

Understanding Spatial Flow of Building Poles’ Opportunities and Challenges for Sustainable Livelihoods and Forest Resources: The Case of Zanzibar, Tanzania

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Abstract

This paper examines the spatial flow of building poles in Zanzibar, Tanzania, its opportunities and challenges. The objective is to understand spatial flow of building poles’ effects on sustainable livelihoods and forest resources. It is a result of a study that took place in March 2013 in Urban West Region, Ukongoroni and Charawe shehias. The methods used included focus group discussions, a brief questionnaire, an in-depth interview and direct observations. Also Arc GIS version 10.2.2 was used to overlay GPS points of building poles’ depots over land use maps. The findings indicated that the availability of building poles contributed to the expansion of the Urban West built up area from 8.3km² in 1985 to 46.8km² in 2009. It also led to income poverty alleviation among building poles distributors. However, it led to the gradual disappearance of indigenous species as they were being replaced by exotic species such as *Casuarina equisetifolia*, which were highly demanded in the construction industry in Zanzibar. It is thus recommended that replanting or silvicultural work involving indigenous species should be encouraged for sustainable indigenous forests in Zanzibar.

1. Introduction

Zanzibar, like most of the developing world, has been experiencing rapid urban population growth. According to the national population census of 2012, about 39.6 percent of the population in Tanzania Zanzibar lived in urban areas compared to 22.6 percent that lived in Tanzania mainland urban areas (URT 2013). However, this rapid urban population growth has been taking place under slow economic growth, which has led to the development of urban informal sector activities. Hence, some urban residents in Zanzibar have depended on rural-based income sources such as selling of building poles from rural areas for their survival and accumulation. This has been the case because the small formal sector has been unable to absorb the increased urban labour force resulting from rural-urban migration and net increase. The urban population growth in

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developing countries is faster compared to that of developed countries (UN 2014). In Tanzania, for example, the population growth rate between 2002 and 2012 for Tanzania Zanzibar was 2.8, and in the case of the Urban West Region the population growth rate was 4.2 (URT, 2013).

In terms of population density, the Urban West region has a very high population density of 2581 persons per square kilometre, which is far above the average national population density of 51 persons per square kilometre (URT, 2013). This rapid urban population growth has created an increased demand for housing, which in turn requires the supply of building poles. Wooden poles play an important role in the construction world for supporting cables, roof supports, fences, building and landscaping. They are cost effective as they compete with alternative pole types such as concrete and steel. In South Africa, for example, it is estimated that the total average annual supply of poles is between 750000m³ and 800000m³. Most of the wooden poles are supplied from plantations (DWAF, 2005). Most of the poles are obtained from upland and coastal forests found in plantations and community forests. However the supply of building poles has been one of the sources of forest degradation and deforestation (Kahyrara et al., 2002; Rebugio et al., 2010).

2. Sustainable Forest Resources and Livelihoods

Demand and supply fosters the flow of people, goods or information between places. However, Okpala (2003) points out that the flow of public and private capital, people and goods between urban and rural areas is termed as rural-urban linkage, which also involves the flow of ideas and diffusion of innovation. Thus, spatial flow is a demand and supply relationship on a geographical space (Ulman, 1980). Usually it is found when benefits exceed the costs incurred by a spatial interaction. Hence, spatial flow is essential for understanding spatial differentiation that occurs at local, national and international levels; and the opportunities and challenges associated with it.

Ulman (1980) points out that spatial flow or interaction depends on complementarity, transferability and intervening opportunity. Complementarity implies a deficit of a good or product in one area and a surplus in another. In this study it was a deficit of building poles at the Urban West region, and the surplus obtained in rural areas that enabled spatial flow to occur. However, such a movement can occur only where there is transferability, that is, the possibility of transporting goods or products at a reasonable cost. Nevertheless, if there is an intervening opportunity in between origin and destination the products will fail to reach the destination. The intervening opportunity thus diverts the flow of goods from the origin to another destination.

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In the case of Tanzania Zanzibar, the socio-economic context of the spatial flow of building poles was the supply of the coastal and upland forest in the rural areas at Ukongoroni and Charawe Chaani Kubwa shehias and Tanzania mainland. Most of the people live below the poverty line and depend mostly on forest resources so as to earn their livelihoods (Sitari, 2005; Kahyko et al., 2011). This enabled spatial flow of building poles to take place. Central to the spatial flow process were interchangeable livelihood assets or capabilities which included natural, social, physical, financial, and human assets that were exchanged so as to achieve desirable livelihood outcomes (Fig. 1). Access to these assets was possible through transforming structures including levels of government, private sector and processes such as, laws, policies, culture, institutions, power relations (Carney, 1998; Ellis, 2000).

