

Support to
De-bushing
Project

Assessment of Existing Incentive Schemes and Financing Products for Encroacher Bush Harvesting and Value Addition in Namibia



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Abbreviations

AFD	French Development Agency
AGRIBANK	Agricultural Bank of Namibia
BFS	Business Financial Solutions
DAS	De-bushing Advisory Service
DIFs	Development Finance Institutions
DECOSA	Development Consultants for Southern Africa
EIA	Environmental Impact Assessment
EIF	Environment Investment Fund
FCS	Forest Stewardship Council
FNB	First National Bank
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRN	Government of the Republic of Namibia
IDC	Industrial Development Corporation of South Africa Limited
IPP	Independent Power Producer
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
MLR	Ministry of Lands and Resettlement
MME	Ministry of Mines and Energy
MITSD	Ministry of Industrialisation, Trade and SME Development
NAD	Namibian Dollar
NAU	Namibia Agricultural Union
N-BIG	Namibia Biomass Industry Group
N\$	Namibian dollars
NDP4	National Development Plan 4
NCRST	National Commission for Research, Science and Technology
NPC	National Planning Commission
NPCS	National Planning Commission Secretariat
NTA	Namibia Training Authority
N-BIG	Namibia Biomass Industry Group
PFI	Participating Financial Institutions
R & D	Research and Development
SA	South Africa
SIIP	Special Industrialization Programme
SME	Small and Medium Enterprise
SUNREF	Sustainable Use of Natural Resources and Energy Finance
SO	Strategic Objective
ToR	Terms of Reference
UNAM	University of Namibia
WFW	Working for Water program



Executive Summary

Namibia, through the Fourth National development Plan (NDP4) recognize invader bush harvesting as a national strategy that should be supported to amongst others, create direct and indirect jobs, increase land productivity (especially livestock carrying capacity) and through these; increase rural economic development and overall economic growth. Studies on invader bush in Namibia have established commercial viability of using the biomass through the creation of secondary value adding enterprises, which is in line with the promotion of local value chains of the Growth at Home Execution Strategy for Industrialization. While both economic and commercial importance of harvesting and adding value to the invader bush are widely acknowledged in the country, the industry is still relatively new and requires optimal support for growth.

In underpinning the growth of the invader bush-based industry, the Support to De-bushing Project through the Ministry of Agriculture Water and Forestry (MAWF) has initiated the establishment of a Namibia Biomass Industry Group (N-BIG) and the De-bushing Advisory Service (DAS) to coordinate the scaling up of industry activities and provide expert advice respectively. The next step for advancing the growth of the industry is the provision of adequate, relevant financing products and incentive schemes for harvesting and value adding.

This study is an assessment of existing incentives/grant schemes and financing products for de-bushing activities in Namibia. The study used a supply and demand analysis to determine the adequacy of the current incentive/grant and financing product offerings and propose feasible adjustments that are more appropriate to support the establishment of a sustainable wood based biomass industry in Namibia. The study also used the Working for Water Programme (WFW) in South Africa as case to draw patterns and observations relevant to Namibia.

The results found that, there are several relevant financing and incentive/grant products in the market for the de-bushing industry, however both suppliers and users of these products have also indicated the need for enhancement. The financial industry has shown readiness to improve their current offerings, specifically with regard to the pricing of the financial products and the collateral required to access them. Currently, commercial financing institutions charge a minimum average interest rates of prime which is 10.25 percent and a maximum of prime + 3 percent while development financing institutions charge an average minimum rate of 8.16 with the maximum of 10.25 percent. For security, financing institutions rely on traditional fixed assets which most industry operators either do not have or do not feel comfortable using, especially for activities that do not in themselves generate revenue, i.e. clearing and harvesting. There are two grant mechanisms in the industry which few industry operators are aware of. The study also revealed bottlenecks in the de-bushing value chain which relate to policy and research and development for new products.

The recommendations made by this study seek collaborative mechanisms between commercial, statutory and non-commercial financial institutions to smooth out inefficiencies in the value chain and deliver industry quick gains. The instruments proposed include the promotion of grant funding to address prefeasibility services and business support; and, the enhancement of debt instruments to address access to and affordability of finance with specific actions outlined under the national strategy which is based on four pillars as follows:

- Improving access to finance
- Market Development
- Supporting R & D to optimise new product development



- Increase access to the resource
- Establish Institutional capacity to deliver the strategic objectives.

The approach taken by the national strategy is that of supporting the value chain rather than being single activity focused, to avoid creating bottlenecks in the supply chain.



1 Introduction

The business case for Namibia's invader bush has been established in several earlier studies that have cited enormous multi sectorial benefits of public and private interest. The invader bush is also recognized as an ecological threat and specially considered to reduce the productive capacity of rangeland, decline in groundwater recharges and reducing biodiversity. Its potential commercial value as a source of fuel (firewood, charcoal, bush blocks), energy generation, construction material, agricultural production inputs and other uses such as traditional medicine, carving and many more is significant to the country (AgriConsult, 2014; DECOSA, 2015; NBII, N.D) and as such required a focused and deliberate strategy to harness its economic value. The cross cutting benefits to be derived from controlling the invader bush includes:

- Increase rangeland for livestock farming and consequently improving the economic contribution of the agricultural sector. According to available statistics, direct economic losses due to the effects of bush encroachment is between NAD 1.4 billion and NAD 1.6 billion per year
- Improving the water table base
- Improved habitat for game and protected species (cape vulture)
- Enterprise formation and growth as new enterprises come to formation and others expand through increased production capacity
- Increased tax base
- Employment creation: one charcoal production team creates a minimum of 25 jobs, whilst a bush chip team creates 10 jobs
- Foreign currency earning (exporting of charcoal and bush chips)

The invader bush in Namibia is estimated to be covering between 26 to 30 million hectares of land and mainly cuts across the following regions: (from most invaded to least) Otjozondjupa, Omaheke, Oshikoto and Khomas (Agra ProVision, 2015: iii). Operators currently involved in the harvesting and value addition of the invader bush entail farmers (who primarily clear the bush for improved grazing) and a few entrepreneurs in value adding such as fencing poles, animal feed, charcoal production, bush chips, furniture and more. Some enterprises have upscale potential but are hampered by market access limitations (critical mass off takers) given the fragmentation of the industry, while others need access to appropriate plant & technologies; finance and advisory services. Total annual consumption is estimated to be 800kt/a, which represents 0.4% of total invader bush resource or 8% of average annual re-growth rate.

The four year Support to De-bushing Project in Namibia has over the past two years supported national projects that promote the utilisation of invader bush-biomass more efficiently. The one key strategy entails the development of strategies for the profitable use of biomass for energy generation as well as agricultural and industrial value chains. Studies commissioned through this program established the feasibility for a robust and profitable industry. Specifically, the studies provide the scope of the resource (specified per region), types of alien species, their effects on Namibia's grass land and other indigenous plants, the uses of the different types of invader bush, possible local and export markets for products of invader bush and the feasibility of the invader bush biomass industry in Namibia. Observations from previous studies show that, there is sufficient invader bush resource that can be used as production input to produce a number of products for both local and international markets. The studies, however, also confirm that the current harvesting and value addition methods need improvement and require a concerted value chain development approach to establish efficient industry linkages from harvesting, semi processing, transportation,



storage, manufacturing, retailing and consumption. To this effect, the De-bushing Advisory Service and a Namibia Biomass Industry Group are being established to provide advice and practical support to invader bush-based biomass producers with market/marketing facilitation and sales of biomass to large-scale consumers viz, local retailers and or joineries, energy producers and exporters.

Having established the availability and feasibility for exploiting the invader bush biomass resource, the next step in developing the industry requires productive capacity to meet market demands at required standards. Unlocking these potentials depends on among others, adequate, relevant financing products and incentive schemes which at the moment are inadequate, not well known or well understood by industry operators. The aim of this study is thus to assess existing incentives/grant schemes and financing products for de-bushing activities, determine their adequacy and propose feasible adjustments that are more appropriate to support the establishment of a sustainable wood based biomass industry in Namibia. Furthermore, the report presents a concise 15 year strategy to support the development of such an industry, focusing on strategies that address the bottlenecks identified.

The rest of this report is structured as follows:

Section 2 provides the objectives and tasks of this study followed by an overview of the effects of the invader bush in Namibia in section 3. Thereafter, the methodology (section 4) used in assessing existing incentives/grants schemes and financing products for de-bushing activities in Namibia is discussed before the presentation of the results from the surveys in section 5. A case study analysis is presented in section 6 after which the outcome of consultations with stakeholders is summarised in section 7. Section 8 is the gap analysis presented alongside observations from the process. Recommendations are thereafter discussed in section 9 and they lead into the proposed national strategy aimed at putting mechanisms in place to develop the invader bush industry into a significant contributor to the economy in section 10. A complementary implementation plan and budget is presented in section 11, with a concluding way forward in section 12.



2 Objective and Tasks of the Assignment

The main aim of this assignment is to identify opportunities to improve existing incentives/grant schemes and financing products and/or to propose new instruments. This assessment is expected to provide valuable information to policy makers, financiers and end-users such as farmers, companies and groups looking for financial resources to invest in their bush control and value addition undertakings.

As such, the task for this assignment is therefore to:

- 3.1 Compile a list of existing incentive/grant schemes and financial products and related financing models in Namibia offered by different institutions that can be accessed by farmers/investors interested in undertaking de-bushing
- 3.2 Compile and evaluate statistical information on existing schemes
- 3.3 Provide an in-depth description of the terms and conditions of each of the incentive schemes and financial products (e.g. eligibility, interest rates, and repayment schedules)
- 3.4 Assess the market acceptance related to de-bushing and value addition activities (i.e. number of users/beneficiaries, gaps, bottlenecks etc.)
- 3.5 Propose recommendations on how to further improve existing products and specifically how the Project and/or Government can contribute towards improving/upscaling the existing schemes
- 3.6 Research on other financial models/products used elsewhere in the world that can be adapted to the Namibian market (best practices in financing approaches for de-bushing)
- 3.7 Identify and recommend other/new possible future incentive/grant schemes, subsidies, tax exemptions, loan products etc. that can be undertaken by the Project, Government, financial institutions and other stakeholders, and
- 3.8 Propose a strategy (detailed road map) that can be employed by the Government and financial sector to effectively support and increase the uptake of incentives, grants and loan facilities.

In the previous studies, efforts have been made to present bush encroachment control related financial products from two institutions, namely, First National Bank and the Agricultural Bank of Namibia. However, none of the studies has provided a comprehensive view from other financial institutions on their products for the wood biomass industry, or lack thereof.



3 Background on Bush Encroachment and its Relevance in Namibia



Figure 1 Bush Encroachment - Illustrative

Source: Cost benefit analysis of encroachment bush removal in Namibia (2008-2009)

The majority of Namibia's rural population, both in communal and commercial farmland areas depend on livestock farming for their livelihood. Namibia is also one of the countries in Southern Africa with an invader bush problem that degrades grazing land, affecting over 65 000 communal households and 6 283 commercial farms and their employees, according to De Klerk, 2004 (cited in AgriConsult, 2014: 13). The invader bush in Namibia consists of about 19 species as presented in Strohbach (2010); NPCS (2010), and DECOSA (2013; 2015), and it is largely severe in the regions of; Otjozondjupa, Omaheke, Oshikoto, Zambezi, Kavango East, Kavango West, Ohangwena and Khomas. Control of the invader bush is an important part of rangeland management in Namibia and different methods are being applied with varying degrees of success and consequences; i.e. mechanical control, chemical control and biological control. The chemical control method which is the use of herbicides (arboricides), popularly applied by aerial spraying is the most effective control method in terms of getting rid of the bush but it also has the most negative environmental consequences. Specifically, when used at a large scale, the chemical method is indiscriminate and destroys indigenous as well as protected plant species. Furthermore, the bush which has been treated with chemicals becomes too hard to harvest and seeing that it still needs to be cut down, the total harvesting cost becomes more. At the same time, the quality of the chemically treated bush may change and thus not conform to the natural properties, thus posing possible negative effects for some uses. The method is thus the most expensive and only wealthy farmers can afford it.

The biological control method on the other hand includes biological agents such as browser animals that prefer woody plants (goats, game such as kudus) or fungus which attack specific species. Research conducted by the University of Namibia (Neudamm Campus) has established that, while the use of browsers prevents the spread of invader bush, it does not solve the existing bush which still needs to be cleared/thinned through other methods. Similarly, the use of fungus is only effective if the area is invaded by a single species. In addition, the fungus does not kill the seeds of the invader bush which often germinate and re-colonize the area.



The use of controlled fire, like the chemical control method, is indiscriminative and destroys indigenous plants that often have less capability to reproduce compared to invasive plants. Depending on the density of the bush, the fire may not be hot enough to destroy the whole plant and thus only kills the top, resulting in coppicing of the bush (Kahumba, 2010). Thus, this method is not effective either.

The mechanical method which involves clearing the invader bush by cutting down or uprooting the plant using saws, axes, machetes and other equipment is regarded as **a socio-ecologically sound rangeland management practice**. The advantage of the mechanical method is that, the harvested bush can be processed for different uses, i.e. charcoal production, energy production and so forth. With high unemployment rates in rural areas of Namibia (30.2 percent in 2014), this method does not only provide ecological benefits, the preserved resource (harvested bush) also yields social and economic benefits. The disadvantages associated with the mechanical method are that, it is labour intensive, requires investment in bush clearing equipment, requires after care management of using either browsers or topical treatment of the stems and it is time consuming compared to chemical and controlled fires. Thus, this method is identified under NDP4 as a focus area for support. The strategy developed under this study expands on mitigating the other negative factors associated with mechanical harvesting and making the rewards more attractive for exponential use of this method. The figure below shows the application of different de-bushing methods in Namibia.

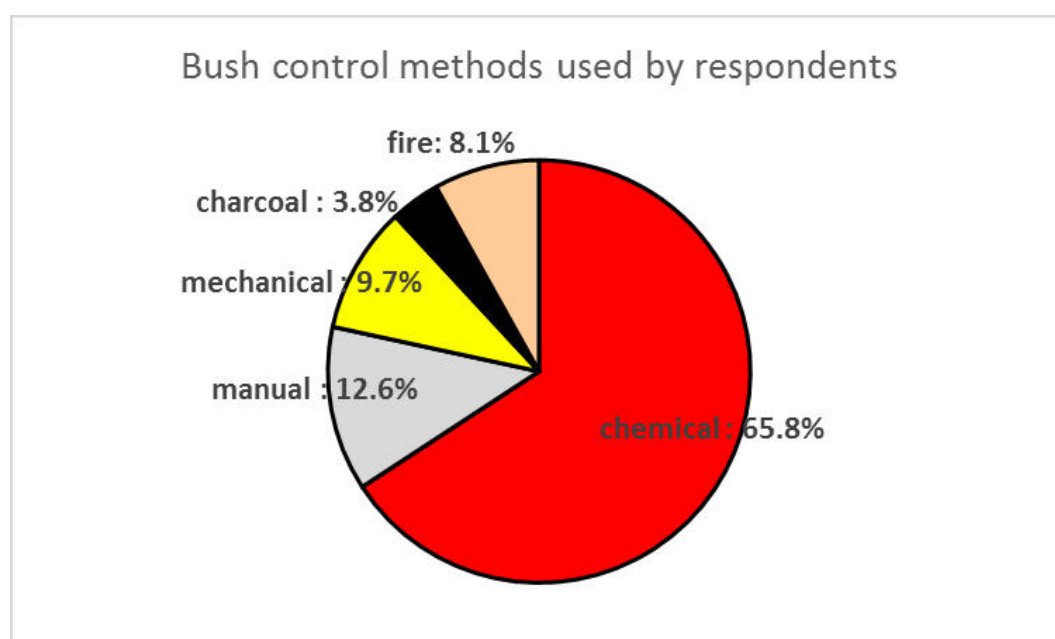


Figure 2: Bush Control Methods used in Namibia
Source: AgriConsult, 2014

In order to optimise economic gains from the invader bush through the use of appropriate control methods, there is a need to re-position the perception of the bush **as a resource and input into production process**; and approach its harvesting and utilization from such angle. Furthermore, there is need to optimise and promote financing options that are relevant for harvesting and adding value ones the bush is cleared. A study by Honsbein, Peacocke & Joubert (2009) demonstrates that, clearing the invader bush without adding value to the biomass results in prolonged negative cash flows (of up to 16 years) for farmers regardless of the method used. However, if the bush is sold/used to add value a positive return on investment is realized.



