wider community integration whilst retaining spheres of trust, however these groups are less stable and often located within existing traditional clan structures.

3. Land Tenure

Land tenure is the most important determining factor in governance, structure and process in any business or project. Using the Integrated Land Group (ILG) approach and registering system is successful in mobilising and organising clans in realising benefits of development when land is a component. The successful organisation of operations, management and distribution of revenue becomes more difficult with a greater number of clans and land rights involved in a group.

This form of organisation is the most commonly used in natural and plantation Community Forestry projects. Clans typically own tracts of forest while in contrast gardens or tree crops usually fall under nuclear family or individual ownership. However the land is still threatened by neighbours and other Wantoks encroaching on land to maximise income.

This is particularly a problem when sustainable forest management techniques are being used.

4. Gender

PNG society is male dominated in most areas and women remain under their shadow. The drive for gender 'equality' is being stimulated by donor agencies and is not being met by communities. Changes in gender dynamics will take a long time to occur effectively and women continue to face many barriers in business and society involvement and decision making.

Differences in matrilineal and patrilineal communal structures in different regions of PNG affect gender involvement in community decision making and governance. Women are traditionally the money regulators at a family level throughout PNG and this can be applied to a business model. Women generally offer a more communal and long term focus to business and financial management when compared to men who are more interested in socialising and gaining status through showing wealth. Self-governing women's groups have become effective ways of introducing development programmes and ideas, and are now favoured as the most stable avenues into a community.

5. Church

The Christian church is widespread in many different denominations. Nevertheless, the whole system retains an ethos of trust, belief and faith. This is practiced through charity and development through the responsible use of money because of the threat of sin and this reflecting badly on the community or individual. Members are also held by the ideas of fate, guilt and not being able to leave the church forcing people to be responsible.

Church committees already have an established governance structure through the pastor, elders, treasurer as well interest representatives (e.g. women and youth). Many deliver programmes and projects however this development is done through principles of goodwill and faith. Business enterprise principles are generally not operating.

6. Management and Governance

Governance strategy is localised to exposure with a lot of Papua New Guineans having a different understanding of what business really is. Many focus on the subsistence business mentality identified earlier. The majority of business failures are due to either poor leadership or poor accounting leading to a breakdown in trust and empowerment of other individuals.

Many businesses are dominated by one individual, or Big Man, which can be effective or devastating depending on the individual. A big problem experienced in business groups is with executives playing the role of both the board and management which leads to autocracy. A division of labour is an effective tool for enabling the sharing of knowledge and power within a business group.

7. Extension

A lack of available and effective government extension services following Independence continues today. A lack of assistance when it is really needed has led to a disenfranchised community not willing to risk or develop. This has also lead to a shift in power and responsibility to NGOs which now deliver most of the successful development programmes. However a culture of teaching and paternal implementation rather than empowerment and facilitation has led to a dependency on extension assistance.

Many donors or extension services have their own timescales and agendas which do not match with the communities. An effective extension program should cater for the extensionist to live on site during programme and be available and out of hours questioning. This approach for stops the 'outsider' problem and is a method increasingly

used in development program implementation. It allows extension services to fully evaluate needs and strategy whilst building trust and allowing a full transfer of knowledge.

8. Capacity/Participation

Capacity and participation is one of the greatest limiting factors in mobilising communities and the long term success of a project or business. Individual capacity is determined by education, exposure, ownership, priorities/interests, family obligations and capital, whilst group capacity is enabled through good trust leadership, governance, participation. Whilst many Papua New Guineans have the potential and capacity to participate, a culture of dependency and apathy has hampered development. This, like gender, will have to be facilitated over a long period of time to ensure its success.

5.3 Recommendations

Whilst these recommendations and the following suggested community business models are practically applicable, each situation in Papua New Guinea is unique and essentially no broad conclusions can be drawn.

1. Business Mentality - People need education in how to share risk as well as profit. The recognition of difference between revenue and profit and an ethos of reinvestment must be instilled in business members. This can be achieved through basic business education, such as book keeping and break even projections and through communal enterprise which attempts to check an individual mentality.

2. Traditional Structures - Use existing groups to introduce and facilitate projects as these are existing stable regimes of structure and governance. Family groups are strong established structures however groups outside the family structure (but within the clan/tribe) should also work well. Wantok members, not involved in the business, must be educated in what is common property and what is business property to overcome the exploitation of business resources and revenue.

3. Land Tenure - Where necessary the groups must recognise that the whole clan has rights to resource regardless of business requirement. Ideally a project should keep the number of clans within a single group or association low to minimise conflict. However this raises the questions of: 1] whether focussing on select groups is really *community* development; and 2] how do we bring large areas of continuous forest together?

4. Gender – Allow gender equality to develop over a long time in the communities own time so that it is truly realised. A clear division of labour ensures one gender or individual does not dominate. Women could be placed in positions of importance and influence, such as treasurer and secretary whilst retaining the traditional male domination.

5. Church - The church should be used as a vehicle for development but not a base for business practice as this alienates other community members outside of these spheres as well as threatening the strength of the societal value of faith structures within the community. The structural approach to management used by the church can be used as a model for governance.

6. Governance - The executive board must be separate from management structure and oversee the day to running of the project. This breaks up the decision making process and puts checks in place. Governance must be focused on key values of transparency, openness, free, prior, informed consent outlined in a commonly agreed constitution.

7. Extension - Work to timescale of the community not the NGO or donor agency. Conflicting obligations of community members does not necessarily indicate a lack of interest. If possible spend a considerable amount of time with the project stakeholders to build up trust and transfer skills and marry objective completion with staged donor payments.

8. Capacity/Participation - Personal membership fees for those involved in business or project puts a financial check on involvement and ensures real ownership and interest in the project. Ensuring groups or individuals approach developers rather than the other way around ensures empowerment. A clear and extensive division of labour and a democratic and transparent governance regime retains trust and empowerment.

5.4 Possible Models for Charcoal Business in PNG

Investment Promotion Authority Model

Figure 6 presents a model based of an Investment Promotion Authority group business model currently in practice in over 500 enterprises throughout PNG. The purpose, location and scope of the business determines the shape and functionality of the model. It ensures the retention of ownership for shareholders and members, whilst providing tax and promotion incentives which individual producers would not be able to receive. It can be applied at both a provincial and national level, however as the business increases in size and/or the number of clans increases instability and inefficiencies can occur at the Association and market outlet levels. For these reason a regional application of this model is suggested.

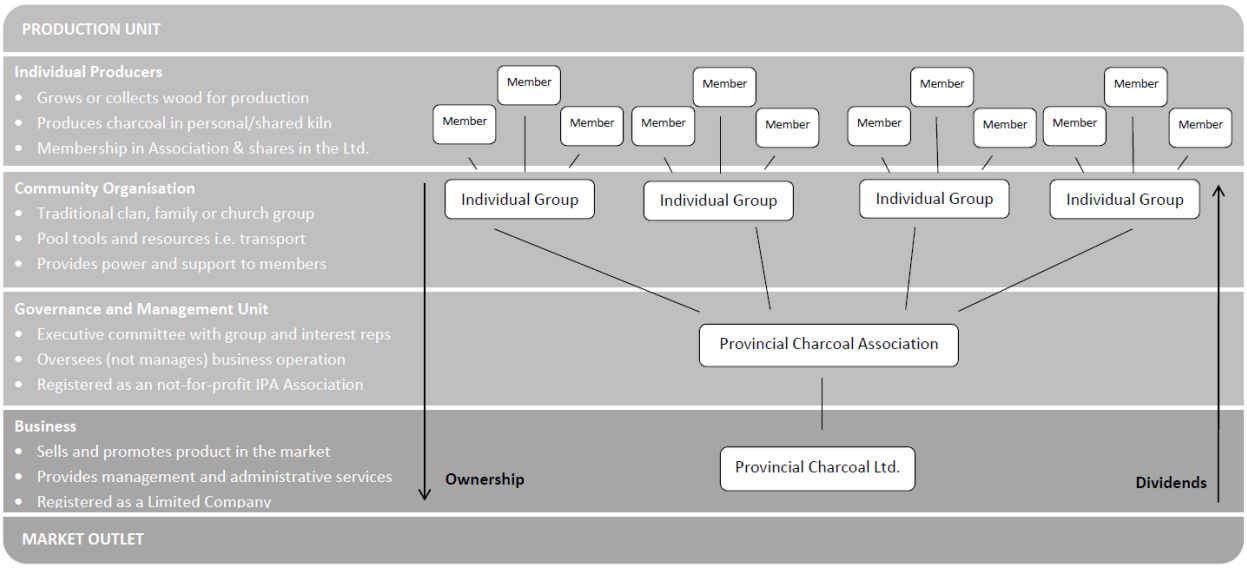


Figure 6 Investment Promotion Authority Model for Charcoal Business Groups

Charcoal Co-operative Model

Figure 7 presents the charcoal co-operative model. This is based on a typical recommended structured used by the Co-operative Societies registration and regulatory department, currently in over 5,000 examples in PNG. It is applicable to a wider range of business enterprises and fits well within the traditional structures of power. It is a widely practiced model of group business operation in PNG because of its simplicity and applicability, it does however have a high failure rate. Like the Business Group model it retains ownership with the membership and decisions are facilitated through the Committee. Without the high number of decision-making checks, especially the representation or management levels, the business at risk of instability and failure. This is an area on which improvements could be made in future models.

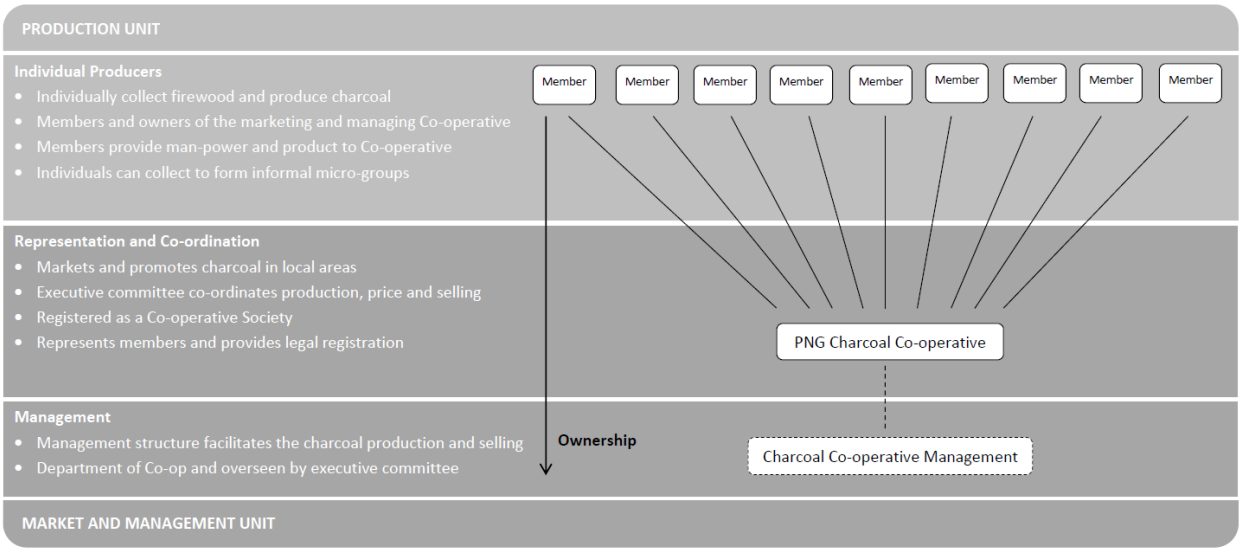


Figure 7 Charcoal Co-operative Model

5.4.1 Final Remarks

The most important component in engaging communities in a development project or business idea is time; time to build trust, ask questions and to fully understand each component and activity. Time should also be allowed for traditional mentalities and obstacles to be addressed and overcome. An extension worker should look to assist but not direct communities in development programmes so that self-reliance is realised, otherwise the culture of dependency will continue. With respect to governance and business structure, a strong but fair leader is required within an active democratic community. Participation, capacity building, empowerment and checks on governance can be achieved by appropriate divisions of labour, where many individuals have different roles and responsibilities which are fully understood and can be realistically realised by those individuals. Either business group model is realistically applicable as they both work on the same principle. However the inclusion of a non-mandatory management level is vital to a fairer more sustainable operation. In the end, each situation in Papua New Guinea is different and unique; so one-size-fits-all approaches are not appropriate. In contrast, the situation calls for a diverse and adaptive approach in community engagement.

6 Training and Community Development

Jessie Abiuda-Mitir

also compiling documents by
Randall Manapangkec and Gabriel Iso

This section reports on the trainings that were done by a Gabriel Iso (project consultant from Result PNG) and project officers Jessie Abiuda Mitir (FRI), Lae and Randall Manapangkec (PARD), Mt Hagen. Gabriel Iso conducted the community development and business planning for micro enterprise training while charcoal production trainings were done by the project officers. Technical assistance for Short Rotation Crop (SRC) techniques was done by Maman Tavune and Agnes Sumareke who were Project Scientists under ACIAR FST/2006/088. Stove construction training was done with assistance from Lae's charcoal group participant who is a member of the Yasugau Family Group.

The community development training was for the project officers while other trainings were for the charcoal groups. The field officers conducted the training using the participatory method and equal participation. Mt Hagen had two male leaders leading two groups, while Lae had 10 group leaders, two females and 8 males, out of which two (a male and a female) had disabilities with their leg.

The report comprises community development training, business planning for micro enterprise training, charcoal production training, SRC training, and stove construction training.

6.1 Community Development Training

6.1.1 Introduction

It was important to undertake community development training before embarking on the project's main objective of engaging charcoal producer-vendor groups in Lae and Mt Hagen. This would assist the field project staff to attract, engage, support, and mentor the charcoal producer-vendor groups. Gabriel Iso conducted the training on 1st June 2012 with participants from PARD, FRI and The University of Bangor.

6.1.2 Objective

The objective of the training was to train participants about concepts and methods of community development to engage with community groups. The trainer distributed copies of '*Trainers Manual: Working with your community, making the changes we want*' (German Development Service 2002), and then facilitated a discussion of the material therein.

Session 1: Opening the workshop

There was a welcome note from the In-country Project Leader Jessie Abiuda Mitir followed by an opening prayer. This was followed by introductions from participants and the trainer. The trainer and participants discussed expectations and methods that would follow later during the session. The objective was to help the participants feel comfortable

with each other and know what to expect from the training workshop. A trainer's manual[1] was given to the participants as a resource material.

Session 2: Papua New Guinea History

The Trainer introduced Papua New Guinea's history by emphasizing contributions by the country's ancestors who had contributed to the human development over thousands of years. The objective was to help participants understand how long their ancestors sustained themselves without outside influence and assistance and appreciate the contributions that their ancestors made. The trainer asked the participants to name events in the last ten years by drawing PNG's timeline from 50,000 years ago when the first humans arrived in what is now Papua New Guinea to 155 years ago when the first European settlement occurred in present day PNG. The Trainer also asked participants to discuss whose history they were taught. The discussion led to the participating concluding that much of the history they were taught in high schools were Western history rather than PNG history therefore they had to discuss more about PNG history and learn to appreciate their traditional knowledge.

Session 3: Self-Reliance

The Trainer introduced the topic of self-reliance and the methods that ancestors of modern Papua New Guineans have used to survive for thousands of years. The objective was to make the participants think seriously about using self-reliance in their development activities. The participants discussed what self-reliance was, how Papua New Guineans practiced self-reliance, whether Papua New Guineans were self-reliant, when they became self-reliant, and when they lost their self-reliance.

Session 4: Cargo Development and Community Development

This session helped the participant understand the meaning of 'cargo development' and 'community development' with the objective of defining the word 'development' so that the participants could differentiate the two development practices. It was discussed that modern Papua New Guineans were practicing more the cargo development rather than community development and this had to be emphasized more during the charcoal group engagement to diverge community groups from the cargo development mentality.

Session 5: Papua New Guinea's National Goals

The Trainer emphasized the importance of Papua New Guinea's National Goals and its direction towards economic, political, social and spiritual development. The objective was to help participants understand that all aspects of development were enshrined in the PNG Constitution.

Session 6: History of Community Work Groups

In this session, the Trainer was supposed to ask the participants to share their experiences in community work. The objective was to help the participants appreciate each other's contributions in their communities to improve their livelihoods through successes and failures. However, the Trainer did not cover this session.

Session 7: Problem Identification, Prioritising & Solving

In this session, the Trainer was supposed to lead the participants to discuss their experiences and identify community problems and prioritise those using local solutions. The objective was to encourage the participants to identify real community problems and

their root causes so that they would be able to find local solutions through local resources to solve the problems. However, the trainer again did not cover this session.

Session 8: Closing Workshop

The closing session was for participants to reflect on their expectations during the workshop about the topics covered with the aim to help participants feel good about their accomplishments. However, the Trainer did not to conclude this session well hence the participants did not reflect well on their expectations and the training session ended without achieving a good result.

6.1.3 Conclusion

In summary, the community development training was an important component of the project's objectives that would have set the stage to attract potential charcoal producer-vendor groups in the communities. However, sessions six and seven which were vital components of the training session were not covered because of a divergence in discussion.

6.2 Business Planning Training for Micro Enterprise

6.2.1 Introduction

Many businesses in Papua New Guinea fail because of the lack of knowledge in the principles of business selection and planning. To establish a business to operate profitably and ethically it was significant to understand the principles of business selection and planning. The project engaged Gabriel Iso of Results PNG to run the *Business Planning for Micro Enterprise workshop* for the Mt Hagen and Lae participants. The Mt Hagen training was held from 6 – 10th August 2012 at the Lutheran Guest House, while the Lae training was held at the PNG Forest Research Institute from 3 – 7th September 2012.

	MONDAY	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**
8:30 10:30	Opening Address Introduction Workshop methodology and rules Workshop objectives and Output	Recap Characteristics of successful business owners	Recap Sales Projections Business Costs	Recap Cash flow projections	Recap Complete Your Business Plan
10:30 10:45	MORNING TEA BREAK				
10:45 12:45	What is Business Types of Businesses Business Triangle	Assess your Market and how to meet customer needs	Profit/Loss Projection	People in your business Organizational Governance	Complete Your Business Plan
12:30 1:30	LUNCH BREAK				
1:30 3:00	Why Businesses Fail	Asses your Market	Profit/Loss Projection	Record Keeping	Complete Your Business Plan
3:00 3:15	AFTERNOON TEA BREAK				
3:15 4:45	Advantages & Disadvantages of starting your business	Marketing Plan	Profit/Loss Projection	Record Keeping	Way forward action Plan Closing

Table 1 Program of Business Planning for Micro Enterprise Workshop

6.2.2 Attendance

The five days Business Planning Training in Lae attracted 11 participants from 10 groups throughout Lae and comprised individuals, community, clan and family group both from urban and rural settings. On individual basis, it attracted community and clan leaders, church executives, a village court clerk and a Ward Councillor and unemployed settlement youths. A total of two females and nine males attended the training. One of the participants was not new to charcoal production and had been producing it informally as a medicinal drink in his local community.

All participants had attended the project's (FST/2011/058) charcoal training and there were already signs of wanting to remain in a larger charcoal group to collectively promote the charcoal business and importantly support each other by working in collaboration, largely complementing each other's business.

In Mt Hagen, the five days Business Planning Workshop for the charcoal producers attracted 13 participants from two community groups. Each group had five members participating as well as three small business operators. The Komane Group hailed from the Dei District and the Muddy Youth Group was from the Hagen Central District. A total of ten men and three women attended the training.

6.2.3 Purpose

The specific outcomes of the five day intervention were:

1. To use new knowledge and skills gained to develop a Charcoal Business Plan for the respective groups.
2. To use the opportunity to further discuss and reach common agreements on key organizational plans such as marketing plan, profit/loss plan, cash flow plan and organizational structure.
3. To agree on future strategies important in the consideration of a future charcoal business.

6.2.4 Business Plans

The participants were introduced to the basic definition of a business and the different types in the business triangle (Figure 7) in order to identify the charcoal production venture. The participants in groups their business interests outlining its advantages and disadvantages. Different groups had their own business plans that resulted in the following plans:

1. Tree farmers and fuelwood sellers
2. Charcoal producers
3. Charcoal stove producers
4. Charcoal demonstrators

The businesses were identified as micro enterprises in the business triangle.

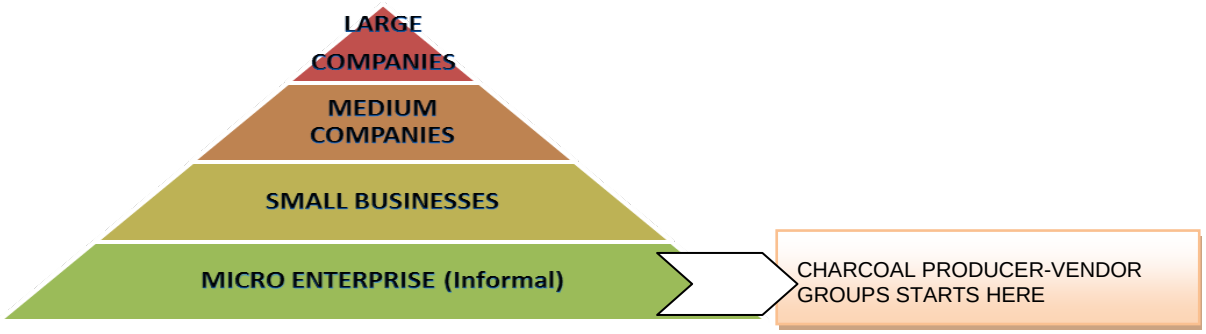


Figure 7: Placing the charcoal-vendor groups in the business triangle.

The Lae groups filled out a business plan after the training as part of the evaluation to gauge their understanding of doing a business plan. Out of the ten groups in Lae one group produced a business plan to construct charcoal stoves, two had demonstration business plans, four planned their business as tree planters and wood suppliers and charcoal producer, while three groups planned to produce and sell charcoal. The two groups in Mt Hagen planned to produce and sell charcoal and stoves.

6.2.5 Profit and Loss Projection

It is important to manage a business by taking care of the money coming in and going out. Therefore, participants were asked to discuss how to take account of their money in their different businesses. The participants drew lists of materials that would be needed and identified them under expense and income. This helped them develop a profit and loss plan and cash flow plan. These details are provided in Section 7.

6.2.6 Marketing Plan

A marketing plan is part of the business plan, which covers products or services that the business will sell, who the customers are, why they are buying the product or paying for the service, price the product or service will cost, how the business will run, why the business is needed and its location. The participants discussed all the questions and got into groups to identify the 4-Ps (product, price, place and promotion) of marketing. Some of the common things identified are shown in Table 2.

Table 2 The Marketing Plan – 4 Ps of Marketing

PRODUCT • Charcoal • Charcoal Stove - single and double burner	**PRICE** • 4 kg Charcoal = K10 (Mt Hagen) • 5 kg Charcoal = K10 (Lae) • Single Burner = K60 (Lae) • Double Burner = K130 (Lae**)**
PLACE *In Lae* • Urban and rural ward markets • Mobile Sale, upon request • Lae City Main Market • Major events - promotional *In Mt Hagen* • Main Hagen market • Street Vending • Retail super markets like Brian Bell • Fast Food outlets	**PROMOTION** *In Lae* • On site demonstrations and word of mouth • Product Brochure • Introductory prices – buy 1 charcoal stove, give away 5 kg charcoal *In Mt Hagen* • Demonstrations with food cooked using charcoal • Distribution of promotional brochures on benefits of charcoal and stove • Stoves distributed to potential users and consistently supplied with charcoal such as street vendors.

6.2.7 Organizational and Reporting Structures

Participants were taught about the importance of business and organizational governance. They were asked to discuss how groups were formed and to show case their group structures. Most understood a basic organization structure and presented their group structures.

6.2.8 Evaluation

The evaluation is based on one on one conversation, feedback after training and business plans submitted by the participants.

