

Exploring the Potential for Green Growth Uptake in the South African Forest Sector

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Region of Focus: The article's specific region of focus is Southern Africa. However, the results and implications are relevant to the whole sub-Saharan Africa due to similar patterns of dependence on forest resources for livelihood by the rural populations.

ABSTRACT

This study assesses the current mode of forest use and management at rural community level in South Africa with a view to locating space for forest based green growth initiatives development and factors that might shape the uptake of such initiatives. This was done with respect to the need to decouple rural livelihood activities from forest degradation. Vegetation type was used as a criterion to select three municipalities (Makhado, Mutale and Thulamela) in Vhembe district. Seven rural communities in each municipality were selected giving a total of 21 rural communities. Using stratified proportionate random sampling procedure, a total of 366 households were selected and interviewed. Findings showed that the informal forest sector is best positioned for immediate delivery of green growth benefits to the local communities. Firewood and wild edible insect (Mopani worms) were identified as the priority products for forest green growth initiative uptake. However, issues relating to skill and technical capacity were identified as a barrier to the uptake of green growth initiatives in the communities. The study thus recommends capacity enhancement initiatives and forest establishment programmes such as afforestation and reforestation as a means of facilitating forest green growth uptake and delivery of green growth benefits to the study communities.

Keywords: *Forest management, green growth, climate resilience, rural development, climate change*

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1. Introduction

Most rural communities in Africa are underdeveloped in terms of infrastructure and government services (Dlamini 2014). People are highly reliant on forests and natural resources for

subsistence and income due to limited employment opportunities and lack of alternative economic activities (Asare et al. 2013; Muyoski 2012; Paumgarten and Shackleton 2011). Firewood, building poles, medicinal plants, and edible fruits are some of the forest products commonly used by rural households for livelihood sustenance (DAFF 2012; Paumgarten and Shackleton 2011). In South Africa, it was estimated (Ofoegbu 2014) that over 60 percent of rural households uses fuelwood as their primary source of energy. In addition, the primary health care of about 27 million rural poor households is dependent on medicinal forest products (DAFF 2012).

Unsustainable forest use and management practices are on the rise, particularly in forests situated within and at the periphery of rural settlements (Matose 2008). This has resulted in growing rates of deforestation and forest degradation, which impacts on rural livelihoods in most communities across Africa (Dercon 2014). This situation is expected to be exacerbated by climate change (Silajdzic et al. 2015). It is projected that climate change impacts will diminish the capacity of forests to provide goods and services that are vital for rural livelihood sustenance (Davis et al. 2010), and community development (Davis et al. 2010; Das and Sarker 2008).

Despite the importance of forests, the current mode of forest resource use and management in most rural communities in South Africa makes it difficult for the communities to translate their forest resources into sustained economic growth and livelihood resilience to climate change challenges (Shackleton and Pandey 2014). However, concerns about climate change and the need to maximize benefits from forests for sustainable rural development is driving national interest in the “green growth” or “green economy” concept (Silajdzic et al. 2015; WEF 2013; Barbier 2010; Bowler et al. 2010). Green Economy is defined as “an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (Musyoki 2012; UNEP 2011). South Africa recognises green growth as a pathway to sustainable development (DEA 2011). The forest sector is uniquely positioned to aid the transition to a green growth pathway at rural community level (Musyoki 2012; Resnick et al. 2012; Slunge and Loayza 2012).

However, despite growing recognition of the importance and economic function of the forest sector in facilitating transition to ‘green growth’ and improving resilience of rural livelihood to climate change, there are concerns that the rhetoric for transitioning to a green growth pathway may not translate into practical action at both the community and sectoral level

(Slunge and Loayza 2012; Dercon 2014). Much of the discussion on ‘green growth’ has remained relatively vague in terms of specifics (Bishop et al. 2012; Dercon 2014). The question of how various green growth strategies and green investments interact with the current mode of forest use and management at rural community level in South Africa is rarely asked. Consequently, factors that might facilitate or hinder transition to green growth in the forest sector at rural community level remain largely unknown.

This study was designed to address this challenge by assessing current mode of forest use and management at rural community level in South Africa with a view to locating space for forest based green growth initiatives development and factors that might facilitate or hinder uptake of such initiatives. Forest dependent rural communities of Vhembe district were purposely selected as a case study. The study sought to answer the following questions:

1. How does forest use and management contribute to employment, income, equity and social inclusiveness in rural community development?
2. What forest sector/forest products offer the best opportunity for transitioning to forest green growth initiatives in the community?
3. Are there any factors that hinder or facilitate the transitioning to a green growth pathway via initiatives based on forest products?