4 Methodology and Approach of the Assignment

This assessment used a three pronged approach supplemented with a detailed desktop research and a case study. The assessment was conducted using surveys, interviews with stakeholders and round table discussions. The surveys were used to determine if a financing gap exist by assessing the demand side and the supply side of financial products / incentives. The interviews were used to understand industry dynamics in terms of framework conditions that could support the development and enhancement of financial products and incentives. The round table discussions provided a platform to investigate the relevance and adequacy of current product offerings, critique the funding gap analysed and explore practical solutions. Concurrent to the approaches described above, case study analysis was utilized to explore how other countries with bush invader problems (particularly in the region) have managed to control the alien species. The process used to collect data/information is depicted in figure 2 below. The industry has been categorised in four (4) groups as follows:

- **Financiers and incentives/grant providers:** Commercial banks, development finance institutions and Government departments and agencies
- **Primary producers:** Farmers, cooperatives, other entrepreneurs
- **Secondary producers:** value adding entrepreneurs/manufacturers, entrepreneurs in supportive industries (such as transporters, equipment suppliers)
- **Enablers:** Government Ministries and agencies, associations, professional service providers

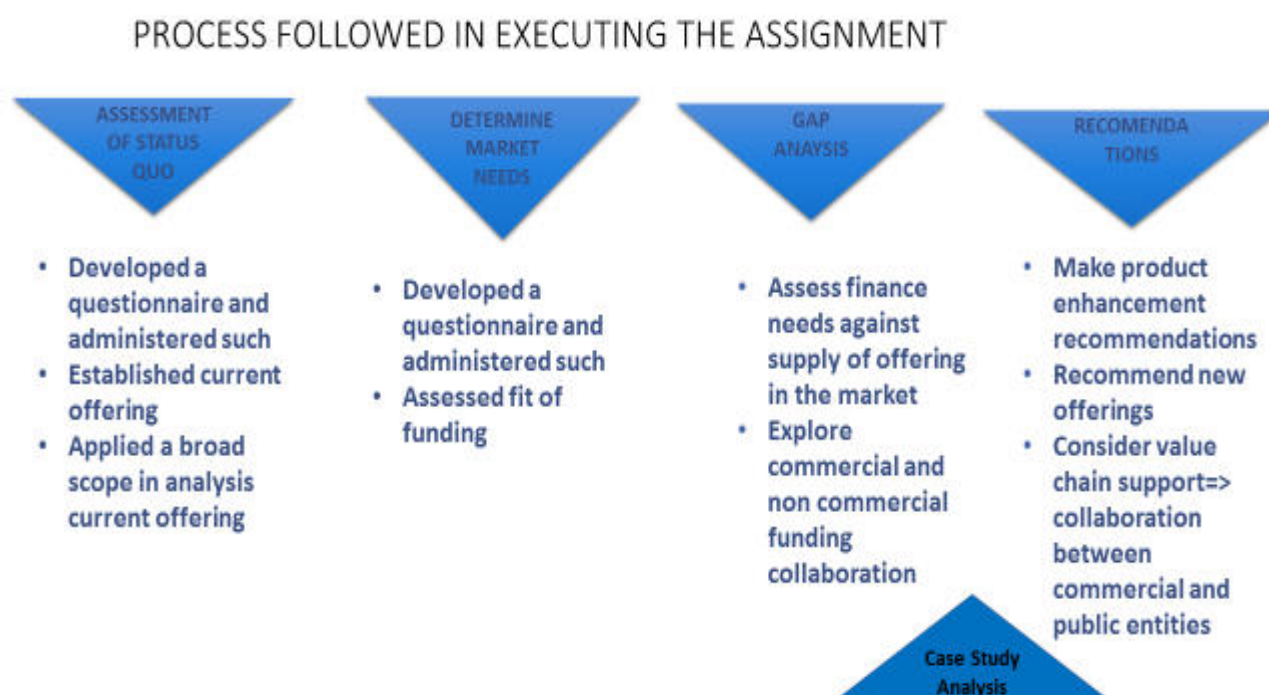


Figure 3: Execution of the Assignment



4.1 Supply Side Assessment

The supply side assessment was conducted using a questionnaire for financial institutions followed by round table discussions. All commercial banks and development financiers in Namibia were approached to participate in the assessment process. The process was complemented with qualitative interviews with subject experts and enablers in the industry. The experts and enablers included stakeholders from the public sector, private sector and the non-governmental institutions. Incentives and grant schemes were assessed through qualitative interviews with incentive providers and related stakeholders.

4.2 Demand Side Assessment

The demand side assessment was primarily conducted using a questionnaire and consisted of a spectrum of potentially viable enterprises across the value chain (both primary and secondary producers), drawn from earlier studies i.e. AgriConsult Namibia (2014); VO Consulting (2014); DECOSA (2015) GIZ (2015a, 2015b.)



Figure 4 Invader Bush Raw Material
Source: www.rictec.com.sg

5 Existing Incentive/Grant Schemes and Financial Products in Namibia

5.1 Results: Supply of Financing/ Incentives/Grants

Incentive Scheme is a program used to promote or encourage specific actions or behaviour by a specific group of people during a defined period of time.

Previous studies, (see for example DECOSA, 2015; Honsbein, Peacocke & Joubert, 2009) have at the time only identified two financial institutions that were providing financing products/incentives schemes for invader bush activities. The two institutions are the Agricultural Bank of Namibia and the First National Bank. Today, a number of financial institutions are showing interest in the de-bushing biomass industry and have developed financial products for this industry, although some still offer generic products.

This study identified ten (10) active financial institutions who were invited to part-take in the assessment. In total, seven (7) financial institutions responded to the questionnaire, which translates to an 80 percent response rate. In addition to the questionnaires, eight (8) financial institutions also participated in the first round table discussion while four (4) participated in the second round table discussion. Of the institutions that responded to the questionnaire, three are commercial banks while four are development finance institutions (DFIs).

Table 1 Respondents of the Supply Side Survey

Name of institution	Category	De-bushing financing product (Yes/No)
First National Bank (FNB)	Commercial	Yes
Standard Bank	Commercial	Yes
Nedbank	Commercial	No
Agricultural Bank of Namibia (Agribank)	DFI	Yes
Development Bank of Namibia (DBN)	DFI	Yes
SME Bank	DFI	No
Environmental Investment Fund (EIF)	DFI	Not primary harvesting with the use of chemicals but funds value adding
The Namibia Procurement Fund	Unlisted Investment	Not specific but products applicable

- Of all the institutions that participated in the assessment, four institutions (two commercial banks and two development finance institutions) indicated that they have a de-bushing policy and or de-bushing specific financial product. The institutions also affirmed the relevance of their product to de-bushing activities. It should however be noted that, while one development finance institution indicated that they do not have a product specifically for de-bushing activities, they do provide products that are appropriate for de-bushing activities, particularly for clearing and harvesting the bush.



- Furthermore standard products such as Commercial Loans (CL) or Article Finance (AF) are fairly applicable to the needs of the industry. The challenge seems to be the cost and associated security requirements.
- The assessment has also identified relevant grant products which are provided by:
 - Environment Investment Fund (EIF): EIF grants and GEF Small Grants Programme (GEF SPG)
 - National Commission for Research, Science and Technology (NCRST): Funding for research and development

The financial/incentive products are described in detail below:

5.1.1 Features of Invader Bush Financial Products

This section is aimed at presenting the different terms of invader bush financing products in the industry, and not as a comparison of the products against each other. Furthermore, the relationship between financing products and incentive schemes is that of supportive and complementary nature than alternatives. The synthesis is presented first followed by detailed individual product features offered by different institutions.

As presented above, there are four institutions that provide financing products for de-bushing activities. Some institutions do not have limits on the values of their products while others do. All four institutions provide loan financing and only EIF provides a grant option that has a minimum value of NAD 150 000 and a maximum value of NAD 500 000. For those institutions with limits on their loans, the minimum value is between NAD 40 000 and NAD 250 000. Only EIF has a maximum loan value which is NAD 4 million. Interest rates charged on the loans range between Prime less 3 percent for secured loans to Prime plus 3 percent for unsecured loans. Grace periods of 1 up to 3 years are provided by three institutions. Grace period is provided for 3 years on loan capital and only to farmers using aerial spraying for invader bush control.

5.1.1.1 Loan Funding

Agribank: Agribank provides financing products to all value chain actors; i.e. primary and secondary producers of invader bush biomass, but the uptake is largely for chemical harvesting and labour based harvesting activities. The financing products do not have maximum or minimum values because applications are evaluated on individual merit. The interest rate on the products for all commercial value chain actors is 8 percent and 7 percent for communal area actors. The financial products are offered over a 15 year period and there is no grace period on most products. For farmers and SMEs, Agribank uses bonds/or mortgages largely on farms to secure the loans.

An exception is made for businesses that require investment in value adding, such as depot, biomass boilers and other production plants. For these types of establishments, Agribank extends infrastructure improvement loans and implement loans which are provided for a period of 10 years at an interest rate of 8.25 percent for those operating in commercial areas and 7 percent for those in communal areas. The improvement loans are repayable over a period ranging between 1 and 10 years while for the infrastructure and implement loans, the repayable period varies between 5 and 10 years. For both loans, the bank accepts conventional collateral for security.

Development Bank of Namibia (DBN): DBN provides a financial product to all de-bushing activities, be it harvesting, primary and or secondary production. The product has a minimum value of NAD 150 000 and a maximum value of NAD 10 million. The products are provided at prime interest rate



for a maximum period of 10 years. The product has a grace period of 18 months for all activities and requires a minimum of 50 percent security.

First National Bank: FNB has a de-bushing specific product which mainly focuses on farmers conducting aerial spraying of arboricides. The product is particularly aimed at supporting farmers to clear and or thin the bush on their farms to increase their livestock carrying capacity. The product does not have a minimum or maximum value and is extended over a period of 10 years. The interest rate depends on the client risk profile and there is a capital repayment grace period of 3 years during which the client only services the interest. Subsequently, capital and interest becomes payable from year 4 onwards. FNB uses the bond on the farm as security for the loan.

Standard Bank: Standard Bank extends their de-bushing financing products to all farmers and businesses in the primary and secondary production value chain, with the exception of community organizations participating in invader bush activities. The Bank extends loans with no minimum values (except for purchasing primary production equipment by farmers and SMEs where a minimum amount of NAD 40 000 applies) and no maximum value. The loans for clearing, harvesting and primary production are extended for a maximum of 5 years, at a minimum interest rate of prime and a 10 to 20 percent deposit is required and there is no grace period. The interest rate for aerial spraying however differs in this category, with the interest rates calculated on prime for secured loans and prime plus 3 percent if unsecured.

For businesses adding value to the invader bush biomass, Standard Bank offers loans for a period of 7 years at a minimum interest rate of prime and a 20 to 30 percent own contribution is required. Bonds over properties are used as collateral except for investment in equipment for clearing and harvesting the bush in which case, the product itself is used as security.

Environment Investment Fund: The Environmental Investment Fund (EIF) is a Fund created by Act 13 of 2001 of Parliament of the Republic of Namibia with the overall aim of supporting individuals, projects and communities to ensure the sustainable use of natural resources.

The EIF was officially launched in 2012 and is currently funded by Government allocation with the mandate to tap on local conservation fees and environmental levies. These funds are used to invest in the protection and wise management of the environment, promoting sustainable use of natural resources for economic development, and conserving biological diversity and ecological life – support functions.

EIF provides two different types of financing options i.e. loan and grant funding (the grant funding option is described later under the next sub section). The loan is available to all Namibian entities involved in primary and or secondary production through environmental and sustainable development projects with a minimum value of NAD 250 000 and a maximum value of NAD 4 million for all type of activities. The loan is extended for a period of up to 10 years, at an interest rate of prime less 3 percent and has a grace period of up to 1 year. The security of these loans is determined on individual basis and includes cession of equipment.

The Namibia Procurement Fund (Nampro Fund): The Nampro Fund is a bridging finance vehicle that finances supply contracts awarded to SMEs undertaking large value chains. The Fund provides both working capital as well as equipment finance through operating leases to enable SMEs to meet contract obligations. The Fund provides a minimum of NAD 100 000 and a maximum of NAD 50 million.



Whilst the Fund has not funded any invader bush specific enterprises, its products will be applicable to finance harvesting plant, provide working capital or invoice discounting to exporters, etc.

Institution	Target Clients	Product Type	Values		Interest/ Financing Terms	Financing Period	Security Requirements	Grace Period Applicable
			Min (N\$)	Max (N\$)				
Agribank	Commercial farmers and enterprises (primary production)	Loan	None	None	8	15 Years	Mortgage/bond	None
	Communal farmers and enterprises (Primary production)	Loan	None	None	7	15 Years	Mortgage/bond	None
	Enterprises adding value to the biomass (commercial)	Loan	None	None	8.25	10 Years	Bond	None
	Enterprises adding value to the biomass (communal)	Loan	None	None	7	10 Years	Bond	None
DBN	Farmers and enterprises at all levels of production	Loan	150,000	10 mil	Prime	10 Years (Max)	Min 50 %	18 months (max)
FNB	Farmers (primary production only)	Loan	None	None	Depends on client	10 Years	Bond on the farm	3 years
Standard Bank	Farmers and SMEs (primary production excluding aerial spraying)	Loan	40,000	None	Prime (min)	5 Years (Max)	10-20% deposit plus the articles	None
	Farmers (aerial spraying)	Loan	None	None	Prime for secured (Min) Prime +3% if unsecured	5 Years (Max)	Bond	None
	Enterprises adding value to the biomass	Loan	None	None	Prime (min)	7 Years	Bond	None (for infrastructure construction, repayment starts after completion)
EIF	Farmers, enterprises and communities at all levels of production	Loan	250000	4mil	Prime -3%	10 Years (Max)	Depend on client risk	12 months (Max)
	Farmers, enterprises and communities at all levels of production	Grant	150000	500000	Zero	N/A	N/A	N/A

Table 2 Financing Products for the De-Bushing Industry



5.1.1.2 Grant funding

EIF: The Grant funding option provided by EIF is available to all Namibian projects that are environmentally friendly with a non-discriminatory target client approach (farmers, enterprises and communities are all eligible). The grant has a minimum value of NAD 150 000 and a maximum of NAD 500 000.

MITSD equipment aid scheme: MITSD provides assistance in the form of equipment and other technology as per requirement to SMEs in order to them to effectively run their business and subsequently create employment.

National Commission on Research, Science and Technology: Having recognized the importance of research, science and technology as the engine of economic growth and development, Government enacted the Research Science and Technology Act, 2004 (Act no 23 of 2004). The objectives, as outlined in section 2 of the Act are:

- to ensure the co-ordination, monitoring and supervision of research, science and technology in Namibia;
- to promote and develop research, science and technology in Namibia;
- to promote common ground in research, scientific and technological thinking across all disciplines, including the physical, mathematical and life sciences, as well as human, social and economic sciences;
- to encourage and promote innovative and independent thinking and the optimum development of intellectual capacity of people in research, science and technology;
- to ensure dedicated, prioritised and systematic funding for research, science and technology application and development in Namibia;
- to promote linkages between Namibia and international institutions and bodies on the development of research, science and technology.

As a new institution, the NCRST is establishing its intervention agenda and to this effect, it is well positioned to support Research & Development activities. The Commission presently supports research initiatives through the National Research, Science & Technology Fund. The projects are funded through calls for proposals and selected on a competitive basis. The Commission has expressed interest to support de-bushing initiatives.

5.1.1.3 Other incentives

The survey has also identified the French Development Agency (AFD) - Sustainable Use of Natural Resources and Energy Finance (SUNREF) which is currently being set up in Namibia. The SUNREF initiative is discussed in Section 6 of this report, as a proxy case study in addition to the main Working for Water program case study.

5.1.2 Evaluation of Existing Incentive/Grant Schemes and Financing Products

Financial providers who have de-bushing products view their products as relevant but, acknowledged that their products can be improved to increase their uptake. Expectantly, financial institutions that provide generic financial products acknowledged that their products are not relevant to de-bushing industry activities. Some of the reasons given for the low uptake of the current financial products include:

Collateral required to access financial products: Most industry players do not have the traditional fixed asset based collateral required by financial institutions. The use of farmland as



security for harvesting activities impedes farmers to take up the offering by financial intuitions, albeit at Prime less 3 percent. **If another means of security is provided, this could incentivize farmers to take up the financing products.**

Product pricing: The pricing of financial products is perceived too high as most products do not have interest subsidy. The analysis shows that the average interest rate financial institutions charge on loans for primary production is 9.46 percent and 9.07 percent for secondary production. In addition to the average interest rate, the data also shows that, the median price for both primary and commercial production activities, which is what most financial institutions indicated as their minimum rate is at prime interest rate, currently standing at 10.25 (see graph figure 3).