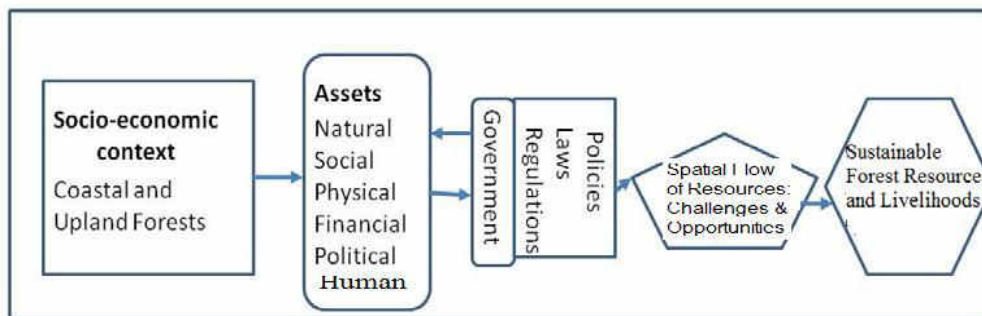


Figure 1: Sustainable Forest Resources and Livelihood Framework

Source: Adopted from Carney (1998)

In Zanzibar, the government forest policy, rules and regulations made it possible for building poles to be moved to Urban West region of Zanzibar from within and outside Zanzibar (CNR, 1999). The forest policy and laws in Zanzibar, for example, established Community Forest Management Agreements (CoFMA) in selected shehias that in principle enabled communities to access forest resources, including building poles sustainably.

Hence, rural communities such as Ukongoroni, Charawe and Chaani, provided natural assets (building poles) which were exchanged with financial assets (money) in urban areas. In turn, urban residents exchanged the building poles with financial assets. Thus, both rural and urban residents were able to access human assets (education and health), physical assets (transport and housing), and natural assets (land) by exchanging their assets. Thus, Ripot (1998) notes that, overall, synergy between forest resources production and urban-based enterprises is often key to the development of more vibrant local economies and, on a wider level, to less unequal and more 'pro-poor' regional economic growth.

3. Methods and Materials

Three *shehias* were selected from rural Unguja Island as the origins of building poles. These included the Charawe and Ukongoroni *shehia*'s in the Southern Region and Chaani *shehia* in the Northern Region (Fig. 2). These areas were pointed out in the literature as important sources of building poles in Zanzibar. The other study area was the Urban West region as the main destination of building poles.

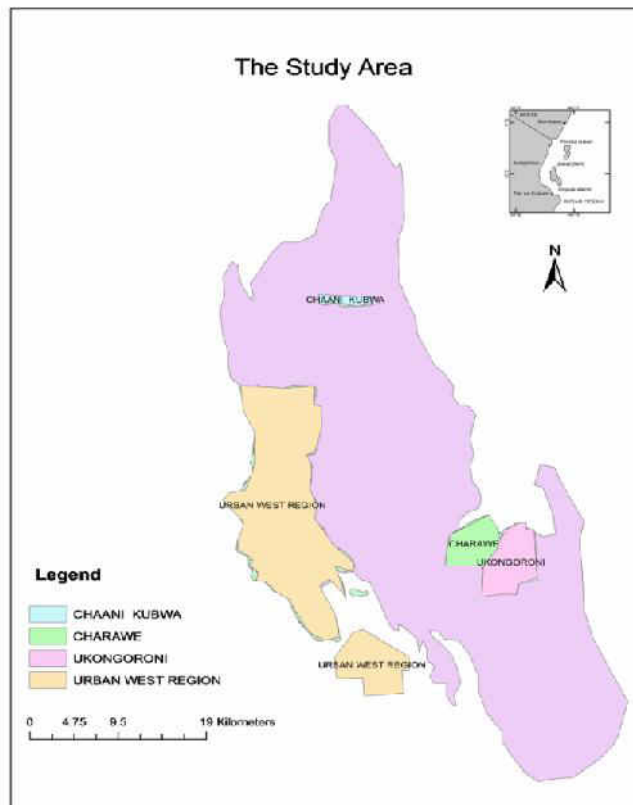


Figure 2: Location of the Study Area

Four focus group discussions were held in total. Three focus group discussions were with eight members from each *shehia*. They comprised of key informants, both men and women, as identified by their *shehia* leaders, popularly known as *sheha*. One focus group discussion of 12 members was held with building poles depot owners in the Urban West Region. A total of 106 wood agents had been identified by the *sheha* as they were asked to identify all the wood agents in their jurisdiction. Of the respondents, 26 were from Charawe, 26 from Chaani, 20 from Ukongoroni, and 34 from Urban