Most of the participants felt privileged to attend the training because such small business training was expensive for average Papua New Guineans. They were grateful for the assistance from ACIAR and its collaborating partners. After the training most participants understood the basic information of starting a micro business however majority of the participants in Lae (83%) still had problem doing their profit and loss and cash flow projections in Microsoft Excel. Therefore, the business plan outlined in 'Start Your Business for Micro-Enterprises' (ILO, 2001) was given to them to help them develop basic Income and Expense Plans and Cash Flow Plans.

Most participants said they had never done small business training before and it was the first time for them to develop a business plan. The training made them aware of the principle of selecting and planning a business. For example, a female participant of Traim Tsol group in Lae always tried different businesses from sewing and selling blouses to selling goods with no business plan in mind and no proper record of her cash flow. But after the training, she planned to go into charcoal demonstration business by cooking and selling food. She said she was very fortunate to attend the business training because it was something she had always wanted to do, and now that she had done it, she was able to plan her business properly and manage it (see testimonial in Appendix 6). Another female participant of the Apie Welkam group in Lae said she used her new found knowledge to apply for a business license.

Figure 8 Group discussion during training in Mt Hagen

Figure 9 A Lae female participant presenting her group's 4-Ps in front of Trainer Gabriel Iso and other participants.

Table 3 Feedback from Lae participants

No.	Full Name	Name of Group	Gender	Title/Position	Comments
1	Mavi Winas	Hifikaram Fellowship Group	Male	Group Treasurer/Clan Leader	Learn plenty of good knowledge which I have gained for future
2	Yawising Daniel	Gobadik Family Group	Male	Sole Entrepreneur	I am well pleased in learning ideas of business and enjoyed it very much
3	Gerson Gideon	Bukwa Community Group	Male	Founder/Community Leader	Very impressed, the training itself is very helpful for our charcoal business.
4	Johnson Philip	Manda Group	Male	Clan Leader	Is very helpful for our charcoal business
5	Gagi Enna	Apie Welkam Marketing services	Female	Chairperson/Community Leader	Come out of my prison gate
6	Tom Daniel	Eety Family Group	Male	Chairperson/Village Court Clerk	Come to understand what is a business
7	Wala Koila	Individual	Female	Individual Business woman	I've learnt a lot of things to help me to plan and manage my own business.
8	Jimmy Yaffon	Individual	Male	Ward 17 Councillor	I'm privileged to attend this training which others spent thousands of kina for it. Thank you very much
9	Robin	Yasugau Family Group	Male	Founder	I am very happy about learning business plan and record keeping and want to know more about it.
10	Abot Jombo	Bukwa Community Group	Male	Member	Happy that I am learning more things that I haven't learn it before. Thank you to give us knowledge of business skill. I enjoy my class for 5 days
11	Elijha	Bukwa Community Group	Male	Member	Enjoying my class of learning more knowledge that I have not gone through so I am very happy to come back next. Thank you.

Table 4 Feedback from Mt Hagen Participants

No.	Full Name	Name of Group	Gender	Title/Position	Comments
1	Leo Pai	Muddy Youth Group	Male	Acting Chairman	It's an eye opener.
2	Julie Aris	Muddy Youth Group	Female	Member	Thank you and learned a lot
3	David Allan	Muddy Youth Group	Male	Member	It's very good to practice new things
4	Elizah Watt	Muddy Youth Group	Male	Member	Very interested in learned new program
5	Alice Joseph	Tailoring	Female	Manageress	Learn many new ways to manage our own business well
6	Sab John	Cordial seller	Female	Manageress	Learn how to use our money good and manage well
7	Joshua Unak	Sole Trader, Kai Bar	Male	Manager	Learning many things that I lacked so I will implement soon.
8	Abraham Aris	Muddy Youth Group	Male	Member	Interesting in learning new things which I never known
9	Paul Alois	Muddy Youth Group	Male	Member	Very happy because I learned and practise a lot of new things
10	Uwani John	Komane Clan Group	Male	Member	Learn many good things to manage our own business
11	Robert Kerema	Komane Clan Group	Male	Treasurer	
12	Kuriti Kui	Komane Clan Group	Male	Chairman	
13	Kelly Komwa	Komane Clan Group	Male	Secretary	Learnt a lot of new things on how to start a business and manage it

6.3 Charcoal Production Training

6.3.1 Introduction

Charcoal usage is not a new concept but for the groups engaged only two group leaders knew how to produce charcoal for fuel and medicinal purposes while the rest of the participants did not know how to produce charcoal and use it. The charcoal production training was conducted in Lae and Mt Hagen in August 2012 respectively. The training included male and female participants.

6.3.2 Objective

The training was to teach the participants techniques in producing charcoal from local woods using basic technology that was affordable through local knowledge.

6.3.3 Materials

The following materials were used for the training.

1. 1 x 200L empty oil drums
2. 1 x Cold chisel
3. 1 x Match box
4. 1 Aluminum Wire
5. 100 kg dried firewoods of *Yar* and *Coffee* (Mt Hagen) and *Eucalyptus pellita* (Lae)
6. 2 x spades
7. 2 x bags
8. Mash wire for sieving (Lae)
9. 1 x Charcoal Stove
10. Rice and meat

6.3.4 Method

The approach was to use local trainers to train participants the skills to produce charcoal locally. Charcoal producer trainers were previously trained by Charcoal expert Lukis Romoso who was the then General Manager of Bris Kanda, a rural enterprise development programme and formally engaged with ATCDI. The train-the-trainer activity was under the extension objective of ACIAR FST/2006/088 'Promoting diverse fuelwood production systems in PNG'.

The charcoal production method was based on the Tongan or Drum Kiln (Gamsar & Harwood 1982; Kamila 1998). This included wood preparation and drum preparation.

The method is appropriate for village base use because it is low cost with minimum tools required. This includes a 200 litre or 44 gallon empty drum, a cold steel chisel and a tie wire. Woods must be hardwood, chopped, split and air dried for a month.

6.3.5 Results

The Mt Hagen participants collected wood from dried species of *Casuarina oligodon* and *Coffea arabica* from their coffee gardens while participants from Lae collected *Eucalyptus pellita* from the National Tree Seed Centre (Bulolo) tree orchard. The woods were chopped and dried up to a month (July – August) before the training was undertaken.

The participants were taught how to prepare the 200L empty fuel drum by using a chisel to cut a piece open as a slot about 20 cm x 85 cm wide along the vertical side of the drum. The cut piece was tied back with the tie wire as a hinge lid. The slot of 20 cm wide recommended by Gamser and Harwood (1982) proved too small for participants in Lae because of the cuts and burns they received when loading the drum with wood. They have decided that 25 - 30 cm slot is appropriate to add and remove wood from the drum.

The training in Lae showed that women were patient and prepared the drum well following instructions, while men rushed and skipped set instructions. The results showed that the first burn of 80 kg wood only produced 5kg of charcoal because the men did not follow proper instructions. The second burn was given to both men and women with clear instructions being followed. The second weight of wood was 100 kg with a total output of 28 kg before sieving and 17 kg of charcoal after sieving. In Mt Hagen 66kg of wood produced 12kg of charcoal.

The participants were taught how to grade the charcoal after removing them from the kiln. In Mt Hagen the charcoal was emptied onto a tarpaulin and sorted by hand, while the Lae participants sieved the charcoal using a cocoa mesh wire. The charcoal was later placed in a charcoal stove to demonstrate the use of charcoal to the participants. The participants tried how to light the charcoal and cooked their rice and meat which they said tasted different from rice cooked on open fire.

To further emphasize on the benefits of charcoal in Lae, poster on the benefits of charcoal and the stove demonstration were used to discuss with the participants the benefits and advantages and disadvantages of charcoal were discussed. Some of the benefits and advantages included less smoke, more heat, no flames, less dirt on the pot, difference in taste, less weight and the convenience of storage. The disadvantage included fuelwood source and preparation and availability of drum.

6.3.6 Discussion

Wood is difficult to collect in the peri-urban areas of Lae and Mt Hagen therefore couple of months was be given to collect wood and prepare them for the training. While Mt Hagen groups collected their own firewood from their back yards the Lae participants depended on the project officer to collect and prepare the wood for the training.

In Lae, most of the participants represent groups from peri-urban areas that depended on road vendors and sawmills as sources of fuelwood. This was one major concern and the participants have been discussing ways to assist themselves source their fuelwood.

6.3.7 Conclusion

Apart from one Lae participant who has been producing charcoal as a traditional medicine, the charcoal production training as fuel was very interesting and a new concept for most of the participants. Most of them have had hands on training and were confident that they could start producing charcoal immediately. Although, participants in urban areas will have difficulty collecting fuelwood this has not deterred them from venturing into charcoal production.

In summary, both project areas achieved their charcoal production training successfully and were looking forward to producing and selling charcoal as an alternate fuel for domestic use. The participants will use the Tongan Oil Drum Kiln method however the participant in Lae who had been producing charcoal for medicinal purpose has been using the pit method which he thinks can be improved for the production of charcoal as fuel energy in mass quantities.

A] Loading the kiln with wood.

B] Sorting charcoal by hand.

C] Testing charcoal.

D & E] 2m^3 metre pit oven by the Wampup Ragin group, Saruan village, Kaiapit, Morobe Province; F] charcoal bags produced from the pit oven**.**

Figures 10 A-F Charcoal production and market in Lae

6.4 SRC Training

6.4.1 Introduction

Training on Short Rotation Coppice (SRC) nursery techniques to establish woodlots was only conducted in Lae. Mt Hagen did not do any SRC training. Lae conducted one day training for all its 10 participants on 22nd August 2012, at Gobadik Village, an hour drive east of Lae. The trainers were Maman Tavune and Agnes Sumareke who were Projects Scientists under the Fuelwood Project (ACIAR FST/2006/088).

6.4.2 Objective

1. Aimed at landowner participants with land that could be used to establish woodlots for fuelwood to supply the charcoal producers.
2. Aimed to create awareness on sustainable environmental practices through tree planting and harvesting.

6.4.3 Materials

1. *Eucalyptus pellita* seeds
2. Germination trays
3. Kunai grass or salon
4. Poly bags or empty packets of 500g sugar or rice
5. Posts and sticks
6. Ropes
7. Bottle spray
8. Garden soil
9. River sand
10. Old sawdust
11. Half cut drum
12. Sieving wire
13. Spade
14. Knives
15. Nails
16. Hammer
17. Measuring tap
18. Flagging tape
19. Posters on nursery techniques, alley planting and SRC planting

6.4.4 Method

1. Technical assistance was provided by PNGFRI to train participants.
2. Trainers used SRC method to establish nurseries and woodlots.
3. Training included basic nursery design and layout, media preparation, sowing, tubing, pricking and transplanting, watering, seed collection, treatment, and storage.

6.4.5 Result

All 10 participants, both male and female, attended the training. The participants were taught how to select a good site to build a temporary nursery. After the male participants completed the nursery everyone including female participants was taught how to mix the media and do pasteurizing. The media was then transferred into germination trays to test if the media was mixed well. This was followed by the sowing of the *E. pellita* seeds. The germination trays were then placed in the nursery.

After a month the trainers visited the nursery site were the Gobadik group was taught how to construct standout beds, tube soil into poly bags and do pricking. The group was instructed to plant out in the field after the seedlings were four to five months old at a spacing of 1 m x 1.5 m or 1 m x 2 m spacing.

Since the training was done in August at the Gobadik group's area further assistance was given to the Eety, Gabsonkeg and Wampup Ragin groups in September 2012. These were the four groups who had opted to establish woodlots. However, out of the four only three were successful in establishing their woodlots. Plantings were done in January 2013 for the three woodlots with total of 1200 trees.

Out of the three woodlots the Eety Charcoal Enterprise which is a newly established family group under the project has had a successful woodlot of 400 trees planted in January 2013. The woodlot is set in a new garden area and has integrated crops with pellita trees which include bananas, water melons and aibika.

Out of the 400 trees planted in spacing of 1 m x 1.5, 223 trees were measured in May 2013 with a mean average height of 1.47 m. Out of which 63 trees were below 1 m with average height of 0.74 m, 104 trees below 2 m with an average height of 1.42 m, and 54 trees below 3 m with an average height of 2.40 m, one tree was 3 m tall and one was destroyed by insect. During a visit to the woodlot sit, it was apparent that the trees were experiencing insect and fungal attacks however because of pellita's natural resistance the seedlings were able to coppice and the woodlot was doing well with group members keeping up maintenance.

The Wampup Ragin planted 500 trees in a grassland area however due to constant insect attacks the seedlings had been constantly replaced. The Gobadik group planted 300 trees in an old garden however there was no report of growth performance because the group leader was always in Lae and reported to have left most of the work to an older relative who neglected his job.

Most of the woodlot sites were outside of Lae and required two to four hours drive to and from the site. Due to logistic and time of travel only the Eety group's woodlot had been visited to assess its woodlot establishment.

6.4.6 Discussion

The SRC training was facilitated by the Lae project officer with technical expertise from Fuelwood Project scientist.

Most of the materials were purchased by the project and transported to the sites. The total cost of SRC production is between K700 – K900. A kilogram of *E. pellita* seeds sourced at the National Tree Seed Centre would have cost K250 but was given free for training purpose. Leucaena seeds can be sourced locally and participants had been taught how to collect the seeds.

The training involved all groups however only four opted to establish nurseries with three successfully establishing woodlots. However, because of the Gobadik group leader spending more time in Lae it cannot be guaranteed that his woodlot is well maintained.

Establishing woodlots for the three was easily undertaken because the knowledge after the training proved to be well understood because of the success in the growth of the trees at the Eety group's woodlot.

Although, there were other trees species such as leucaena which the groups were encouraged to plant, given the local source, they preferred pelitta because of its growth and natural resistance to insects and fungi (Eety group observation).

E. pellita was recommended because of seed availability and it suitability for charcoal and fuelwood (has a high calorific value of 4800 kcal per kg[2]).

To set up a woodlot, one would need between K700 – K900 but the return is good because according to ACIAR FST/2006/088 results, eucalyptus trees planted in a 20 m x 20 m woodlot with a spacing of 1 m x 1.5 m can yield an average of 1400 - 1500 kilogram of dry wood per tree.

The groups each have planted 400 – 500 trees and based on their agreement to sell firewood for K0.30/kg, it is a profitable venture.

6.4.7 Conclusion

Overall the training was successfully undertaken as the results of tree performance in the woodlots have been very good. The SRC training was only done in Lae and involved most of the groups in the project. It was worthwhile to have the technical experts from PNGFRI to assist with the training. Materials for the training were only purchased for those groups who opted to establish their nurseries and woodlots. The groups set up their woodlots in different sites, which included a grassland hilly area and rainforest gaps used as gardens. Most group leaders were landowners and subsistent farmers who had the time to oversee the maintenance of their woodlots. Although, there is a total of 1200 trees planted by the three groups, the Eety and Wampup Ragin groups have expressed interest in expanding their woodlots.

A]. Trainers Agnes Sumareke and Maman Tavune with SRC training participants.

B]. Preparing media at Gabsonkec site.

C]. Sowing seeds at Wampup Ragin site.

D] Maman Tavune (green shirt) discussing SRC techniques with participants at the Gobadik nursery.

E & F] Stand out bed at Wampup Ragin site.

G] Field selected for planting at Wampup Ragin site.

H] Visiting the Eety Group's woodlot.

Figures 11 A-H SRC training

6.5 Stove Construction Training

6.5.1 Introduction

Charcoal stove production and sales is a support business of charcoal production and sales. The groups expressed that charcoal alone could not be sold and they wanted to know how to construct charcoal stoves. The charcoal training did not start until the end of June 2013 because ATCDI did not respond to PNGFRI's invitation to run the training for the groups. This training was made possible with the assistance of a group member of the Yasugau family group who was formally trained by ATCDI in the 1980s. Participants included all groups in Lae and project officers from Mt Hagen. The training was held at the PNGFRI on 29th June 2013.

6.5.2 Objective

The aim was to train participants how to construct low cost charcoal stove using basic technology. The training would assist them produce their own stoves and sell them alongside their charcoal bags.

6.5.3 Method

The charcoal construction method was based on Venatius B. Kamila's manual (Kamila 1998). The stove is a one pot stove and is similar to the traditional Asian cooking equipment known as Thai charcoal stove. Although many charcoal stoves have been used around the world, the one pot stove constructed by Kamila is a result of many field tests. It uses a galvanized bucket as its casing and the inner part is lined with concrete. It is portable, given the buckets handle, and has high heat retention due to the concrete.

6.5.4 Materials

Most of the materials can be purchased at hardware shops and are quite expensive. Sand can be collected from nearby rivers, while the mould can be carved or requested for purchase through ATCDI at The University of Technology in Lae.

Tools	**Materials**
Hammer	12 L galvanized steel bucket
Hacksaw	Cement
Spade	Metal perforated grate
Tin snip	Chicken wire
Marking pen	Wood carved mould
Pliers	Fine sand
Tape measure	

Figure 12 Stove construction materials

6.5.5 Result

The 12 L galvanized bucket was used instead of the recommended 9 L galvanized bucket because we could not find one. But the purpose was to show the participants how to construct charcoal stoves using galvanized buckets.

The fine sand was collected at a village across the Markham river delta while tools were all purchased at the Hardware Haus hardware. For the mould, a rain tree wood billet was given to ATCDI to construct the mould which cost K250 including service fees from the Mechanical Engineering Department at The University of Technology. Mould was the expensive material that was needed to construct the stove. A mould is made out of metal or wood that helps shape the inner part of the bucket.

The participants already had the notes to Kamila (1998) but went through training instructions to get hands on training.

It was a basic training and the Trainer shared his practical knowledge with the participants about how to improvise materials that were costly. During the training two stoves were constructed.

6.5.6 Discussion

Stove construction is expensive and will cost about K800 to purchase all the materials needed to construct stoves. Note that the 9 L buckets are recommended because 12 L uses more cement mix than a 9 L bucket. We used a 12 L bucket because we could not get a 9 L bucket. There may also be confusion about the type of mesh wires to use, according to Kamila (1998:17) who recommended copra mesh or arch mess, which we found to be too strong and not the appropriate so care must be taken to purchase a chicken wire which can be easily bended and cut to place inside the bucket.

When collecting sand we found that the fine sand from the beach did not create a good mix with the cement, therefore the participants decided to use river sand.

Two moulds were purchased, one for the Lae groups and one for the Mt Hagen groups. The mould will be shared amongst the stove construction groups.

Although the start up cost may seem expensive (K800) there is a good return from the sales because the only ongoing cost will be purchasing sand, labour, cement, grates, chicken wire and buckets which would cost less than K200. The groups have decided to sell the stoves for K100 based on their profit and loss projection plan which means they will be making profit.

6.5.7 Conclusion

It was difficult to conduct the training because ATCDI would not train our groups because the technical know-how and the stove that they were producing was one of their major revenue. However, we were able to cover the training because of the assistance of one of our own participants who was kind enough to share his trade secret with his other charcoal *wantoks* to assist them in their charcoal venture.

In sum, stove construction was an expensive exercise because of the cost of materials that were needed to construct stoves but because the groups agreed that they would be selling their stove for K100 based on their profit and loss projections, the venture seemed profitable.

The mould has been shared amongst the groups, and apart from the Yasugau group's expertise and experience, the Eety group in Lae has put its new found knowledge into practical use and has produced seven stoves.

7 Developing and testing charcoal business models

This section begins with the generic framework that the project team developed at the Mt Hagen and Lae training sessions. It is then followed by the specific models for the two research sites. The authors of the Mt Hagen business model were Ben Robinson, Randall Manapangkec and Joseph Pumai, while Jessie Abiuda-Mitir prepared the Lae business plan. The difference in the two site reports reflects their different focus and processes.

7.1 Generic framework for charcoal business model

The process began by constructing a generic framework that could be applied across both the Mt Hagen and Lae sites. This framework is shown in Figures 13 and 14

Figure 13 Considerations for developing business models (ref 2012_6)

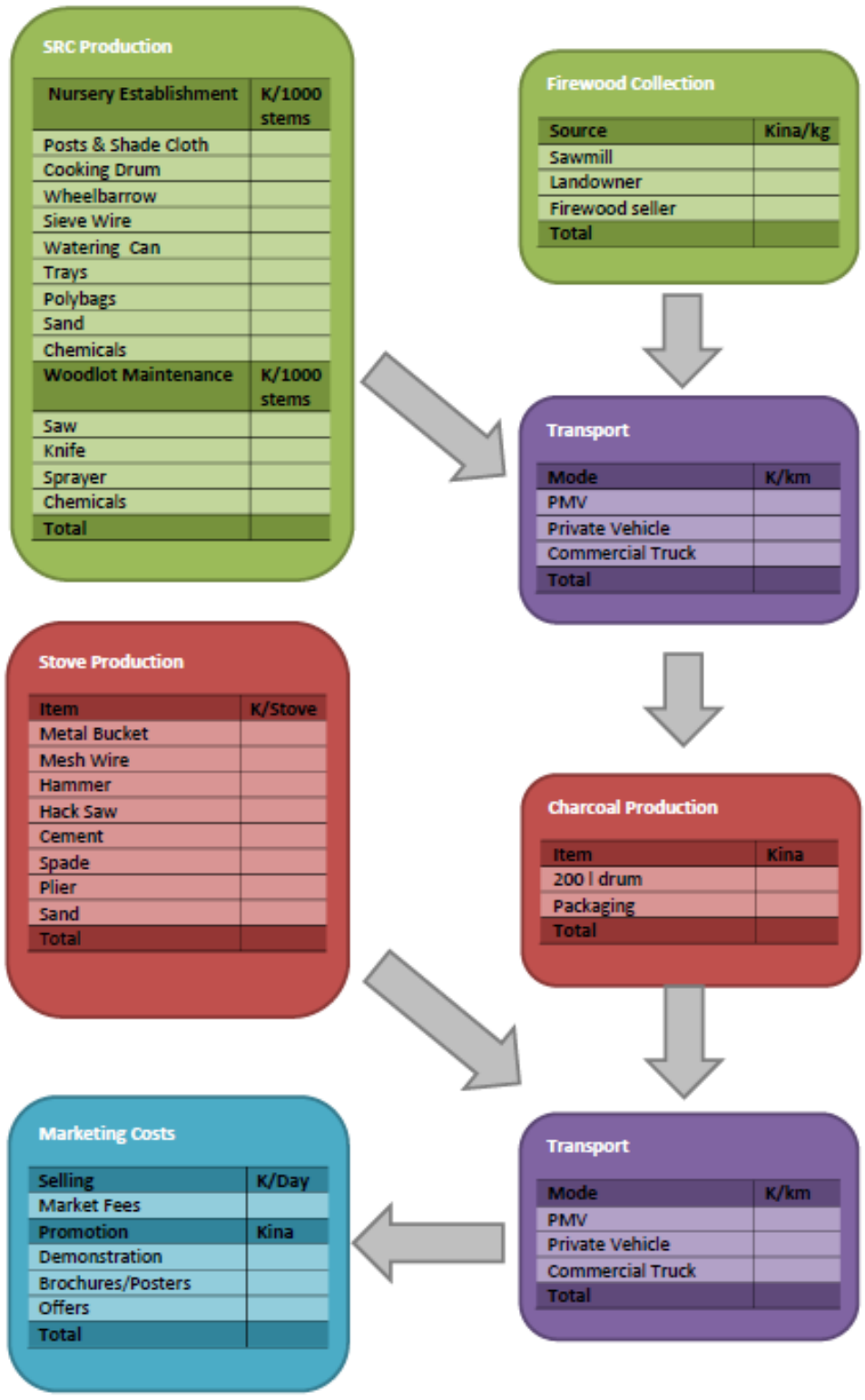


Figure 14 Framework derived for developing charcoal business models (ref 2012_7)

7.2 Mt Hagen charcoal business model and report of activities

This report was prepared by Joseph Pumai and Randall Manapankec. It contains material also reported in project documents 2012_21 and 2012_22.