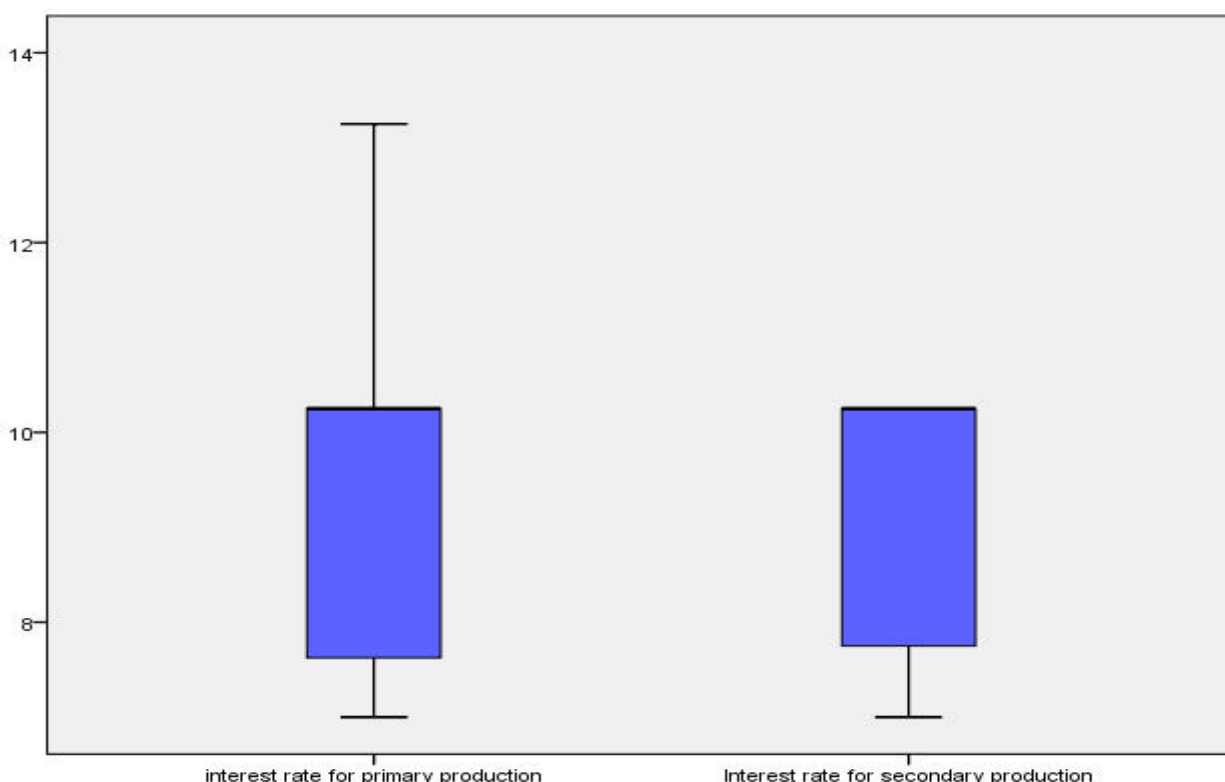


Figure 5 Interest Rates on De-Bushing Financing Products

The last quartile under primary production is made up of interest rates of financial products for aerial spraying method. This supports the evidence from previous studies which have concluded that the chemical application is the most expensive method for controlling bush encroachment.

In terms of financial institutions category, as expected, the minimum average interest rate charged by commercial banks on their financial products towards de-bushing activities is higher at 10.75 percent compared to the overall minimum average rate of 9.27 across all financial products. The exception, which is reflected as an outlier at 13.25 percent (see figure 4) is again caused by the same financing product for aerial de-bushing/clearing method described above.



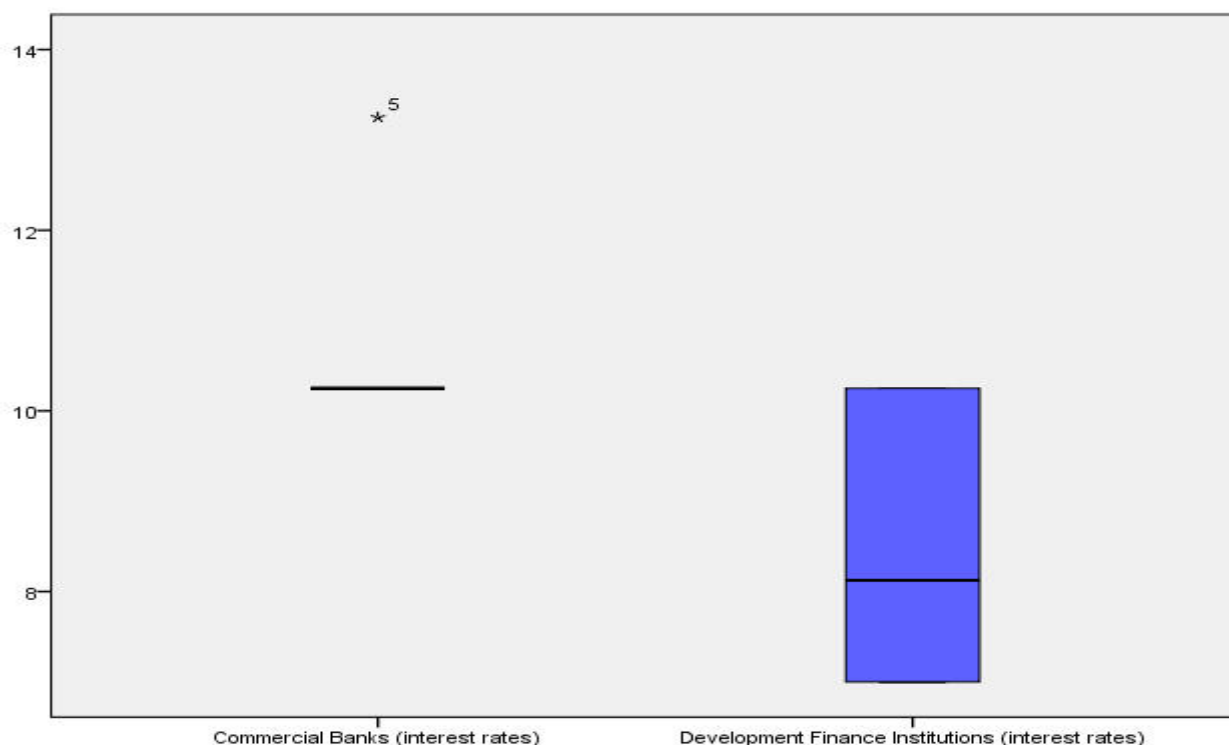


Figure 6 Interest Rates of De-bushing Products by Type of Financing Institutions

Development finance institutions on the other hand have an average minimum interest rate of 8.16 percent with half of the products charged below 7.63 percent.

The financing strategy in section 11 is thus developed taking this pricing dynamic into consideration.

Industry Information: There is not enough quality information to inform the features of the financing products. Banks were reluctant to share product information from a competition perspective, because of this, there is limited understanding of the de-bushing value chain which leads funding institutions to focus on individual transactions without taking a wider view. Presently, activities funded are largely of a harvesting nature. The clearing and harvesting of the bush does not in itself generate immediate benefits for a farmer albeit after 3 years when the grazing is restored. For a farmer to get full value of the land de-bushed, a further investment through the acquisition of animals is also required to optimize improved rangeland. This lengthens the period for positive return on investment, unless if payment terms are synchronized to the cash flows associated with increasing livestock carrying capacity. Because of these dynamics, pricing and collateral for financial products is inadequately structured to increase higher uptake.

If there is support in terms of incentives in the industry, non-farmer enterprises which primarily consider the bush as an input into their production process will be encouraged to assimilate the cost of harvesting and leave farmers to only carry the cost of aftercare. Farmers will then have an option of engaging private harvesters who come in and clear the bush for value addition. Those Farmers who wish to engage in clearing and harvesting the invader bush to augment their revenues can also use targeted financial products. Thus, creating a business case for financing de-bushing activities by different players in the value chain.



Product promotion: The financial products are not well promoted to industry operators, as most of them do not even know of any incentives/grants available.

These results reveal that, even though there are financial products for de-bushing activities in the industry, the providers are also aware that the products are inadequate in addressing the needs of their clientele

5.2 Demand for Financing / Incentives/Grant Products

While the negative effects of invader bush in Namibia have been documented since the 1970s, efforts to contain the problem effectively have been lacking. Both the results from earlier studies and the current study confirm that farmers are aware of the deepening effects of invader bush encroachment on soil degradation and on ground water potentials, yet, by 2014, only 17 percent of Namibia's land that is affected by the invader bush was exposed to some bush control activities. De Klerk (2009; 2012) has attributed the challenge facing the control of invader bush in Namibia to the lack of incentives that manifests through lack of appropriate capital, high costs associated with bush control and legislative barriers, especially in terms of inflexible and job-stifling labour laws. His findings are supported by the results of a rapid assessment conducted by AgriConsult Namibia (2014) which shows that 66 percent of farmers would undertake de-bushing activities if appropriate incentives are provided. The current assessment investigates in details what the financing needs of the de-bushing industry are and mirror that to the financial products currently offered in the market.

5.2.1 Uptake of Financial products, Incentives/Grant Schemes by the Industry

The information presented below was collected from users of financial products for de-bushing activities. The responses came from both farmers and non-farmer enterprises in the industry. The first section will deal with the uptake of financial products by farmers followed by the uptake by non-farmer industry operators. The study experienced a low response rate from farmers compared to non-farmer operators. As such, data regarding the use of financial products was drawn from previous studies to augment the current responses in making descriptive and not inferential conclusions. Inferential demand is only made under the uptake by non-farmer industry operators.

5.2.1.1 Uptake by Farmers

The primary objective for farmers' involvement in de-bushing is to improve rangeland which increases the livestock carrying capacity of the land. The results of this study support findings from previous studies which show that the majority of farmers want to control the invader bush in their farms but prefer the chemical method (aerial application or arboricides). The main reasons, according to the outcome is that, it is a faster way to clear larger areas and farmers do not have to pre-occupy themselves with after care activities once the bush is destroyed. However, since financing for aerial application of arboricides is expensive, farmers end up treating small areas only, or leaving the invader bush uncontrolled. Hence the escalating problem of bush encroachment in the country.

This finding is in agreement with the results from AgriConsult (2014) that shows that, most farmers do not have the means to control the invader bush in their farms. This could be explained by the fact that, the financing product for their preferred control method is also the most expensive products in the market as presented in 5.1.



5.2.1.2 Uptake by Non-Farmer Operators

The results show that, small non-farmer enterprises in the industry are involved in more than one activity along the value chain. Most are involved from the clearing and harvesting stage, all the way to semi processing and even manufacturing and packaging stage. Most operators are either micro or small with a handful of medium enterprises. It is the view of the Consultant that entrepreneurs often take this position (of being involved throughout the value chain) to create supportive cash flows from complementary activities. However, if enabled to scale-up, these entrepreneurs can focus their energies on a particular value chain activity.

The commercialization of invader bush products is a relatively new industry in Namibia with most enterprises established after 2000. From the responses received, the oldest firm is 17 years. The majority of these enterprises are in existence for less than 5 years. This implies that most enterprises are still in the start-up phase.

The majority of the surveyed operators have applied for loans from banks, which they have used to supplement their own resources to purchase equipment for their business operations. While most loans were approved, operators reported that, they had to try more than one bank before their loans were approved. The application process for loans from DFIs is particularly said to be lengthy and complicated. As a result, operators apply for commercial loans at commercial terms just to avoid the complexities. Most operators, especially those that got funding from commercial banks were able to apply through the local bank branches. The majority of operators have not provided the amounts they applied for and the amounts they received due to confidentiality issues. However, the results from those that provided information show that the size of the current loans range between NAD 250 000 and NAD 20 million, with an average loan size being NAD 11 million.

The results further shows that, there is limited knowledge of incentives/subsidies among industry operators. Only 33 percent of the respondents mentioned that they know of an incentive in the industry which is provided through donor support and only 22 percent have benefited from it.

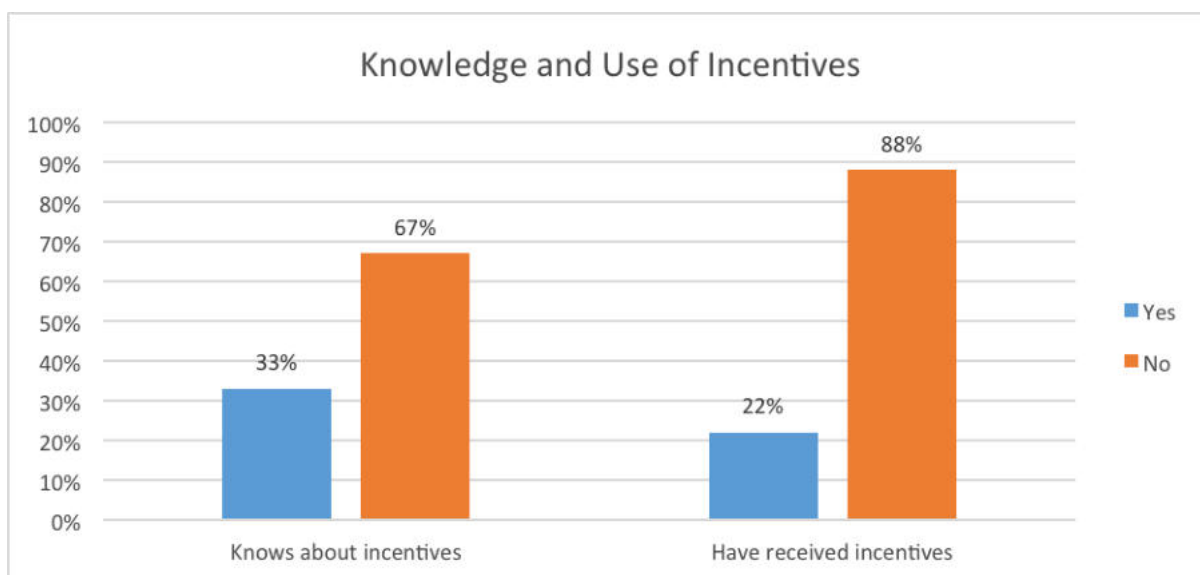


Figure 7 Knowledge and Use of Incentives by Industry Operators

From the operators' perspectives, the main available financing option for their industry is loans. This is so despite the EIF offering grants of up to NAD 500 000 and the calls for proposals by the NCRST.



This lack of knowledge is further cemented through an earlier study by AgriVision 2015, which confirms that advisory services relating to information sharing is a significant priority (ranked as second).

Of most interest from the results are industry prospects. All the surveyed operators indicated that they have growth plans and will need funding/ incentives to finance such plans. The average loan required to finance growth plans is estimated to be around NAD 15 million with the minimum range being NAD 1 million and the maximum being NAD 30 million. Over 90 percent of these loans will be required to purchase equipment with less than 10 percent going to skills development and contingencies.

The average size of the loans is aligned to the nature of activities that enterprises are involved in (in addition to clearing and harvesting) i.e. production of charcoal, energy/heat, construction material and so forth. The fact that enterprises are engaged in different processes/activities; and each activity needs different types of equipment/plant are partly the reason why loan sizes are generally large. Currently, enterprises do not invest in single activity processes. Their business models are vertically integrated to avoid bottle necks and use revenues from profitable activities to finance less profitable activities. As it will be described later on in the case study, less profitable activities can benefit from incentives resulting in a more profitable value chain. The average loan size required in the industry is particularly important because it should, ideally, inform the size of the financing products on the market.

Industry operators have expressed mixed perceptions regarding funding institutions' understanding of their needs. Those that said funding institutions understand their needs believe that this is due to the exposure of the industry that has been created recently, especially through Ohorongo Cement activities.

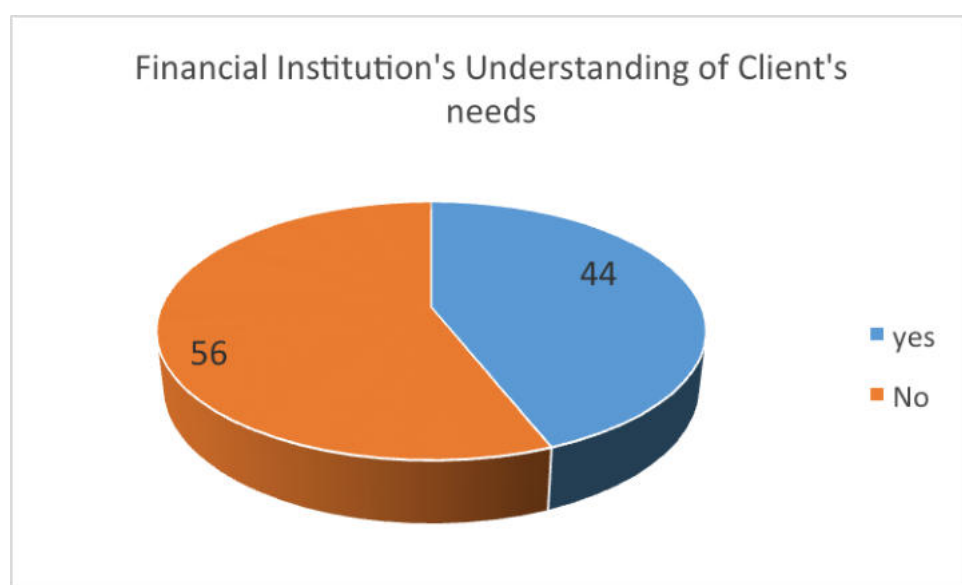


Figure 8 Understating of Client Needs by Financial Institutions

Greater awareness is however needed to allow funding institutions to understand industry activities from the value chain perspective.