2. METHODOLOGY

2.1 Description of Study Area

The study was conducted in Vhembe District Municipality, Limpopo province of the Republic of South Africa (22° 56 S, 30° 28E). The District (figure 1) shares international borders with Zimbabwe and Botswana in the north and north-west respectively (Mpandeli 2014). The main languages spoken are Tshivenda (69%) and Xitsonga (27%). The study closely examined the role of different forest types, social, economic, and infrastructural contexts on households’ forest use and management and its implication for forest green growth initiative uptake. Three municipalities (Makhado, Mutale, and Thulamela) were selected in Vhembe District. In each of the selected municipalities, we further selected a replicate of seven rural communities. This gave a combined total of 21 rural communities, which were then surveyed for this study. A total of 366 households were sampled from the 21 rural communities using stratified proportionate random sampling procedure.

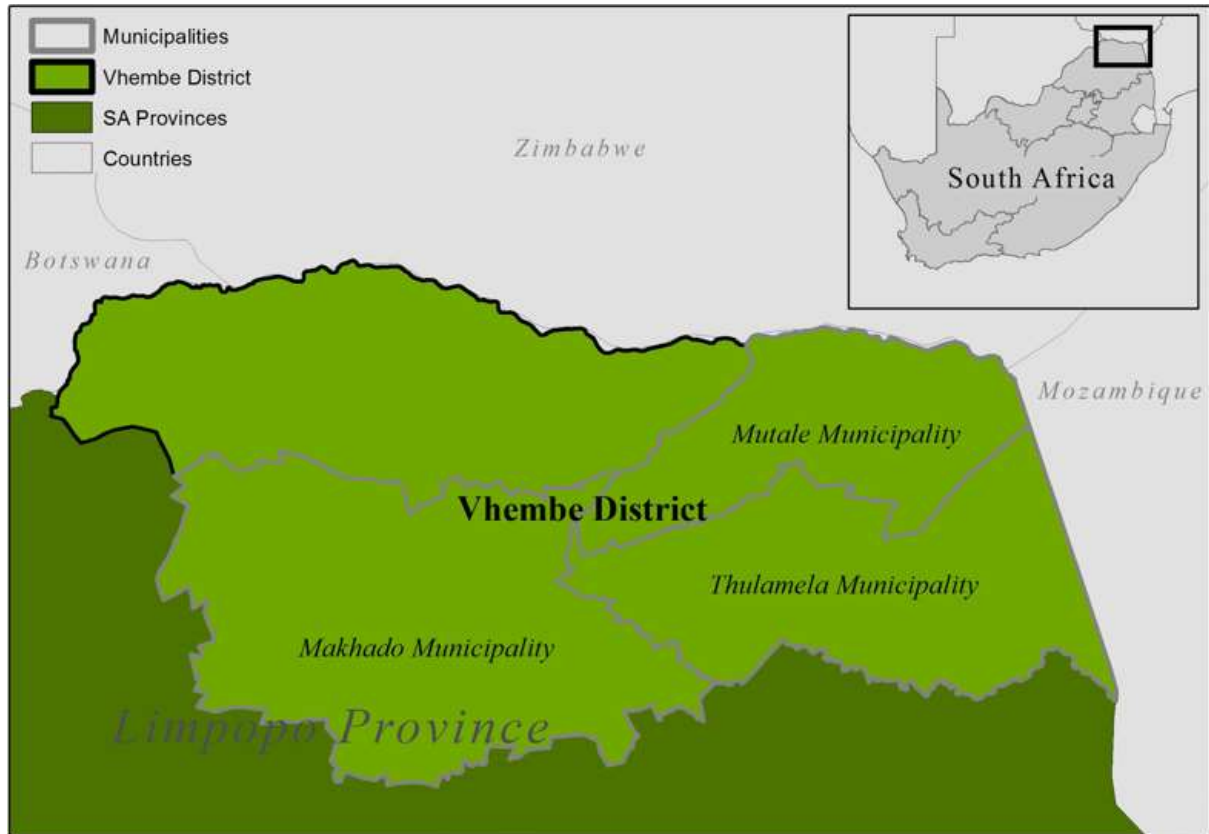


Fig. 1. A map illustrating the location of the study areas in South Africa (source: Ofoegbu and Chirwa 2018)

The study area falls within the Savannah Biome (Mucina and Rutherford 2006). The dominant livelihood strategies in the study communities are based on farming, livestock-keeping and forest-product use (Turpie and Visser 2013; Paumgarten and Shackleton 2011). Unemployment rates are high in Vhembe and most rural households depend on social grants (VBR 2012). Additionally, these communities are characterized by a high mobility, subsistence-level existence, and informal settlement housing (DEA 2011).

2.2 Measurable Variables: key questions and indicators

The study used a household questionnaire survey to address the research questions. Forest management was operationalised as compliance with regulations guiding forest use and management at rural community level in South Africa. The study used 11 of the national forest management principles and criteria that apply to communal forests and woodlots management as indicators of sustainable forest management -SFM (Table 1). Thus, questions on social inclusiveness in forest management were focused on respondents' participation in activities (implemented within the framework of these indicators of SFM) targeted at controlling

the use or exploitation of forest resources either from communal forests or woodlots in their community.