7.2.1 Attracting participant groups

For the Mt Hagen groups, we used public notice boards to advertise request for application from organised Community Based Organisations (CBOs) to become business entrepreneurs in charcoal production and marketing. The advertisement outlined the vision of setting up charcoal business enterprise and the selection criteria for charcoal producing groups. These selection criteria were developed during the project inception meeting at PNG FRI, Lae in June, 2012, and they were:

- group must have access to firewood and if possible land to grow firewood within an accessible distance of a market;
- be an existing group or a new group and be able to register as a legitimate business;
- have strong, trusted and responsible members with a deliberate attempt to promote gender equality;
- be interested and willing to use and market the technology as ambassadors of charcoal;
- be financially secure (i.e. default free), and willing to invest their own money as a contribution in the business; and show strong work ethic whilst being able to commit the required time and attention to the business.

We developed an application form using the selection criteria that was used as a filter for candidate groups. The advertising ran for 14 days and we received seven interested applicants. The applications were then screened and out of seven candidate groups, two were selected to partake in the charcoal business. They were the Muddy Youth Group and Komani Clan Group.

Both groups are responsible and hard-working members who were not loan dependent and will take ownership of the business and recognise the core goal of self-reliance. These groups were newly formed at the time and needed to register as legitimate businesses.

Muddy Youth Group comprised of 29 extended family members of which 7 are females and 22 are males who live in the same village. This group hails from the Hagen Central District of Western Highlands Province (WHP), which is located about 6 km out of town. The management committee includes chairman, treasurer and secretary. Chairman is Leo Pai who is the village leader formerly worked as a supervisor at a Tea plantation, treasurer is Lucy Pai who currently works as Loans Officer for the Village Banking Program (VWBP) and secretary is Julie Aris who works as Area Loan Supervisor for the VWBP. All members buy into the charcoal group buy registering PGK25.00 each. All management committees including members live in the village so communication and distribution of responsibilities and participation is effective.

Komani Clan Group consisted of 12 members, of which 7 are males and 5 are females who are from different villages living in the same clan. This group is from the Dei District of WHP, which is located about 16 km out of town. The management committee comprises of chairman, treasurer and secretary. Chairman is Kuriti Kui who also holds a position in the church as treasurer. All members buy into the charcoal group by registering PGK10.00 each. Secretary is Kelly Kombra, director of the Vision for Homes and treasurer is Robert Kerma. The secretary is the only well-educated person who leads the group. However, he lives in town and barely visit the charcoal group members so communication is ineffective resulting

in low charcoal production and marketing. Since group members are form different families they have different ideas and plans contradicting each other which also affects the operation of the charcoal group.

Table 5 Mt Hagen charcoal producer group members

No	Name of Members	Gender	Age	Level of Education	Position (BOD, Manager, supervisor, member)
Muddy Group, Komkui, Hagen Central District					
1	Leo Pai	M	52	Grade 10	Manager
2	Michael Dupcy Pai	M	29	Grade 12	Member
3	Lucy Pai	F	40	Grade 12	BOD
4	Benjamin Dokta	M	33	Gr. 8	BOD
5	Paul Aris	M	56	Gr. 10	BOD
6	Abraham Aris	M	25	Gr. 10	Supervisor
7	David Allan	M	22	Gr. 10	Member
8	Elijah Dokta	M	22	Gr. 10	Member
9	Julie Aris	F	28	Gr. 12	Member
10	Michael Alois	M	23	Gr. 6	Member
11	Timothy Las	M	23	Gr. 10	Member
12	John Norr	M	33	Gr. 6	Member
13	Refery Kot	M	51	Gr. 5	Member
14	Jacob Las	M	49	Gr. 8	BOD
15	Alois Kauga	M	50	Gr. 8	BOD
16	Shirley Aris	F	20	Gr. 10	Member
17	Zebkun Pai	M		Gr. 6	Member
18	Rosa Aris	F		Gr. 6	Member
19	Issack Luke	M		Gr. 10	Member
20	Nelson Las	M		Gr. 12	Member
21	Rosemary Las	F		Nil	Member
22	Soki Kot	F		Nil	Member
23	Elijah Kot	M		Gr. 12	Member
24	Raphael Billy	M		Gr. 12	Member
25	Rachael Aris	F		Gr. 12	BOD
26	Benjamin Kuri	M		Nil	Member
27	Paul Tat	M		Gr. 12	Member
28	Junior Pai	M	12	Gr. 4	Member
29	Imori Daniel	M		Gr. 8	Member
Komani Group, Dei District					
1	Kelly Kombra	M	43	Agr. College	Manager
2	Kuriti Kui	M	46	Nil	Chairman
3	Yuwani John	M	35	Gr.6	Supervisor
4	Robert Kerma	M	35	Gr. 6	BOD
5	Monmundi Kerma	F	32	Nil	Member
6	Angela Kui	F	38	Gr. 6	Member
7	Thomas Tikil	M	48	Nil	Member
8	Wel Tengei	M	35	Nil	Member
9	Mintdui Tikil	F	39	Gr. 6	BOD
10	Komarui Kagl	M	45	Nil	Member
11	Lo Rombogl	M	29	Gr. 6	Member
12	Timothy Kar	M	46	Gr. 6	BOD

7.2.2 Business plan development

Small Market Research

The charcoal groups carried out a small market research activity in order to do their business planning, see Table 6. The potential customers are vendors at buai (betel nut) markets, women from the Village Bank, average working class in urban areas and peri-urban settlement dwellers. Other customers are expatriates, especially Asians and firewood stressed communities.

From that research they found that there are four markets where they can sell their products. The main selling outlets are Mt Hagen Main Market, Kaiwe Buai Market, Kalakai Buai Market and Kamnga Buai Market which are within the vicinity of the town. The charcoal producers will also look at selling charcoal through supermarkets like Best Buy and Brian Bell in the future and also as wholesalers.

The market fee is K2 for all markets. There are two full-time firewood sellers at the main market who sell firewood from small splits to logs; with an average daily income of PGK150.00. The average daily income looks promising because urban and peri-urban

dwellers use firewood often because it is a cheap energy. When customers buy large number of firewood the sellers give some free firewood or reduce the price as discounts. The firewood sellers at the buai (betel nut) markets are small retailers.

Table 6 Results of small market research activity undertaken by Muddy and Komani Charcoal Producer-Vendor Groups.

Indicators	Mt Hagen Main Market	Kaiwe Market	Kalakai Market	Kamnga Market
Market fee	K2	K2	K2	K2
No. of firewood sellers	2	2	1	1
Type of firewood sold	Local yar	Local yar	Local yar	Local yar
Current retail price for firewood	K2 (4 pieces)	K2 (4-5 pieces)	K2 (4 pieces)	K2 (4 pieces)
Discounts	Yes	Yes	Yes	Yes
Average daily income from selling firewood	K150	K120	K50	K100
Full-time or Part-time Retailer	Full-time	Full-time	Part-time	Full-time
No. of vendors cooking sausages, lambs, etc.	Nil	7	2	5
Types of heat energy used	-	Firewood	Firewood	Firewood
Do vendors like charcoal/stove? Yes/No	-	Yes	Yes	Yes
Is charcoal sold? Yes/No	No	No	No	No
Possibility of selling charcoal	Highly possible	Highly possible	Highly possible	Highly possible
Any comments	Charcoal and stoves will be sold inside the market.	Good chance of charcoal and stove demo. Vendors requested charcoal/stove.	Vendors requested charcoal/stove	Vendors requested charcoal/stoves

When selling charcoal it is very important to effectively carry out the promotional activities to put up a good competition with firewood sellers. Demonstrations cannot be done at the Mt Hagen Main Market because the town authority prohibits vendors cooking foods. The vendors at the buai markets were very enthusiastic to use charcoal. They were complaining about smoke and uneven heat produced by firewood. Some vendors wanted to take part in the promotional activities as demonstrators. This could be a good opportunity for charcoal producers to liaise with vendors to sell their products.

The other three are informal markets, that is; Kaiwe, Kalakai and Kamnga. There are full-time firewood sellers at Kaiwe and Kamnga and part-time sellers at Kalakai markets. There are high chances of charcoal and charcoal stoves demonstration at these markets. There are also potential vendors who can buy charcoal and charcoal stoves to cook foods. There is a possibility charcoal groups can liaise with vendors to sell their products. Charcoal is not sold in these markets; it is a new technology to vendors.

At the business planning workshop these groups decided their charcoal will be produced and sold in clear plastic bags. The also decided to sell charcoal stoves to complement the sales of charcoal. Initially, PARD placed an order for 60 stoves from Appropriate Technology & Community Development Institute (ATCDI, Lae Unitech) at a cost of K65.00 per stove with loan guarantee from the Village Bank. These stoves were to be sold at a mark-up price to end-users in Mt Hagen.

There have been instances where people want bigger stoves or double burner stoves for large number of families. However, ATCDI cannot meet these demands with their current stove design and also, it took ATCDI more than 4 weeks to produce the stoves and involve

high transport cost from Lae to Mt Hagen. Accordingly, the charcoal producers decided to produce their own stoves.

The groups determined the best selling price for charcoal would be PGK10.00 per 4 kg of charcoal. Charcoal is transported in 50kg empty bags to selling points and from there they weigh and pack into clear plastic for retailing.

Promotional brochures on benefits of charcoal and stove need to be distributed at the selling outlets. Charcoal producers also need to liaise with vendors at buai markets for demonstration purposes by supplying charcoal at discount price.

Management and Operation structures

Muddy Charcoal Producer-Vendor Group – Initially, the management team were selected from members within the charcoal group who have some form of education and work experience. The team comprises of 6 board directors; 2 females and 4 males, including the chairman. The manager oversees finance and administration functions. There should be two production and sales supervisors reporting to the manager. See organisational and reporting structure in Figure 15.

Production of charcoal and stoves takes place in the village at Leo's place. This location has been selected because it is close to the main road for ease of transportation and good security. The products are transported on PMVs to selling points.

Komani Charcoal Producer-Vendor Group – This group also selected their management team from members within the charcoal group. The team comprises of 3 board directors including the chairman. The manager will oversee finance and administration functions. There will be production and sales supervisors reporting to the manager similar to Muddy group.

Production of charcoal and stoves takes place in the village at Kelly's home. It is close to the main road for ease of transportation and safe. The products will be transported on PMVs to selling points.

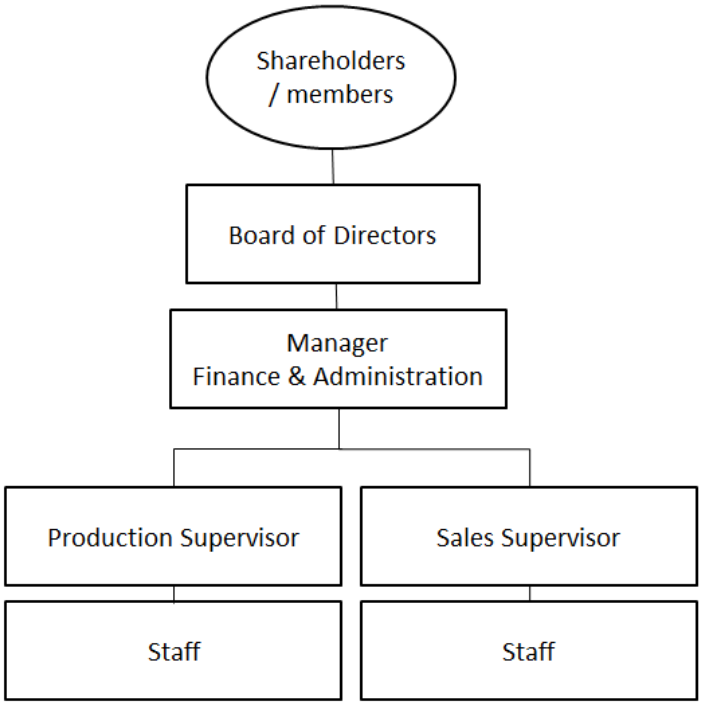


Figure 15 Structure of Muddy and Komani Charcoal Producer-Vendor Groups

The business plans

Figure 16 presents the general Mt Hagen business structure, while Tables 7 to 10 show the profit and loss projection plans and cash flow projection plans for both Muddy and Komani groups. While Table 11 provides the monthly production schedule the Muddy group planned. PARD allocated K8,000 project funds as loan guarantee to the two groups.

Notes on the business plans

- The Selling Price for charcoal is K10 per 4kg. The projected sale for the first month was 100 bags and then increase by 20 bags every month relative to number of stoves sold out.
- 50kg Empty Bags – Cost per bag is K2.The empty bags are required to transport charcoal to the markets then repacked into clear plastic bags for sale. Each empty bag can hold 20kg of charcoal. Therefore, the cost of bags per month is: (K2 per bag * Total kg of charcoal to be sold per month)/20kg.
- Transport of firewood is K100 per month and for charcoal is K2 per 50kg bag.
- Labour: Initially, K100 will be allocated for payment of workers. This amount has been agreed by charcoal producers. They will invest their time and resources as sweat equity to run their business at this infant stage.
- Market Fee – K2 per bag. Cost of market fee is: K2 per bag * no. of bags per month.
- Communication, stationary and brochures – These costs will be covered on quarterly basis.
- Interest – Loan repayment is six months with 18% interest.
- Drums: K100/drum. Three drums will be needed for production from January to June. Another drum will be purchased in July to cater for increase in production. Refer to monthly production schedule below.
- The charcoal producers will produce stoves and sell them on monthly basis at K100 per stove. The only expensive material is galvanised steel bucket which is K49 at the moment. Apparently, charcoal groups will look at purchasing galvanised buckets in bulk in the near future. For production, a mixture of cement and sand in the ratio of 1:4 (1 spade cement to 4 spades sand) is required per stove (Kamila 1998). Hence, the costs for cement and fine sand are based on this ratio. Fine sand is purchased quarterly at K100 per m^3.

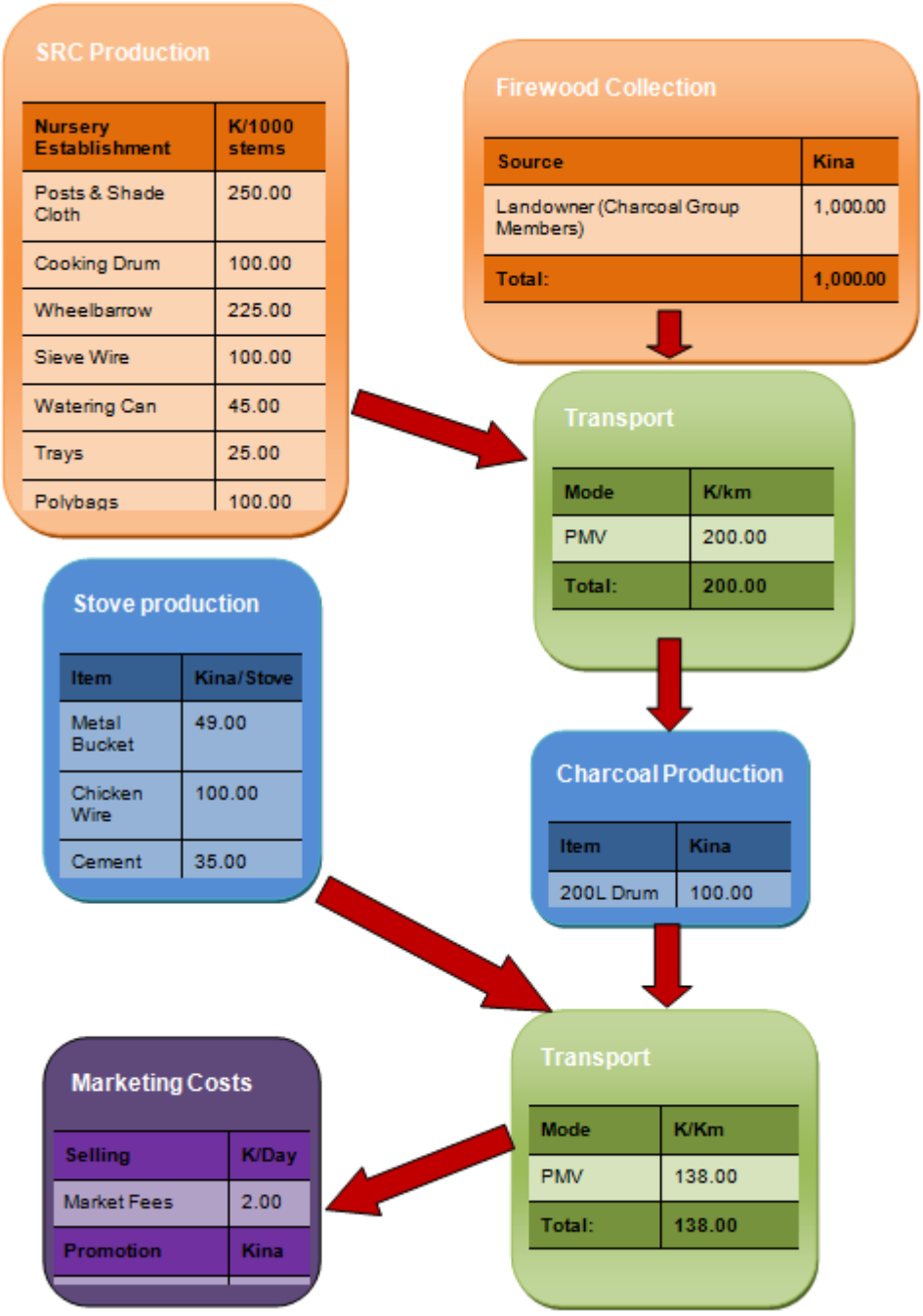


Figure 16: Specific framework for developing business plan for Muddy Charcoal Producer-Vendor Group which is not too different from Komani Charcoal Group.

Table 7 Profit & Loss Projections of Charcoal Production for Muddy Group, Mt Hagen

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
INCOME													
No. of Bags	100	120	140	160	180	200	220	240	260	280	300	320	2,520
Price (PGK)	10	10	10	10	10	10	10	10	10	10	10	10	
Total Monthly Income	***1,000***	***1,200***	***1,400***	***1,600***	***1,800***	***2,000***	***2,200***	***2,400***	***2,600***	***2,800***	***3,000***	***3,200***	***25,200***
EXPENSES													
Cost of Firewood	300	300	300	300	300	300	400	400	400	400	400	400	4,200
Clear Plastic Bag @ K0.70	70	84	98	112	126	140	154	168	182	196	210	224	1,764
50kg Empty Bag @ K2	40	48	56	64	72	80	88	96	104	112	120	128	1,008
Twine	10	10	10	10	10	10	10	10	10	10	10	10	120
Transport Firewood	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Transport Charcoal @ K2	40	48	56	64	72	80	88	96	104	112	120	128	1,008
Labour	100	100	100	200	200	200	200	400	400	400	400	400	3,100
Market Fee @ K2	40	48	56	64	72	80	88	96	104	112	120	128	1,008
Communication	40			40			40			40			160
Stationery	10			10			10			10			40
Brochures	50			50			50			50			200
Interest @ 18% (6 months)	60	60	60	60	60	60							360
Total Monthly Expenses	***860***	***798***	***836***	***1,074***	***1,012***	***1,050***	***1,228***	***1,366***	***1,404***	***1,542***	***1,480***	***1,518***	***14,068***
Monthly Profit/Loss	***140***	***402***	***564***	***526***	***688***	***950***	***972***	***1,034***	***1,096***	***1,258***	***1,520***	***1,682***	***10,832***

Table 8 Cash flow projections for charcoal production and sale by Muddy Group, Mt Hagen

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CASH IN													
Cash at Start of Month	*0*	*-628*	*-559*	*-328*	*-35*	*420*	*1,037*	*1,798*	*3,032*	*4,328*	*5,586*	*7,106*	
Sale of Charcoal	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	25,200
Member Contribution	290												
Total Monthly Cash In	***1,290***	***572***	***841***	***1,272***	***1,765***	***2,420***	***3,237***	***4,198***	***5,632***	***7,128***	***8,586***	***10,306***	***25,200***
CASH OUT													
Cost of Firewood	300	300	300	300	300	300	400	400	400	400	400	400	4,200
Clear Plastic Bag @ K0.70	70	84	98	112	126	140	154	168	182	196	210	224	1,764
50kg Empty Bag @ K2	40	48	56	64	72	80	88	96	104	112	120	128	1,008
Twine	10	10	10	10	10	10	10	10	10	10	10	10	120
Transport	140	148	156	164	172	180	188	196	104	212	220	228	2,108
Labour	100	100	100	100	200	200	200	200	400	400	400	400	2,800
Market Fee @ K2	40	48	56	64	72	80	88	96	104	112	120	128	1,008
Communication	40			40			40			40			160
Stationery & Brochures	60			60			60			60			240
200L Drum @ K100	200						100						
2 Axe @ K35, 2 Bush Knife@ K25	110												
2 Spade @ K12 & Scale (15kg)	69												
Tarp (30 x 36)	111						111						
Wheelbarrow	225												
Loan Repayment (6 months)	393	393	393	393	393	393							
Total Monthly Cash Out	***1,918***	***1,131***	***1,169***	***1,307***	***1,345***	***1,383***	***1,439***	***1,166***	***1,304***	***1,542***	***1,480***	***1,518***	***14,368***
Cash at End of Month	***-628***	***-559***	***-328***	***-35***	***420***	***1,037***	***1,798***	***3,032***	***4,328***	***5,586***	***7,106***	***8,788***	***10,832***

Table 9 Profit & Loss Projections for Stove Production for Muddy Group.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
INCOME													
No. of Stoves	20	20	20	20	30	30	30	30	40	40	40	40	**360**
Price (PGK)	100	100	100	100	100	100	100	100	100	100	100	100	
Total Monthly Income	***2,000***	***2,000***	***2,000***	***2,000***	***3,000***	***3,000***	***3,000***	***3,000***	***4,000***	***4,000***	***4,000***	***4,000***	***36,000***
EXPENSE													
9 Litre Steel Bucket @ K49	980	980	980	980	1,470	1,470	1,470	1,470	1,960	1,960	1,960	1,960	**17,640**
Cement @ K3.50/Stove	70	70	70	70	105	105	105	105	140	140	140	140	**1,260**
Arch Mesh @ K1.20/Stove	24	24	24	24	36	36	36	36	48	48	48	48	**432**
Chicken Wire @ K0.90/Stove	18	18	18	18	27	27	27	27	36	36	36	36	**324**
Fine Sand @ K100/m^3	300			400			400			500			**1,600**
Transport Sand @ K100/Trip	100				100				100				**300**
Transport Stoves @ K1/Stove	20	20	20	20	30	30	30	30	40	40	40	40	**360**
Market Fee @ K2/Stove	40	40	40	40	60	60	60	60	80	80	80	80	**720**
Labour	100	100	100	200	200	200	200	400	400	400	400	400	**3,100**
Communication	20			20			20			20			**80**
Brochures	50			50			50			50			**200**
Stationery	10			10			10			10			**40**
Interest @ 18% (6 months)	60	60	60	60	60	60							**360**
Total Monthly Expense	***1,792***	***1,312***	***1,312***	***1,892***	***2,088***	***1,988***	***2,408***	***2,128***	***2,804***	***3,284***	***2,704***	***2,704***	***26,416***
Monthly Profit & Loss	***208***	***688***	***688***	***108***	***912***	***1,012***	***592***	***872***	***1,196***	***716***	***1,296***	***1,296***	***9,584***

Table 10 Cash flow projections for Stove Production for Muddy Group.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CASH IN													
Cash at Start of Month	*0*	*-181*	*174*	*529*	*304*	*883*	*1.562*	*2.154*	*3.026*	*4.222*	*4.938*	*6.234*	*23.845*
Sale of Stoves	2,000	2,000	2,000	2,000	3,000	3,000	3,000	3,000	4,000	4,000	4,000	4,000	36,000
Members Contribution	290												
Total Monthly Cash In	***2,290***	***1,819***	***2,174***	***2,529***	***3,304***	***3,883***	***4,562***	***5,154***	***7,026***	***8,222***	***8,938***	***10,234***	***36,000***
CASH OUT													
Galvanised Steel Bucket	980	980	980	980	1,470	1,470	1,470	1,470	1,960	1,960	1,960	1,960	17.640
Cement	70	70	70	70	105	105	105	105	140	140	140	140	1,260
Arch Mesh	24	24	24	24	36	36	36	36	48	48	48	48	432
Chicken Wire	18	18	18	18	27	27	27	27	36	36	36	36	324
Fine Sand	300			400			400			500			1,600
Transport	120	20	20	20	130	30	30	30	140	40	40	40	660
Market Fee	40	40	40	40	60	60	60	60	80	80	80	80	720
Labour	100	100	100	200	200	200	200	400	400	400	400	400	3,100
Communication	20			20			20			20			80
Brochures & Stationery	60			60			60			60			240
4 X Hammer, Hacksaw, Spade	176												
4 X Tin Snip, Pliers	84												
2 X Hand Drill, Tape Measure	86												
Loan Repayment	393	393	393	393	393	393							
Total Monthly Cash Out	***2,471***	***1,645***	***1,645***	***2,225***	***2,421***	***2,321***	***2,408***	***2,128***	***2,804***	***3,284***	***2,704***	***2,704***	***26,416***
Cash at End of Month	***-181***	***174***	***529***	***304***	***883***	***1,562***	***2,154***	***3,026***	***4,222***	***4,938***	***6,234***	***7,530***	***9,584***

Table 11 Monthly Production Schedule for Mt Hagen groups

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Firewood Requirement (Kg)	4,380	4,380	4,380	4,380	4,380	4,380	5,840	5,840	5,840	5,840	5,840	5,840	**61,320**
Cost of Firewood (PGK)	**300**	**300**	**300**	**300**	**300**	**300**	**400**	**400**	**400**	**400**	**400**	**400**	**4,200**
Charcoal Production (Kg)	720	720	720	720	720	720	960	960	960	960	960	960	**10,080**
Packaging: No. of Bags (4kg/bag)	180	180	180	180	180	180	240	240	240	240	240	240	**2,520**
Expected Sale (No. of Bags)	**100**	**120**	**140**	**160**	**180**	**200**	**220**	**240**	**260**	**280**	**300**	**320**	**2,520**
Remaining Bags for Next Sale	80	140	180	200	200	180	200	200	180	140	80	0	

Notes:

73 kg of Firewood is required to produce 12 kg of Charcoal per burn (drum) per day for 5 working days.
Number of Drum Kilns required:

- ☞ 3 drum kilns (January – June)
- ☞ 4 drum kilns (July – December)

Cost of firewood: K5.00/drum
Firewood Requirement Per Month: 73kg of firewood * no. of drums * 5 days * 4 weeks = Total Kg of Firewood
Cost of Firewood Per Month: Cost of firewood per drum * no. of drums * 5 days * 4 weeks = Total Cost

January to June – 4,380 kg of firewood is required to produce 720 kg of charcoal per month. For packaging, 4kg of charcoal per bag which gives a total of 180 bags per month. The expected sale for January is 100 bags and the remaining 80 bags is for the next sale. The sale projection is based on the number of stoves to be sold out. Three drum kilns are required for charcoal production.