5.2.2 Evaluation of Challenges in Accessing Financing/Incentives

Industry operators have outlined a number of challenges they are facing in accessing finance and or incentives in Namibia as follows:

Policy Framework: With regards to incentives, the main perceived challenge is the policy framework which according to the operators does not support the de-bushing industry fully. A clear policy environment in the industry will lead to better regulations and will enable Namibia's products to obtain internationally recognised certification and access more markets. The de-bushing strategy in the National Development Plan (NDP4) is nonetheless Government's commitment towards scaling up de-bushing activities across the country, with specific focus on labour-intensive de-bushing methods. The effective translation of NDP4 strategies into growth supportive programs is constrained by a number of other regulations which are identified and discussed in section 9.

Research and Development: Operators expressed concern regarding the lack of industry research to support product development. Besides charcoal as a well-established industry, other products can be pioneered in the market but given that the industry is at infancy stage, financial resources are scarce. Potential products for pioneering can include:

- Animal feed – support current activities that are happening on small scale
- Construction material – DMC boards, roof shingles and given our housing challenges, this is most aligned to national priorities
- Pellets – production of pellets will open up enormous markets in Europe
- Furniture – these products include school furniture and other Governmental procurement needs

Preferential Procurement: Public procurement is potentially an effective tool to establish infant industry and serves as an effective incentive for private operators to invest in a particular area. Furthermore, stationeries and other Government consumables can be produced using invader bush as an input and help create markets for locally produced goods. Currently, the producers are constrained by the lack of large off takers for their products and they do not get shelf space in larger furniture shops around the country.

Collateral and Insufficient Grace Period: Another challenge echoed by the operators is the issue of collateral which they often do not have. Standard security in the form of a bond over the farm disincentivise farmers due to the lag in achieving expected return on investment. Non-farmer operators are also negatively affected by insufficient grace period which in return affects their cash flows because, the period required for clearing, harvesting, manufacturing and packaging before they realise revenue can be lengthy, placing cash flow strains on entrepreneurs who are fully reliant on this venture. Financial institutions do not consider these dynamics when determining loan repayment terms.

Interest on Loans: The interest rate on specific de-bushing financial products has been echoed as too high. This is evident in the low take up of some products and the over extension across complimentary activities to generate adequate cash flow to service loans.



6 Case Study Analysis

According to vegetation experts, invader bush is a southern Africa problem which is largely in South Africa, Lesotho, Botswana, Namibia and some parts of Zimbabwe. Like Namibia, none of the other countries has successfully managed the invader bush problem although efforts for rangeland management and protecting the region's indigenous biodiversity are recorded. The case studies examined for this report are the South Africa's Working for Water program, which is the main case study and it is augmented with an analysis of the Sustainable Use of Natural Resources and Energy Finance (SUNREF) initiative. The information for the case study is mainly drawn from South Africa's Department of Water Affairs and Forestry which for a long time has been the lead coordinating institution, given that the program is interdepartmental with the Department of Environmental Affairs and Tourism, and the Department of Agriculture. Currently, the program coordination is run from the Department of Environmental Affairs and Tourism.

6.1 Working for Water: A South African Case

The working for water is one of the most cited best practice invader bush management program in Africa. The program was established just after the country's independence in 1995 to control invasive alien plants in a sustainable manner. According to South Africa's Department of Environmental Affairs, the country has 198 invader bush species which threaten its biodiversity, water security (as these plants use a lot of water) and land productivity among others. The Working for Water program was established by the Government to control the invader bush species by clearing large infected areas across the country. The program works on a tender system whereby unemployed people receive training in de-bushing activities from Government and can thus tender to provide these services. The program started off as a fully interdepartmental Government funded program using poverty relief funds as public works. Today, private land owners, especially farmers and plantation owners are paying up to 60 percent of the total cost for invader plants clearing through the program. Given that the forestry industry in South Africa is more advanced than in the rest of Africa, they also support the program with planning, mapping, vehicle donations, and training. Secondary industries which are a spin-off from the Working for Water program also benefit from research and development emanating from businesses in the forestry industry.

6.1.1 Secondary Industries: Value Adding Industries

As part of the Working for Water program, a Secondary Industries Unit was established in the Department of Water Affairs and Forestry to promote value addition for the wood and biomass cleared. The initiative to support small enterprises is driven by the following objectives:

- Minimising the net cost of clearing.
- Maximising economic impacts (jobs creation addressing the "poorest of the poor").
- Minimising potential negative environmental impacts such as fires by optimising the biomass.

Resultantly, private spin off enterprises are being supported to manufacture several products such as fencing material, furniture, indoor and garden furniture, wooden educational toys, charcoal, firewood and wooden chips among others.

In order to establish the secondary industries, the Working for Water program developed a strategy to promote and expand the industry. Since their establishment, the most critical challenge facing secondary industries has been finance.



6.1.2 Finance and Incentives

The Working for Water program is financed at two levels with funds from different sources administered by Government through financial institutions. Government provides the biggest allocation to the program. Over the years, the budget for the Working for Water program increased from R 25 million in 1995/1996 to R 250 million in 1997/1998. At that stage, it was estimated that R 600 million per year will be needed over the next 20 years. The savings from these investments, taking in consideration the costs if the invader bush had not been cleared, has been estimated at R 35.2 billion every year. Today, the Working for Water program is the largest program in the Department of Environmental Affairs which along with other programs on forests, fire, wetlands and energy have a 3-year budget of R 7.8 billion under the strategic plan for 2012–2017.

First level funding and incentives: The clearing of invader bush on non-private land is fully funded by the Government from the Poverty Relief Fund. The Government also funds ancillary developmental activities in the program such as child care for the workers' children, HIV/Aids initiatives and reproductive health services. The Government further funds training and skills development for employees. Similarly, at the same level, the funding for clearing private land is borne by both Government and land owners where the owner pays up to 60 percent of the cost as indicated above.

Second level Funding and incentives: The second level funding is for secondary industries involved in value adding to the cleared bush. Even though secondary industries are conceived as projects, and primarily small, their viability is assessed on business principles. The financing strategy for secondary industries is based on a revolving credit facility provided by the Secondary Industries' Unit within the Department of Water Affairs and Forestry, but administered by financial institutions.

In addition to these financial products, other incentives provided through the Secondary Industry Unit include access to raw materials (the cleared bush), mentoring services and business linkages with the wider forestry industry. The support to secondary industries has a time limit of an initial 3 years. After that, it is expected that businesses have established their systems and networks to function, unless if expansionary capital is needed in which case they move on to a different source of funding such as conventional bank loans or through the Industrial Development Corporation.

The Industrial Development Corporation of South Africa Limited (IDC), through Strategic Business Unit for Forestry and Wood Products provides larger businesses funding for fixed assets, working capital, start up (Greenfield) projects, expansion capital and rehabilitation of existing businesses. Given that IDC is an industrial development agency whose mandate is based on socio-economic transformation, they participate in deals with greater risk profiles than banks generally do. IDC prices risk profile at a far lower rate than banks do because an assessment of development returns is part of their decision-making process. Within the forestry and wood products sector, IDC funds both new and existing firms requiring an equivalent of between NAD 1 million to NAD 1 billion. Depending on the assessment and size of the project, IDC may take equity in a business. Collateral is applied based on economic merit of the business promoters or nature and risk of the business.

Funding for industry operators is structured differently, and it is informed by the nature of the project to be financed. IDC uses an array of instruments for structuring financing as follows:

- Debt/equity
- Quasi-equity
- Guarantees
- Trade finance, and
- Bridging finance



In addition to a bankable business plan, funding by IDC for Forestry and Wood Products are extended under the following requirements.

- Businesses need to demonstrate compliance with international environmental standards.
- Shareholders/owners should make financial contribution towards the venture, but contributions for historically disadvantaged people may be lowered under special circumstances.
- In the case of existing businesses, audited financial statements are required

Observations from this case are drawn upon in section 8 to identify best practices from the Working for Water program, which could be implemented as part of addressing the financing gap in Namibia's de-bushing industry.

6.2 Sustainable Use of Natural Resources and Energy Finance (SUNREF)

SUNREF is an initiative to promote investments in energy and environmental services in developing countries by the French Development Agency. Through SUNREF, AFD provides green credit lines and dedicated technical support to scale up environmental finance.

SUNREF offers benefits to actors involved in the ecological transition as follows:

Table 3 SUNREF Benefits

Banks and Companies	Individuals
○ Access to new markets related to green growth: dedicated financing and consulting services for banks, new production methods that strengthen the resilience of companies to external shocks ○ Management of environment-related risks: assessment and management of the financial and image risk for economic and financial actors in sectors that are dependent on fossil fuels ○ Upgrading of production facilities and competitiveness gains by reducing the energy bill ○ Greater societal recognition by clients, employees, civil society and international financial partners ○ Reduction of risks of non-compliance with environmental protection rules thanks to a better anticipation	○ Access to low-cost new technologies ○ Use of renewable energies, which are often the only way for isolated households to access energy ○ Use of more environmentally friendly and less harmful solutions, thereby safeguarding the physical capital and health

Through SUNREF, AFD places partnership innovations at the centre of an integrated approach with partners as they:

- Provide banks and their clients with structured financing with tariffs tailored to “green” investments;
- Build banks’ capacities to sustainably finance its activities;
- Assist companies in structuring their “green” investments;



- Shares, via guarantee mechanisms, certain credit risks borne by banks seeking to develop their “green” finance portfolios;
- Feed into the public policies of the Governments concerned;
- Facilitate access to “green” finance for individuals and companies.

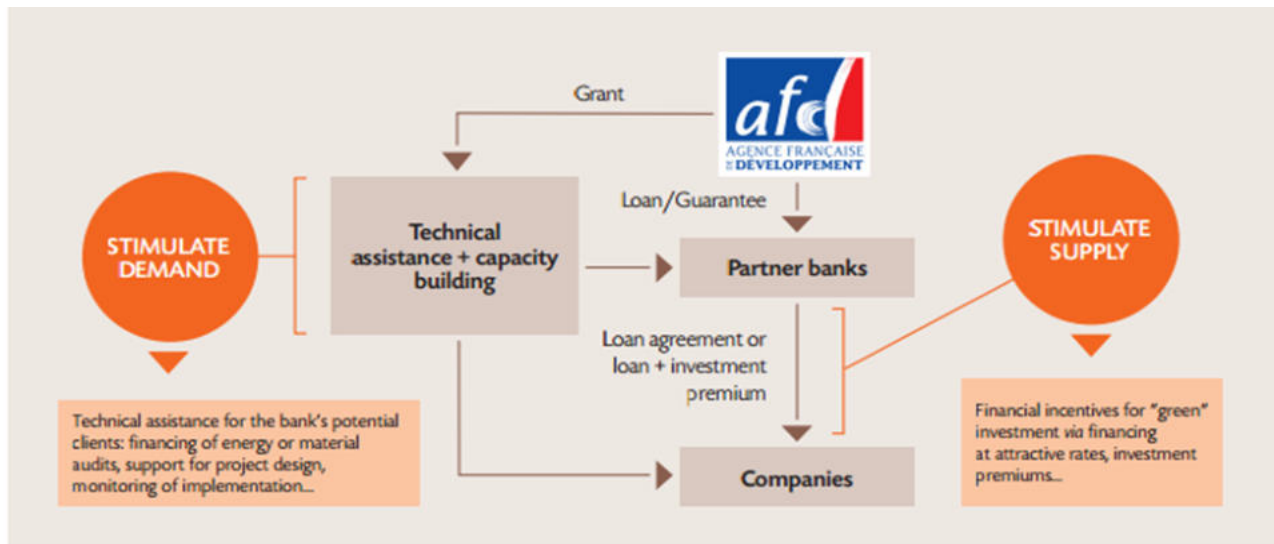


Figure 9 AFD, SUNREF Green Credit Line

Examples of Projects Funded by SUNREF

- AFD has allocated a EUR 30m concessional SUNREF loan to Co-operative Bank of Kenya, the country's third largest bank, in order to support projects with high energy efficiency and renewable energy potential. This loan is combined with a technical assistance program financed by the European Union.
- The partnership initiated by AFD with the bank UBCI to finance environmental projects results in investments financed through a dedicated credit line. This range of environmental financing is also followed up by a technical assistance program and a grant allocated by the European Union. One of the beneficiaries of this program is the company El Mazraa (Poulina Group), for a total amount of EUR 4.9m, to finance energy efficiency investments (installation of a 5 MW cogeneration unit) and recover industrial poultry waste to produce food for animals.
- In Mauritius SUNREF program has a set of two efficient tools made available to local banks and private companies for financing investments in renewable energy, energy efficiency, pollution abatement and clean technology businesses, thus contributing to the realisation of Maurice Ile Durable objectives in Mauritius.
- EUR 40m Loan – signed in October 2009 and now fully disbursed – has funded 104 projects with project sizes ranging from EUR 4k to EUR 4m and has had convincing environmental impacts. Building on the nascent market dynamic of green investments in Mauritius, a comprehensive programme, called SUNREF was set up comprising:
- EUR 60m concessional Loan to local banks with a stronger ambition in terms of scope, diversity and quality of projects, and eligibility criteria.
- EUR 1.7m provided by the European Union's Infrastructure Trust Fund destined to provide technical assistance to market stakeholders and support the National Energy Efficiency Programme.



7 Consultations with Industry Stakeholders: Summary Findings

Stakeholder discussions focused on understanding the regulatory environment and subsequently assessing appetite for suggested supportive mechanisms to improve the offering by the financial sector were held with Stakeholders. The consultations further explored the required institutional arrangements that need to be in place. Furthermore, funding sources of the activities identified were investigated. Inter-ministerial and agencies collaboration were investigated and the overall conclusions confirm stakeholders' readiness to embrace a collaborative approach that delivers value chain support in order to harness the value potential of the invader bush. Consultations were also held with specific sector representatives such as the NAU, logistics experts and subject experts to zoom into specific areas of interest.

Presented below is a synopsis of the consultations held. The details are discussed under section 10 of this report.

7.1 Policy Issues

Discussions were held with representatives from the Ministries of Agriculture, Water and Forestry, Industrialization, Trade and SME Development, and Land Reform to investigate issues of access to the resource, limiting nature of the harvesting permits, limited monitoring capacity by the Forestry division, access to resettlement land and capacity development support for enterprises in the different value chains.

In line with the analysis on the demand survey, the need for a regulatory framework that provides a basis for the development of the invader bush industry is consistently reported as a gap in the market and as such compromising the role and contribution that sustainable use of invader bush holds for the country. There is a need for the creation of an enabling policy regime supported by an incentive scheme to incentivise the harvesting of the bush. This will elevate the value offering beyond the agricultural sector and pave the way for optimal value extraction.

Given the spread of the value chains, current regulations are fairly fragmented and spread across various Ministries. While the resource is under the regime of the MAWF, and regulated mainly under the Forest Act 12 of 2001 and its amendments, harvesting is further subjected to regulations governed by MET such as the Environmental Management Act 7 of 2007, Labour Act 11 of 2007 and its amendments etc. There is a need for an overarching policy framework that speaks to long term national objectives, stimulate development and provide clarity.

7.2 Process related issues:

The Forestry division issues harvesting licences for commercial and communal areas for 3 months and 1 week respectively. These durations are found to be a risk to the security of biomass supply and as such are to be re-looked with the intention of longer term licences with in-built supportive and monitoring mechanisms. Issues relating to labour conditions, safety and security standards were found to be lacking particularly in the charcoal industry. Capacities need to be created to assist smaller firms to comply with such industry requirements.

For the purposes of charcoal production, environmental impact assessments (EIAs) need to be carried out which might be onerous on small enterprises to comply with.



7.3 Research and Development

The consultations assessed supportive industry capacity with regards to mechanical engineering, product development and business advisory capacity. These investigations were particularly relevant considering the wide application possibilities of the invader bush resource and the current lack of focused interventions. The strategy was to further explore potential applications that provide solutions to local problems and feed into existing international markets. The possibilities were well received and as such, commitment for a focused support initiative by both EIF and NCRST were received.

Furthermore, institutions such as Fablab, National Renewable Energy Program and the University of Namibia (UNAM) are some of the potential implementers of R & D activities. Mechanical capacities for prototyping plant across the value chain were also investigated with equipment manufacturers. It was noted that:

- Private funding for R & D is limited
- Private funding for R & D into products and processes that has significant public impact is rarely funded conclusively through private means
- There is thus a need to channel public funding to R & D activities in efforts to build a new industry, increase R & D capacity and develop new products.

7.4 Financing of invader bush enterprises

Following the supply and demand side surveys, round table discussions with the majority of financial institutions and other financing support institutions discussed the features of current finance product offerings (loans and grant schemes). Market readiness to make changes to financial product features and process related changes that need to be made were observed. The Financial service providers were in agreement that an incentive to bring down the cost of financing will result in a greater product uptake.