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West region. A short questionnaire was administered to them, and an in-depth interview was held with each of the respondents. The short questionnaire and the interview examined the flow of building poles, its opportunities and challenges in the study area. In addition, direct observations were carried out in the study area to identify different types of building poles. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) in terms of descriptive statistics and cross tabs. Global positioning systems (GPS) were used to locate different building poles depots, which were then plotted using ArcGIS version 10.2.2.

4. Findings and Discussions

4.1 Profile of the Respondents

The respondents included 82 males (77.4 percent) and 24 females (22.6 percent). 43.4 percent of the respondents were aged between 21 and 40, and 56.6 percent were aged between 41 and 60. In terms of education, 2 had a degree, 48 had secondary education, 40 had primary education, and 16 had no formal education. Thus building poles distributors involved different age groups and education levels.

4.2 Types of Building Poles in Zanzibar

Three types of logs were identified at various building poles' depots in Zanzibar Urban West region. They included small sticks, *simbaulanga*, and *Casuarina equisetifolia* (*mivinje*). Small sticks (Plate 1a) were largely premature trees that were used for making ceilings in urban areas, and for making indigenous houses in the rural areas. However, the rural indigenous houses were increasingly disappearing as modern houses were being built of cement bricks. *Simbaulanga* (Plate 1b) were hard wood logs that were mainly imported from the mainland coastal areas such as Kilwa, Rufiji, Lindi, Mkuranga, Mtwara, and Tanga. They were transported by dhows to Zanzibar port, where they were carried by trucks to various building poles' depots or to construction industrial sites. It was noted through focus group discussions that recently the *simbaulanga* logs were becoming increasingly scarce and expensive, and their qualities tended to decline.

Thus, some building poles depot owners resorted to *casuarina equisetifolia* (*mivinje*) (Plate 1c) logs as an alternative to *simbaulanga* logs. The *casuarina equisetifolia* logs were considered durable and cheap. One of the respondents in the focus group discussions at Ukorongoni remarked.

Many of the tourist hotels in the East Coast of Zanzibar are increasingly using casuarina equisetifolia instead of simbaulanga logs in their construction activities as they are cheaper than simbaulanga logs.

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Plate 1a: Small sticks



Plate 1b: *Simbaulanga*



Plate 1c: *Casuarina*

Figure 3: Plates Showing Types of Logs

Fig.4 shows the spatial flow of building poles in Tanzania Zanzibar where sources include Tanzania mainland, Ukongoroni, Charawe and Chaani; and Urban West Region is the main destination.

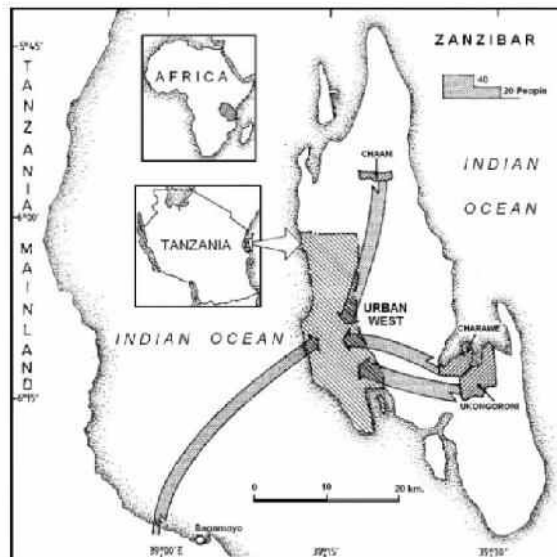


Figure 4: Spatial Flow of Building Poles in Zanzibar

4.3 Opportunities Posed by Spatial Flow of Building Poles in Urban West Zanzibar

4.3.1 Establishment of Major Building Poles' Depots

The availability of building poles has made possible the establishment of 17 major building poles depots in the Urban West Region. They include Kiembe Samaki, Mwembe Gwaride, Kijangwani, Kinazini, Amani, Maruhubi, Welezo, and Kianga. Others include three depots each at Fuoni and Mtopepo. GPS was used to locate the 17 building poles depots (Fig. 5).