Table 1: Criteria and Indicators for fostering sustainable forest management in South Africa

No	Criteria
1	Forest ecosystem structures are conserved and processes maintained
2	Forests are protected from negative effects of fire, pests, diseases and alien plants.
3	Production potential is maintained or improved
4	Forests make a positive contribution to the economy
5	The forest economy is resilient
6	Cultural, ecological, recreational, historical, aesthetic and spiritual sites and services supplied by forests are maintained.
7	The distribution of employment benefits from forests is fair
8	The distribution of the costs from forestry is fair
9	There is effective stakeholder participation in forestry management
10	Forests are developed and managed so that persons or categories of persons previously disadvantaged by unfair discrimination are advanced.
11	People participate in forestry policy development and review

Adapted from the South Africa national level principles, criteria, indicators and standards (DAFF 2016)

Households' dependence on forest income was examined in terms of formal and informal forest sectors' contribution to household income with a view to locating space for forest green growth initiatives development and factors that might facilitate or hinder uptake of such initiatives. We used the work of Arrikum (2014) and results from the reconnaissance survey to identify key formal forest sectors in the area. These included tourism, sawmill, tree plantations, furniture and wood artisan/carving, and key forest products traded in the informal sector. Informal trade of forest products as operationalised in this study involves unorganized small-scale trade in forest products by individuals and/or households. The trade mostly occurs in the community's market. Most buyers come from neighbouring communities and urban places (nearby big towns and cities). The questionnaire contained a series of questions on opportunity for green entrepreneurship in forest resource use and management in the community, level of social inclusiveness in forest management, potential contribution of innovative forest management to green growth in the community, and ways of promoting equity in forestry propelled development in the community. In general, the questionnaire was structured in a way that allowed deduction to be made on how forest management in each community links to green growth objectives; environmental sustainable growth, social inclusive growth, and economic growth.

2.3 Data Analysis

Data from the questionnaire survey were subjected to weighting adjustment against the actual population in order to correct for either over- or under-representation of variables (Bethlehem 2015). The weighted data were then subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS) (Levesque 2007).

Discrete variables were summarised by the frequency of each code within the questionnaire and summary statistics computed for all numeric variables. Categorical data on the opinion of respondents were analysed based on individual responses. Descriptive statistics and chi-square test were used to analyse: households' dependence on formal and informal forest sector, and opportunities and challenges for social inclusiveness in forest management. The Pearson Chi-square was used where the expected cell frequency was ≥ 5 , while Maximum-Likelihood (M-L) Chi-square was used when the expected cell frequencies were lower than five (Ofoegbu et al. 2016). However, in order to identify variables that were independent predictors of participation in forest management, we used logistic regressions from where the estimated odds ratios (γ) were derived to ascertain the effect of the predictors on respondents' participation in forest management. Odds ratios were used to measure the magnitude of strength of association or non-independence between two binary data values. A p-value of $p < 0.05$ represented statistical significance in hypothesis testing and 95% confidence intervals were used to describe the estimation of unknown parameters (Ofoegbu et al. 2016). The explanatory variables used in the logistic regression are presented in table 2.

Table 2: Explanatory variables used in the binary logistic model

Explanatory variables	Possible response	
	1	0
a) Employment status	employed	Not employed
b) Farming skills	yes	no
c) Animal husbandry skill	yes	no
d) Carpentry skills	yes	no
e) Education level	educated	Not educated
f) Less than or equal to 38 years of residency in the community	yes	no
g) 39-52 years of residency in the community	yes	no
h) 53-65 years of residency in the community	yes	no
i) 66 years and above length of residency in the community	yes	no

3. RESULTS AND DISCUSSION

3.1 Forest Use and Household Income

3.1.1 Formal Sector

Despite the abundance of forests including plantations in the area, the formal forest sector's contribution to household income was generally low and varied significantly ($P=0.000$) per sector and between municipalities (table 3). In Thulamela, tree plantation (60.4 %), sawmill (56 %), and tourism (51 %) sectors were the three top contributing sectors to household income. In Makhado and Mutale, formal forest sector's contribution to household was lower accounting for less than 42 % to the income of households.

Table 3: Contribution of selected formal forest sectors to households' income

Forest Sector	Contribution rating	Proportion of respondents (%) in		
		Makhado (n =156)	Mutale (n = 110)	Thulamela (n =100)
Tourism	High	12.7 ^a	31.2 ^b	45.0 ^b
	Medium	0.6 ^a	2.8 ^a	4.0 ^a
	Low	4.5 ^a	1.8 ^a	2.0 ^a
	No contribution	82.2 ^a	64.2 ^b	49.0 ^b
Sawmill	High	15.9 ^a	33.9 ^b	50.0 ^b
	Medium	3.2 ^a	3.7 ^a	3.0 ^a
	Low	4.5 ^a	3.7 ^a	3.0 ^a
	No contribution	76.4 ^a	58.7 ^b	44.0 ^b
Tree plantation	High	26.3 ^a	38.2 ^{a,b}	53.5 ^b
	Medium	6.4 ^a	4.5 ^a	5.9 ^a
	Low	4.5 ^a	2.7 ^a	1.0 ^a
	No contribution	62.8 ^b	54.5 ^a	39.6 ^b
Furniture	High	12.1 ^a	25.5 ^b	48.0 ^c
	Medium	3.8 ^a	2.7 ^a	3.0 ^a
	Low	2.5 ^a	1.8 ^a	1.0 ^a
	No contribution	81.5 ^a	70.0 ^a	48.0 ^b
Woodwork/carving/artisan	High	10.3 ^a	32.1 ^b	46.5 ^b
	Medium	3.2 ^a	2.8 ^a	1.0 ^a