7.5 Off taker/Market

Investigations were made into the market needs assessing the consumption appetite for both energy production and other products. Existing demand both locally and internationally was affirmed to be unmet. Security of raw material supply was perceived to create insecurities for potential off takers.

Spin-off supportive industries were identified and found to be easily met if sustainable value chains are established. It is however cautioned that any transport strategy should limit its reliance on rail.

Competing technologies e.g. Solar technology affect the competitiveness of the invader bush resources. Also centralised expectations around specific off taker markets are not progressive.e.g Nampower as a private consumer.

7.6 Plant appropriateness

The current harvesting methods were all subjected to some form of critic. Either too small or manual, thus labour intensive, such plant is unlikely to harvest significant volumes of biomass. If too mechanically and found to be efficient in delivering the required volumes then considered environmentally insensitive. Also, the plant adaptability to resource (hardness of the bush) and the roughness of the terrain remains an unresolved matter. To achieve the required volumes to serves



the existing market demand, a medium size unit comprising of a sheer/roller and a chipper, estimated to cost N\$ 6 million seems most appropriate.



Figure 10 Harvesting Methods
Source: Woodco, DECOSA

7.7 Logistical considerations

Logistical consideration need to be made with regards to optimal radius requirements because the product is voluminous and will make significant demands on transport and the road infrastructure. Furthermore, new warehousing capacities will be required to meet market demand.



Figure 11 Example - Storage of Invader Bush-Based Products

Source: www.rictec.com.sg



8 Observations and Gap Analysis

The results of the financing supply side analysis, demand side analysis, case study analysis, and discussions with stakeholders indicate that the de-bushing industry in Namibia is experiencing a multitude of issues, but also holds significant potential. Below are observations and patterns that have been observed.

8.1 Financial and Non-Financial Contribution by Government

One of the most crucial success factors leading to the success of the Working for Water program in South Africa is that, invader bush is nationally acknowledged by both the public and private sector as a problem. Government conducted public awareness campaigns on invader bush species and made initiatives to put a policy framework in place that requires clearing of such plants. Specifically, amendments to the Conservation of Agricultural Resources Act allowed the enforcement of laws related to the cost of clearing land and enabled Government to support the industry further. The regulatory framework has enabled the prominent involvement of the state in providing incentives for the industry throughout the value chain since inception. In South Africa, the clearing and harvesting of the invader bush is fully paid for by Government through public works funds. Government further partially subsidise the cost clearing private land through the Working for Water Program employees.

The secondary industries (value adding) benefit from a revolving credit facility which is established by the state. The state also provides secondary industries free access to the cleared bush which would otherwise be left on land and for mentorship services during their start-up phase.

Another key element related to the regulatory environment has been the contribution of private land owners to the program. If the industry is well regulated, private landowners in Namibia would be encouraged to allow independent contractors to carry out de-bushing activities on their land. Similarly, if the industry is well developed, independent contractors would increase their de-bushing operations given that there is a market for their resource, establishing a self-sustaining industry.

The involvement of the Government in the industry has further enticed larger forestry industry players to participate in the implementation of the program, particularly in terms of their contribution to research, sharing of planning information and donations.

Gap: For Namibia, the involvement of Government in terms of policy guidance provision of incentives to sustainable funding and non-financial support to the industry is critical to give impetus to the industry.

8.2 Pricing of Financial Products

Pricing of financial products is observed as a challenge throughout the literature, supply and demand surveys, as well as from the case study. The findings reveal that the prevailing interest rates are too high.

The lessons drawn from the case study on Working for Water in South Africa shows that the de-bushing wood industry cannot be left to conventional commercial loans alone. The revolving credit facility established in SA, along with the Strategic Business Unit for Forestry and Wood Products in



the Industrial Development Corporation of South Africa Limited (IDC) are exemplary interventions by Government.

When compared to Namibia, the reverse is true. The industry does not have access to adequate subsidies and or incentives. As AgriConsult Namibia (2014:31) has contextualized the situation, bush control cannot succeed without incentives in Namibia because it is a very important ecological service which is being provided by ‘thousands of small businesses (mainly farmers) that have to apply it to a huge area, the whole country’.

Gap: Presently, the de-bushing industry in Namibia is largely reliant on conventional bank financing. There are limited subsidies and or incentives to support the growth of the industry. Thus there is merit in exploring an interest subsidy scheme.

8.3 Collateralization

The issue of collateral is raised in both surveys as a challenge that needs to be addressed. Financial institutions, particularly commercial banks are risk averse. In a case where there is limited information on an industry as it is with the de-bushing industry in Namibia, financial institutions perceive the risk of financing these operations even higher. It is therefore no surprise that banks have resolved to traditional collateral of immovable assets (farms).

The literature on financing in Namibia has indicated that, due to historical reasons, most previously disadvantaged Namibians do not have collateral which they can use to back their financing needs and as a result, the use of fixed assets is excluding majority of the de-bushing industry operators from accessing loans, stunting their growing.

Gap: Financial institutions in Namibia largely rely on fixed assets as security for loan facilities while their clients lack these collateral requirements. There is limited use of alternative collateral in the industry. The credit guarantee scheme in the making is an instrument that can mitigate this gap.

8.4 Industry Segmentation

The issue of industry segmentation is observed in both the demand and supply side surveys. Financial institutions do not have factor based criteria for funding de-bushing value chain activities. For instance, some financial institutions have financial products for bush clearing by farmers only and do not extend such to other processes within the de-bushing value chain. At the same time, some financial institutions have financial products that are not extended to non-farmer industry operators who are involved in the same de-bushing activities as farmers, though with different objectives. As discussed in the results section, industry players are involved in more than one activity along the value chain and if one part of it is financed while other processes are not, it creates operational bottle necks. Extending financing support to the value chain instead of funding fragmented activities or specific groups within the value chain has potential to eject exponential growth in the industry.

It is also important to note that, the average sizes of loans required in the industry for value adding are relatively big. As explained earlier, the need for larger loans is mainly because enterprises in this industry are engaged in more than one process and more manual processes may require equipment/plant. As such, even if the enterprise is classified as micro or small size, its capital requirement is most often than not significant. In other industries with more defined value chains, especially in the agricultural industry, financial institutions can consider value chain financing



through large/anchor buyers. However, in the case for Namibia, de-bushing industry operators are fragmented and working across several processes.

Gap: There is no industry criterion for segmenting operators in the de-bushing industry. The general categorization does not represent the activities of the industry and leads to a mismatch between what the financial institutions are offering and what the operators need.

8.5 Possible Industry Profile Effects

Generally, the forestry industries are financed from domestic funds, mainly through Government allocations, complimented with international funds and Banks. In Namibia, de-bushing activities have traditionally taken place in an informal setting and the national system has not been able to accurately capture its contribution to the national economy. Consequently, the industry has not received the same level of priority like crop and livestock production which are in the same Ministry. Until now, there is inadequate data that directly links the industry's contribution to the national economy without inferring it through its proxies to rangeland management. There are examples from other countries such as Kenya, Tanzania, Zambia, Sudan and Ethiopia who have formalized earnings from forest products such as charcoal, gum and carvings through regulations and have enabled the Governments to collect revenues from these industries. Government will have better regulation on the de-bushing industry if it has a legal framework that it can use to develop and manage industry activities.

Even though the reforms cited above are based on non-invader bush products, the rationale is the same with invader bush products. An exercise of this nature would require political will and collaboration among Ministries. For instance, the Ministry of Agriculture Water and Forestry will need to take the lead in the reform process and other Ministries such as the Ministry of Industrialization, Trade and Small and Medium Enterprise Development would come in with industrial promotion and possibly provide export subsidies. The Ministry of Finance also has to enable the fiscal system to capture the industry's contribution to the national economy. Other ministries such as the Ministry of Land and Resettlement and the Ministry of Environment and Tourism also need to be party to such reforms by virtue of their mandates. The state owned farms on which Namibians are resettled can provide access to a significant resource, given that the Government owns a large amount of land.

Gap: The contribution of the de-bushing industry to the national economy is not fully captured and not accounted for. As such, the industry remains a lesser priority for development. Opportunities will range from employment creation, to enterprise growth, contribution to forex earnings and import substitution.



8.6 Assessment of market acceptance related to de-bushing and value addition activities

The assessment findings as it relates to products in the market and those perceived to be market ready established a sound business case as presented in the grid below:

Table 4 Assessment of Invader Bush Industry Products

		Bottlenecks	End Users	Market acceptance
Products presently in the Market	Furniture	Only Presopsis wood suitable	Schools, Offices, Hotels	Demand is higher than supply
	Charcoal	Lack of control; partly illegal harvesting, Permit system not practical, Labour Intensive small production capacity	Power Generation, Construction Industry, Pharmaceutical Industry	Positive image of Namibia barbeque charcoal, world market undersupplied
	Wood Chips	Efficient plant, adequate markets, investment costs	Power Generation, Industrial Heating	Worldwide demand for wood chips with imports of 35.1 million tons of chips per annum
	Compressed Firewood	Sand content in the resources	Power generation, Industrial Heating, Households	Existing market in Namibia/RSA demand exceeds current production capacities
	Firewood	No formal market	Households	Positive, stable domestic demand
	Poles	No formal value chain in place, the poles are seldomly really straight	Construction Industry	domestic market - positive, particularly at commercial farms and in communal areas
	Briquettes	Investment cost associated with the manufacturing	Households	SA & world market demand high
Products with Market Potential	Animal Feed	Suitability of species, optimal production processes and feed composition isn't clarified yet	Farmers	Considerable domestic demand for complementary and emergency animal feed both in communal and commercial areas
	Wood-cement Bonded Board and Bricks	Material specifications of Namibia bush and related suitability not clarified yet	Construction Industry	Increasing demand in industrialised countries due to excellent properties
	Medium Density Fibre Boards (MDF)	to be subjected to extensive R & D	Furniture Manufacturing, Construction Industry	Possible demand for indoor construction in Namibia and other African countries
	Wood-plastic Composite (WPC)	Market demand/opportunities in Southern Africa not verified	Furniture Manufacturing, Construction Industry, Farmers	Test results with mixed encroacher species promising
	Parquet	Wood of high density required and only larger woody parts of bushes suitable	Construction Industry	Small local market (high end)
	Shingles	to be subjected to extensive R & D	Construction Industry	High end European market
	Traditional Medicines	to be subjected to extensive R & D	Pharmaceutical Industry	Increasing import demand in Europe and North America



9 Recommendations with regards to financing, incentives and other catalytic considerations

The assessment revealed that collaborative mechanisms between commercial, statutory and non-commercial financial institutions presents opportunities that can smooth out inefficiencies in the value chain and deliver quick gains to the industry. Through a value chain offering that provides a step up approach from prefeasibility to feasibility and subsequent commercial funding through debt and or equity; a number of viable enterprises could be realized. Below are the specific recommendations and features of the proposed instruments:

9.1 Grant funding

Grant funding would be used to address prefeasibility services and business support. In this industry, entrepreneurs often find themselves overwhelmed by the capital requirements associated with conducting research and product development to establish a business case and comply with environmental standards and requirements before placing a product on the market. The public gain associated with invader bush control activities warrants grant support to cover the cost or partially costs in this category. This could entail:

- Scientific analysis to solve problems (e.g. the sand content in the bush)
- Securing environmental clearance certificates (could be onerous for small players)
- Business guidance and mentoring on processes and standards (e.g. applying for an environmental impact assessment, safety and security standards for the charcoal industry etc.)

9.2 Debt Financing

Debt instruments need to be enhanced to address access to and affordability of finance. The assessment recognises the existence of commercial lending instruments as presented in section 5. However, past research shows that the uptake of financial products is extremely low. This is partly attributed to the costs associated with the funding and the supportive security requirements. Thus, the following recommendations are made:

- An interest rate subsidy scheme: Loans for primary and secondary enterprising activities to be subsidised through an interest rate subsidy. The differential is to be claimed as a subsidy by the financing institution from the interest subsidy Administrator. The details of the workings of the scheme are covered in the next section (section 10) on the National Strategy.
- Credit Guarantee – Having affordable loans does not solve the issue of collateral, thus entrepreneurs involved in the primary or secondary industry relating to invader bush need to benefit from the national credit guarantee scheme to enable them to meet security requirements of financial institutions.



9.3 Other Recommendations: Low hanging opportunities

9.3.1 Biomass for industrial use/combustion:

The harvesting and chipping of biomass for combustion firing purposes can increase harvesting volumes exponentially. The market for such biomass is both local as well as international.

The local case can be established by creating multiples of the Ohorongo Cement case studies. The anticipated shortfall in energy supplies is creating a market opportunity for the dual sourcing of energy supplies. It is thus incumbent upon private sector players to explore such opportunities and position themselves favourably to create supply capacities for off-takers. Off take agreements with potential energy users for combustion firing need to be explored more aggressively.

The opportunity for decentralized power generation is not exhaustively explored and the market potential of the REDs in highly infested areas is to be investigated. Of course, considerations need to be paid to factors to ensure viability, such as the harvesting radius, interconnectivity and capacity of lines to feed energy from IPP etc. However, such decentralized off take opportunities are ideal to reduce the risk of monopolies and large concentrations of production capacities which in turn increases capital investment requirements.

On the international front, the market for biomass is infinitum as the well developed markets continue to pursue energy generation methods that reduce carbon emissions and holds a 'green energy flavour'. The challenge to be addressed relates to the transporting of volumes of biomass and the capacity challenges of rail transport, for the purpose of exports

9.3.2 Charcoal



Figure 12 Charcoal in Namibia
Source: Jumbo Charcoal

The charcoal market is an international well established market with significant demand for Namibian charcoal presently unmet by the producers. The top 6 importers of charcoal are: (Germany, China, Japan, Brazil, South Korea and UK- in the order of largest to smallest) have in excess capacity of a 1 000 kt/a in import requirements. The hardness of the Namibian charcoal makes it a sought after product and given the progressive trade relations Namibia enjoys with these



countries, there is significant scope to increase exports to these countries. Total exports can easily be increased 3 fold (to 400 kt/a) and earn EUR 48 million in foreign earnings.

The challenges associated with increased production relates to:

- Low cost methods applied in both harvesting (manual) and production
- Access to affordable funding for more mechanised harvesting and production plant
- Compliance with labour, safety and security standards
- For charcoal- capacity development in understanding market requirements (end buyer sentiments) by producers is critical

The introduction of larger Kilns and modern processing plants is necessary to increase export quantities

Figure 13 Charcoal Production Kiln

9.3.3 Foreign earnings

The products identified as low hanging fruits, are potential contributors to foreign currency earnings and the proposed upscaling of these products can make significant contribution to our balance of trade account. Both charcoal and bush chips are highly exportable products, whilst pellets (when brought to market) are a potential significant contributor to foreign currency earnings.

9.3.4 Research and development priorities

There is need to define R & D priorities in accordance to national priorities. The prioritization can be drawn from Government policies & programs such as NDP4, Industrialization policy, ITSEP, SIIP. Furthermore national priorities such as the housing problem can inform R & D priorities. The details of the priorities are covered in section 10.3.

9.3.5 Grid overreliance

The overreliance on the grid as a natural supplier and delayed feed in tariffs regime development display wasted opportunities that could have created improved market readiness and better reception for alternative energy generation. Furthermore, the associated expectation for Nampower to be the natural off taker of independent power producers presents a limited outlook and further limits market developmental potential. There is need to explore alternative off take arrangements with private entities such as medium sized to large entities in the infested regions as potential off takers, e.g.:

- Namibia Breweries - Windhoek
- Namibia Poultry Industries - Okapuka Farm
- Dundee Precious Metals - Tsumeb
- Namib Mills - Windhoek, Otjiwarongo
- Meatco - Windhoek, Okahandja
- Witvlei Meat - Witvlei
- Ohorongo Cement - Otavi
- SAB Miller - Okahandja
- Namibia Dairies - Windhoek, Otjiwarongo
- Tschudi Mine - Tsumeb
- B2Gold - Otavi



9.4 Institutional arrangements

The need to establish centralized institutional arrangements building on a policy and program framework is critical to the establishment of the invader bush industry. This might require new capacity requirements, the strengthening of existing capacity and most probably, co-ordinating the activities of established entities in a more organized manner.

Consultations with policy makers confirm commitment towards regulatory amendments as may be required and financial support. Most specifically, license duration and the utilization of honorary foresters were explored as strategies that can be implemented in the short term.

Furthermore, the support of specific activities under SME development and the industrialization strategy were explored.

The detail of capacity requirements are covered under section 10.3.



10 NATIONAL STRATEGY FOR THE OPTIMIZATION OF INVADER BUSH

10.1 INTRODUCTION

The Strategy is established on the premise that the invader bushes are a valuable resource that needs to be optimized. The harvesting of invader bush will stimulate the creation of enterprises that are likely to be rural based closer to the resource. The proposed strategic plan is thus formulated as a national guide to the sustainable management and utilization of the resource in order to meet market needs. The strategic plan proposes support mechanisms for changes in policy, regulation and product responsive nature and address bottlenecks identified throughout the value chain whilst putting mechanisms in place to smooth out such bottlenecks so as to enable optimization.