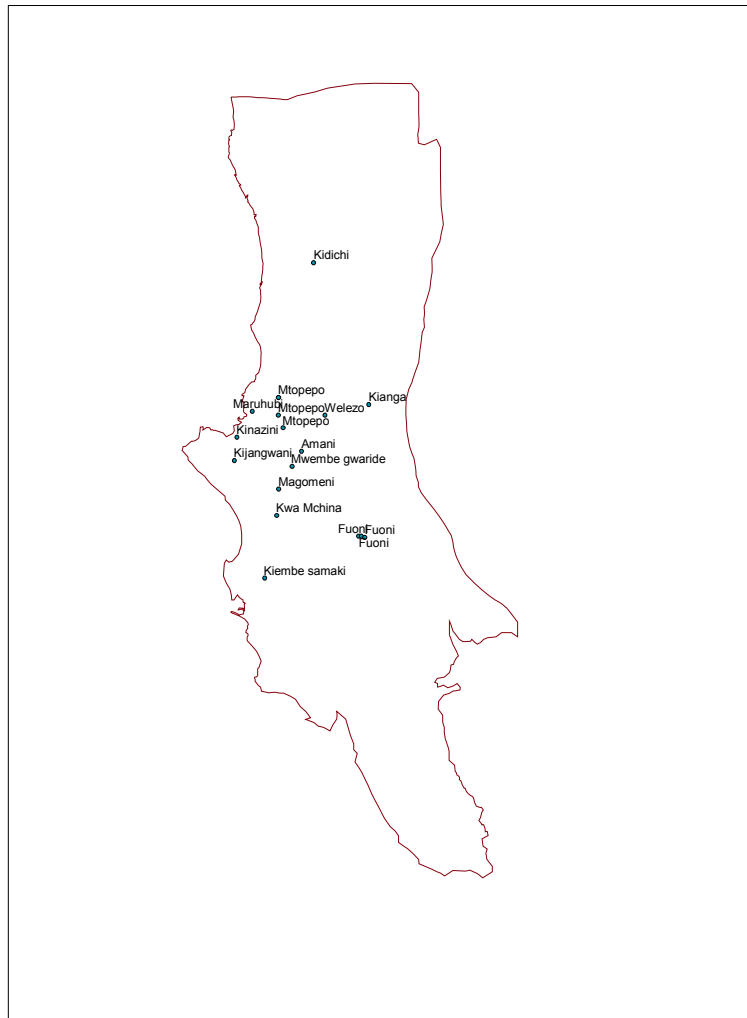


Figure 5: Spatial Distribution of the Building Poles Depots in the Urban West Region

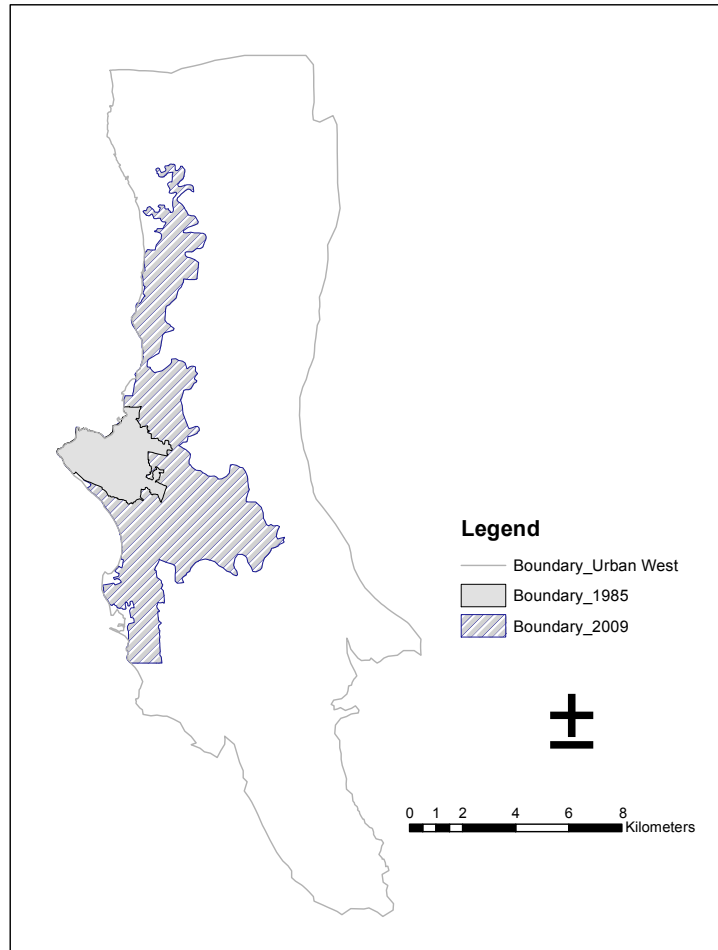


Figure 6: Change of the Size of Built-up Area between 1985 and 2009

4.3.2 Expansion of Urban Area

The availability of building poles had made possible the expansion of the urban area from 8.3km² in 1985 to 46.8km² in 2009.