Low	1.9 ^a	.9 ^a	1.0 ^a
No contribution	84.6 ^a	64.2 ^b	51.5 ^b

Each subscript letter denotes a subset of “Makhado, Mutale and Thulamela” categories whose column proportions do not differ significantly from each other at the 0.05 level.

From the results, the abundance of the forest resource appears to play a significant role in the contribution of the formal forest sector to households’ income. Respondents in areas with higher concentration of forests (Thulamela) reported higher contribution of the formal forest sector to their households’ income.

3.1.2 Informal Sector

However, despite the low contribution of the formal forest sector to job creation and households’ income in the study area, there was widespread informal trade in forest products. This informal forest sector was found to be a significant ($P=0.000$) contributor to job creation and households’ income in the study area (Table 4).

Table 4: Informal forest product trade contribution to job creation and household income

Forest product	Informal Forest Product Trade	Proportion of respondents (%) in		
		Makhado (156)	Mutale (n=110)	Thulamela (n=100)
Firewood	Yes	100 ^a	100 ^a	79 ^b
	No	0 ^a	0 ^a	21 ^b
wild fruits and food	Yes	94.3 ^a	100 ^b	73 ^c
	No	5.7 ^a	0 ^b	27 ^c
Timber/construction wood	Yes	83.3 ^a	45.9 ^b	42 ^b
	No	16.7 ^a	54.1 ^b	58 ^b
Charcoal	Yes	17.9 ^{a,b}	29.4 ^b	15 ^a
	No	82.1 ^{a,b}	70.6 ^b	85 ^a
Thatch grass	Yes	75.5 ^a	85.3 ^b	67 ^a
	No	29.5 ^a	14.7 ^b	33 ^a
Wild vegetables	Yes	91.7 ^a	94.5 ^a	62 ^b
	No	8.3 ^a	5.5 ^a	38 ^b
Mushroom	Yes	82.2 ^a	42.2 ^b	42 ^b

	No	17.8 ^a	57.8 ^b	58 ^b
Honey	Yes	86 ^a	51.4 ^b	41 ^b
	No	14 ^a	48.6 ^b	59 ^b
Medicinal plants	Yes	62.8 ^a	90.8 ^b	40 ^c
	No	37.2 ^a	9.2 ^b	60 ^c
Fodder	Yes	75.6 ^a	94.5 ^b	49.5 ^c
	No	24.4 ^a	5.5 ^b	50.5 ^c
Weaving fibre	Yes	68.2 ^a	45.9 ^b	40 ^b
	No	31.8 ^a	54.1 ^b	60 ^b
Bush meat/edible insects	Yes	84.1 ^a	98.2 ^b	66 ^c
	No	15.9 ^a	1.9 ^b	34 ^c

Each subscript letter denotes a subset of “Makhado, Mutale and Thulamela” categories whose column proportions do not differ significantly from each other at the 0.05 level. The comparison is across column for each forest product

Apart from charcoal, all the forest products surveyed in the informal sector made significant contribution to households’ subsistence and income (livelihood outcomes). Firewood and timber were the most commonly traded wood products and therefore contributed highest to households’ income in the study area. The firewood contribution to households’ income was significantly different ($p=0.000$) among the municipalities. The majority of respondents in Makhado (97.5 %), Mutale (97.2 %) and Thulamela (68 %) rated firewood contribution to their household income as high. The Bonferroni test, however, showed that firewood contribution to household income did not differ significantly between Mutale and Makhado, but was significantly different between Thulamela, and Makhado/or Mutale. Unlike in other parts of Africa, charcoal and mushroom were not popularly traded for income in the area. The majority of respondents in Makhado (81.2 %), Mutale (71.4 %), and Thulamela (84 %) were not involved in charcoal trade. This was due mainly to the fact that, culturally, the people prefer firewood and rarely use charcoal for cooking. Likewise, the majority of respondents in Mutale (58 %) and Thulamela (57 %) were not involved in the sale of mushroom (Table 4).

Bush meat/wild edible insects e.g. edible winged insect (*Macrotermes falciger*), particularly mopani worms (*Gonimbrasia belina*), were widely consumed in the area. The consumption was highest in Mutale (92.7%), followed by Makhado (71.3%), and lowest in Thulamela

(63%). The Pearson chi-square test showed a significant difference ($P=0.000$) in the rate of consumption across the municipalities. The Bonferroni test, however, showed that the significant difference was only for the rate of consumption in Mutale compared to Makhado and Thulamela.