The strategy forms the basis of the programs and activities of the MAWF and GIZ support program and will require National buy in from both public and private sectors. Thus resources will need to be committed to create such awareness. The proposed strategy is thus expected to present a realistic and compelling business case that will convert the national bush challenge into a valuable productive input in various value chains.

10.2 SYNOPSIS OF THE CURRENT SITUATION

The resource is spread across +/- 30 million hectares of land, largely encroached by alien plants reducing the land carrying capacity for livestock and robbing the soil of moisture. Some encroachment is extremely dense, reported at an average encroachment of 12 000 BE/hectare which is 10 times the acceptable norm (measures as a thumb of rule as 2x average annual rainfall). This reduced the economic contribution by the agricultural sectors and whilst effort to de-bush is being made, at 17% de-bushing, the gains being made are relatively small compared to the potential. Such gains are of a cross cutting nature across the sectors, holding both public and private gains. These relate but are not limited to:

- Rangeland improvement (live stock holding capacity, reversal of annual +/- NAD 700 million losses in economic value)
- Water table improvement
- Enterprise formation & growth (SME development)
- Job creation
- Forex earnings
- Import substitution
- Research and development capacity improvement, etc.
- Rural development

Given the extent of public gains that can be made, it is imperative that the national strategy is public sector driven, to create framework conditions that are conducive for the private sector to participate meaningfully. The assessment concludes that access to land is a low ranked problem and can be easily addressed. Thus, the focus is on institutional and systematic bottlenecks and the devising of strategies to effectively address those.

The following key considerations are made:



- That the product is perceived to be viable by market definition, BUT, there is a need for adequate input and adequate off take market within acceptable logistics consideration to maintain viability (i.e. biomass for combustion)
- That there are logistics challenges through rail infrastructure capacity and will devise its transport and logistics requirements independent of rail infrastructure. The resource concentration is defined and location priorities (Regions: Kavango, Oshikoto, Otjozondjupa, Zambezi, Ohangwena and Omaheke regions)
- Concentration of resource between commercial land (private owned) and State land (resettlement farms, communal and Government farms) is equal.

The value chain is presented from market to raw material harvesting with opportunities and key stakeholders defined:

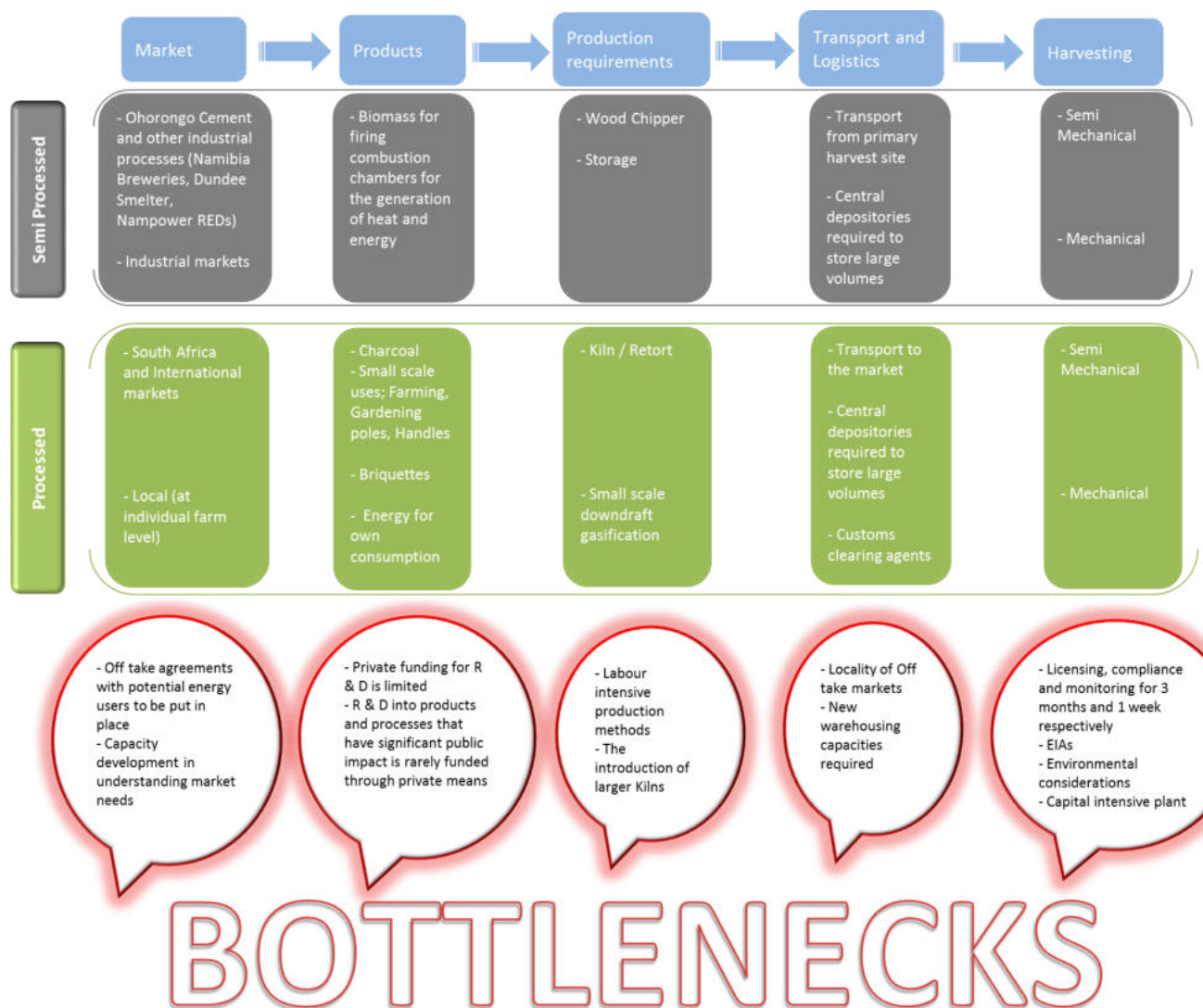


Figure 14: Value Chain Assessment



Bottlenecks identified throughout the value chain as it relate to the regulatory environment, challenges associated with harvesting, logistics and storage requirements, production technology, new product development and market related issues are comprehensively defined in the mitigation strategy.

10.3 STRATEGIC OBJECTIVES

A fifteen year (15) strategic plan is presented. The overall goal of the strategy is to optimise the use of invader bush through the application of the bush as input into numerous products. The strategy intends to address gaps/bottlenecks and barriers identified through this and other studies, and present a concise road map, comprising of short term, intermediate and long term strategies to deliver tangible results.

The Strategy is pillared on five key strategic objectives:

- Improving access to finance
- Market Development
- Supporting R & D to optimise new product development
- Increase access to the resource
- Establish Institutional capacity to deliver the strategic objectives

The strategy draws from market/potential market needs and works back to define the requirements and capacities essential to satisfy various off take markets. It is projected that such approach will result in the establishment of sustainable industries. For illustration, if Ohorongo Cement requires biomass for energy production, then improved rangeland is a by-product of such activities. **This economic proposition is likely to incentivise players to participate in the harvesting of bush.**

The strategy is further cemented in supporting value chain than being single activity focused.

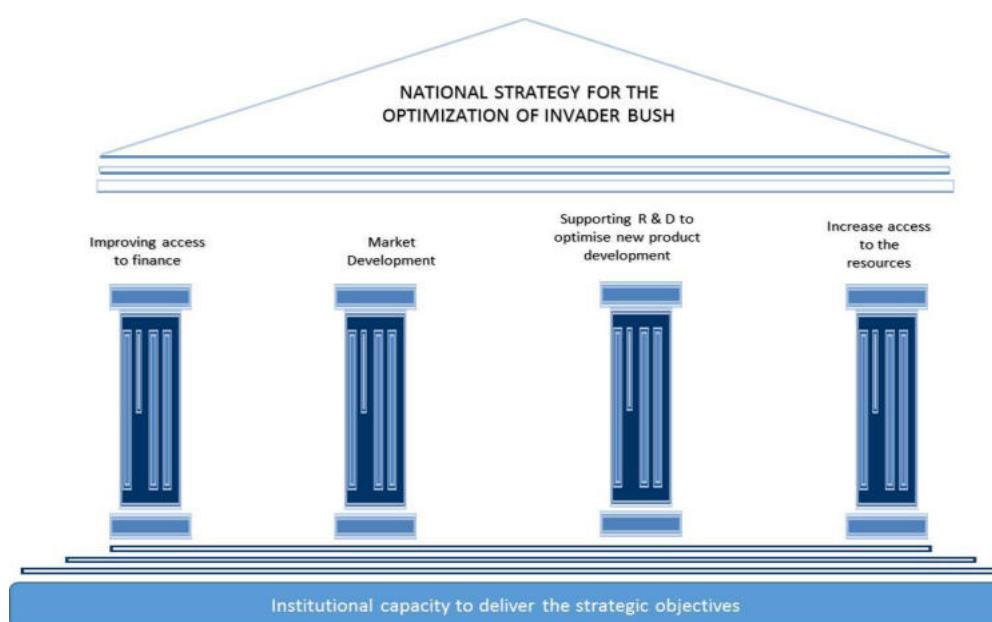


Figure 15 National Strategy Pillars

The intended outcomes of this strategy are:

- Create financing mechanisms for invader bush value chains
 - Support the establishment of value adding enterprises
 - Create sustainable jobs
 - Contribute to the country's GDP in direct forex earnings
 - Improve harvesting of land and improve rangeland
 - Increase the GDP contribution of the agricultural sector

Strategic objectives:

10.3.1 Strategic Objective 1 (SO1): improving access to finance

CHALLENGE:

The nature of investment required is significant (+/- NAD 500 000 for small charcoal enterprise, NAD 6 million for a medium size harvesting plant, and +NAD 20 million for further value adding). The nature of the investment is generally capital intensive and requires reliable cash flow capacity to service interest rates and a strong Balance Sheet to provide security. The standard security in the form of a bond over the farm dis-incentivises farmers to make such investment given the lag in achieving expected return on investments and the subsequent re-stocking required for such return to be achieved (stocking up animal numbers to graze increased rangeland).

Non-farmers are mainly dis-incentivised by their limited Balance Sheets and as such their inability to access loans. Furthermore, small scale players tend to diversify their activities, so as to generate cash flow from multiple sources to meet repayment requirements.

Risk capital is in short supply, given the infant venture capital market coupled with limited funding for R & D. Because of this, many opportunities do not come to market as entrepreneurs' resources to fund R & D are exhausted.

THE MITIGATION STRATEGIES:

The strategy proposes a mix of instruments. When applied collaboratively, they will result in an increased uptake of loans and subsequently more enterprises formed and up scaled. It is anticipated that enterprises with scalable operations will take up larger loan sizes if such loans are awarded at lower interest rates, therefore the interest subsidy is proposed. It is further recommended that the interest subsidy is complemented by a Credit Guarantee scheme to support entrepreneurs with an inadequate Balance Sheet, unable to meet owners' contribution requirements or security requirements. It is the proposition of this strategy that reducing cost of funding does not remove the barrier associated with security and as such, the Credit Guarantee scheme will mitigate this barrier. Additionally, the strategy advocates for a collaborative working arrangement between funders and development support initiatives such as grant providers and other support services. This will result in an effective application of resources and re-direct financial resources where they are most likely to enhance returns i.e. if an entrepreneur can access grant funding to perform R & D and secures such from the NCRST, private capital can then be applied to meet investment requirements.



10.3.1.1 SO1.1 Interest rate subsidy:

A subsidy is proposed to serve as an incentive that will entice entrepreneurs across various value chains to utilize debt funding. The subsidy scheme recognises that the different categories of financiers (i.e. developmental, commercial and risk based) and the range of pricing ranging from Prime less 3 percent to Prime plus 7 percent. It is proposed that a 5 percent subsidy is applied to all loans granted in support of enterprises in the invader bush based value chain. This will apply for both primary and secondary enterprises. For DFIs that already offer subsidised loans, e.g. Agribank, the beneficiaries will only qualify for 50% of the subsidy. All finance needs will be considered except loans for aerial spraying, a method considered environmentally undesirable. An initial Fund valued at around NAD 101.2 million is proposed over the first five year starting off with NAD 9.2 million in the first year and increasing to NAD 13.4 million, NAD 20.9 million, NAD 24.8 million, NAD 32.9 million from the second year to the fifth year respectively.

The subsidy is expected to be administered by EIF and all participating financial institutions (PFI) will log their claim for a subsidy after a particular loan is approved, with specific supportive information to be determined for the scheme. Such PFI will thus receive the monthly subsidy for the duration of the loan and will effectively build a subsidy portfolio with the EIF. Below is the administrative mechanics.

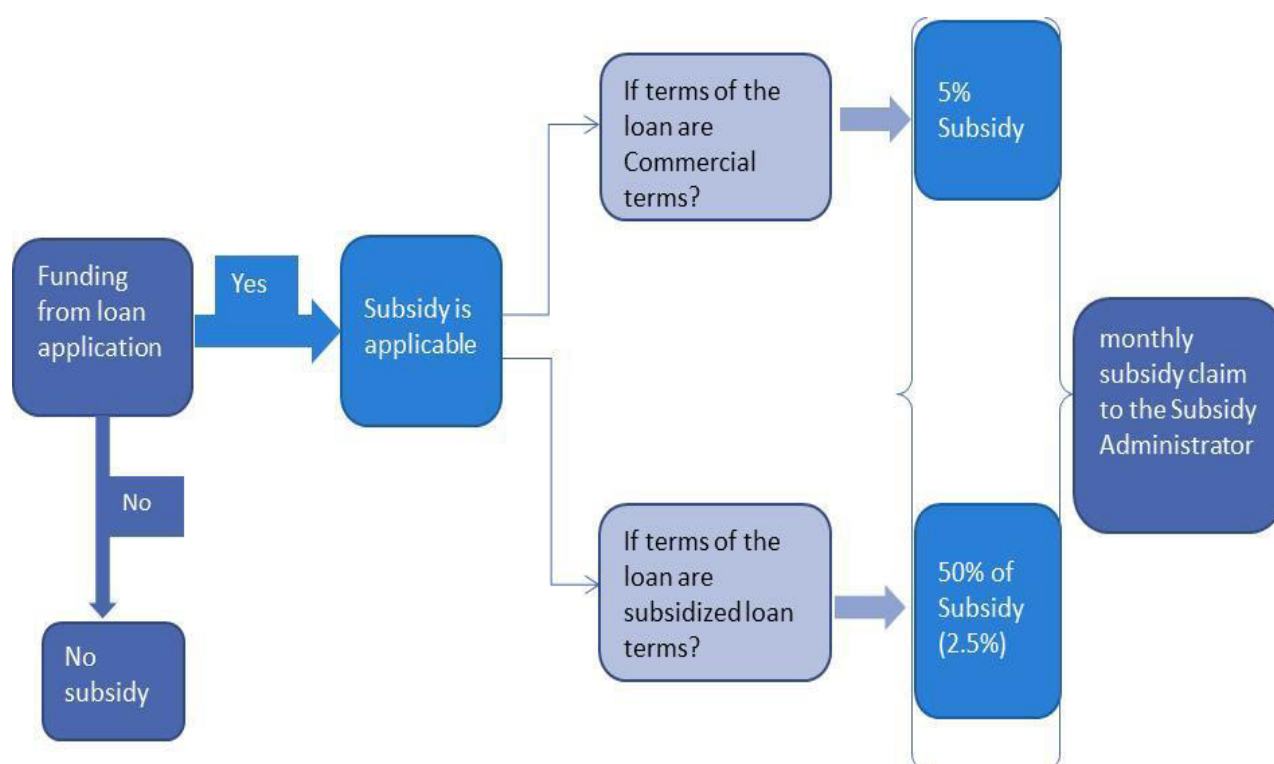


Figure 16 Administration of the Proposed Subsidy



The subsidy impact is illustrated below clearly demonstrating the effect on the cost of capital.