July to December – 5,840 kg of firewood is required to produce 960 kg of charcoal per month. Another drum will be purchased in July to cater for the increase in production.

7.2.3 Progress of Mt Hagen groups

Evaluation of risks and opportunities

As part of one of their regular meetings the Mt Hagen groups undertook an evaluation of risks and opportunities in their business plan. This is presented in Table 12

However the ***one risk that was not accounted for was that of inter-tribal conflict***. As it turned out there was a murder of a villager councillor in the Nelga clan of Dei district within which the Komani group belongs, and the assailant was from the Moge Komunga clan of Hagen Central from which the Muddy group belongs. This happened in April and continued to May and June of 2013 and it meant that the PARD personnel could not approach either group for monitoring activities

Table 12 Evaluation of Risks and Opportunities by the Mt Hagen groups

Scenario	Risk	Opportunity
Production	Shortage of fuelwood supply as demand increases.	At present both groups have sufficient firewood from members and also suppliers. As a contingency plan for the future, charcoal producers will be trained on tree nursery and planting, and management techniques to grow their own trees. Both groups have land to grow firewood.
	No skills/knowledge on how to produce charcoal.	Both groups have been trained on charcoal making techniques.
	No skills/knowledge on how to produce stoves.	TOT training of charcoal stoves at ATCDI is not possible now so charcoal producers will trial the technology with assistance from Randall using the book by Venantius B Kamila, 1998. Charcoal and Charcoal Stove Making, ATCDI, Lae.
Market	Competition from other charcoal/stove producers	At the moment there will be no competition because the technology is new to majority of the people. There might be competition in the future when this technology gains popularity but by then the two groups will already have better skills and knowledge to produce quality charcoal and stoves, and also gain the confidence of more customers.
	Deficiencies in promotional activities especially demonstration on charcoal stove use.	Simple, readable and amply illustrated handouts will be made available which explain the basic operation of charcoal stoves. For demonstration, vendors will be given charcoal at discount price and assisted by charcoal producers for explanation and distribution of brochures. The project facilitator will assist in promotional activities.
	Town authority prohibits sale of cooked foods inside Mt Hagen main market which will affect promotional activities such as demonstration.	Promotion at the main market will include distribution of brochures and word of mouth. Demonstration will be carried out at the buai (betel nut) markets and also during major events such as Mt Hagen Show, Independence Day, etc.
Pricing	People might think K10 per 4kg of charcoal is expensive compared to firewood and kerosene stove.	Effectively explaining the value and importance of charcoal such as clean and higher energy weight, even heat and no smoke compared to air-dried wood. This price is cheap compared to imported charcoal which is K30 per 3kg at Super Value Store, Mt Hagen. Since it's a new technology people might just want to try it out.

Table 12 Evaluation of Risks and Opportunities by the Mt Hagen groups (continued)

Scenario	Risk	Opportunity
Management/ Governance	Lack of business management skills	Both groups have attended one week training on Small Business Management conducted by Gabriel Iso (consultant).
	Poor leadership leading to a breakdown in trust and empowerment of other individuals	Leo Pai of Muddy and Kelly Kombra of Komani are the team leaders. Both group members have chosen them based on their work experiences and leadership roles in running church groups and other organisations in the communities. For work experience, Kelly worked with Coffee Industry Corporation and now director of Vision for Homes in Mt Hagen, and Leo Pai worked as manager for Tea plantation and now leading church activities and youths in the communities.
	Possibility of one person taking ownership of the business or finance which creates conflicts and jealousy within the group.	All members have registered into the groups to take ownership of the business. This risk can occur only if the team leaders are not faithful and committed in running the businesses. It has been observed that both team leaders have displayed their aspirations to helping youths and their communities to provide income-earning opportunities by effectively organising their members and sharing of responsibilities.
	Male domination in the management team leading to poor management decisions.	Both groups have male and female representatives in their management teams for equal participation and decision making. Promoting gender equality.
Weather Conditions	Wet seasons will hinder production especially charcoal making.	During wet seasons temporary shelter will be provided using tarpaulin. A permanent shelter will be erected in the future.

SRC Production

A crucial aspect of this project was to encourage the producer groups to grow their own wood they convert to charcoal. The Short Rotation Coppicing (SRC) systems developed in the earlier Fuelwood project was the model. SRC production was going to start with a nursery techniques training and field planning and management of selected SRC tree species. This activity was postponed to give sufficient time for the two charcoal producer groups to focus on charcoal production and organising the charcoal business.

Firewood Collection

Initially, members supplied firewood from their own gardens for charcoal production. Both groups used local Yar and also coffee trees. Firewood collection is done by male members of the charcoal groups. Trees are cut down using axe then chopped up the logs at 2 meters and the split them to sizes easy to carry. The split logs are then carried to the production sited where they are dried and ready for charcoal production.

Muddy Charcoal Group collects firewood from Leo Pai's (chairman) coffee garden which is close to the production site at his home. Other members pledged to supply firewood once they ran out. For Komani Charcoal Group, all members supplied firewood from their own gardens. Initially, both charcoal groups are using own trees (backyard). In the future they will look at collecting firewood from sawmills, PNG Forest Authority and possibly do own planting (SRC production). Transporting of firewood by vehicle is not necessary at the moment because both groups are collecting firewood from their own gardens.

Figure 17 Split logs (Yar) dried for charcoal **Figure 18 2kg charcoal packed in clear plastic bag sold at PGK5.00 per bag. At the back are 50kg bags used for transporting charcoal.**

Charcoal Production and Packaging

PARD conducted a one-day charcoal training prior to initial commencement of charcoal production by the two charcoal producer-vendor groups. Muddy Charcoal Group commenced charcoal production in October 2012 right after the charcoal training. Komani Charcoal Group began production in January 2013. Both groups used 200L drum kilns for charcoal production. Each drum kiln (200L) was bought at PGK100.00 per drum.

Table 13 Charcoal production at Mt Hagen

	Muddy Charcoal Group		Komani Charcoal Group	
	Kg of Wood	Kg of Charcoal	Kg of Wood	Kg of Charcoal
December	1,140	240	-	288
January	3,816	263	2,016	-
February	1,140	190	-	-
March	1,106	180	-	-
April	1,000	162	-	50
May	1,010	160	400	-
June	1,020	185	-	-
Total	10,232	1,380	2,416	338

Charcoal production for Muddy was good. In October and November Muddy did trial and error to improve the burning technique so no proper record of charcoal production was kept. In December they produced 240kg of charcoal from 1,140kg of wood, 263kg of charcoal from 3,816kg of wood in January, 190kg of charcoal from 1,140kg of wood in February, 180 kg of charcoal from 1,106 kg of wood in March, 162 kg of charcoal from 1,100 kg of wood in April, 160 kg of *charcoal* from 1,010kg of wood in May and 185 kg of charcoal from 1,020 kg of wood in June 2013. So far, Muddy Charcoal Producer-Vendor Group has produced 1,380 kg of charcoal, of which 320 kg of charcoal has been sold.

Charcoal production ratio for Muddy falls within the standard ratio of 1:6 because they have improved the burning techniques after several attempts of charcoal production. The only constraint was during rainy periods when production was disrupted that was in January resulting in poor charcoal production.

Komani commenced production in January 2013, producing 288kg of charcoal from 2016kg of wood and then ceased production in February, March and April, reporting that they were experiencing continuous rain during these months. In May they produced 50 kg of charcoal from 400 kg of wood and there was no production in June. So far they produced 338 kg of charcoal from 2,416 kg of wood. Sale is very slow for Komani because their charcoals are of low quality (small pieces of charcoal). In April, Komani Charcoal Group arranged a cross-field visit where two of its members went to Muddy and learned charcoal burning techniques.

Charcoal are graded manually and packed in clear plastic bags at 2kg of charcoal per bag.

These clear plastic bags are then packed into 50kg empty bags and transported to selling points; one 50kg bag can hold 10 clear plastic bags of charcoal. Each 2kg plastic bag of charcoal is sold for PGK5.00.

Charcoal Stove Production

Since charcoal stove construction is a new technology to both charcoal groups, PARD purchased 60 stoves: 30 for Muddy and 30 for Komani from ATCDI (Unitech Lae) at K65 per stove. These stoves were purchased using loan guarantee from the VWBP. PARD will conduct stove construction training for both groups so that they can produce their own stoves to sustain themselves. Stove construction will require metal buckets, chicken wire, cement, sand, hacksaw, spade, pliers and hammer.

Market Demonstration and Selling

Charcoal and charcoal stove promotion was carried out on the 09th of March. The promotion team consisted of seven members from Muddy and four members from Komani Charcoal Producer-Vendor Groups with assistance from Randall. The team targeted two main informal markets within the vicinity of the town; *Kaiwe and Kamnga Markets*.

The first promotion at Kaiwe market attracted a lot of vendors and onlookers. The Team explained how to use charcoal stove and the benefits of charcoal by doing demonstration, distribution of posters and word of mouth. Most of the people said this is a new technology and they were very excited about it. After that the team proceeded to Kamnga market for their second promotion. The Team used the same strategy for the second promotion which attracted a good number of vendors and onlookers. Since it is a new technology more awareness and promotion is needed to successfully market the products to sustain the charcoal business.

Current Status of the two Charcoal Producer Groups

The Muddy Youth Group is still producing charcoal and the selling point is at PARD's VWBP office in the conference. The latest delivery to the selling point is 160kg of charcoal packed 2kg pack. Komani Clan Group had not delivered any charcoal to the selling point since April, 2013.

The customer base to date is 32 charcoal stove owners. These charcoal owners do not seem to turn up regular to buy charcoal. PARD is working on a strategy to how to get the charcoal stove owner to buy charcoal regular. The number charcoal stove owner will be increased through more sales of charcoal stoves. PARD will further arranged for promotions through its village banking groups.

7.3 Evaluation of the Mt Hagen charcoal producer groups

Joseph Pumai

7.3.1 The Business Model Experiment

"Business model" is a term defined as how a business enterprise is structured to make profit in terms of how it uses its resources, develops partnerships and customer relationships in order to create and capture value to maximize profits. The charcoal producer groups are social groups with the main goal of organizing and accessing external development institutions and resources.

The two groups selected for Mt Hagen represented quite different social structures. The Komani Clan Group was the larger clan community group; members were generally, ethnically related but not closely. The Muddy Youth group was an extended family group.

As it turned out, Komani Clan Group showed inconsistency in putting its effort into charcoal production, indicating that they could not sustain a cooperative business model. On the other hand, the Muddy Youth group was organized such that the group leader, Leo Pai and his family members, were heavily involved in the charcoal production and marketing. In contrast the Komani Clan Group was not organized such that an individual leader or member of the group became the "lead charcoal producer" adapting the new technology into his own household. Consequently, Leo Pai successfully adapted the new technology and produced up to 1,380kgs of charcoal as compared to Komani Clan Group's 338kgs. The Komani Clan Group produced less charcoal.

7.3.2 Suggested new model: "lead charcoal producer"

From this experience PARD suggested the "lead charcoal producer" model of organisation. This is where some individual families within the two charcoal producer groups are supported technically and financially to develop their capacity to adapt the new technology and turn into a business.

Figure 19 (next page) illustrates how this new models works. A "lead charcoal producer", is a sub-group identified from the larger charcoal producer group. The best sub-group in accordance with the results of the trial is the individual family unit in the extended family grouping like Leo Pai's household. Leo Pai's family becomes a lead charcoal producer. The project or the external promoter of the new technology focuses on developing the capacity of the lead charcoal producer. The lead producer than identifies other households in the Charcoal Producer Group or the wider community to produce charcoal and sell to the lead charcoal producer acting both as a wholesaler and retailer in the charcoal business.

7.3.3 Strategy for Up-Scaling of Approach

PARD will focus on using the trend that had developed by using the individual lead charcoal producer. We will continue to build the capacity of the lead charcoal business entrepreneur as main producer and retailer of the product until a market demand is created through the production and sales of charcoal stoves. Some new lead charcoal producers will be identified from the VWBP social network to supply the market if the supply from the existing lead charcoal producers cannot meet the market demand.

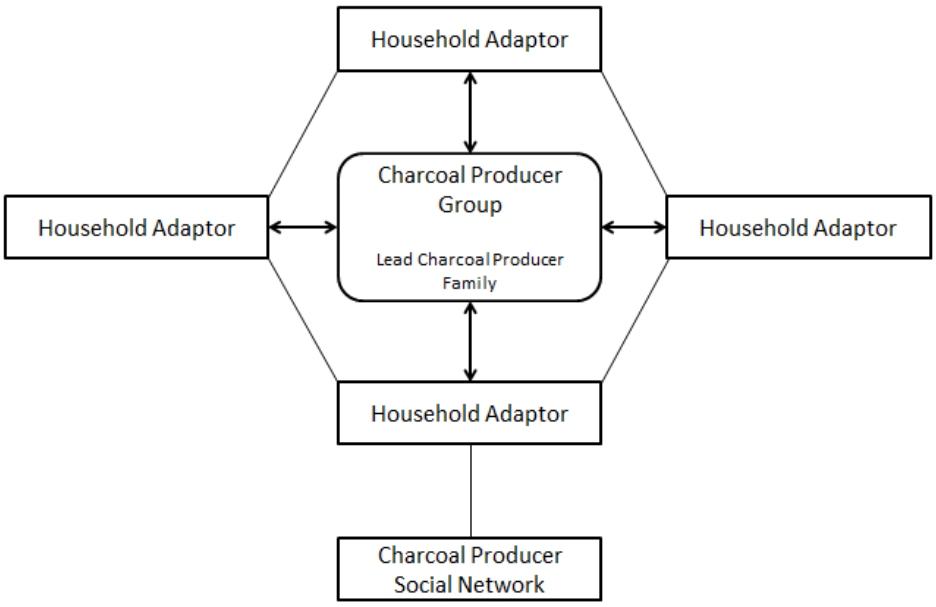


Figure 19: The Lead Charcoal Producer development structure

7.3.4 Lessons Learnt, Challenges and Opportunities

A number of lessons were learnt as follows:

i) Broader social groups are unstable and are prone to disintegrating when desired goals are not forthcoming. Therefore, introduction of new ideas and technologies should individual family units as the basic adaptation social groups.
ii) The desire for charcoal as an alternative energy source is there but more awareness and promotion is need emphasizing the advantages of using charcoal over firewood.
iii) "Lead Charcoal Producer" at the household level needs to be focused to make the charcoal business successful.
iv) Wood used to make charcoal and the heat produced can create interest in the customer to continue to purchase charcoal. The charcoal business entrepreneurs need to consider these two features very carefully.
v) Market vendors frying meat are using firewood intensively hence the charcoal business entrepreneurs should formulate a strategy to how attract these vendors to become long term customers of charcoal.
vi) Continuous dissemination of information on SRC production, charcoal production and charcoal stoves will contribute to sustainability of the charcoal business.
vii) Linking the charcoal producers groups into PARD's VWBP social network can enhanced social integration and maintenance of effort into the charcoal business.
viii) This is opportunity to introduce the charcoal technology to other members of the VWBP social network.

7.3.5 Conclusions and Recommendations for Mt Hagen

The Muddy Youth Group is rated as more successful than the Komani Clan Group in relation to the level of charcoal production. The former group is successfully selling more charcoal and has in stock 60kgs of charcoal stocked at the selling point. This difference in the quantity of charcoal produced directly indicates the structure of the group formation. Muddy Youth Group is an extended family group unlike Komani Clan Group, is a bigger social group with a number of extended families.

It can be concluded that the broader the group, the likelihood of its disintegration is higher. The charcoal business model can be structured within an extended family group first by identifying "lead charcoal producer" household from the extended family group to ensure adaptation of the new technology. A social network of the charcoal producer groups can be initiated by the lead charcoal producer household.

The charcoal production needs to coincide with the charcoal stoves production and sales. Ownership of a charcoal stove will motivate the purchasing of charcoal. The market for charcoal is unavailable and needs to be created by the charcoal business entrepreneurs through the sales of the stoves. Knowing that they are substitute energy sources, the advantages of charcoal needs to promoted and the production process should continue to be studied and improved to maintain a better quality.

The charcoal business model in Hagen needs to be organized within the extended family system with more focus on individual family units within the extended family for adaptation of the new technology before any up-scaling to the broader clan group. Any attempt for cooperative business model should be advocated only after the new technology is adapted by a number of households and there is a community of practice in existent. Stove charcoal and charcoal are complement goods and their promotions should be done concurrently. A charcoal market needs to be created to make the charcoal business sustainable. The leading charcoal producer group in the project is rated as the successful charcoal producer group and the institutional capacity of this group is of paramount importance to making it become a successful charcoal business.

7.4 Lae charcoal business model and report of activities

Jessie Abiuda-Mitir

7.4.1 Business plan workshop

This business plan was facilitated on 3-7 September 2012 at FRI and compiled by Gabriel Iso.

The 5 days Business Planning Workshop for the Lae Charcoal Producers attracted 11 participants from all over Lae and comprised individuals, community and family groups both from urban and rural settings. On individual basis, it attracted community and clan leaders, church executives, a village court clerk and a Ward Councillor and settlement youth who are members of a settlement group wanting to better their lives through Charcoal business. A total of 2 female and 9 male attended this training. Two of the rural groups were not new to Charcoal business and have been at it informally with a future view to increasing efficiencies. As a group, they have been in attendance together for a charcoal training and group discussions and there were already signs of wanting to remain in this larger charcoal group to collectively promote the charcoal business and importantly support each other by working in collaboration, largely complementing each other's business. More information on the specifics of the groups and individuals can be obtained from the Lae Coordinator and Charcoal PNG Team Leader, Jessie Abiuda-Mitir.

The workshop developed a viable Business Plan and the projections contained relate to Bukwa Charcoal Group, which is not too different from the other.

The marketing plan developed by the groups is presented in Table 14. This is followed by the Profit/Loss and Cashflow projections Tables 15 and 16

Table 14 The Marketing Plan for Lae – 4 Ps of Marketing

PRODUCT	**PRICE**
Charcoal: 5 Kg and 10 Kg bags	5 Kg Charcoal = K10
Charcoal Stove: Single and double burner	10 Kg Charcoal = K20
Label:	Single Burner = K60
Bukwa Charcoal	Double Burner = K130
Bukwa Charcoal Stove	Special Quantity Purchase
Packaging	5 Kg = K8.50
Clear Plastic Bags	10 Kg = K18.50
Galvanize Bucket	Single Burner = K51.00
	Double Burner = K105.00
PLACE	**PROMOTION**
Urban settlement market, where Bukwa is based	On site demonstrations and word of mouth
Mobile Sale, upon request	Product Brochure
Lae City Main Market	Introductory prices – buy 1 charcoal stove, give away 5 kg charcoal
Major events – Lae show	

Table 15 Profit and Loss Projections Plan 2013 for Lae groups

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total 2013
INCOME													
Weight of Charcoal Kgs	600	600	600	750	750	750	900	900	900	1,000	1,000	1,000	**9,750**
No of Bags	120	120	120	150	150	150	180	180	180	200	200	200	
Price	10	10	10	10	10	10	10	10	10	10	10	10	**120**
Total Monthly Income	***1,200***	***1,200***	***1,200***	***1,500***	***1,500***	***1,500***	***1,800***	***1,800***	***1,800***	***2,000***	***2,000***	***2,000***	***19,500***
EXPENSES													
Firewood (Kgs)	*3,529*	*3,529*	*3,529*	*4,412*	*4,412*	*4,412*	*5,294*	*5,294*	*5,294*	*5,882*	*5,882*	*5,882*	***57,353***
Cost of Firewood (K10	**353**	**353**	**353**	**441**	**441**	**441**	**529**	**529**	**529**	**588**	**588**	**588**	**5,735**
Clear Plastic Bag	60	60	60	75	75	75	90	90	90	100	100	100	**975**
Matches	5	5	5	5	5	5	5	5	5	5	5	5	**60**
Kerosene	5	5	5	5	5	5	5	5	5	5	5	5	**60**
Twine Rope	10	10	10	10	10	10	10	10	10	10	10	10	**120**
50 Kg Bag @ K2.00	71	71	71	88	88	88	106	106	106	118	118	118	**1,147**
Transport	100	100	100	100	100	100	100	100	100	100	100	100	**1,200**
Labour	200	200	200	200	200	200	200	200	200	200	200	200	**2,400**
Communication	10	10	10	10	10	10	10	10	10	10	10	10	**120**
Market Fee	50	50	50	50	50	50	50	50	50	50	50	50	**600**
Brochures	100	100	100	100	100	100	100	100	100	100	100	100	**1,200**
Stationery	10	10	10	10	10	10	10	10	10	10	10	10	**120**
Total Monthly Expenses	***974***	***974***	***974***	***1,094***	***1,094***	***1,094***	***1,215***	***1,215***	***1,215***	***1,296***	***1,296***	***1,296***	***13,737***
Monthly Profit/Loss	***226***	***226***	***226***	***406***	***406***	***406***	***585***	***585***	***585***	***704***	***704***	***704***	***5,763***

Table 16 Cash Flow Plan Projections 2013 for Lae Groups

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total2013
CASH IN													
Cash at start of Month	*0*	*-861*	*-634*	*-408*	*-2*	*404*	*754*	*1,339*	*1,924*	*2,358*	*3,062*	*3,767*	*11,703*
Charcoal	*1,200*	*1,200*	*1,200*	*1,500*	*1,500*	*1,500*	*1,800*	*1,800*	*1,800*	*2,000*	*2,000*	*2,000*	19,500
Total monthly Cash In	***1,200***	***339***	***566***	***1,092***	***1,498***	***1,904***	***2,554***	***3,139***	***3,724***	***4,358***	***5,062***	***5,767***	***19,500***
CASH OUT													
Cost of firewood	353	353	353	441	441	441	529	529	529	588	588	588	*5,735*
Clear Plastic Bag	*60*	*60*	*60*	*75*	*75*	*75*	*90*	*90*	*90*	*100*	*100*	*100*	*975*
Matches & Kerosene	10	10	10	10	10	10	10	10	10	10	10	10	*120*
Twine Rope	*10*	10	10	10	10	10	10	10	10	10	10	10	*120*
50 Kg Bag @ K2.00	*71*	*71*	*71*	*88*	*88*	*88*	*106*	*106*	*106*	*118*	*118*	*118*	*1,147*
Transport	100	100	100	100	100	100	100	100	100	100	100	100	*1,200*
Labour	200	200	200	200	200	200	200	200	200	200	200	200	*2,400*
Communication	10	10	10	10	10	10	10	10	10	10	10	10	*120*
Market Fee	50	50	50	50	50	50	50	50	50	50	50	50	*600*
Brochures **&**	110	110	110	110	110	110	110	110	110	110	110	110	*1.320*
Wheel Barrow	*300*												
Scale Drum x 2,	*40*					*10*							
Spade & Hammer	50												
Tie Wire & Cold Chisel	47												
Axe, Knife & File	185					15							
Canvas	30					30							
Hand Gloves	135												
Storage Yard	300								150				
Total monthly CashOut	***2,061***	***974***	***974***	***1,094***	***1,094***	***1,149***	***1,215***	***1,215***	***1,365***	***1,296***	***1,296***	***1,296***	***13,737***
Cash at end of Month	***-861***	***-634***	***-408***	***-2***	***404***	***754***	***1,339***	***1,924***	***2,358***	***3,062***	***3,767***	***4,471***	***5,763***

7.4.2 Report of activities

This report of business activity for the Lae groups is based on actual activities undertaken from July 2012 to July 2013. Figure 19 illustrates the Lae business model.