Informal trade in forest products is mostly due to poor development of markets and structure regulating production, harvest and trade of these forest products. Managing these issues will create opportunity for maximizing benefits from production and trading of these forest products.

3.1.3 Prospects of the formal and informal forest sectors to support green growth

Current contribution of the formal forest sector to household income and employment opportunity in the study communities is significantly lower than the informal sector. Furthermore, contribution of the formal forest sector is highly dependent on availability of thriving forest plantations and associated forest products industries. Expanding the forest resource base of a community is thus a precondition for the development of a vibrant formal forest sector and inadvertently the development of a formal forest sector based green growth initiatives. However, expanding the forest resource base of a community, may only deliver green growth benefits in the long run due to the long term nature of the forest based industry. Thus, the formal forest sector does not offer immediate transitioning into the green growth in the short term in the study communities.

Moreover, not all rural communities in South Africa, like the case of Mutale have the favourable environment for forest expansion e.g. afforestation or tree plantation development (Chamberlain et al. 2005). The informal forest sector in this regard offers a good option for immediate uptake of green growth initiatives and delivery of green growth benefits to rural host communities. Thus, given the prevailing condition, the informal sector is best positioned for immediate uptake of green growth initiatives in the forest sector at rural community level in South Africa. This was evident in Mutale and Makhado communities that are characterised as having arid vegetation and degraded forests where the informal forest sector was observed to make more contribution (table 4) to households' income. Thus the informal forest sector is crucial to rural development and livelihood sustainability and transitioning to green growth at rural community level in South Africa (Montmasson-Clair 2012).

3.2 Linking Local Level Forest Use and Management to Green Growth Uptake

In this section, we offer a critical discussion of current modalities of forest use and management in the informal sector at rural community level in South Africa with a view to identifying critical factors that will shape transitioning to green growth. This discussion forms the basis for a more in-depth discussion of how to facilitate transitioning to green growth in the forest sector at rural community level in South Africa.

3.2.1 Forest Use in the Informal Sector and Link to Green Growth

The informal sector is the most significant contributor to employment creation and household income in most of the study communities. The sector also offers significant business opportunities for many of the rural dwellers who operate as small-scale forest entrepreneurs. This form of employment/or livelihood strategy provides important livelihood security for most rural households, who often are among the poorest and most marginalised groups in South Africa. This is corroborated by the findings of the South African Department of Agriculture, Forestry and Fisheries where they estimated that up to 100 000 households are engaged in small-scale trade in forest products (DAFF 2012).

In response to the green growth transition agenda, we attempt to identify most commonly traded products per community by municipality. This will identify forest products with best prospects for transitioning to green growth pathway in the study area. The identified most commonly traded forest product in Makhado are; firewood, wild fruits and food, timber/construction wood, thatch grass, wild vegetables, mushroom, honey, medicinal plants, fodder, weaving fibre, and bush meat/edible insects. The most commonly traded forest products in Mutale are; firewood, wild fruits and food, thatch grass, wild vegetables, honey, medicinal plants, fodder, and bush meat/edible insects. In Thulamela, the most commonly traded forest products are; firewood, wild fruits and food, thatch grass, wild vegetables, and bush meat/edible insects.

All identified forest products in each municipality (table 3) showed potential for promotion of forest based green entrepreneurship. These forest products can be effectively used to initiate green growth projects in the informal forest sector at the community level. However, not all products are widely traded across the study communities, and therefore, their suitability for green growth initiative uptake varies across communities. There are many constraints, some of which are universal to all informally traded forest products (Shackleton and Pandey 2014; Paumgarten and Shackleton 2011), and some specific to each product that may restrict the

products suitability for inclusion in green growth initiatives (Shackleton and Pandey 2014). In this regard, firewood and edible insects' production and trade offer the best prospect for forest green growth initiative across all surveyed communities. Specifically for Makhado, construction wood and honey offers the second best option. While the second best options for Mutale are wild fruits and food and medicinal plants, for Thulamela municipality, it is wild vegetables.

The most obvious constraints to transitioning to green growth pathway in the informal forest sector at rural community level are the current mode of forest use and management. Forests in most rural communities of South Africa are treated as open access resources with little or no regulation over their use and management (DAFF 2010). Consequently, unsustainable forest use and management practices leading to forest degradation is on the increase in most rural communities across South Africa (Berliner 2005; von Maltitz et al. 2003). This condition is constraining forests' ability to contribute sustainably to household livelihood security (Musyoki 2012), and may impede transitioning to green growth pathway in the forest sector at rural community level (Shackleton and Pandey 2014; Somorin 2010).

3.2.2 Regulatory factors for green growth uptake in the informal forest sector

It is unlikely that rural forest entrepreneurs in the informal forest sector will be able to grow and position themselves for meaningful participation in a green growth setting without some external intervention. This is especially because they do not have the technical skills, knowledge, and resources to develop their businesses to position themselves for meaningful participation in green growth initiatives (Ofoegbu et al. 2016).