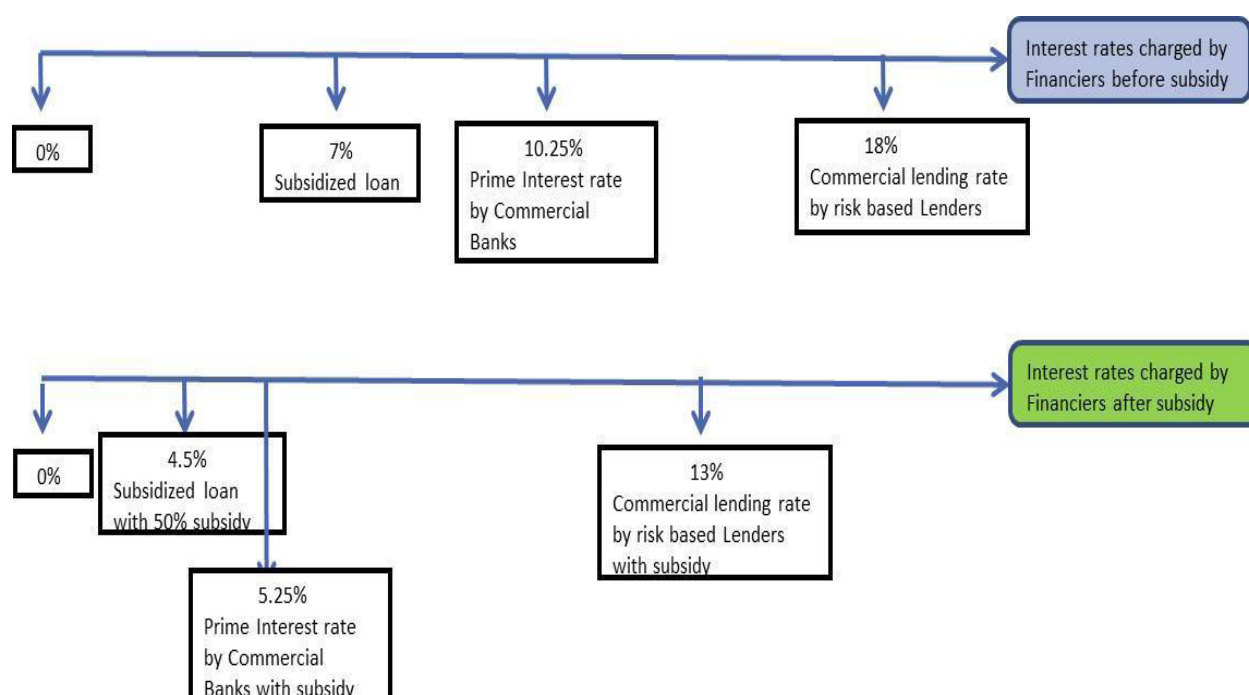


Figure 17 Effects of the Proposed Subsidy

Subsidy calculation					
Column1	Subsidy on energy plant	Subsidy on harvesting equipment	Subsidy on Charcoal manufacturing	Subsidy on other manufacturing	Total
Year 1	-	6,562,500.00	875,000.00	1,750,000.00	9,187,500.00
Year 2	5,031,250.00	5,380,768.86	1,006,250.00	2,012,500.00	13,430,768.86
Year 3	4,635,886.73	12,815,903.08	1,157,187.50	2,314,375.00	20,923,352.31
Year 4	10,873,595.01	9,943,993.59	1,330,765.63	2,661,531.25	24,809,885.48
Year 5	9,912,760.96	18,399,162.36	1,530,380.47	3,060,760.94	32,903,064.73
Year 6	17,701,170.81	13,150,931.52	1,759,937.54	3,519,875.08	36,131,914.95
Year 7	15,945,308.05	24,332,892.23	2,023,928.17	4,047,856.34	46,349,984.79
Year 8	14,097,262.50	17,392,106.94	2,327,517.40	4,655,034.79	38,471,921.62
Year 9	12,152,194.55	12,105,412.43	2,676,645.00	5,353,290.01	32,287,542.00
Year 10	10,105,010.54	6,541,166.47	3,078,141.76	6,156,283.51	25,880,602.27
Year 11	7,950,349.36	3,354,240.05	3,078,141.76	6,156,283.51	20,539,014.68
Year 12	5,682,568.48		3,078,141.76	6,156,283.51	14,916,993.74
Year 13	3,955,232.99		3,078,141.76	6,156,283.51	13,189,658.25
Year 14	2,137,212.39		3,078,141.76	6,156,283.51	11,371,637.65
Year 15	1,095,939.60		3,078,141.76	6,156,283.51	10,330,364.87
Total Subsidy	121,275,741.96	129,979,077.54	33,156,462.24	66,312,924.47	350,724,206.20



10.3.1.2 SO 1.2 Credit guarantee scheme:

The need to mitigate security requirements is eminent in the financial sector and has been cited in many reports as an entry barrier. This is particularly true for new market entrants and for high growth enterprises where revenue generating capacity grows faster than the enterprise Balance Sheet. This is further recognised in SME policy and is presently being developed as an instrument geared to improve access to finance and deepen the financial sector as part of the SME finance strategy implemented under the auspices of the Financial Sector Strategy. The administration of the scheme is still to be determined and is likely to be seed funded by PFI and development partners.

10.3.1.3 SO 1.3 Concessional loan scheme with SUNREF:

An opportunity to engage international DFIs such as ADF, SUNREF exists for Namibian financial institutions to establish concessional loan arrangements that can be passed on to their clients as end users of financial products.

10.3.1.4 SO 1.4 Value chain support:

The assessment highlighted a need for collaborative support between commercial financial and non-commercial funding institutions to streamline support towards ventures that are potentially viable. The level of awareness between institutions and end users was found to be extremely low and resulting in market inefficiencies and failure. A referral and collaborative system is thus proposed that will facilitate grant funding for conceptual ideas and products that requires further R & D or funding to secure compliance with specific standards and regulations. These projects can subsequently be funded in a commercial manner, through debt or venture capital finance. It is thus expected that such collaborative approach will result in some products coming to market that otherwise might not, e.g. wood glue. Below is an illustration of such collaborative support:

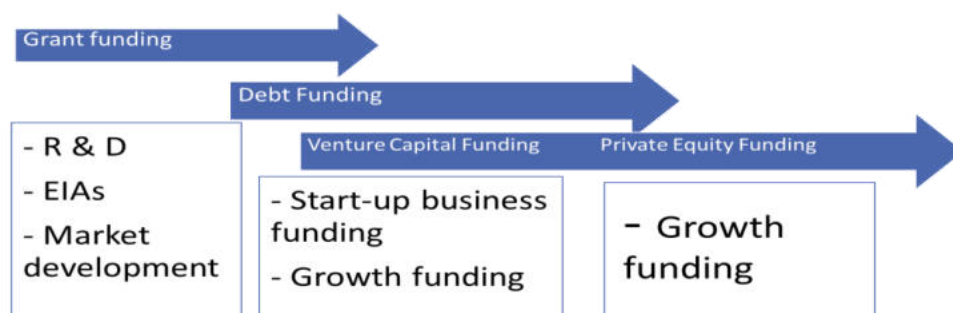


Figure 18 Collaborative Financing and Support

10.3.2 Strategic Objective 2 (SO2): Market Development

CHALLENGE:

The Market for products that utilize invader bush as an input is in its infancy and fairly limited. Detlof von Oertzen (October 2014) cites market development as a significant challenge to the development of the invader bush industry and explains the reason for the low level of harvesting (0.4% of current resources) despite the negative economic impact. There is thus need for a focused market



development strategy that will incentivise entrepreneurs to invest in the value chains identified as potentially economic viable.

The current market has limited application as per below:

- As source of domestic fuel: firewood, compressed wood, bush block and charcoal
- Industrial heat generation /combustion firing: Ohorongo Cement
- Poles: farming, construction and gardening
- Agricultural use: animal feed and Compost

The products presently in the market are short supplied and an immediate opportunity exists to upscale the market for biomass combustion use locally or externally and charcoal production. The increase in production to service the market for these two products can up scaled immediately with output increasing from 235 kt/a to 700 kt/a and eventually 930 kt/a within 10 years.

Studies have however affirmed the potential of various economic value chains that can be derived from invader bush. With supportive R & D and improved access to affordable finance, exponential growth can be achieved and a significant industry established at the back of invader bush as **key input resource**.

As for the charcoal market, mired by a number of challenges typical in the infancy stage and specifically relating to limited experience in conducting general business, practices compliance matters, meeting market expectation (case in point the article in “The Independent”, August 09, 2015 on Namibian charcoal producers paying a high price for cheap British barbecue).

Interventions will cover both technical and soft business matters to achieve improved efficiencies in the market.

THE MITIGATION STRATEGIES:

The strategies will vary from direct market development to increasing the number of sizable off take arrangements across various value chains, to training and support to ensure compliance. It can also take the form of specific intervention to obtain standards certification in order to achieve specific rank supplier status and thus access additional markets. For example, the small charcoal producers could be assisted to secure Forest Stewardship Council (FSC) certification. This gives them access to international market.

10.3.2.1 SO2.1 Market development:

The first strategy would be to increase current production in terms of biomass for combustion and charcoal production to meet existing market demand.

For industrial uses, i.e. energy generation, an organized supply arrangement (group scheme) is required to generate the necessary volumes of biomass required as input resource. N-BIG, a non-profit association of primary harvesters is putting mechanisms in place to ensure such security of supply. This model is establishing a **bush bank** and will trade in the acquisition and sale of biomass to buyers.

Local industrial consumption for heat and energy production can be increased. The Ohorongo Cement business model can be replicated but this will require enterprising pro-activeness to stimulate the market. There are a number of large enterprises in the highly infested regions



(Otjozondjupa, Oshikoto, Kunene, Omaheke) that collectively consume about 42 Mw/h. If 20% of that is generated using biomass, it will create opportunities with a market value of NAD 200 million.

Charcoal as a low hanging product, a well-established market with unmet demand and potentially a high foreign currency earner, is easily up-scalable to establish a larger market. This can be done by increasing export volumes to optimize bilateral trade agreements such as that with China, the 2nd largest market for Namibian Charcoal +/-220 kt/a in demand. However, this will require a better organised industry in terms of production capacity, labour and safety and security.

Brokerage services such as the model applied by Jumbo Charcoal can be up scaled to incorporate a larger number of producers. Namrock, a marketing association of lobster producers established a functional business model that can be replicated in other industries.

Furthermore, there are few near-market ready products that require R & D support as presented under SO3, which will require market development support and the security of bankable off take agreements. This is however dependent on the security of raw material supply and as such, the regime of harvesting licence allocation need to be revamped as per recommendations under SO5 to ensure consistent supply of required quantities for value adding.

Other products such as furniture manufacturing could realize a sizable market though public procurement support. For example, the Ministry of Education could be directed to procure school furniture, exclusively from local suppliers with quota allocation to the use of invader bush.

10.3.2.2 SO2.2 Business support services:

Business development services will range from very basic support, income tax & VAT, other compliance relating to products standard and market requirements.

Furthermore, general business support to improve business management capacities and improve entrepreneurs' understanding of processes and requirements will be required.

Grant support should be given to small business owners to conduct EIAs. General advisory services on invader bush related activities and processes. Business support services can be delivered through DAS and funding provided by MITSD, Ministry of Higher Education, MAWF, and GIZ.

SO2.3 Pre-license certification:

To mitigate against the risks associated with longer term license duration, it is recommended that harvesters and charcoal producers are certified in key requirements as per table below:

Table 5 Requirements for Certification

Harvesting	Charcoal production
○ Bush species identification ○ Harvesting methods ○ Labour ○ Environmental considerations	○ Bush species identification ○ Harvesting methods ○ Labour ○ Environmental considerations ○ Safety and security ○ Export markets requirements



10.3.3 Strategic objective 3 (SO3): Research and Development

CHALLENGE:

The Study by DECOSA that assessed value added end use opportunities (May 2015) identified a number of products that can potentially be brought to market subject to R & D investments in critical areas. The R & D needs identified range from technical, chemical and mechanical nature in terms of determining the most appropriate equipment for harvesting to the identification of appropriate technology to de-sand the bush for the production of energy pellets. This will generate new revenue streams and in fact contribute to economic development, through the establishment of new enterprises, job creation, foreign currency earnings and rural economic development. This is further substantiated by the national development goals as captured in Vision 2030, the national development plans, industrial policy and it's Growth at Home Execution Strategy, along with sectoral policies as highlighted below which advocates for high and sustained economic growth, employment creation and increased income equality.

- In NDP4, Agriculture is one of the priority sectors in the country with a desired outcome of contributing 4% real growth per year over the NDP4 period. Due to high level of bush encroachment, the livestock holding capacities are reduced to 36% of what they were in 1959. It is estimated that this result in NAD 1.4 to 1.6 billion loss per annum. If this is restored, this will increase the sectors contribution to GDP.
- The utilization of invader bush to create secondary value adding enterprises is in line with the promotion of local value chains of the Growth at Home Execution Strategy for Industrialization. Specifically, the de-bushing value chain is part of the agricultural sector which is among the focus sectors targeted under the growth at home strategy. Harvesting and value addition activities can be supported with equipment, access to local markets (especially for construction materials such as boards and planks that can be used to supply the national housing market which is also a national priority) and international markets for products such as charcoal through MITSD programs such as the Industrial Upgrading and Modernization Programme and the Special Industrialization Programme. Exported products from the invader bush will contribute to the country's goal of increasing the ratio of value added exports to 70 percent by 2030.

MITIGATION STRATEGIES:

Research & Development is recommended to cover the following range of interventions:

- Harvesting methods
- Product specific R & D requirements
- Processes employed for the development and commercialising new products and technologies.

The analysis in determining R & D priorities took into consideration national policies and programs, current challenges facing the nation such as unemployment, the housing needs, and the balance of trade; and, based on the matrix provided below, makes the following recommendations:



Table 6 Recommended Products

Value chain	Product	Project in process or not	R & D required	Pioneering Funding source	Implementing party
Energy value chain	Pellets	Project under private initiative: WoodCO	De-sanding the bush	Private to be complimented with public funding - NCRST	WoodCO
Value Chain: Building material	Wood – Cement bricks	Project under the leadership of Dr. Eroid Naomab NAMIBIND	Further testing on material suitability	NCRST	UNAM
	Medium Density boards for construction	Not known	Further testing on material suitability	NCRST	TBD
	Wood plastic composites	Not known	Further testing on material suitability	NCRST	TBD
	Roof shingles/tiles	Not known	Assess sugar content	NCRST	TBD
	Parquet Flooring	Not known	Adequacy or resource and appropriateness of properties to be investigated	NCRST	TBD
Animal feed	Animal Feed	Project under private initiatives	Assess nutritive value	NCRST	TBD

10.3.4 Strategic objective 4 (SO4): Increase access to the primary resource

CHALLENGE:

Sustainable access to the resource is considered a serious threat to the establishment of the invader bush industry. Whilst the resource is in abundant supply, the security of supply is hampered by a number of factors:

- Private Land owners are unlikely to contract into long-term (e.g. 15 years) harvesting arrangements whilst industry is still in its infancy stage and market dynamics likely to change in the medium term.
- The duration of harvesting permits is too short and considered a business risk in contracting off take agreements. Licensing in commercial and communal areas is issued for 3 months and 1 week respectively. For the purposes of charcoal production, Environmental Impact Assessments (EIAs) need to be carried out as an additional requirement. EIA requirements might be onerous for small enterprises to comply with.



- Inadequate capacity to ensure compliance and monitoring of harvest, which can lead to harvesters cutting down non-invasive species.
- Harvesting method: the creation of savannahs or just grass lands. Highly mechanised methods are perceived to be non-discriminatory to some degree.

THE MITIGATION STRATEGIES:

- SO4.1 increase access to land
 - State land (communal, resettled and research land) should provide a more sustainable supply of raw material as this represents 40% of resource land. Combined with commercial farms, the hectares available for harvesting will be more than the 1.86 million hectares required based on the interest rate subsidy model
 - Licences should be issued for longer period (3 years) to mitigate the risk of supply and improve business viability (longer tenure, improves security of supply). Such licencing can be supported by monitoring intervals every 3 months executed by honorary foresters who are to verify compliance with license requirements. This could be implemented through the issuance of a new gazette w.r.t new license period supported by new licence fees as per approval of the National Treasurer
 - As provided for by the Forestry Act 12 of 2001, to improve the process of license issuing, the Minister can appoint non civil servants as license Officers to streamline the issuance of harvesting licenses.
- SO4.2 Improved monitoring and compliance
 - As provided for by the Forestry Act 12 of 2001, honorary foresters should be established throughout the regions that are highly invaded to improve monitoring and compliance with standards.
 - Additional training capacity needs to compliment the new licensing periods and harvesters certified in key areas (bush species identification, harvesting methods etc.). Monitoring visits by honorary foresters will then assess compliance against certification and license standards.
- SO4.3 Appropriate harvesting methods

A mixed harvesting model of mechanical harvesting supported by a manual application of arboricides is advised for industrial volume harvesting and semi mechanised supported by a manual application of arboricides for smaller industries such as charcoal production.
- SO4.4 Establish a bush bank

The Divisions of Forestry and Resettlement are well positioned to pioneer the establishment a **Bush Bank in collaboration** with N-BIG. Such Bush Bank will ensure a sustainable supply of biomass that can be used as an input into various supply chains (bush chips, manufacturers, charcoal etc.).