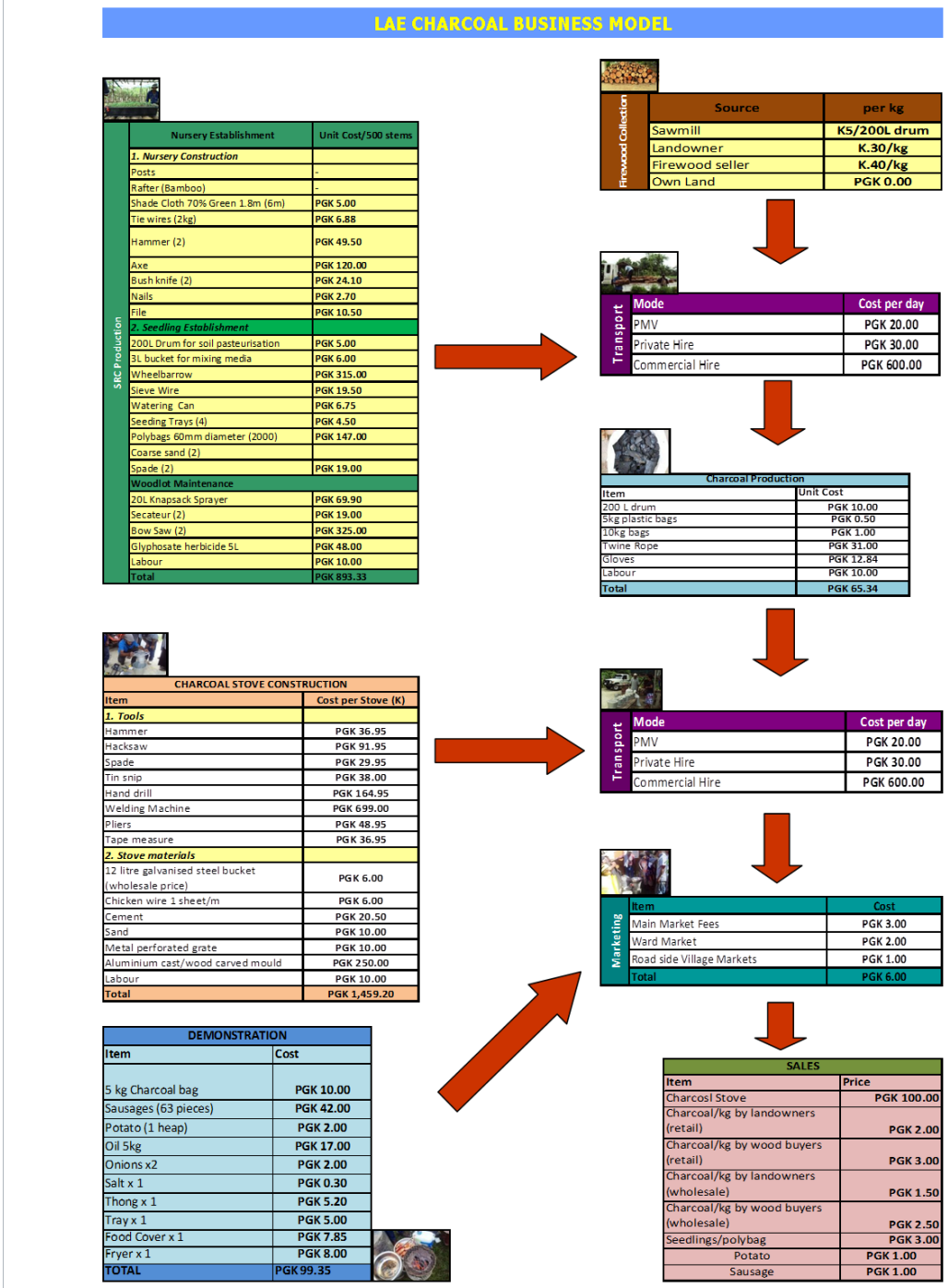


Figure 19 Lae charcoal business model

Tree planting or SRC Production

Planting SRC species for fuelwood was done by land owner groups such as Eety, Gobadik and Wampup Ragin groups. The tree planters planted *Eucalyptus pellita* supplied by PNGFRI. *E. pellita* seeds were selected because of the availability and the information about its fuelwood growth and use as a species trialled under the ACIAR Fuelwood project (FST/2006/088). It is a short rotation crop which has coppicing ability, is fast growing and can be harvested for charcoal production after two years. For the groups who have planted in 2013, they would be harvesting in 2015. The wood was tried for its charcoal ability during the charcoal production training, and although Leucaena and Taun were burnt, *E. pellita* was accepted as the best species by the groups because of its heat. Given this, the groups wanted to plant E. *pellita* in their woodlots. So far the three tree farmers have planted a total of 1200 trees.

Wood collection

Four fuelwood sources were identified. These included wood from land owners forests, wood from sawmills and wood from street vendors. The cost of wood sold by landowners was determined by the group members and it was based on the amount of wood that was required to be placed in the 200L drum to produce charcoal. This information was acquired during the charcoal production training where 100kg of wood produced 17kg of charcoal. In actual practice 100kg of wood has produced at a minimum of 12kg and a maximum of 20kg. The output depended on the best practice of controlling airflow and timing of carbonization.

The results helped groups determine price at K0.20/kg, however when the income and expense was drawn by the landowner groups providing firewood, K0.20/kg was not profitable given the expenses and so the group members increased it to K0.30/kg.

The cost of wood at the sawmills was based on sawmill off cuts at the Timber and Forestry Training College's commercial yard, while the cost of firewood by street vendors was determined by the weight of one bundle of firewood at K2/kg. Most wood collection by the landowner groups from their own forests to produce charcoal did not incur any cost.

Transport

Transport was expensive and difficult to access. This hindered much progress in transporting firewood to charcoal producers and charcoal to the markets. The cost of public transport in Lae differs for commuters within city limits and outside city limits however the Eety Group and Wampup Ragin Group normally paid K20 to travel to and from the city. This mode of transport was not reliable to transport wood and charcoal but smaller materials. Therefore, private hire was used on most occasions to transport firewood and charcoal bags. For example, the Wampup Ragin Group was charged K300 for a week hire to transport firewood, while most of the groups were charged K30 for a day hire. For a commercial hire, the project hired at a rate of K600 per day to assist the groups deliver their materials.

Market fees

Market fees depended on the market place that the groups used. This ranges from K2.00 to K3.00. The village markets would charge K1.00 while the ward markets charged K2.00. The Lae Main Market charged K3.00 per day depending on the type of produce or product sold. Most of the groups did not use the regular market spots and have yet to set up a market spot to sell the charcoal stove and charcoal bags. Most have had mobile markets or sold from their private locations. This information was gathered from other market vendors.

Demonstration

Demonstration is done by cooking and selling sausages and potatoes, and coffee using the charcoal stove. This is a profitable part of the charcoal venture and has been successfully undertaken by the Apie Welkam Marketing group and Traim Tsol who have benefited from their profit by boosting their micro bank accounts and their daily living expenses.

Charcoal Stove Construction

Local charcoal stoves are produced by the ATCDI at The University of Technology in Lae. A letter was sent to the Director requesting training but there was no response to the correspondence after numerous calls and visits. This was a major setback for the groups because they wanted to produce their own stoves despite the fact that they could buy their stoves from ATCDI and resell it.

In the end, a Yasugau group member volunteered to share his stove construction knowledge which he acquired during a training run by ATCDI in the 1980s. This training has helped the charcoal groups who are now confident to produce their own charcoal stoves. So far three groups produced a total of 20 stoves in July which they sold for K100 each. The Apie Welkam Marketing group produced five stoves; the Eety group produced five and the Yasugau group produced 10 stoves.

Costs of Materials

Costs of items were based on actual purchases for production and sales undertaken by the groups. Most items were purchased at the main agriculture hardware shops such as Hardware Haus, BNBM, Bowmans and Brian Bell in Lae.

There were two categories of costs, the recurring cost and the long-term costs. The recurring costs included items that were used immediately and needed continuous purchase while the long-term cost included the materials that would depreciate overtime. The business model included both costs and can be seen in the profit loss projection plan and the cash flow plan. The costs in the plans are actual cost rounded to the nearest Kina.

Charcoal Production

Charcoal production may not be a new concept but to the participating groups it was their first time to acquire the knowledge and skill. The training has helped the groups understand the types of materials needed and the cost involved. Most of the groups started off with one 200L drum and produced more than 50kg to 100kg of charcoal in a week. The Yasugau group has five drums, while the Wampup Ragin uses a two cubic metres pit oven which has produced more than 100kg of charcoal in a week. This proved that with more than two drums each group can produce more than 200kg of charcoal in a week. These have been captured in the profit and loss and cash flow plans.

Group Structure

To take ownership of activities, the Lae groups set up an umbrella group called the ‘Charcoal Wantok’ group. Each group will be responsible for their business activities and will share resources with other Charcoal Wantok members. For example, the mould that is needed to construct the stoves was purchased under the project funds at a cost of K250, this for the members is not easy to acquire hence the mould is now being circulated amongst stove construction groups to help them produce their stoves until such time they are able to purchase a mould at ATCDI, or produce their own mould using the specifics given to them in a manual by Kamila (1998).

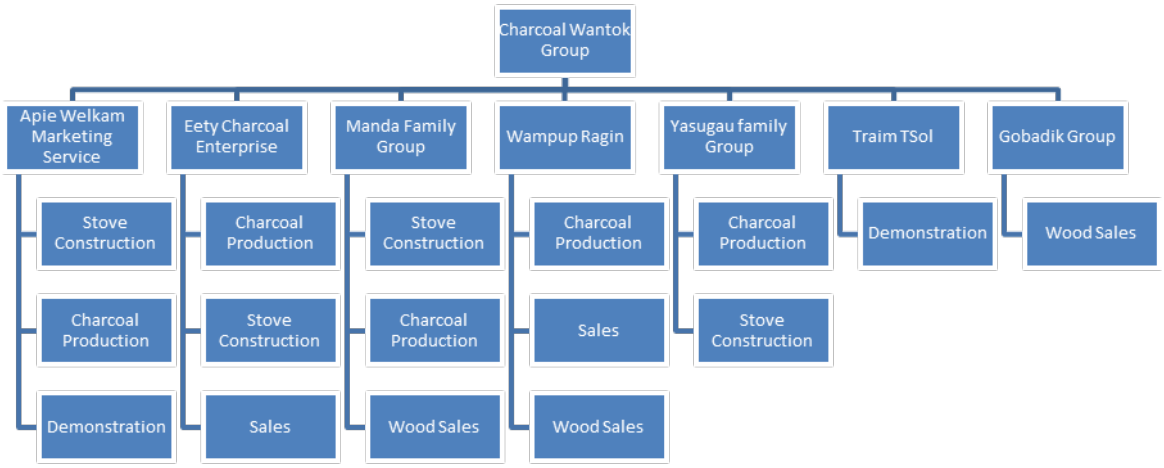


Figure 20 Charcoal Wantok Group Structure, Lae, Morobe Province.

The structure of the group is similar to the model used by the Investment Promotion Authority's group business model. The groups have paid a group membership fee of K10 each and have opened up an account with the Nationwide Microbank. To increase their savings each member will contribute K10 monthly from their income during their monthly meetings. Each individual group has their own microfinance account. Another existing charcoal producer/seller in the Gabensis area of Lae who was not part of the project has also affiliated as a member. Other groups who were not part of the project engagement but approached us were encouraged to affiliate to the Charcoal Wantok group so that the charcoal activities can easily be monitored.

After the business training the Apie Welkam Marketing Service acquired a business license to operate in 2012 and will be renewing it annually (see Appendix 5). Since entering into the charcoal business the group has made about K300 in a week. This has encouraged other members to buy into the business.

8 Microfinance and the Charcoal Producer Groups

Joseph Pumai
PARD Director

8.1 Introduction

PARD's microfinance program is called the Village Women's Banking Program (VWBP). The VWBP is the outcome of the EU funded project that pilot tested the village bank methodology to determine its suitability to PNG's cultural, social, economic and political contexts. The overall goal of the VWBP is to address the problem of financial exclusion is PNG by making financial services more accessible to the rural and urban informal sector population through the use of modified concept of the village bank methodology. The VWBP commenced in January, 2009, and up till now (July, 2013), there are 1,400 members from 70 Community Based Organisations (CBOs).

About 85% of PNG's total population are engaged in the informal economic sector and do not have access to PNG's formal financial system. Semi-subsistence farming is dominant as the indigenous people have seen the need to earn modern cash to afford basic goods and services. Profit oriented farming enterprises require new improved technologies and education and training. Availability of appropriate rural financial system is fundamentally very vital to enabling more households to become entrepreneurs through access to credits for initial seed capital. The VWBP aims at providing a solution to the problem of financial exclusion.

The Muddy Youth Group and Komani Clan Group were used to trial if microfinance linked to an introduction of a new small business can strengthen the financial capacity of the entrepreneurs to sustain their business operation and become profitable. The results of observations made with these two groups are reported in this chapter.

8.2 Background

Charcoal production is a new technology and the community based social groups selected to become charcoal business entrepreneurs to need to adequately acquire the knowledge for the product and product marketing. The interests for charcoal from the public and the VWBP members were observed and the level of exploitation of this interest and conversion of these interests into demand would depend on the entrepreneurial ability of the charcoal business entrepreneurs. Charcoal and firewood can be substitute goods if charcoal can be promoted to the firewood consumers of its advantages and the disadvantages of firewood.

In terms of charcoal making becoming an income generating activity of charcoal producer groups or even individual households, the microfinance institutions will be interested in a business plan and cash flow statements to determine the viability of the business. The VBWP lends mainly to agricultural micro/small businesses but attempting to support a new business with completely new product is inevitably involves high risk of business failure. Therefore, PARD advocated the loans to the charcoal producer groups should be subsidized or guaranteed by the project. It should also be noted that the 'free handout' concept was not implicated in this approach.

8.3 Methodology

The two charcoal producers groups were assisted to access financial services. Each group was given a project subsidized loan of PGK2,000.00 and charcoal market creation support of PGK2,000.00 for purchasing charcoal stoves from the ATCDI (Unitech, Lae) and also finance initial charcoal business start-up costs. Their business transactions were monitored through the VWBP savings account statements.

Deposits and withdrawals made helps the facilitators to evaluate the behaviour of the charcoal producers groups' commitment towards the new charcoal business. How the charcoal producer groups reacted to their access to financial services and the adaptation of the new technology was observed to determine whether this approach positively or negatively induced the sustainability of the charcoal business model.

The VWBP savings account statement generated the data for the financial management behaviour of the groups. Quantitative information on the amount of charcoal produced and sold were recorded by the project facilitators. The number of charcoal stoves sold was also recorded for each group. Other qualitative data are included in this report.

8.4 Results and Discussions

The Muddy Youth Group produced 1,380kgs of charcoal and Komani Clan Group produced are total of 380kgs. The MYG produced 160kgs in stock while Komani Clan Group has nothing is stock since April. Both sold out 16 stoves each. The transactions incurred are shown in the VWBP saver's statement for each charcoal producer group below. The two sources of income generated were charcoal and charcoal stove. All the expenditures incurred are also shown on the saver's savings statement. (Refer to account statements in Appendix 3)

Both groups kept a cashbook for recording income and expenses transactions. The reviewed cash flow budget in Table 17 below is the actual adjusted cash flow budget which can be compared to the planned cash flow budgets of the two groups. The reviewed cash flow budget showed how the charcoal business was actually operated. The MYG made a total deposit of PGK4,491.00. The total expenditure, that is the total withdrawals was PGK3,869.00. The subsidized loan was not repaid, therefore, we could not conclude the profitability of the charcoal enterprise. The charcoal businesses are still in the infant stage and may become profitable later depending on the increase in the sales of charcoal stoves and charcoal.

Both groups had a positive bank balance but insufficient to repay their subsidized loans. Some amounts of money withdrawn for the savings accounts were not found to be related to the charcoal business. In the adjusted cash flow budget in Table 18, it is taken as group members' benefits. A profit and/or loss can be calculated by utilizing the VWBP savings accounts statements.

8.4.1 Financial Performance of the Charcoal Producer Group

An adjusted actual cash flow budget was compiled for the MYG using the VWBP saver's statement. It is more realistic than the planned cash flow budget. It is assumed that if MYG consistently produces and sells charcoal concurrently with charcoal stoves, the charcoal business is obviously profitable. The subsidized loan can be repaid and business can become self-sufficient.

Table 17: Muddy Youth Group Cash Flow Budget Reviewed

Month	1	2	3	4	5	6	7	8	9	10	11	12	Total
Income Source													
Charcoal 2kg pack @ K5.00		800		800		800		800		800		800	4,800
Charcoal Stoves @ K100		1,600				1,600			1,600			1,600	6,400
Other Income	200		200		200		200		200				1,000
Loan	2,000												2,000
Total Income	2,200	2,400	200	800	200	2,400	200	800	1,800	800		2,400	14,200
Expenses													
200L drums	160					160							320
Trees Purchasing	400				400				400				1,200
Packaging Costs		100		100		100		100		100		100	600
Promotions			200				200				200		600
Charcoal stove 23		1,040				512			512			512	2,576
Transport		50		50		50		50		50		50	300
Group members benefits sharing						1,000						1,000	2,000
Loan Repayment													
Total Expenses													7,596
Surplus/(Deficit)													6,604

8.4.2 Microfinance: The VWBP and the Charcoal Enterprise

The directed credit programs or subsidized loan to develop micro-, or SMEs has produced negative results and were abandoned in the 1990s. The new paradigm is the financial market approach where the market force is allowed to set the lending interest rate. The directed credit approach led to weak loans recovery, spoiling the commercial lending environment, and creating crowding out effect for other banks and non-bank financial institutions in the economy. It is never viable to subsidized loans for SMEs or micro-enterprises. However, SMEs should be financed through other financing vehicles. In fact, the VWBP subsidized loan is not a sustainable approach for the charcoal business. But what PARD aimed at achieving was linking the charcoal producer groups to access financial services as a business start up support to encourage the adaptation of the innovation. Linking the groups to the VWBP social network also induces internalization of its norms, values and attitudes that influences the members to fulfil their social responsibilities.

8.4.3 Subsidized Loans

The subsidized loans are aimed at assisting SMEs to access finance for strengthening their financial capacity to fund a new and innovative business. The VWBP's loan policy for group loan considers certain characteristics of the structure of the group and the reason for its formation. If the group is found to be a well-organized with a strong culture, eligibility for the group loan is approved. Group collateral is emphasized and a loan agreement is signed by the lender and the borrower. The groups are registered members of PARD's VWBP social network. Financial and non-financial services are provided to the members such the norms and values of organization are modelled to induce a very strong social integration of the members. Appendix 3 shows the loan accounts of the two charcoal producer groups. The two groups have not made any attempts on the repayment of their loans.

8.5 Lessons Learnt

Some lessons were learnt when linking microfinance to a new innovation and observing the adaptors on the diffusion of the new technology. These lessons were:

i) The directed credit approach motivated the adopters to test the new technology initially to see if it's profitable to make any serious commitment of resources for the charcoal.

ii) Due to lack of access external development institutions and resources as a result of the widening gap between the government agencies and the

community people, the community people develop a stronger mutual relationship with any formal organization that directly provide social and economic services, or create the platform them to access services.

iii) The VWBP micro-financial savings facility assisted the two charcoal producer groups to save and withdraw money. The VWBP saver's account statement indirectly helped the ACIAR project facilitators to study the behaviour of the participants on how the operate the charcoal business. Even a cash book was not properly maintained by the groups.

iv) Business development and ownership appears to work better with individual family units, than the extended family group or clan groups. The MYG had narrowed down to the group leader's family which took the responsibility for full time charcoal production.

8.5.1 Challenges and Opportunities

Some challenges and opportunities

i) Illiteracy and low formal education appears to contribute to lack of understanding of the new ideas and approaches.

ii) Cooperative business model does not suit the approach of introducing a new technology. Other business models using the extended family system and further targeting individual households can make new creative businesses sustainable.

iii) All the households are already self-reliant as they have been supporting their livelihoods using their own means. When we talk about self-reliance in the event we try to introduce a new technology, the community do not have surplus resources, particularly money, to finance any costs incurred to adapt the new technology. Therefore, initial support is necessary to induce adaptation of the technology.

iv) The dependency attitude is indirectly exhibited by some participants. The initial group selection criteria need to be reviewed for improvement in the selection criteria.

v) Lack of formal education and high illiteracy rate hinder adaptation of concept ideas and approaches.

vi) Increase in the sales of charcoal stoves can directly increase the demand for charcoal.

vii) Charcoal can increase profit as compared to firewood as raw material.

8.6 Conclusions and Recommendations

The following conclusions and recommendations are made :

i) Sales of charcoal stove needs to be highly focused to create the charcoal market.

ii) The VWBP savings accounts statements of the two charcoal producers groups indicated the progress of the charcoal business. The group that made relatively more deposits and withdrawals appears to be successful in the charcoal business.

iii) The VWBP subsidized loans played a major role strengthening the financial capacity of the charcoal producer groups to afford initial capital cost, excluding labour cost.

iv) The positive savings account balances of the two groups indicated the two are still operating their charcoal business.

v) More product promotion is needed to introduce the technology to more people.

vi) The norms and values of the VWBP can direct the two charcoal businesses to internalize these norms and values by interacting with institution and its networks members.