Additionally, availability of the various forest products traded informally in the study communities are not uniform. There is considerable differentiation in the availability of these products as a function of seasonality (Ofoegbu et al. 2018). Some products are available all year round e.g. firewood, while some are available on seasonal basis e.g. wild fruits (DAFF 2010). This will have significant impact on the operations and profitability of any green growth initiatives based on such products (UNEP 2013; Musyoki 2012). For example, products such as wild fruits and edible insects are widely traded across the study communities and present good prospect for green growth initiatives uptake. However, the seasonality that characterises their availability may pose a significant constraint to scaling up and profitability of these initiatives.

Another major limitation is the issue of access to credit facilities. As supported by Shackleton and Pandey (2014), most rural forest entrepreneurs do not have access to credit facilities, which is crucial if they wish to expand their businesses for meaningful participation in a green growth initiative.

Additionally, there is a challenge of structuring and organising the numerous informal forest entrepreneurs in the study communities for collective benefit in a forest green growth initiative. This will need to be addressed in order to maximize green growth benefits via informal forest sector in the area. Organising and restructuring rural forest entrepreneurs are indeed an important prerequisite for successful implementation of forest green growth initiatives. As was the case of Dukuduku wood carvers and reforestation project funded by UNDP and GEF in South Africa, the project organised wood carvers in a single co-operative (UNDP South Africa 2015). This helped facilitate sustainable use, conservation and restoration of the Dukuduku forest while also improving the socio-economic status of the rural host community through income generation by selling non-timber wood products. This is also supported by AfDB (2012) and DWAF (2005) who argued that, “rural forest entrepreneurs require better organisation to collectively bargain and lobby for their interest and have access to resources and training support to improve their productivity and participate in value adding production opportunities”. Facilitating forest green growth initiative uptake through reorganisation of informal forest sectors in the study communities will also require improving efficiency of product exploitation and handling throughout the value chain (DAFF 2012; FAO 2009).

Improving efficiency of forest product exploitation and handling along the value chain has direct link to availability of products in sufficient quantity to meet increasing production demand. As supported by Shackleton and Pandey (2014), and Paumgarten and Shackleton (2011), forest product sourcing via destructive harvesting method particularly of slow-growing species will pose a major challenge in terms of sustainability of the forest industry. Furthermore, technical issues related to regulation of rate of product exploitation from forests in the community can have implication for green growth initiatives. According to Steele et al. (2015), long-term biologically sustainable supply of forest products in the right quantities is a pre-requisite for enterprise development. Forest product supply and sustainability is thus a major challenge that needs to be addressed to stimulating rural forest entrepreneurs’ participation in green growth initiatives. In addition, inefficient methods of processing and lack of market development may significantly hinder development of forest green growth initiatives

in the study area (Steele et al. 2015; Shackleton and Pandey 2014). Hence, as observed by Shackleton and Pandey (2014), creating enabling mechanisms can help unlock the potential of the informal forest sector in fostering a transition to green growth in the forest sector particularly at rural community level.

Perhaps of greater significance for ensuring sustainability of forest green growth initiatives, other than technical constraints, are the issues of equitability and social inclusiveness in access to forests and sharing of benefits from forest ventures. These can have substantial impact on efforts to secure long-term resource supplies from the forest and sustainable forest management in the communities (Shackleton et al. 2011). This can have implication for private investors that may have interest in forest green growth initiatives in the community.

3.2.3 Equity and social inclusiveness in forest use and management and implication for green growth uptake

It is recognised that forest green growth initiatives such as forest enterprise development can play an effective role in sustainable forest use and management, and delivery of green growth initiatives to communities (FAO 2009). However, issues relating to equity and social inclusiveness are identified to be crucial to profitability and sustainability of such initiatives (UN DESA 2012). As highlighted by Paumgarten and Shackleton (2011), and Geldenhuys (2002), equitable benefit sharing or distribution of benefits from forest enterprise, and rights to access and benefits from forest resources are crucial for profitability and sustainability of forest enterprise and forest management initiatives. Similarly, Shackleton et al. (2011), and Shackleton and Gumbo (2010) observed that in places where local people were well organised, effectiveness of forest development initiatives were ensured and local participants enjoyed greater benefits from the initiative.

We consequently examined equity and social inclusiveness in current state of forest use and management and how these can be enhanced via forest green growth initiatives. We found that there were no political or socio-cultural barriers to: access to forests or forest resources; or entrant or pursuant of effective forest enterprise business. We however noted that there are some socioeconomic issues that limit people's access to formal forests (e.g. woodlots) in the communities. The results in Figure 2 show that socioeconomic issues in the form of permit issuance and travel distance are the key factors that limit people's access to formal forest. However, this challenge is offset by over-reliance on communal forests (informal forests) in

the community. Although in theory access and use of these forests are to be regulated by traditional and tribal authorities, in practice, access to and use of these communal forests are unregulated.