10.3.5 Strategic objective 5 (SO5): Institutional arrangement

CHALLENGE:

The limited regulatory framework is a critical deterrent for the establishment and growth of the invader bush industry. The economic spin-offs post harvesting are largely falling outside the scope of the MAWF and as such, require policy directives that recognize the cross sectoral value that the



invader bush holds. It has been advocated in past papers that a bush utilization policy is established; that subsequently, alignment with existing regulations and policies such, Forestry Act 12 of 2001, the Environmental Management Act 7 of 2007, Labour Act 11 of 2007 and Electricity Act 4 of 2007 is achieved.

The mitigation strategies:

SO 5.1 Establishing a conducive regulatory framework:

- Bush utilization policy – with support of SUNREF, alignment of regulations such as the Forestry Act 12 of 2001, Environmental Management Act 7 of 2007, Labour Act 11 of 2007, Electricity Act 4 of 2007
- Infant industry protection (e.g. furniture)/Levies on importing against school furniture.

SO 5.2 Establish the necessary institutional capacity:

The creation of a National agency to support the development of the industry is an important intervention that needs to be considered in the medium to long-term. The cross sectoral gains of a public, private and social nature warrant a co-ordinated support as follows:

- DAS' role in capacitating private operators to make appropriate decision and access relevant support institutions
- N-BIG's role in ensuring security of supply
- The role of the Ministries, the inter ministry collaboration
- EIF in pioneering the interest subsidy scheme
- NCRST in pioneering R & D support

SO 5.3

Create National awareness and buy in through a focused information program that will create awareness and establish citizen buy-in.



11 BUDGET:

11.1 Budget assumptions

- Annual Budget increase of 15% per annum
- Interest rate subsidy drawn from pilot project financial model
- 100 Harvesting units to be financed
- 20 MWh of power generation using biomass to be financed
- 930,000 tonnes of wood to be harvested per annum

11.2 Funding sources

- Interest subsidy – draw from EIF, MITSD, MAWF,
- R & D – NCRST, MITSD, NPC
- Business support- MITSD, MLRR, NPC
- Draw from national budget and check various Ministries budgets



11.3 Key components

Table 7 Financing of the Strategy

Strategic Objective	Specific strategic objective	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
SO1 Improving access to finance	SO1.1 Interest rate subsidy	9 187 500	13 430 769	20 923 352	24 809 885	32 903 065	101 254 571
	SO1.2 Credit guarantee Scheme	-	-	-	-	-	-
	SO1.3 Concessional loan scheme with SUNREF	-	-	-	-	-	-
	SO1.4 Value chain support	3 000 000	3 450 000	3 967 500	4 562 625	5 247 019	20 227 144
	Sub Total Improving access to finance	12 187 500	16 880 769	24 890 852	29 372 510	38 150 083	121 481 715
SO2 Market Development	SO2.1 Market development	5 000 000	5 750 000	6 612 500	7 604 375	8 745 031	33 711 906
	SO2.2 Market Business support service	5 000 000	5 750 000	6 612 500	7 604 375	8 745 031	33 711 906
	Sub Total Market Development	10 000 000	11 500 000	13 225 000	15 208 750	17 490 063	67 423 813
SO3 Research and Development		32 378 000	35 139 333	37 171 000	42 746 650	49 158 648	196 593 631
	Sub Total Research and Development	32 378 000	35 139 333	37 171 000	42 746 650	49 158 648	196 593 631
SO4 Increase access to the primary resources	SO4.1 Increase access to land	-	-	-	-	-	-
	SO4.2 Improved monitoring and compliance	2 500 000	2 875 000	3 306 250	3 802 188	4 372 516	16 855 953
	SO4.3 Appropriate harvesting methods	-	-	-	-	-	-
	SO4.4 Joint initiative by department of Forestry and Resettlement - Bush clearing program	45 000 000	51 750 000	59 512 500	68 439 375	78 705 281	303 407 156
	Sub Total Increase access to the primary resources	47 500 000	54 625 000	62 818 750	72 241 563	83 077 797	320 263 109
SO5 Institutional arrangement	SO5.1 Establishing a conducive regulatory framework	-	-	-	-	-	-
	SO5.2 Establish necessary institutional capacity	5 000 000	5 750 000	6 612 500	7 604 375	8 745 031	33 711 906
	SO5.3 Public awareness	5 000 000	5 750 000	6 612 500	7 604 375	8 745 031	33 711 906
	Sub Total Institutional Arrangements	10 000 000	11 500 000	13 225 000	15 208 750	17 490 063	67 423 813
Ongoing Support		10 000 000	11 500 000	13 225 000	15 208 750	17 490 063	67 423 813
	Sub Total Ongoing Support	10 000 000	11 500 000	13 225 000	15 208 750	17 490 063	67 423 813
							-
	Total Budget	122 065 500	141 145 102	164 555 602	189 986 973	222 856 715	840 609 893

12 IMPLEMENTATION PLAN & PROPOSED PRIORITIES

12.1 The implementation plan

The implementation plan outlines a five year road map of the national strategy and cements the foundation of a long term strategies as well as short term and medium term strategies. The implementation plan further identify championing parties and those in supportive capacities, short to medium term gains and establishes key performance measures/indicators, performance targets and time lines in conjunction with the strategies to assess and improve performance. The detailed implementation plan is attached as annexure 2.

12.2 Pilot/Pioneering projects

This section extracts priority projects that can be implemented within the first 6-12 months after the delivery of this report.

Table 8 Quick Win Projects

Project & Description	Targeted objectives	Next steps
Policy formulating – ○ bush use policy ○ Harvesting permits	To provide an enabling regulatory framework To achieve efficient and sustainable access to the raw material	MITSD should drive the development of the bush use policy. Through SUNREF program, can support policy development through availment of technical expertise and financial support MAWF can make the necessary amendments to increase the duration of harvesting licenses to 3 years and introduce preconditions such as required training courses on bush types, labour matters etc
Interest subsidy scheme	To achieve affordable funding	EIF's mandate allows for the establishment of an interest subsidy scheme as such EIF is well positioned to pioneer the invader bush interest subsidy scheme. EIF can draw complimentary funding from SUNREF program
Bush Bank	To ensure security of supply	N-BIG to establish a bush harvesting program in collaboration with MAWF and MLR
Research and Development	To prioritize R & D priorities and put a supportive framework in place	NCRST interested to establish an R & D pilot support program to private sector in collaboration with GIZ. The debushing program must initiate discussions with NCRST
Honorary Foresters	To support the monitoring capacities of the Forestry Directorate	MAWF to activate the honorary forester program to strengthen monitoring



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14 Annexures

14.1 Annex 1: List of Stakeholders consultation

Table 9 List of Stakeholders Consultation

Name	Institution
Mr Jaco Kruger	Trusto Bank
Mr Benedictus Limbanda	EIF
Mr Pandeni Kapia	
Mr Shalli Shindume	Agribank
Mr Christo Viljoen	FNB
Mr Laura Mbuwa	Nedbank
Mr Arthur Diedericks	
Mrs Hellen Amupolo	Development Bank of Namibia
Mr Andre Botes	Standard Bank
Mr Ben Herunga	SME Bank
Ms Aina Shikodhi	
Mr Mbo Mena Luvindao	Bank Windhoek
Mr Simon Ulamba	Nampro Fund
Hon.Obeth Kandjoze	Ministry of Mines and Energy
Mr Vilyo Kuutondokwa	
Mr Brian Christian	MTM Engineers
Mr Nobert Liebich	Transworld Cargo-WOODCO
Dr N Nghifindaka	Namibia Emerging Commercial farmers Union
Dr Michael Humavindu	Ministry of Industrialisation, Trade and SME Development
Mr Joseph Hailwa	Ministry of Agrculture, Water and Forestry
Mrs Sophia Kasheeta	
Dr Malan Lindeque	Ministry of Enviroment and Tourism
Mr Clive Smith	Walvis Bay Corridor Group
Mr Sakkie Coetzee	Namibia Agricultural Union
Mr Wallie Roux	
Ms Iyaloo Shimutwikeni	Nampower
Mr Grant Muller	
Mrs Margaret Mutschler	
Mr Chongo Kasanda	Fablab Namibia
Dr R Trede	DECOSA



Mr Petrus Shifotoka	Bank of Namibia
Mr Daniel Van Vureen	Charcoal Producer Association
Mr Roelie Venter	
Mr Tobias Konzmann	Ohorongo Cement
Dr Eino Mvula	NCRST
Ms Alushe Nditya	
Ms Diina Shuuluka	
Mrs Inge Zaamwani	Office of the President
Mrs Penny Akwenye	
Mr Kingsley Kwenani	Meatco Foundation



14.2 Annex 2: Implementation plan

14.2.1 ASSUMPTIONS

Conversion of wood to charcoal to get 1 tonne charcoal	11	tonnes of wood
1 Kilotonnes	1.000,00	tonnes
5 MWh	40.000,00	tonnes of woody biomass per annum
Harvesting unit output per day	30	tonnes
Number of operating days per annum	312	days (6 days per week * 52 weeks)
Wood required to produce 5 MWh per annum	17.500	tonnes
Annual escalation of equipment prices	15,00%	
Construction cost per Mwh	20.000.000,00	Year 1
Harvesting equipment per unit	6.000.000,00	Year 1
Construction cost per Mwh	40.227.143,75	Year 6
Harvesting equipment per unit	12.068.143,13	Year 6
Mega Watt Hour produced per plant	5	
Number of renewable energy plants Year 2	1	
Number of renewable energy plants Year 3	1	
Number of renewable energy plants Year 4	1	
Number of renewable energy plants Year 6	1	
Number of harvesting units in Year 1	25	
Number of harvesting units in Year 3	25	
Number of harvesting units in Year 5	25	
Number of harvesting units in Year 7	25	
Micro producers of Charcoal financed per annum	10	
Small scale producers of Charcoal financed per annum	10	
Micro Producers set-up costs	500.000,00	
Small Scale Producers set-up costs	1.500.000,00	
Other producers set-up costs per annum	40.000.000,00	
Subsidy on Commercial funding	5,00%	
Subsidy on Subsidized funding	2,50%	
Subsidized funding component	25%	
Commercial funding component	75%	
Total subsidy on mixed funding	4,38%	



14.2.2 Funding requirements for Debushing projects

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
BIOMASS											
Harvesting equipment	150.000.000		198.375.000		262.350.938		346.959.115				957.685.052
Renewable energy plant		115.000.000	132.250.000	152.087.500		201.135.719					600.473.219
	150.000.000	115.000.000	330.625.000	152.087.500	262.350.938	201.135.719	346.959.115	-	-	-	1.558.158.271
CHARCOAL											
Small Scale Producers CAPEX requirement	15.000.000	17.250.000	19.837.500	22.813.125	26.235.094	30.170.358	34.695.911	39.900.298	45.885.343	52.768.144	304.555.774
Micro scale Producers CAPEX requirement	5.000.000	5.750.000	6.612.500	7.604.375	8.745.031	10.056.786	11.565.304	13.300.099	15.295.114	17.589.381	101.518.591
Sub Total CHARCOAL Funding requirements	20.000.000	23.000.000	26.450.000	30.417.500	34.980.125	40.227.144	46.261.215	53.200.398	61.180.457	70.357.526	406.074.365
											-
OTHER											
CAPEX requirement for other producers	40.000.000	46.000.000	52.900.000	60.835.000	69.960.250	80.454.288	92.522.431	106.400.795	122.360.915	140.715.052	812.148.730
Sub Total OTHER Funding requirements	40.000.000	46.000.000	52.900.000	60.835.000	69.960.250	80.454.288	92.522.431	106.400.795	122.360.915	140.715.052	812.148.730
Total Funding Requirements	210.000.000	184.000.000	409.975.000	243.340.000	367.291.313	321.817.150	485.742.761	159.601.193	183.541.372	211.072.578	2.776.381.365

14.2.3 Investment Portfolio

Column1	Energy plant	Harvesting equipment	Charcoal manufacturing	Other manufacturing	Total Investment Portfolio
Year 1	-	122.989.002,48	20.000.000,00	40.000.000,00	182.989.002,48
Year 2	105.963.125,27	94.559.927,59	23.000.000,00	46.000.000,00	269.523.052,86
Year 3	96.451.814,63	227.291.282,05	26.450.000,00	52.900.000,00	403.093.096,67
Year 4	226.577.393,34	158.201.345,11	30.417.500,00	60.835.000,00	476.031.238,45
Year 5	203.462.471,19	300.592.720,50	34.980.125,00	69.960.250,00	608.995.566,70
Year 6	364.464.184,01	209.221.278,91	40.227.143,75	80.454.287,50	694.366.894,16
Year 7	322.223.142,76	397.533.872,87	46.261.215,31	92.522.430,62	858.540.661,56
Year 8	277.764.446,84	276.695.141,36	53.200.397,61	106.400.795,22	714.060.781,03
Year 9	230.971.669,39	149.512.376,44	61.180.457,25	122.360.914,50	564.025.417,58
Year 10	181.722.271,12	76.668.344,07	70.357.525,84	140.715.051,68	469.463.192,71
Year 11	129.887.279,44	0,00	70.357.525,84	140.715.051,68	340.959.856,96
Year 12	90.405.325,43		70.357.525,84	140.715.051,68	301.477.902,95
Year 13	48.850.568,83		70.357.525,84	140.715.051,68	259.923.146,35
Year 14	25.050.048,09		70.357.525,84	140.715.051,68	236.122.625,60
Year 15	0,00		70.357.525,84	140.715.051,68	211.072.577,52



14.2.4 Subsidy calculation

Column1	Subsidy on energy plant	Subsidy on harvesting equipment	Subsidy on Charcoal manufacturing	Subsidy on other manufacturing	Total
Year 1	-	6.562.500,00	875.000,00	1.750.000,00	9.187.500,00
Year 2	5.031.250,00	5.380.768,86	1.006.250,00	2.012.500,00	13.430.768,86
Year 3	4.635.886,73	12.815.903,08	1.157.187,50	2.314.375,00	20.923.352,31
Year 4	10.873.595,01	9.943.993,59	1.330.765,63	2.661.531,25	24.809.885,48
Year 5	9.912.760,96	18.399.162,36	1.530.380,47	3.060.760,94	32.903.064,73
Year 6	17.701.170,81	13.150.931,52	1.759.937,54	3.519.875,08	36.131.914,95
Year 7	15.945.308,05	24.332.892,23	2.023.928,17	4.047.856,34	46.349.984,79
Year 8	14.097.262,50	17.392.106,94	2.327.517,40	4.655.034,79	38.471.921,62
Year 9	12.152.194,55	12.105.412,43	2.676.645,00	5.353.290,01	32.287.542,00
Year 10	10.105.010,54	6.541.166,47	3.078.141,76	6.156.283,51	25.880.602,27
Year 11	7.950.349,36	3.354.240,05	3.078.141,76	6.156.283,51	20.539.014,68
Year 12	5.682.568,48		3.078.141,76	6.156.283,51	14.916.993,74
Year 13	3.955.232,99		3.078.141,76	6.156.283,51	13.189.658,25
Year 14	2.137.212,39		3.078.141,76	6.156.283,51	11.371.637,65
Year 15	1.095.939,60		3.078.141,76	6.156.283,51	10.330.364,87
Total Subsidy	121.275.741,96	129.979.077,54	33.156.462,24	66.312.924,47	350.724.206,20

Breakdown of subsidy over 5 year periods

Year 1 - 5	101.254.571,38
Year 6 - 10	179.121.965,62
Year 11 - 15	70.347.669,20
Total Subsidy requirement over 15 years	350.724.206,20

14.2.5 Equipment requirements

Phase 1

BIOMASS input requirements	215.000,00 tonnes
Charcoal input requirements	400.000,00 tonnes
Other input requirements	<u>100.000,00 tonnes</u>
	<u>715.000,00 tonnes</u>

Number of Harvesting units requirements 76 units

Number of 5MWh enrgy plants 2 plants

Phase 2

BIOMASS input requirements	430.000,00 tonnes	increased energy production from 10 to 20 MWh
Charcoal input requirements	400.000,00 tonnes	
Other input requirements	<u>100.000,00 tonnes</u>	
	<u>930.000,00 tonnes</u>	

Number of Harvesting units requirements 99 units

Additional harvesting units required 23 units

Number of 5MWh energy plants 4 units

Additional harvesting units required 2 units

Assessment of Existing Incentive/Grant Schemes and Financing Products for Encroacher Bush Harvesting and Value Addition in Namibia

The commercialisation of encroacher bush is relatively new to Namibia. Growth of this industry would achieve a whole range of public gains such as development of small and medium enterprises especially in rural areas, forex earnings and import substitution, capacity building in research and development as well as rangeland improvement.

This study presents an assessment of current incentives, grants and financing products for de-bushing activities in Namibia. Through a supply and demand analysis, it determines their adequacy and proposes feasible adjustments to support the establishment of a sustainable encroacher bush based industry. It looks at institutional and systematic bottlenecks and makes recommendations on how to effectively address them. The study further identifies opportunities to improve existing incentives and financing products, proposes new instruments and concludes that a public sector driven national strategy is imperative.