9 Review and Evaluation of Activities

The project is first reviewed through the following assessments:

1. The extent to which the **project logic** is being followed, and reasons for divergence; and
2. The extent to which the **project vision** matches **project reality**.

The overall success of the project is then evaluated on the basis of what has been learnt from this exercise.

9.1 Review of Project Logic

The 10 project activities are listed in Section 4.1.1 of this report. It is understood that, as an action research project, not all activities occur at the initial scheduled time, if at all, and other activities may arise in the context of adaptive management. This section will review the extent to which the project logic was followed by answering a series of related questions. The internal project documents cited here are listed in Appendix 9.1 and available on the CD attached to this report.

The two project sites, Lae and Mt Hagen, were managed by different partners dealing with different social and cultural contexts, so it is no surprise that there were differences in progress and achievement. The differences in achievement reflect the social and cultural contexts and not the capacity of partners.

1 Action research meetings

*Q1: To what extent did these meetings occur as planned**?***

The Action Research Meetings occurred according to the Project Teams Action Plan of 4 meetings and not the 5 meetings in the original project proposal.

According to the project schedule there were supposed to be five meetings, however due to Jessie taking compassionate leave in June 2012 Lae activities started later than Mt Hagen and the second meeting which was supposed to involve broader actors did not eventuate. This was taken on as individual meetings and presentations and with good outcomes (Lae activities).

In sum, only four meetings were planned in the Action Plan by the Project Team during the Preliminary Meeting which were all undertaken. The team meetings were always led by Jessie as the In-country Project Leader and the project team members were well informed during the meetings to act on any matters of concern.

The Act-Reflect-Decide-Plan method can be measured through the success of the Project Team's Action Plan. The Remarks column added to the Action Plan matrix below confirms the outcome of the activities.

Table 18 Action Plan Matrix

ACTIVITY	LOCATION	RESPONSIBILITY	DATE	REMARKS
SSI Research	Mt Hagen, Lae, NCD	Ben	11 May – 10 Jul 2012	Successful
SSI Research	Mt Hagen, Lae, NCD	Ben	11 May – 10 Jul 2012	Successful
Team Meeting 1	Lae	All Team Members	31 May 2012	Successful
Community Dev. Training	Lae	All Team Members	1 Jun – 2 Jun 2012	Training undertaken but not satisfactory
Cost/Time Analysis	Lae and Mt Hagen	Randall	1 Jun – 15 Jun 2012	Jessie helped complete the Lae costs
Desk Top Business Model	Lae and Mt Hagen	Randall	1 Jun – 15 Jun 2012	Ben assisted which helped Randall and Jessie carry out business activities
Engage Potential Groups	Lae and Mt Hagen	Jessie via NARI and PR Randall via VB and DPI	15 Jun – 16 Jul 2012	Jessie through local media Randall through local notice board
Stove Construction Training	Lae	Randall & Jessie	16 Jul - 17 July 2012	28th June 2013
SSI Summary Report to Team	-	Ben	18 Jul 2012	Successful
Charcoal Training	Mt Hagen	Randall	20 Jul – 21 Jul 2012	Successful
Business Training	Mt Hagen	Gabriel	23 Jul – 3 Aug 2012	Successful
Team Meeting 2	Mt Hagen	All Team Members	4 Aug 2012	Successful
Charcoal Training	Lae	Jessie	9 Aug – 10 Aug 2012	Successful
Business Training	Lae	Gabriel	13 Aug – 24 Aug 2012	September
Mid-Term Meeting	Lae	All Team Members	3 Dec 2012	Successful
End Meeting	Lae	All Team Members	June 2013	Successful

Q2: To what extent did the team formally follow the ACT-REFLECT-DECIDE-PLAN process of action research?

The team members had their own experiences and were ready to implement the project. The team meetings were an avenue for the members to reflect on these experiences so that they could decide and plan their activities and act on them.

There was much flexibility in implementing the plan but the major activities that were planned were all undertaken, such as all four meetings and the trainings. It was good to

have the meetings because it always brought the team together to reflect on the current issues that were affecting progress of their activities.

The reflections were a good way to look at their past experience and challenge their capacity to decide and plan and act according to the challenging circumstances. For example, communication between group leaders and members were a concern in the Komane group in Mt Hagen. After much discussion followed by attempts to rectify this problem the team decided that the problem was the group leader's attitude and capacity of leadership that had affected the group's activities and progress. Therefore it was apparent that the group needed a new leader.

There were times also when the team reflected on issues that they did not have much control over. For example, it was only during the final meeting that Randall and Joe talked about the murder case in Mt Hagen that involved one of their Muddy Group members. This very much affected the group's charcoal production activities towards the end of the project. But as much as possible the team decided that as soon as the problem was sorted out PARD would assist the group get back into the business of producing charcoal.

Overall, the team had their own experiences and capacity to implement the project objectives and the action research approach of act-reflect-decide-plan really helped the team to work together.

2 Engagement with producer groups

Q3: How did field staff attract and initiate charcoal producer-vendor groups?

The two project sites took very different approaches to attract interested groups.

Mt Hagen project staff attracted interests from local groups by posting a notice on public notice boards.

Lae project staff attracted interest using the local radio station – Kundu FM by sending a paid community announcement through a media release. The notice was delivered to the station on Monday 9th July and the announcement was aired on Tuesday, Wednesday and Thursday three times daily during their noticeboard segment. This was done during the National Elections counting when most of the listeners tuned in to hear the election results. The message reached far and wide and attracted 10 groups from both rural and urban areas of Lae.

Q4: How did field staff monitor the progress of charcoal producer-vendor groups?

In Lae, after the all the trainings the charcoal producer groups met monthly. Jessie had good communication through mobile contacts, regular visits from group leaders and used the monitoring form. Site visits and monthly meetings were also done.

3 Developing a business model

Q5: What is the nature of business plans for Mt Hagen and Lae ?

The business plans for all the groups are very thorough and systematic. The process of training and facilitation was very effective because they follow a logic that emerged from the group rather than being imposed on them.

Lae has established retail market for charcoal users. This includes fuelwood supply for charcoal producers, charcoal stove and charcoal bags for charcoal users. A permanent market spot has yet to be established in the Lae Main Market. The groups have been meeting since July to come up with a way to set up the market.

(ref 2012_6; 2012_7; 2012_10; 2012_11; 2012_17; 2012_18; 2012_21)

4 Training and community development

Q6: How were training and community development activities devised and implemented?

All the training and community development activities were devised through project action planning meetings following the guidelines in the proposal. Overall they were successful in terms of participation numbers and participant engagement and reflections. The only exception was the in-house training of project partners in community development, which did not achieve its objectives.

5 Semi-structured Interviews

Q7: How were the results of the preliminary report of the survey integrated into the action plan?

The only information from the preliminary interviews which was used to inform the action plan, was the need for 'Stove Construction Training'. This was realised due to a lack of availability of the stoves or knowledge on how they could be constructed. It was clear that the knowledge was held by ATCDI and this needed to be transferred to the producer groups for future business growth.

Other than that the action plan was written fairly independently from the knowledge gained through the preliminary interviews.

Regardless of this the group structure that emerged in Lae still used the Investment Promotion Authority group business model that was recommended from the SSI survey.

In general, there was not a good articulation of the knowledge from the SSI survey and the project activity. This was largely due to the parallel timing of activities.

9.2 Realisation of the Project Vision

The key elements of the project vision (from Box 1) are represented here as a framework to ask to what extent the vision was realised. Responses supplied by Jessie Abiuda-Mitir and Ben Robinson

1 There will be a permanent selling point, staffed daily, in the central market.

Q8: To what extent is this selling arrangement being realised?

Permanent selling points were not successful in the Lae Main Market, Bumayong Market and Mutzin Market

They were not attempted in Mt Hagen. The PARD office became the selling point.

Q9: Is there a better way of promoting and selling charcoal?

In Lae, there is the Morobe Agricultural Show and the NARI Open Day. The NARI Open Day was on the 27th of June 2013 where the groups produced charcoal bags and stoves and took them out to showcase their products.

The following activities were done:

1. The Yasugau Group produced 10 stoves and five bags of charcoal. They sold 3 stoves at K100 each and 3 bags of charcoal totalling 17 kg for K3.00/kg.
2. Eety group produced three charcoal bags and sold 20 kg.
3. Apie Welkam produced one 5 kg.
4. Seventy (70) E. Pellita seedlings were sold for K3.00 each by another nursery business group, which is not part of the charcoal producer groups but is into the nursery business and has been planting E. Pellita to sell to landowners in the Nawaeb area.

5. Demonstration of sausage sizzling was done by Traim Tsol group. Sausages sold out at K1.20 each.
6. Following pamphlets and information were given out to interested show goers:
    a. How to grow your own tree
    b. How to collect store and sow seeds
    c. Charcoal benefits in English and Tok Pisin
    d. Contacts of all groups

Each group has done its own awareness and promotion in their local areas. For example, the Eety group given its location at the Markham Bridge has done awareness and promotion along the Bulolo Highway, while the Traim Tsol has done promotion through its demonstration business. However this is only to a small audience.

It would be good to use the local media to promote the use of charcoal but this depends on the groups establishing their business at a central market before going out public, because this has been one of their setbacks.

Figure 21 Group leaders of Lae charcoal producer-vendor groups (Eety, Traim Tsol & Apie Welkam) as charcoal ambassadors promoting charcoal at the NARI 2013 Open Day.

Figure 12. A customer who bought 12 kg of charcoal and a charcoal stove asking questions to charcoal sellers during the NARI show.

2. Members will be involved with some or all of the following activities: growing SRC fuelwood ; making and bagging charcoal; transporting charcoal to central market; staffing the central sales point; making charcoal stoves; keeping records and other self-management activities

Q10: To what extent is this participation in the production chain being realised?

Most of the Lae groups have participated in all activities, however staffing the central market was not done.

The success of the Muddy Youth group in Mt Hagen relied on the energy and involvement of the group (and family) leader.

3 Members must buy into the group so there is proper ownership and commitment.
Buying into the group will be facilitated through micro-credit facilities.
Members can determine their level of involvement which will be reflected in the income and other benefits they receive.

Q11: To what extent is this level of ownership being realised?

The Lae groups set up the "Charcoal Wantok Group" to oversee all their activities. The group has opened a microfinance bank account from member contributions at the Nationwide Microbank in Lae. To increase contributions each member must pay K10 during monthly meetings. The account is part of their financial security when applying for future loans for the purpose of charcoal activities

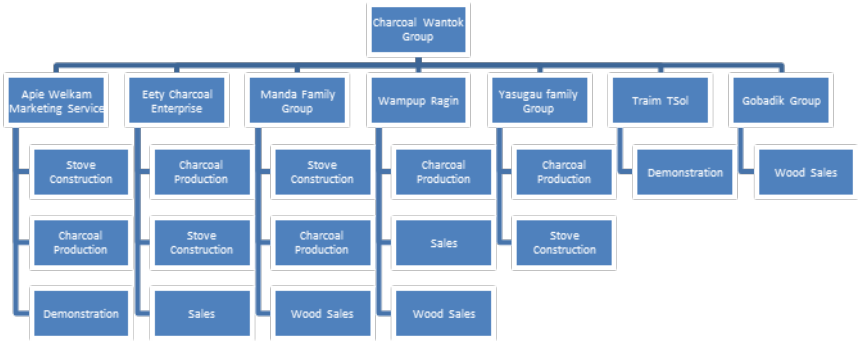
Q12: What is the nature of the micro-loans being made?

While the Mt Hagen groups received loans from Village Women's Banking Program (see Chapter 8), none of the Lae members have taken any loans from any microbank.

It was too difficult to coordinate loans in Lae from a microbank in Mt Hagen

4 The group should be structured so that members are truly working co-operatively and not competitively. How this structure emerges must come from the founding members themselves in a facilitated process of participatory design.

Q13: How do the structures differ between Lae and Mt Hagen and across groups?



This structure was developed by the Lae groups based on the nature of their charcoal business that they agreed to do. Charcoal producers who are not landowners do not have fuelwood supply (Apie Welkam and Yasugau groups) and have agreed to buy from Gobadik and Etty groups because of the groups' accessibility. All members have agreed that the charcoal producers who buy fuelwood will charge their charcoal for K3/kg, while charcoal producers who collect wood from their own forest will sell their charcoal at K2/kg. Each group have agreed on their local market spots and where they will be supplying at a central market they will label their products and keep record of the sales.

The structure of the Muddy Youth group in Mt Hagen was very self-contained within an extended family group, and was successful. A similar structure, but within the larger clan-based Komane group was not successful.

9.3 Self Reflection

The nature of Action Research is that we 'learn by doing'. The bulk of this report represents the collective learning of the project team about the feasibility of establishing charcoal producer-vendor groups in PNG. Each member of the team will also have their personal perspectives of what is learnt from this exercise. As each member has very different background and experience their individual reflections may provide some useful depth and richness to the story.

The following paragraphs represent the personal reflections on the feasibility of establishing charcoal groups generally, and in specific locations, in PNG. The reflections have been written independently of each other, and without knowledge of what the other team members were writing.

Overall-Project leader: Ian Nuberg

I am genuinely pleased by the amount of useful knowledge generated by this project. A PNG tourist slogan is "Land of the Unexpected"; and some of the unexpected events during the Fuelwood project were not always fortunate (e.g. three murders over two events within the grounds of field trials). Even in this small research activity, there was a murder within the two clans participating in the Mt Hagen work which restricted PARD's access to both groups. Yet despite this they managed to generate very useful knowledge.

I don't think there is one-size-fits-all model for charcoal microenterprises; it is very culturally dependent. The cultural differences between Mt Hagen and Lae are very pronounced, and they affect the nature of successful microenterprise and the capacity of organisations that attempt to facilitate them. For example, in Mt Hagen it seems that smaller, tighter family-based groups with a male leader may have more success in starting a business. Whereas Lae seems a better environment for broader-based group membership with strong women leadership and involvement. In Mt Hagen, the facilitating NGO is inextricably bound into all the local cultural and social obligations, and as such is limited in the extent to which it can reach and work in all social networks in WHP. Contrastingly in Lae, a government officer could reach and work effectively with a relatively wide range of local social groups.

I'm impressed with the ability of Jessie Abiuda-Mitir in motivating and facilitating community work. FRI does not have a formal extension or community outreach function. It could have such a better profile in the community if it developed such a function. Jessie is well suited to lead that development.

In-country leader and Lae facilitator: Jessie Abiuda-Mitir

Charcoal production and usage is an ancient practice in other parts of the word but in Papua New Guinea it is a new concept in terms of fuelwood usage. The 1980's research of charcoal production was not successful because it lacked proper awareness and extension work. The research initiative by Ian Nuberg supported by ACIAR and implemented in PNG by PARD and FRI was a small research activity that had to facilitate the establishment of charcoal producer-vendors in two research sites, Mt Hagen and Lae.

The charcoal venture although not new in Lae but lacked mass awareness proved feasible for the community groups established. Setting up community charcoal-vendor groups and training them to understand how to plant fuelwood trees, produce charcoal, charcoal stoves, and how to start up and manage these activities using business principles on a micro level was a significant way of transferring knowledge from experts to communities. This was a good extension method that created awareness on good practices of community development, sustainable environmental practice and micro enterprise.

The challenging aspect was good governance and startup capital. Nonetheless, it was vital to take a holistic approach to establish charcoal producer-vendor groups; and the community development and business training added great value to the successful outcome.

Mt Hagen facilitator: Randall Manapangkec

The establishment of charcoal groups in the highlands as business enterprise is a challenging task. Frankly, charcoal production is a laborious job and to operate as a business enterprise it needs groups that are intact and committed. In PNG most of the small business enterprises are successful because they are operated by individuals and not by groups. Apparently, charcoal business is to be undertaken by groups and family group is more successful.

From my experience with this small research project, Muddy Charcoal Group which consists of extended family members who know their status and values within the family so selection of the management committee and distribution of responsibilities was done effectively. There is strong social integration in the family unit than in any other groups, which is evident in effective running of this charcoal group. Komani Charcoal Group is a clan group consisted of different people living in the same clan who have different family values and status which makes it difficult in running the charcoal business.

Charcoal production is a new technology and it needs more time for charcoal groups to disseminate the information on the use of charcoal through effective promotion and awareness to create better market. Apart from any other groups, family group is more successful so future research can look at setting up charcoal groups using family unit.

Mt Hagen facilitator: Joseph Pumai

The charcoal production is a new technology and a new business enterprise for families who would like to adapt as an income generating activity. Through ACIAR project trialling of charcoal producer groups as micro-group business appears to sell charcoal packed in 2kgs and 34 customers established through the charcoal stoves sold. The number of charcoal stoves sold out directly determines the level of demand for the product, the charcoal. The charcoal producer groups cannot produce charcoal without selling the charcoal support. Customers for the charcoal are obviously the charcoal stove owners. The 46 charcoal stoves purchased from the ACDTI (Unitech) and re-sold to interested buyers initially created interest for the two charcoal producer groups to produce charcoal and sell to these charcoal stove owners. The expansion of the charcoal market will depend on the number of stoves sold. The charcoal producer groups will have to produce their own charcoal stoves to increase the number of stoves sold. For instance, if 200 stoves are sold, there are 200 charcoal buyers in the charcoal market to make the charcoal business operationally and financially sustainable. This approach needs to be implemented properly as it is vital to the success of the charcoal business.

The two charcoal producer group are highly susceptible to discontinuing their charcoal production and marketing. Leo Pai of Muddy Youth Group is the leader of the group and with his wife Lucy have produced more charcoal to date than the Komani group. Leo said while producing charcoal was able to continuously grade charcoal and had learnt how to produce quality charcoal. This was evident when Leo's charcoal were used in terms of heat produced and size of the charcoal piece. Leo has an empty shed beside the road in his village where his charcoal packs are stored for transporting to town. It can be concluded that Muddy Youth Group produced more charcoal than Komani Clan Group. It is also found that larger social groupings like clan or extended family cannot continue to contribute time and efforts into a new group activity if the returns are less than their on-going economic activities. Therefore, Komani Clan Group, a broader clan produced less charcoal as compared to Muddy Youth Group, an extended family group. Leo Pai in the Muddy Youth Group put in more effort in the charcoal production than the other group

members. The individual family in the extended family grouping can be most sustainable social unit that can adapt any new business concept and/or new technology and maintain The practice in the long term than other forms of social groupings as they too broad are prone to collapse.

The access to a microfinance savings and credit institution is one of the motivating factors influencing household entrepreneurs to adapt and maintain any new concept or technology introduced by the host organization. Access of individual family groups to an external social or economic network like the VWBP through a community social institution in which they are affiliated members, helps to access external socio-economic development institutions and resources. In PNG, limited or no access to external development institutions and resources, is major problem for the rural mass. Consequently, organizations such as PARD acting as a bridge for the disadvantaged community households developed a culture where the members have internalized its norms, values and attitudes which influences the phenomenon of very strong social integration. While profit is conventionally thought as driving force for entrepreneurs to start businesses, a well-established social organization can drive members to fulfil what they are required to do as members of the social institutions even for profit and also as social obligations. Thus, the charcoal producer groups who are members of the social VWBP network can continue to produce charcoal and charcoal stoves as a micro-business initially but advance to a small and/or medium sized business in the near future.

Research student and Semi-Structured Interview surveyor: Ben Robinson

Whilst knowledge exists about what charcoal was and how it could be utilized, to establish sustainable businesses a stable and reliable level of both supply and demand would have to be established. Both producer and consumer confidence in this supply and demand is integral to getting any charcoal business off the ground. This would be best achieved by both facilitating production and promotion and then relying on reputation to increase demand over time

Group business members must be part of the same Wantok to ensure trust and cohesion is maintained but where possible groups should operate outside of the traditional Wantok hierarchies of power. Using women, a large management committee, democratic decision making processes and membership 'buy in', 'Big Man' and male domination could be mitigated against. This is vital to long-term stability as soon as clan or dominant male leaders start to take control other members will become disenchanted and disinterested threatening the sustainability of the group.

9.4 Evaluation of Success

A summary evaluation of success is based on

1. The extent to which the **project logic** was followed,
2. The extent to which the **project vision** matches **project reality,**
3. The quality of knowledge generated from the exercise

An **action research project logic** is very useful in contexts where the goals are uncertain and the research environment is difficult to control; however for it to work it does require a certain discipline among the research team. The goals of this project were uncertain because we didn't know if the project vision could possibly match reality (as it turned out there was considerable divergence). The research environment in PNG is characteristically difficult (e.g. impact of tribal violence on the Mt Hagen groups). Another complicating element was that the two research sites are far apart, with quite different social-cultural make-up, and being facilitated by two organisations with very different

modus operandi. Nevertheless, basically all activities were achieved and recorded following action research protocols (see Table 18).

The fact that the **project vision** (Box 1) **did not entirely match the project reality** reflects more the project leader's hubris and not the lack of capacity of the project team. The sustainability of the Mt Hagen groups still needs to be proven; although technically both groups are still operating at close of project, at least one group is unlikely to survive due to a disintegrating group structure. The Lae groups have potential to survive but not necessarily in the form of the project vision. Both of these experiences have generated useful knowledge that has been particularly well articulated at the end of Sections 7.3 and 8.5, and will be summarised in Section 10.

It should be noted that the original project objective was that *only two* charcoal producer groups were to be established (see Section 4.1.1). However, in the reality 13 groups (2 in Mt Hagen, initially 11 and finally 7 in Lae) were facilitated; in this area the project reality greatly over achieved the vision.

The **quality of knowledge** generated by the project can be assessed at two levels. From the point of view of the participants in various training activities, their feedback and testimonials attest to a positive impact in engendering an appropriate business mentality; at least in Lae.

From the point of view of the project team we are interested to know the most appropriate structures for small charcoal enterprises. The SSI work across stakeholders revealed structures known to work in other sectors: the Investment Promotion Authority model and the Cooperative Societies model. The work in Lae resulted in a group structure that resembled the IPA model in the form of the Charcoal Wantok Structure. The work in Mt Hagen resulted in a completely new model, the Lead Charcoal Producer model. These structures have emerged through participatory approaches, and as such reflect the social needs and capacity of the participants. From this we are confident that the knowledge generated and summarised in Chapter 10 is of high quality.

10 Conclusions and recommendations

10.1 Conclusions

Summarising the main knowledge generated from this small research activity.

From the SSI survey we found that:

- As PNG society develops a 'business mentality' appears to be growing in some social sectors which may limit the success of communal enterprises
- Reliance on wantoks can lead to lethargy in entrepreneurship. There should be clear separation between family and business finances
- Important trust relationships are difficult within clans. Village and church organisations offer wider community integration, but they are not as stable as family relationships and are often located within existing traditional clan structures anyway. Development activities undertaken by village and church organisations tend not to follow business principles.
- The majority of business failures are due to either poor leadership or poor accounting leading to a breakdown in trust and empowerment of other individuals.
- Self-governing women's groups have become effective ways of introducing development programs and ideas, and are now favoured as the most stable avenues into a community.
- Possible models for charcoal business groups are the Investment Promotion Authority Model or the Cooperative Society Model.

From the experiences with the facilitating the establishment of groups in Mt Hagen and Lae we found that there is no one-size-fits-all structure for establishing charcoal producer groups. The social and cultural differences between highlands Mt Hagen and coastal Lae are such that different approaches are necessary in the different locations.

In **Mt Hagen** we found that broad social groups are unstable and are prone to disintegrating when desired goals are not forthcoming. A business models using the extended family system and further targeting individual households is more appropriate. We determined the household-level "Lead Charcoal Producer" as the best way to facilitate successful charcoal businesses. Linking the charcoal producers groups into PARD's VWBP social network can enhance social integration and help producers maintain their business efforts; it will also make the charcoal business option more visible and accessible to a wider group of potential entrepreneurs.

While there is an expressed desire in Mt Hagen for charcoal as an alternative energy source (especially among hot food vendors), there is still much to be done to establish the market. The charcoal business relies on and cannot be separated from the charcoal stove business.