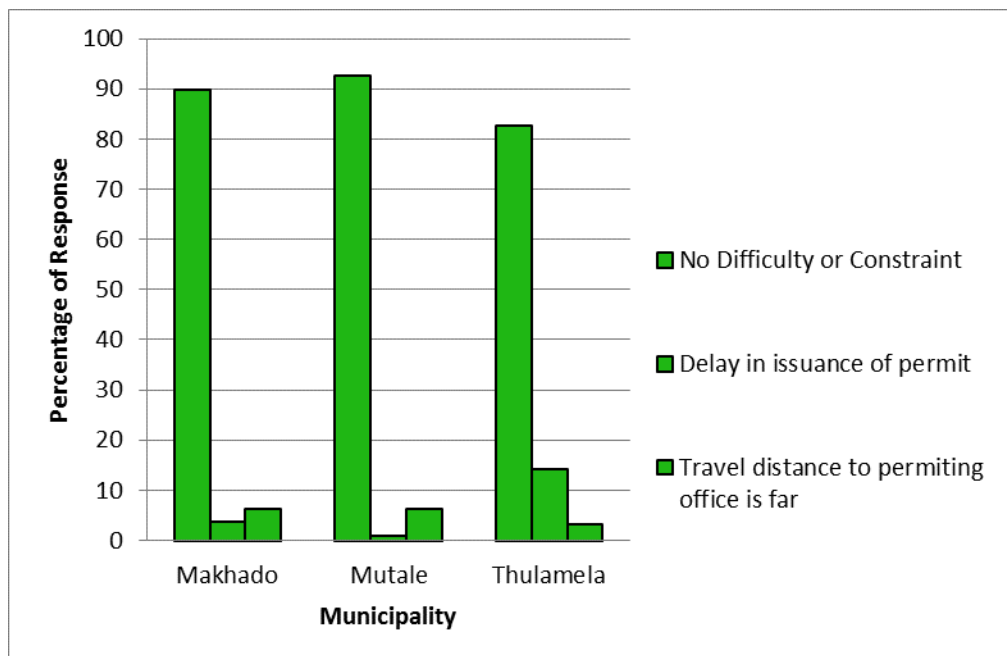


Figure 2: Perceived constraints to accessing forest products from formal forests in the study communities

We further examined current state of social inclusiveness in forest management in the communities. We found that there is poor community inclusion in forest management in the area. Result in Figure 3 show that over 70 % of respondents were not in any way involved in forest management in their community.

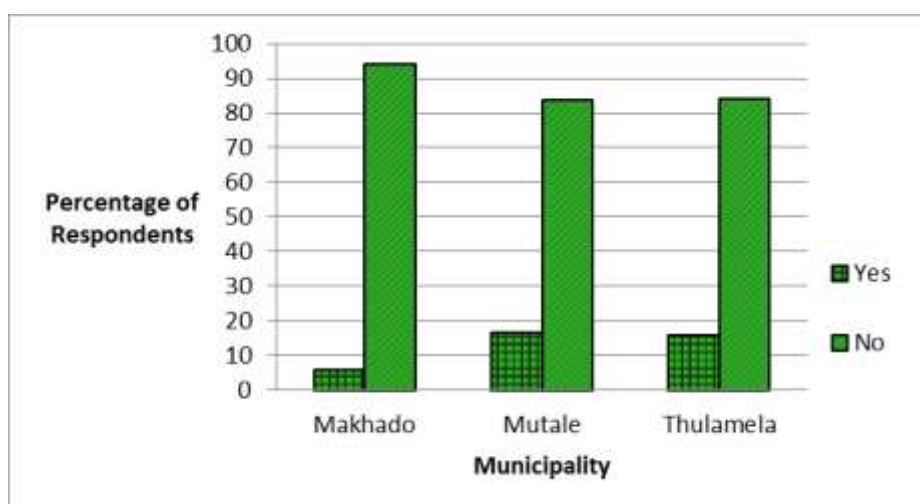


Figure 3: Respondents participation in forest management in Vhembe District

The observed poor status of community inclusion in forest management in the study communities is a major concern for the delivery of green growth benefits. As noted by Turyahabwe et al (2006), improved participation of local people in forest use and management, and forest enterprise development is essential for sustainability and profitability of forest based development initiatives. Thus, government and local authority need to actively encourage all segments of the community to participate unhindered in forests and forest enterprise management and development.

We further investigated factors that drive participation in forest use and management as a way of determining strategy to improve social inclusiveness in forest management. We used logistic regression to examine socioeconomic variables that drive people's participation in forest management (see table 5).