Access to micro-credit loans was an important feature of the Mt Hagen experiment. We found that the directed credit approach motivated the adopters to test the new technology initially to see if it's profitable to make any serious commitment of resources for the charcoal. The VWBP micro-financial savings facility assisted the two charcoal producer groups to save and withdraw money. The VWBP saver's account statement indirectly helped the project facilitators to study the behaviour of the participants on how the operate the charcoal business. Even a cash book was not properly maintained by the groups.

Illiteracy and low formal education appears to contribute to lack of understanding of the new ideas and approaches. Also, despite our apparently rigorous group selection criteria, an attitude of dependency was indirectly exhibited by some participants in Mt Hagen.

In **Lae**, the experience was quite different. The 7 groups that finally emerged represented a broad range of social and cultural characteristics. Also in contrast to Mt Hagen some were landholders and some did not have land to collect or grow their own fuelwood. Despite this they managed to come together under a successful Charcoal Wantok Group structure similar to the IPA model that emerged from the SSI survey. Amongst these groups they differed in their emphases on charcoal and stove production, wood and charcoal sales, and charcoal demonstration (and hot food sales) activities. They also agreed on charcoal prices, as well as their local market spots, to minimise competition that might stifle the development of the charcoal market.

The Lae groups needed microfinance facilities to enter the charcoal business, but the project did not need to facilitate these loans as such a service already exists in Lae.

The final overarching conclusions of this project are:

- It is possible to facilitate the establishment of charcoal producer groups in both Mt Hagen and Lae, but different approaches must be taken to account for the characteristics and capacity of potential entrepreneurs. In Mt Hagen, business groups should be kept at the family level, in Lae it is possible to develop a socially broader cooperation between business groups.
- Charcoal production and sales can't be separated from production and sales of charcoal stoves and persistent demonstration of the value of charcoal use in the market place.
- Training in all aspects of the charcoal value chain is necessary as is the involvement of entrepreneurs in the development of their own business plans.
- The 18 months of engagement and monitoring followed in this project is probably a bare minimum period for this kind of work.

10.2 Recommendations

Specific recommendations for the Mt Hagen and Lae charcoal producer groups.

1. Some low level monitoring / observation of the progress of the charcoal producer groups over the next few years will yield further useful information. The groups that survive and prosper will be those that evolve beyond the level that the project facilitated. The directions these groups take will provide information for promulgation into other areas
2. Port Moresby is obviously an area that could support a charcoal market. The nature of successful groups in NCD is likely to resemble those in Lae rather than Mt Hagen. Further study of the Lae groups should be undertaken before any attempt is made to facilitate a charcoal market in NCD. Such a study would include personal and social profiles of the successful individuals and groups, as well as a rigorous choice modelling study of energy products.
3. There is a clear need for a sustained and long term charcoal awareness program. FRI is a likely candidate organisation to oversee such a program. However, it needs to officially recognise the critical nexus between research and extension, and to support the latter. If FRI cannot take up this challenge, then NARI should be encouraged to do so.

4. Considerable knowledge and institutional capacity has been developed from ACIAR's investment in the earlier Fuelwood project and the current Charcoal project. A mechanism is needed to transfer this knowledge and capacity to cognate ACIAR projects in PNG, such as the new Community Forestry project.

General recommendations for facilitating small businesses associated with forestry and other natural resource management emerged from the SSI work:

5. **Business Mentality -** People need education in how to share risk as well as profit. The recognition of difference between revenue and profit and an ethos of reinvestment must be instilled in business members. This can be achieved through basic business education, such as book keeping and break even projections and through communal enterprise which attempts to check an individual mentality.
6. **Traditional Structures** - Use existing groups to introduce and facilitate projects as these are existing stable regimes of structure and governance. Family groups are strong established structures however groups outside the family structure (but within the clan/tribe) should also work well. Wantok members, not involved in the business, must be educated in what is common property and what is business property to overcome the exploitation of business resources and revenue.
7. **Land Tenure** - Where necessary the groups must recognise that the whole clan has rights to resource regardless of business requirement. Ideally a project should keep the number of clans within a single group or association low to minimise conflict.
8. **Gender –** Allow gender equality to develop over a long time in the communities own time so that it is truly realised. A clear division of labour ensures one gender or individual does not dominate. Women could be placed in positions of importance and influence, such as treasurer and secretary whilst retaining the traditional male domination.
9. **Church** - The church should be used as a vehicle for development but not a base for business practice as this alienates other community members outside of these spheres as well as threatening the strength of the societal value of faith structures within the community. The structural approach to management used by the church can be used as a model for governance.
10. **Governance** - The executive board must be separate from management structure and oversee the day to running of the project. This breaks up the decision making process and puts checks in place. Governance must be focused on key values of transparency, openness, free, prior, informed consent outlined in a commonly agreed constitution.
11. **Extension** - Work to timescale of the community not the NGO or donor agency. Conflicting obligations of community members does not necessarily indicate a lack of interest. If possible spend a considerable amount of time with the project stakeholders to build up trust and transfer skills and marry objective completion with staged donor payments.
12. **Capacity/Participation** - Personal membership fees for those involved in business or project puts a financial check on involvement and ensures real ownership and interest in the project. Ensuring groups or individuals approach developers rather than the other way around ensures empowerment. A clear and extensive division of labour and a democratic and transparent governance regime retains trust and empowerment.

11 References

11.1 References cited in report

Dombro, D.B (2010) Eucalyptus pellita: Amazonia Reforestation's red mahogany, An e-book for tropical tree investors, Planeta Verde Reforestación S.A.

Gamser and Harwood, 1982, Charcoal Production and Use in Papua New Guinea, Energy Planning Unit, Department of Minerals and Energy, Konedobu.

German Development Service (2002) Trainers Manual: Working with your community, Workshop 1, Making the changes we want, Papua New Guinea.

Kamila, V.B (1998) Charcoal and charcoal stove making, Appropriate Technology & Community Development, Liklik Buk Information Centre, The Papua New Guinea University of Technology, Lae.

11.2 List of publications produced by project

A scholarly paper based on this project is currently in preparation.

Robinson B, Nuberg I, Abiuda-Mitir J, Brooke R (in prep). How to engage small charcoal business in Papua New Guinea. *Journal of Development Studies*

12 Appendixes

12.1 Appendix 1: Internal project documents

These documents are available from the CD attached to the back page of this report.

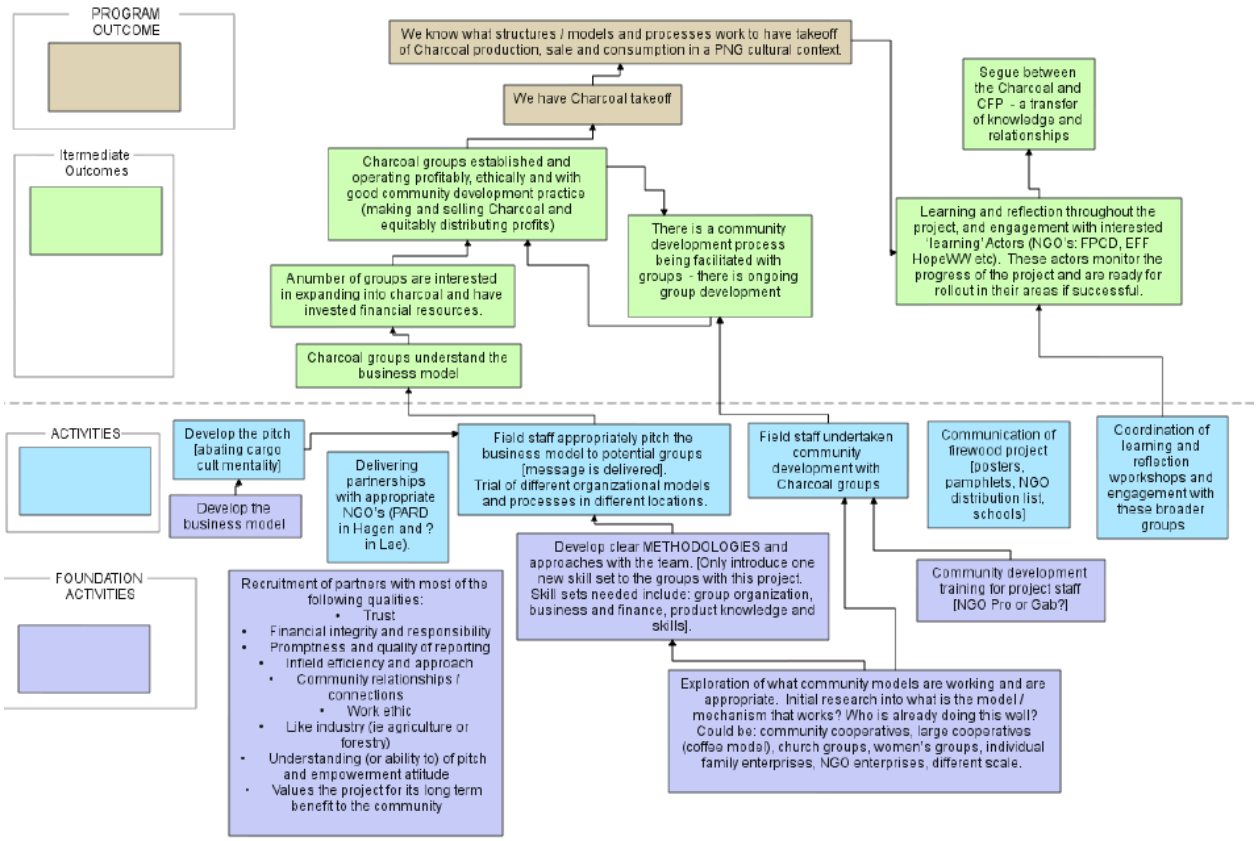
Ref	Title	Content, author, file name
2011_1	**Charcoal Cooperatives in PNG: an ACIAR Small R&D Activity**	Initial scoping paper for the SRA Author: Ian Nuberg Charcoal Cooperatives in PNG_111116.docx
2011_2	**Facilitating the Establishment of Charcoal Producer Groups in PNG**	Formal project proposal Author: Ian Nuberg FST-2011-058_Charcoal.pdf
2012_1	**Principles of Charcoal Groups: Inception workshop**	An introductory document for the Inception workshop. Outlines principle concepts of 'charcoal producer groups' and suggestions for how the inception workshop should proceed in the absence of project leader. Author: Ian Nuberg Principles Charcoal Groups_120523.pdf
2012_2	**Charcoal flows**	Diagram of possible flow of activity from fuelwood collection, planting, production, transport, selling, and organisation required. For inception workshop Author: Ian Nuberg CharcoalFlow_120524.docx
2012_3	**Action plan**	This is an action plan for activities from June 2012-June 2013 for the project Author: Ben Robinson Action_plan_120603.docx
2012_4	**Inception meeting notes**	These are notes from the Inception Meeting on Thursday 31st June 2012 recording what was discussed at the meetings and workshops which ran until Saturday 2nd June. The meeting was led by Jessie Waibaru Abiuda-Mitir with Joseph Pumai, Randall Manapangkec, Gabriel Iso and Ben Robinson in attendance. Author: Ben Robinson inception_meeting_notes_120606.pdf
2012_5	**Selection criteria for charcoal producer groups**	Selection criteria determined at Inception meeting Author: Ben Robinson selection_criteria_120606.pdf
2012_6	**Charcoal business model 1**	Theoretical framework for developing the charcoal business model Author: Ben Robinson charcoal_business_model_120606.pdf
2012_7	**Charcoal business model 2**	Framework for itemising costs in the production chain of the charcoal business model Author: Ben Robinson business_model_costing_120606.pdf
2012_8	**Monthly group monitoring form**	Monthly group monitoring form with sections on production, governance and marketing Author: Ben Robinson ? monitoring_form_120606.pdf
2012_9	**Semi-Structured Interview progress report**	A progress report and summary of the semi-structured interviews conducted to investigate structures and processes appropriate to establishing successful charcoal producing groups. Author: Ben Robinson interview_report_120617.pdf
2012_10	**Business Costing Mt Hagen**	This report presents a brief explanation of Business Costing for Mt. Hagen Author: Randall Manapangkec Business costing_Randall_120622.docx
2012_11	**Business Costing Mt Hagen & Lae**	Spreadsheet of details in producing and selling charcoal in Mt Hagen and Lae Author: Ben Robinson business_costing_Hgn_Lae_120622.xlsx

Ref	Title	Content, author, file name
2012_12	**FRI TokSave**	FRI press release to attract community groups for meeting 13 July 2012 in Lae Author: Jessie Mitir FRI_press release.docx
2012_13	**How to engage small group charcoal enterprises in Papua New Guinea**	This report summarises the research, analysis and conclusions made from a study completed in May-July 2012 into appropriate structures and process in community enterprises in PNG. Author: Ben Robinson CharcoalSSI_summary_report_120711.pdf
2012_14	**A public presentation to engage charcoal produce-vendor groups**	Report of a public presentation to engage charcoal produce-vendor groups on 13 July 2012 at FRI. Includes acquittal Author: Jessie Abiuda Mitir Public Presentation REPORT_120713.docx
2012_15	**Project progress report June-Oct 2012**	This report gives a progressive summary of activities to date for Lae and Mt Hagen charcoal groups since the last meeting. So far the Project team has met twice, first in Lae (May) and later in Mt Hagen (August). A tabulated activity for Lae and progressive report for Mt Hagen is also provided. Author: Jessie Abiuda Mitir JUNE - OCT 2012 PROGRESSIVE REPORT.pdf
2012_16	**Business training notes Mt Hagen**	This is a report of the business training activity in Mt Hagen from Monday 6th of August until Friday 10th of August 2012. Author: Ben Robinson Business_Training_notes__Action_Plan.pdf
2012_17	**Business Planning Workshop Report – Hagen Charcoal Producing Groups.**	Report of the business planning workshop 6-10 August 2012 in Mt Hagen Author: Gabriel Iso Hagen BP Workshop Report_120814.docx
2012_18	**Research for business plan**	Framework for research to gather information for business plan. Author: Ben Robinson ? Small Market Research for Business Planning_120815.docx
2012_19	**Progressive Report of Charcoal Production for Mt Hagen Charcoal Producer-Vendor Groups**	This is a brief progressive report of Muddy and Komane charcoal producer-vendor groups after the Business Planning Workshop. Author: Randall Manapangkec Progressive Report-Charcoal Production_121009.docx
2012_20	**Summary report**	Report of first 6 months project activity. Author: Jessi Abiuda Mitir FST 2011 058 - Charcoal Project REPORT_121116.docx
2012_21	**Business plan for Mt Hagen**	Business plan for Mt Hagen charcoal producer-vendor groups Author: Randall Manapangkec BP for Mt Hagen Groups_121123.docx
2012_22	**Business Planning Workshop Report – Lae Charcoal Producing Groups**	Report of the business planning workshop 3-7 September 2012 in Lae Author: Gabriel Iso LAE BP Workshop Report_121129.docx
2012_23	**Charcoal project review visit report**	This brief report presents the charcoal project review visit for the Mt Hagen charcoal producer-vendor groups on the 09th of December 2012. The team comprised of Brian Gunn, Joseph Pumai and Randall Manapangkec. Author: Randall Manapangkec HagenProject review visit report_121212.docx
2012_24	**ACTIVITY 3.2** ***Project Team Meeting No. 3***	Minutes of project team meeting on 12 December 2012 at FRI Author: Jessie Abiuda Mitir Proj_Team Meeting Minutes No 3_121219.docx
2012_25	**Engaging charcoal producer-vendor groups vital for community forestry businesses**	FRI Newsletter with article titled "*Engaging charcoal producer-vendor groups vital for community forestry businesses"* Author: Jessi Abiuda Mitir FRI Newsletter Volume 12 Issue 3.pdf
2012_26	**Project Review** **Dec 2012**	Review of ACIAR Project FST/2011/058 as part of Brian Gunn's visit to PNG Author: Brian Gunn CharcoalReview report BG Dec2012-1.docx
2013_1	**Activity 3.2.5 Field Staff Attract and Initiate Charcoal Producer-Vendors Groups**	This report explains how and to what extent the selection criteria were applied and steps taken to attract charcoal producing groups in Mt Hagen Author: Randall Manapangkec AttractingParticipants_130107.docx

Ref	Title	Content, author, file name
2013_2	**Activity: 3.2.8 Regular Meetings with Charcoal Groups # 1**	Records of meetings with charcoal producer-vendor groups in August, September and December 2012 Author: Randall Manapangkec Regular meetings with charcoal groups_130107.docx
2013_3	**Activity: 3.2.8 Regular Meetings with Charcoal Groups # 2**	Records of meetings with charcoal producer-vendor groups in 14 January 2013 Author: Randall Manapangkec Progress Review Meeting with Charcoal Groups_140113.docx
2013_4	**Promotional Posters**	Seven posters in English and Tok Pisin promoting charcoal stoves with titles: • How charcoal stove works • How to start you charcoal stove • Comparison between use of firewood and charcoal • Benefits of charcoal and charcoal stove • How to look after your charcoal and charcoal stove • Women in the village trying out charcoal • Cooking with charcoal using your charcoal stove Author: Jessie Abiuda Mitir Promo posters_07032013.docx
2013_5	**Charcoal Poster**	Poster: Basic use and benefits of charcoal and charcoal stove Author: Randall Manapangkec Basic use and benefits of charcoal charcoal stoves_130307.docx
2013_6	***Activity 3.2.9* Field Staff Monitor Charcoal Groups**	Summary of group monitoring activity in Mt Hagen for Dec 2012-Feb 2013 Author: Randall Manapangkec Field monitoring Hagen_130307.docx
2013_7	**Activity 3.2.9** **Charcoal and stove production**	This reports early activity of charcoal and stove promotion in Mt Hagen Author: Randall Manapangkec Charcoal Promotion_130309.docx
2013_8	***Lae Action Plan***	Spreadsheet with details of the plan for activity in Lae including budgets for meetings, tree plantings, seed money and web design Author: Jessie Abiuda Mitir Lae Action Plan 2013.xlxs
2013_9	**Preview of Buang trip**	Photos of village demonstration at Buang in Wagau area of Morobe Province Author: Jessie Abiuda-Mitir Preview of Buang trip.pdf
2013_10	**Business Model Lae**	The business model for the Lae groups is based on actual activities undertaken from July 2012 to July 2013. Author: Jessie Abiuda-Mitir Business_Model_Lae.docx
2013_11	**Charcoal vendor testimonial**	Description of involvement and expression of appreciation from one of the Lae charcoal producers Author: Wala Koila Traim_Tsol_report – Charcoal.docx
2013_12	**Training and Community Development report**	The report comprises community development training, business planning for micro enterprise training, charcoal production training, SRC training, and stove construction training. Authors: Jessie Abiuda-Mitir, Gabirel Iso and Randall Manapangkec CommunityDevelopmentTrain_130819.docx

12.2 Appendix 2: Program logic used to design the project

The following diagram was developed in consultation with Natalie Moxham from Clear Horizon (http://clearhorizon.com.au/). It underpins the program logic used in this project.



12.3 Appendix 3: Microfinance tables

Table A3.1: Muddy Youth Group VWBP Saver's Account Statement

Peoples Action For Rural Development Inc - Branch: Head Office
P.O.Box 1677, Mt.Hagen 281, WHP, Papua New Guinea, Tel: +(675) 5421053

Printed on: 31/07/2013
Printed by: Lucy

SAVERS STATEMENT OF RUMA MUDDY YOUTH GROUP, ACCOUNT: HO/G/00016

Bank Statement from 11/05/2009 to 31/07/2013
Date opened: 24/10/2012
Current Interest Rate: 0.00 % Interest on savings calculated on Running balances.

Reference No.: 000115
Current Minimum Balance:
Product: Free Savings

Date	Transaction No:	Voucher no.	Cash/ Cheque/ Transfer	Description	Particulars	Debit	Credit	Balance
					Balance B/F			0.00
24/10/2012	212/009807	06952TT2	Cash	Free savings cash deposit	Savings Deposit	0.00	327.00	327.00
21/12/2012	213/000106	8260WT1-C	Cash	For personal use	Savings Withdrawals	50.00	0.00	277.00
21/12/2012	213/000120	08268WT1	Cash	Free savings deposit	Savings Deposit	0.00	100.00	377.00
28/12/2012	213/000248	08310WT1	Cash	Free savings deposit	Savings Deposit	0.00	40.00	417.00
31/12/2012	213/000286	08337WT1	Cash	Free savings deposit	Savings Deposit	0.00	115.00	532.00
04/01/2013	213/000362	08380XT1	Cash	Free savings deposit	Savings Deposit	0.00	10.00	542.00
07/01/2013	213/000418	07764YT2	Cash	Free savings cash deposit	Savings Deposit	0.00	125.00	667.00
10/01/2013	213/000467	08422XT1	Cash	Free savings deposit	Savings Deposit	0.00	110.00	777.00
10/01/2013	213/000456	07792YT2	Cash	Free savings cash deposit	Savings Deposit	0.00	145.00	922.00
14/01/2013	213/000563	08446XT1	Cash	Free savings CHQ#000993	Savings Deposit	0.00	1,700.00	2,622.00
14/01/2013	213/000581	07822YT2	Cash	F/Savings 3X Stove & 6X Charcoals	Savings Deposit	0.00	330.00	2,952.00
15/01/2013	213/000651	08462	Cash	F/savings dep. (1xstv & 3x charcz)	Savings Deposit	0.00	115.00	3,067.00
15/01/2013	213/000598	8452XT1-Ca	Cash	For charcoal project	Savings Withdrawals	300.00	0.00	2,767.00
18/01/2013	213/000721	07828YT2	Cash	F/savings cash deposit 1x stove	Savings Deposit	0.00	100.00	2,867.00
23/01/2013	213/001051	7884YT2-Ca	Cash	Withdrawal for charcoal production	Savings Withdrawals	200.00	0.00	2,667.00
25/01/2013	213/001202	07919YT2	Cash	F/ savings deposit(13xcharcoal pkts)	Savings Deposit	0.00	65.00	2,732.00
25/01/2013	213/001172	7984ZT1-Ca	Cash	For Charcoal Project	Savings Withdrawals	100.00	0.00	2,632.00
31/01/2013	213/001405	08038ZT1	Cash	Free savings deposit	Savings Deposit	0.00	120.00	2,752.00

*Report generated by: Loan Performer Version 7.10.12 ***

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Date	Transaction No:	Voucher no.	Cash/ Cheque/ Transfer	Description	Particulars	Debit	Credit	Balance
04/02/2013	213/001620	07605AaT2	Cash	F/Savings 2x stove & 7x charcoals	Savings Deposit	0.00	235.00	2,987.00
04/02/2013	213/001624	07607AaT2	Cash	F/Savings Dep 1xstove part instalment	Savings Deposit	0.00	20.00	3,007.00
04/02/2013	213/001643	7611AaT2C	Cash	For part payment for logs	Savings Withdrawals	400.00	0.00	2,607.00
07/02/2013	213/001785	07647AaT2	Cash	F/savings dep(1xstove & 14x charcoal)	Savings Deposit	0.00	170.00	2,777.00
11/02/2013	213/001948	7668AaT2-C	Cash	Payment for firewood for charcoals	Savings Withdrawals	300.00	0.00	2,477.00
13/02/2013	213/002111	7692AaT2-C	Cash	W/d for Plastic bags for charcoals	Savings Withdrawals	19.00	0.00	2,458.00
01/03/2013	213/002813	08903AcT2	Cash	F/Savings deposit (9x charcoals)	Savings Deposit	0.00	44.00	2,502.00
08/03/2013	213/003041	8769AbT1C	Cash	Charcoal promotion	Savings Withdrawals	50.00	0.00	2,452.00
12/03/2013	213/003117	08960AcT2	Cash	F/savings dep (6xcharcoals)	Savings Deposit	0.00	30.00	2,482.00
14/03/2013	213/003222	8973AcT2-C	Cash	For personal use	Savings Withdrawals	100.00	0.00	2,382.00
25/03/2013	213/003519	09047AcT2	Cash	F/savings dep (1x stove 2x charcoals)	Savings Deposit	0.00	110.00	2,492.00
25/03/2013	213/003381	8843AbT1C	Cash	For firewood	Savings Withdrawals	60.00	0.00	2,432.00
27/03/2013	213/003495	9256AeT1C	Cash	For personal use	Savings Withdrawals	200.00	0.00	2,232.00
08/04/2013	213/003780	9123AdT2-C	Cash	W/d for meeting expenses	Savings Withdrawals	20.00	0.00	2,212.00
16/04/2013	213/003953	9193AdT2-C	Cash	W/d for labour cost for firewood	Savings Withdrawals	20.00	0.00	2,192.00
24/04/2013	213/004121	09207AdT2	Cash	Free savings cash dep (12x charcoals)	Savings Deposit	0.00	60.00	2,252.00
25/04/2013	213/004178	09391AeT1	Cash	Free savings deposit	Savings Deposit	0.00	5.00	2,257.00
25/04/2013	213/004148	09382AeT1	Cash	Free savings deposit	Savings Deposit	0.00	15.00	2,272.00
26/04/2013	213/004208	09216AdT2	Cash	Free savings dep (10x charcoal)	Savings Deposit	0.00	50.00	2,322.00
26/04/2013	213/004226	9401AeT1C	Cash	For payment of firewood	Savings Withdrawals	100.00	0.00	2,222.00
01/05/2013	213/004373	9245AdT2-C	Cash	W/d for payment for firewood	Savings Withdrawals	750.00	0.00	1,472.00
01/05/2013	213/004418	09250AdT2	Cash	F/Saving dep(Reg fees from the Group)	Savings Deposit	0.00	350.00	1,822.00
10/05/2013	213/004740	9686AgT1C	Cash	For the payment of firewood	Savings Withdrawals	100.00	0.00	1,722.00
17/06/2013	213/005997	1013AhT2-C	Cash	For personal use	Savings Withdrawals	1,000.00	0.00	722.00
25/07/2013	213/007200	0188AjT2-C	Cash	Payment for Charcoal packing bags.	Savings Withdrawals	100.00	0.00	622.00

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Table A3.2: Komani Clan Group VWBP Saver's Account Statement

Peoples Action For Rural Development Inc - Branch: Head Office
P.O.Box 1677, Mt.Hagen 281, WHP, Papua New Guinea, Tel: +(675) 5421053

Printed on: 31/07/2013
Printed by: Lucy

SAVERS STATEMENT OF KOMANI CHARCOAL GROUP, ACCOUNT: HO/G/00017

Bank Statement from 11/05/2009 to 31/07/2013
Date opened: 10/09/2012
Current Interest Rate: 0.00 % Interest on savings calculated on Running balances.

Reference No.: 000116
Current Minimum Balance:
Product: Free Savings

Date	Transaction No:	Voucher no.	Cash/ Cheque/ Transfer	Description	Particulars	Debit	Credit	Balance
					Balance B/F			0.00
10/09/2012	212/008091	06C02PT2	Cash	Free savings deposit	Savings Deposit	0.00	15.00	15.00
24/10/2012	212/009845	06761ST1	Cash	Free savings deposit	Savings Deposit	0.00	327.00	342.00
14/01/2013	213/000580	08447XT1	Cash	Free savings CHQ#000994	Savings Deposit	0.00	1,700.00	2,042.00
17/01/2013	213/000743	8482XT1-Ca	Cash	For charcoal project	Savings Withdrawals	500.00	0.00	1,542.00
22/01/2013	213/001052	7895YT2-Ca	Cash	Withdrawal for charcoal production	Savings Withdrawals	150.00	0.00	1,392.00
11/03/2013	213/003113	8780AbT1C	Cash	For personal use	Savings Withdrawals	100.00	0.00	1,292.00
11/03/2013	213/003079	08780AbT1	Cash	F/Savings (stove payment)	Savings Deposit	0.00	100.00	1,392.00
11/03/2013	213/003082	08780AbT1	Cash	Free savings deposit	Savings Deposit	0.00	100.00	1,492.00
02/04/2013	213/003609	09077AdT2	Cash	F/savings deposit (stove)	Savings Deposit	0.00	50.00	1,542.00
09/04/2013	213/003783	9126AdT2-C	Cash	For personal use	Savings Withdrawals	500.00	0.00	1,042.00
25/04/2013	213/004179	09392AeT1	Cash	Free savings deposit	Savings Deposit	0.00	5.00	1,047.00
26/04/2013	213/004233	09403AeT1	Cash	For buying of charcoal	Savings Deposit	0.00	4.00	1,051.00
01/05/2013	213/004336	09420AeT1	Cash	Charcoal payment	Savings Deposit	0.00	22.00	1,073.00
13/05/2013	213/004757	09552AfT2	Cash	Free savings dep (2xstove&3xcharcoal)	Savings Deposit	0.00	215.00	1,288.00
16/05/2013	213/004857	09706AgT1	Cash	Charcoal payment	Savings Deposit	0.00	17.00	1,305.00
17/05/2013	213/004954	9599AfT2-C	Cash	For charcoal stove awarness	Savings Withdrawals	200.00	0.00	1,105.00
20/05/2013	213/004989	09622AfT2	Cash	Free savings cash dep (1xstove)	Savings Deposit	0.00	50.00	1,155.00
05/06/2013	213/005604	10054AiT1	Cash	Buying of charcoal	Savings Deposit	0.00	10.00	1,165.00

*Report generated by: Loan Performer Version 7.10.12 ***

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Date	Transaction No:	Voucher no.	Cash/ Cheque/ Transfer	Description	Particulars	Debit	Credit	Balance
17/06/2013	213/005951	10124AiT1	Cash	Buying trees for firewood	Savings Withdrawals	300.00	0.00	865.00
19/06/2013	213/006032	10138AiT1	Cash	Buying of plastic bags	Savings Withdrawals	200.00	0.00	665.00
03/07/2013	213/006658	0207AkT1	Cash	F/ savings deposit for charcoal	Savings Deposit	0.00	20.00	685.00
08/07/2013	213/006777	0238AkT1	Cash	For plastic bags	Savings Withdrawals	80.00	0.00	605.00

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Table A3.4: Muddy Youth Group Loan Account Statement

Peoples Action For Rural Development Inc - Branch: Head Office
P.O.Box 1677, Mt.Hagen 281, WHP, Papua New Guinea, Tel: +(675) 5421053

Printed on: 31/07/2013
Printed by: Lucy

Loan Ledger Card Ruma Muddy Youth Group, Loan No.: HO/03015, Repayments against Current Dues

Address :Kiapuga, Mt. Hagen Phone:

Reference No. : 000115

Annual Interest Rate: 54.00000
Installment type: Four-Monthly
Number of Installments: 1
Interest calculation method: Flat Rate
Interest Deducted at Disbursement: No
Interest calculation in days: No
Calculate interest for grace period: No
Interest Instalments also in Grace Period: No

Product Name: Loans General
Grace Period (in days): 0
Interest on grace period compounded.: No
Charges at Application/Approval
Commission paid on: / /
Stationery: 0.00
Loan Commission: 0.00
Development Fee: 0.00

Credit Officer: Joseph
Interest paid upfront?: No
Charges at Disbursement
Commission paid on: / /
Stationery: 0.00
Loan Commission: 0.00

Date	Transaction	Voucher	Principal	Interest	Penalty	Running Balance	Balance principal	Balance Interest	Balance Penalty	Total balance	Cheque Status
24/10/2012	Loan Application		2,300.00	414.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/10/2012	Loan Approval		2,300.00	414.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/10/2012	Disbursements	Cash	2,300.00	0.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/02/2013	Installment Due		2,300.00	414.00	0.00	2,714.00	2,300.00	414.00	0.00	2,714.00	

Client is in arrears as of reporting date by 157 days for an amount of 2714.0000

Table A3.5: Komani Clan Group Loan Account Statement

Peoples Action For Rural Development Inc - Branch: Head Office
P.O.Box 1677, Mt.Hagen 281, WHP, Papua New Guinea, Tel: +(675) 5421053

Printed on: 31/07/2013
Printed by: Lucy

Loan Ledger Card Komani Charcoal Group, Loan No.: HO/03016, Repayments against Current Dues

Address :PNGCC - Komani CC, Mt. Hagen Phone:

Reference No. : 000116

Annual Interest Rate: 54.00000
Installment type: Four-Monthly
Number of Installments: 1
Interest calculation method: Flat Rate
Interest Deducted at Disbursement: No
Interest calculation in days: No
Calculate interest for grace period: No
Interest Instalments also in Grace Period: No

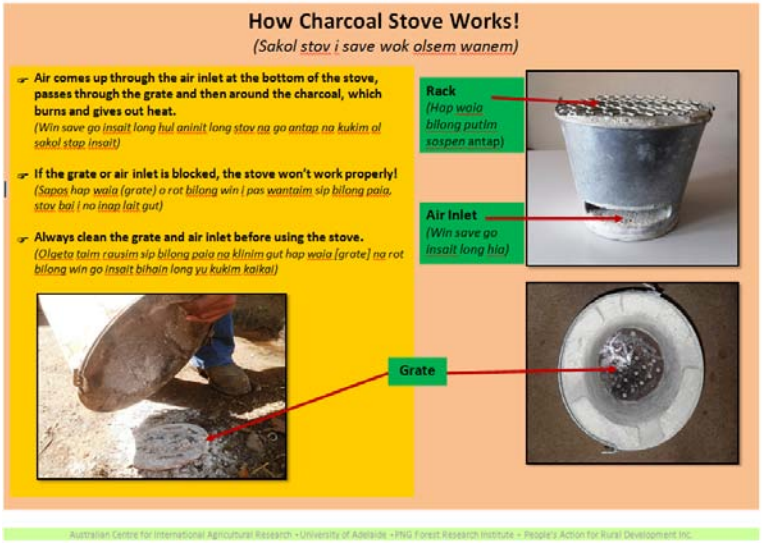
Product Name: Loans General
Grace Period (in days): 0
Interest on grace period compounded.: No
Charges at Application/Approval
Commission paid on: / /
Stationery: 0.00
Loan Commission: 0.00
Development Fee: 0.00

Credit Officer: Joseph
Interest paid upfront?: No
Charges at Disbursement
Commission paid on: / /
Stationery: 0.00
Loan Commission: 0.00

Date	Transaction	Voucher	Principal	Interest	Penalty	Running Balance	Balance principal	Balance Interest	Balance Penalty	Total balance	Cheque Status
24/10/2012	Loan Application		2,300.00	414.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/10/2012	Loan Approval		2,300.00	414.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/10/2012	Disbursements	Cash	2,300.00	0.00	0.00	0.00	2,300.00	414.00	0.00	2,714.00	
24/02/2013	Installment Due		2,300.00	414.00	0.00	2,714.00	2,300.00	414.00	0.00	2,714.00	

Client is in arrears as of reporting date by 157 days for an amount of 2714.0000

12.4 Appendix 4 Charcoal promotional posters



BENEFITS OF CHARCOAL AND CHARCOAL STOVE

(Gutpela bilong sakol na sakol stov)

- ✓ **Clean and even heat**
  (Paia bilong sakol em kiln na bai lait gut)
- ✓ **Smokeless**
  (I nogat simuk)
- ✓ **Strong heat energy**
  (Paia bilong sakol em strong)
- ✓ **Safe compared to gas and electricity**
  (Em seif taim yu komperim wantaim gas na pawa)
- ✓ **Clean pots**
  (Sospen bilong yu bai klin)
- ✓ **Food have original taste**
  (Kaikai bai i gat gutpela teist)
- ✓ **Mobile cooking**
  (Isi long karim i go long arapela hap na kuk)
- ✓ **Can be used as heater for chicks**
  (Yu ken usim olsem heater bilong bebi kakaruk)

How to look after your Charcoal and Charcoal Stove

(Rot bilong lukautim gut sakol na sakol stov bilong yu)

- **Store charcoal in a dry place**
  (Putim sakol long ples drai)
- **Do not sit or put heavy objects on charcoal bags**
  (Noken sindaun o put hevi samting antap long sakol bek)
- **If charcoal get wet, dry them properly in the sun**
  (Sapos sakol i wet, draim gut long sun)
- **Do not pour water on the stove because the concrete will break**
  (Noken kapsaitim wara antap long stov bikos cement bai bruk)
- **Remove the ashes and clean the stove regularly to maintain good condition**
  (Rausim sip bilong paia na klinim stov olgeta taim)
- **Do not sit on the stove**
  (Noken sindaun antap long stov)
- **Take extra care when moving the stove around. Do not drop the stove because the concrete inside will break.**
  (Lukautim gut taim yu laik kisim i go long arapela hap. Noken larim stov i pundaun bikos cement bai bruk)

Women in the village trying out charcoal

(Ol mama long ples i kuk long sakol)

12.5 Appendix 5 Attracting participants

Activity Methodology: 3.2.5 Field Staff Attract and Initiate Charcoal Producer-Vendors Groups

This appendix explains how and to what extent the 'selection criteria' were applied and steps taken to attract charcoal producing groups. In Mt Hagen we used public notice boards to advertise the request for application from organised CBOs to become business entrepreneurs in charcoal production and marketing. The ad clearly outlined the 'vision' of setting up charcoal business enterprise and the 'selection criteria' for charcoal producing groups with the 'expected outcomes'. We developed an application form using the selection criteria that was used as a filter for candidate groups. The advertising ran for 14 days and we received seven interested applicants. The applications were screened and out of seven candidate groups, two have been selected to partake in the charcoal business.

In Lae and advertisement was posted in the local paper.

Over the follow pages are the advertisements and application form that were used to attract and initiate charcoal producing groups as per activity methodology *'3.2.5 Field staff attract and initiate charcoal producer-vendor groups'.*

PAPUA NEW GUINEA FOREST AUTHORITY

NATIONAL FOREST SERVICE

FOREST RESEARCH INSTITUTE
Papua New Guinea

Papua New Guinea Forest Research Institute

P.O Box 314
LAE, 411
Morobe Province, Papua New Guinea

Telephone: (675) 472 4188
Facsimile: (675) 472 4357
Email: enquiry@fri.pngfa.gov.pg

FOR IMMEDIATE RELEASE

MEDIA RELEASE

TOKSAVE

THIS TOKSAVE IS FOR MEMBERS OF SMALL COMMUNITY BASED GROUPS AND ASSOCIATION WHO ARE INTERESTED IN PLANTING LOCAL TREES TO PRODUCE CHARCOAL AS A SMALL BUSINESS ENTERPRISE.

THERE WILL BE A SEMINAR PRESENTATION AT THE FOREST RESEARCH INSTITUTE LOCATED AT THE LAE BOTANICAL GARDEN AT 10.00 AM ON FRIDAY 13TH OF JULY 2012.

IF YOU ARE INNOVATIVE AND WANT TO VENTURE INTO A SUSTAINABLE COMMUNITY BUSINESS, THIS IS YOUR OPPORTUNITY.

THE PRESENTATION WILL BE A LEAD UP TO:

1. CHARCOAL STOVE CONSTRUCTION TRAINING
2. CHARCOAL PRODUCTION TRAINING
3. STARTING AND MANAGING SMALL BUSINESS TRAINING

REGISTRATION WILL BE ON THE SAME DAY.

FOR FURTHER INFORMATION, CONTACT THE PROJECT LEADER JESSIE MITIR ON 472 4188 DURING BUSINESS HOURS.

THIS INFORMATION WAS AUTHORISED BY THE DIRECTOR OF PNG FOREST RESEARCH INSTITUTE PROFESSOR SIMON SAULEI.

APPROVED FOR RELEASE

.....

PROF. SIMON SAULEI
DIRECTOR

"Providing scientific basis for the management of Papua New Guinea's forest resources through research"

PEOPLE'S ACTION FOR RURAL

AGC Building, Hagen Drive
P.O.Box 1677,MT.HAGEN 281
WHP, Papua New Guinea
Tel: (675) 542 1053
Mobile: 71448620
Fax: (675) 542 1053
e-

PROGRAMS:

- **Community People's Capacity Building for Good Governance(CPCBGG)**
- **Sustainable Community Land Management (SCLUP)**
- **Microenterprises Development &**

Strengthening People's Livelihoods for Poverty Alleviation & Environmental Sustainability

22nd June, 2012

NOTICE

REQUEST FOR APPLICATION FROM ORGANIZED CBOs TO BECOME BUSINESS ENTERPRENEURS IN CHARCOAL PRODUCTION AND MARKETING

To: Community Based Organizations (CBOs)

We are looking for organized CBOs groups to participate in the project 'Charcoal Production as a Business'. The successful applicants (groups) will be selected in line with the criteria specifically developed to select groups that are well organized and have the governance and management capabilities. The selected groups are expected to be self-reliant and should be able to identify problems of firewood scarcity and develop solutions innovatively such as a charcoal business plan and its implementation to achieve profitability and sustainability.

The CRITERIA for group selection are as follows:

(1) Selection Criteria for Charcoal Producing Groups

Vision

We are looking for groups who buy into the idea of environmental sustainability and communal business enterprise. They have responsible and hard-working members who are not loan dependant and will take ownership of the business and recognize the core goal of self-reliance.

Criteria

Groups must:

1.1 Have access to firewood and if possible land to grow firewood within an accessible distance of a market.

1.2 Be an existing group or a new group and be able to register as a legitimate business.

1.3 Have strong, trusted and responsible members with a deliberate attempt to promote gender equality.

1.4 Be interested and willing to use and market the technology as ambassadors of charcoal.

1.5 Be financially secure (i.e. default free), and willing to invest their own money as a contribution in the business.

1.6 Show strong work ethic whilst being able to commit the required time and attention to the Business.

(2) Expected Outcomes

1. 1,000 trees planted to replace trees cut for charcoal production;
2. Group members are fully qualified in nursery techniques and field woodlot management;
3. Group members are trained and qualified to plan and manage charcoal business;
4. The selected groups are able to govern and manage their groups such that the charcoal enterprise is turned into a profitable business in Mt.Hagen;
5. The selected groups ensure marketing principles are applied and the products (charcoal and charcoal stoves) are promoted consumers at larger scale;
6. The selected groups legalized as business entity and operate formally in the formal business environment.
7. Consistent monthly charcoal production targets.
8. Consistent sales targets are maintained through effective production and marketing planning and implementation.

(3) Applying:

If you wish to apply for this request for application, get a copy of the application form from PARD office.

Contact Person : Mr. Randall Manapangkec
Project Officer

APPLICATION FORM

1. BACKGROUND AND ORGANIZATIONAL CAPACITY INFROMATION

a) Name of Group: _____
b) Organisation Type : (Tick): NGO___, CBO____, Semi-Government Agency___
c) Social Grouping Type: (Tick): i) Church Women's Group __, ii) Non-church Women's Group__ , iii) Clan/Family Environment Group___, iv) Clan/Family Farming Group__,
    a. iv)Youth Group(Boys/Men)__, v) Youth Group (girls/women)__, Other form of group__(Specify_____).
d) When was the group/organization established?
e) What is the purpose for forming the group
f) Name two achievements made by the group as a result of good governance and leadership?
g) Describe the Group's management structure?
h) (h) What is the decision making procedure?

i) What are your main three(3) objectives of your group for the next five years?

_____
Group Chairperson

12.6 Appendix 6: Testimonial of Wala Koila, Mi Triam Tasol group

I (Wala Koila) would like to express my appreciation for the opportunity given to me by the Project Co-ordinator (Jessie Abiuda) to participate in the Charcoal Project funded by ACIAR.

In this project I learned how to produce charcoal and the use of charcoal in many ways both business and domestic use. The very interesting part of the training was the Business Training which taught me a lot of basic things I need to know about running small Business for Micro-Enterprises purposes. I never took part in the nursery Technique and planting process as I am not a Landowner around Morobe Province.

I participate as a Demonstrator to demonstrate and promote the use of charcoal to the community where I live.

As a Demonstrator, I used Charcoal Stove and Charcoal to BBQ Sausages and lamp Flaps at the front of my house and Sell to the people living around me to make some money. I take this exercise to make awareness on the use of Charcoal as a new means of heat to cook food and at the same time I am making a business by selling the food I cooked for an income to support my living.

The charcoal I used was bought from two of our Charcoal Wantok members (Tom Daniel and Sab John). I see that Sab's charcoal (from Leuceana) burns out fast and gives less heat then Tom' s (from Taun) which gives big heat and I can cook plenty of food with five (5) hand full of charcoal.

Straight after the Training given to us by the Charcoal Project, I bought a Charcoal Stove with my own money from the Project Co-ordinator (Jessie Abiuda) and I was given some free charcoal to start doing the Demonstration and or introducing the use of Charcoal using Charcoal Stove to the community of West Taraka. I see that the community out there were so interested and wanted to try but no stoves and charcoal was available to sell to them at that time. I have talked to the Charcoal and Stover producers in our Charcoal Wantok meetings on the people's demand to purchase stoves and charcoal.

I started the above promotion and awareness from October – November, 2012 with my own money and made a lot of money from the demonstration exercise. Most of the money made was used to meet my day to day needs and I only banked K288.05 into my PNG Women In Business account.

I didn't continue on with my charcoal demonstration business out to the public due to short fall with cash but I still bought charcoal and used it for Domestic purposes; mostly for cooking food and other uses like giving heat in the house on cold raining times and give heat to chicks in my poultry.

Assistance from Charcoal Project – Seed Money or Grant Assistance

I am thank-full with the assistance given to us by the project funder – ACIAR. The project Co-ordinator gave me K500.00 on the 30/04/13. The money is used to purchase necessary items to continue with the demonstration and awareness exercise on the use of Charcoal to the communities.

The Lamp Flaps and Sausages bought were cooked on the 04/05/13 and 05/05/13 using other materials bought. I made good and fast sales with Sausages & k*aukau* (sweet potato) but Lamp Flaps were not sold as expected. I bought the Lamp Flaps at K128.60 and expected to make K200.00 plus but I only make K86.80 which was a loss for me.

The money made was used to pay for the maintenance of my washing Machine, purchase stock feed for chicken for my poultry and keep some money for new purchase of items for sale the next week-end.

The loss was due to the following reasons;

1. Timing - Early Morning is the best time for my clients (I put my sales table out late)
2. Weather - Rain or wet day affects my sale.
3. Type of Food - Lamp Flaps was never cooked before but I cooked for market survey only.

I have now decided to BBQ Sausages and kaukau only when doing my demonstration on the use of Charcoal because my big interest is to make some money and take this exercise as a Micro-Enterprise Business .

With that, I would like to thank ACIAR for funding the Charcoal Project and the Project Co-ordinator – Jessie Abiuda for giving me the opportunity to take part in the project.

From: Wala Koila, Mi Traim Tasol group

Date: 15/05/13

12.7 Appendix 5: Business licence, Apie Welkam Marketing Services

MOROBE

LAE URBAN LOCAL LEVEL GOVERNMENT
P.O. BOX 1333, LAE 411, MOROBE PROVINCE, PAPUA NEW GUINEA

BUSINESS REGISTRATION NUMBER: W6 -019

LICENCE NUMBER: 422-2012

LICENCE TO OPERATE BUSINESS

In pursuance of the Licensing Act (Chapter 324) and Lae Urban Local Level Government General Licensing & Local Trading Law (No. 4/2005) as amended to date, approval is hereby granted **APIE WELKAM MARKETING SERVICES P. O. BOX, LAE, MP** to operate at Section **188** Lots(s) **06 KAMULA STREET (Ward 06)** Lae City.

This license shall continue to be in force from the date hereof until the **thirty-first of December, two thousand and twelve (2012)** or sooner suspended or cancelled in breach of regulatory laws.

Class/Category of License: **PEDDLERS & HAWKERS**

Prescribed Fee: **K256.00** Official Receipt No. **159118** Date: **01/11/12**

Dated this 13th day of November 2012.

ACTING CITY MANAGER
Licensing Authority

LAE URBAN LOCAL LEVEL GOVERNMENT
Common Seal
Of Lae Urban Local Level Government
THE COMMON SEAL OF COUNCIL