Table 5: Factors influencing respondents' participation in forest management

Dependent Variables	Independent Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Participation in forest management	Employment status (employed)	0.254	0.471	0.291	1	0.590	1.289
	Formal education	0.073	0.387	0.035	1	0.851	1.076
	Farming skills	1.196	0.450	7.081	1	0.008*	0.302
	Animal husbandry skill	0.112	0.363	0.096	1	0.757	0.894
	Carpentry skill	1.237	0.803	2.372	1	0.123	0.290
	Years of residency (≤ 38)	1.382	0.650	4.522	1	0.033*	0.251
	Years of residency (39-52)	0.180	0.817	0.049	1	0.825	1.198
	Years of residency (53-65)	0.804	0.667	1.452	1	0.228	0.448
	Years of residency (66+)	1.240	0.646	3.683	1	0.055	0.289

Superscript * denotes significance at 5%

Results showed that participation in forest management in the study communities was significantly influenced by possession of farming skills, and years of residency (≤ 38). This suggests that relatively new settlers in the community (≤ 38) and people with skills to farm, plant and raise trees are more likely to participate in forest enterprise business and forest green growth initiatives. Relatively new settlers in the community are more likely to actively engage in forest use and management as they strive to establish themselves in the communities. This links to the issue of capacity development. The challenge of weak capacity is a widespread phenomenon in Vhembe district and has been cited as a significant challenge to sustainable development in the district (CoGTA 2012; Mpandeli 2014). In addition, weak capacity at rural community level has serious implication for promotion of sustainable forest utilisation and management in the study communities. As observed by Nelson and Agrawal

(2008), capacity development at rural community level has positive correlation with sustainability and effectiveness of community based forest initiative and forest green growth initiatives.

Furthermore, we assessed training needs of the people for capacity improvement towards facilitation of social inclusiveness in forest management by asking the respondents to indicate the type of training that would most interest them in order to improve their capacity to participate meaningfully in forest management (Table 6).

Table 6: Respondents' desired skills and knowledge for active participation in forest management

Training	Proportion of respondents (%) in		
	Makhado (n =156)	Mutale (n =110)	Thulamela (n =100)
Sustainable forest resource harvest practices	33.3	35.5	14.9
Training on best practice in forest regeneration	18.6	23.6	23.8
Business opportunity in non-timber forest resources such as honey, thatch grass	11.5	2.7	11.9
Training on agroforestry practice	12.8	7.3	21.8
None	23.7	30.9	27.7

The majority of respondents expressed the need for in-depth training on several types of forest management practices so as to improve their capacity to participate meaningfully in integrated sustainable forest and forest enterprise management (table 5). Respondents in Makhado (33.3) and Mutale (35.5) were more interested in training on sustainable forest resource harvest practices, while respondents in Thulamela (23.8) were more interested in training on best practice in forest regeneration. Provision of these skills will definitely play an active role in facilitating people's participation in forest rehabilitation and sustainable forest management programmes. Interestingly, there was also high interest in training for business skills, NTFPs (Non timber forest products) and forest product marketing.

However it is important to note that capacity enhancement does not necessarily have to be through formal education. As shown by our results in table 4, possession of formal education does not have any significant impact on people's participation in forest management initiatives. The onus is therefore on government to provide the people with relevant skills for capacity enhancement as a way of facilitating social inclusiveness in forest use and management, and forest green growth initiatives in the communities. It has been reported that providing people with required skills is necessary and essential for uptake of forest based green growth initiative in the communities (Holmes-Watts and Watts 2008; Turyahabwe et al. 2006). As observed by Musyoki (2012), rural households' capacity enhancement is a key tool for promotion of green entrepreneurship and decoupling of household livelihood activity from destructive forest use practices in the rural areas of Vhembe district.

4. CONCLUSION AND RECOMMENDATIONS

There are myriad of opportunities to stimulate transitioning to green growth pathway in the South African forest sector particularly at rural community level. This study has identified and prioritised forest sectors and forest products suitable for green growth initiatives uptake at rural community level in South Africa. With the majority of the population in the study communities engaged in the informal forest sector for livelihood outcomes, the informal forest sector provides an appropriate foundation for transitioning to green growth pathway in the area. While additional comprehensive research is warranted with respect to profitability and sustainability of forest green growth initiative, empirical evidence from this study showed that promotion of forest enterprise based on firewood and edible insects (e.g. Mopani worms) offers good prospect for uptake of forest green growth initiatives in the study communities.

The green growth initiative indeed can be a powerful means to turn the tide in favour of forests and help rural communities realize full benefits from the forest resource base in their communities. However, much needs to be done to spur development of policies and actions that will promote viable forest green growth initiatives in the context of sustainable management of both formal and informal forests in the communities. Based on insights from this study, such needs will entail resolving issues related to:

- Organising the informal forest sector particularly the numerous small scale forestry enterprises in the study communities for collective bargaining and lobbying

- Provisioning of relevant and well-targeted technical assistance to these entrepreneurs on modalities for forest business and forest management as a way of ensuring sustainability of product supply.
- An in-depth study of current and future outlook of markets for formal and informal forest product trade. This should include in-depth analysis of regulatory and institutional framework guiding forest product trade, cross-border trade in forest product e.g. the mopani worms' trade, and how such might impact the emerging green growth market.

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