When the building poles depots GPS layer was overlaid over the land use map of the Zanzibar urban built up area of 1985, it was observed that only three building poles depots were within the 1985 built-up area. These included Kinazini, Kijangwani and Mtopepo (Fig. 7a). When the building poles' depots GPS layer was overlaid over the 2009 land use map of built-up area, it was found out that 14 building poles depots were located within the 2009 built-up area.

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Figure 7a: Location of Building Poles Depots on the 1985 Land Use Map



Figure 7b: Location of Building Poles Depots on the 2009 Land Use Map

However, three building poles' depots -- namely Kidichi, Kianga and Welezo -- were outside the 2009 built-up area. These building poles depots indicated the future direction of the expansion of Urban West region. It was also observed that the number of building poles depots tended to increase towards the urban fringe where construction activities were prevalent.

4.3.3 Urban Informal Sector Growth

Urban expansion enabled informal sector activities such as the sellers of building poles to increase their supply and in turn receive more financial assets to support their livelihoods. The acquired financial assets enabled them to buy foodstuffs, plots, build houses, and pay school fees and medical expenses. Table 1 shows that about 66 percent of the financial assets accessed by respondents were used to buy food. This is important as UNDP (2013) notes that 67.9 percent of the population in Zanzibar lives below the US\$1.25 a day. URT (2012) points out further that due to the lack of opportunities for income generation, poor local communities have relied on natural environment to sustain their livelihoods.

Table 1: The Use of Financial Assets Accessed by the Respondents.

	Build	%	Fees & food	%	food	%	Total	%
Rural	2	2.9	22	31.4	46	65.7	70	100
Urban	8	22.2	4	11.1	24	66.7	36	100
Total	10	9.4	26	24.5	70	66	106	100

As Tacoli (2004) puts it, this situation can be attributed to the increase in the cost of food and the introduction of user fees for education and health services, which has forced many households to seek cash incomes through income source diversifications.

However, when the respondents in the rural areas were asked about other sources of income, 72.2 percent pointed out agriculture; and 27.8 percent indicated fishing, furniture-making and small shops. In fact, in the rural areas there was no respondent who had only one source of income. In the case of urban areas, 52.9 percent indicated that they used income source diversification as a strategy of sustainable livelihoods (Table 2).

Table 2: Diversification of Income Sources

	Agriculture	%	Other	%	None	%	Total	%
Rural	52	72.2	20	27.8	0	0	72	100
Urban	4	11.8	12	35.3	18	52.9	34	100
Total	56	52.8	32	30.2	18	17.0	106	100

Tacoli (2003) and Rakodi (2002) note that diversification of income through participation in more than one income-generating activity is an effective survival strategy for many people in the developing world. This is also supported by Lerise et al. (2001), who carried out a survey on employment patterns in southern Tanzania and found out that 67 percent of the respondents living in villages and in the intermediate town of Lindi were engaged in more than one income-generating activity, including both farming and non-farm activities.

Hence, 94.1 percent of the respondents indicated that they would like to expand the activity of selling building poles so as to be able to earn more income. Others (5.9 percent) pointed out that they wanted to quit the activity as it was not profitable since they faced some challenges in its operation.

One of the respondents in the focus group discussions at Charawe remarked:

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“When we take building poles illegally from the forest and the forest officers catch us they confiscate our goods and ask us to pay a fine TZS300000 which is far above the value of the goods we possess.”

4.4 Challenges Facing Spatial Flow of Building Poles in Unguja, Zanzibar

4.4.1 Deforestation and Degradation

The cutting down of trees for the supply of building poles has led to forest degradation, i.e., deforestation. This is supported by Kukkonen (2013) who notes that between 1996 and 2009 the proportion of indigenous forest in Unguja, Zanzibar, had been reduced from 62.94 percent to 59.61 percent. He further points out that indigenous forests have diminished significantly in size by 79.65km² and that forest degradation happens more frequently in indigenous forests than in other types.

Furthermore urban expansion, which is partly a result of the availability of building poles, has also led to deforestation. This is supported by Kukkonen (2013) who has identified urban-rural interface as one of the deforestation hot spots in Unguja, Zanzibar (Fig. 8).

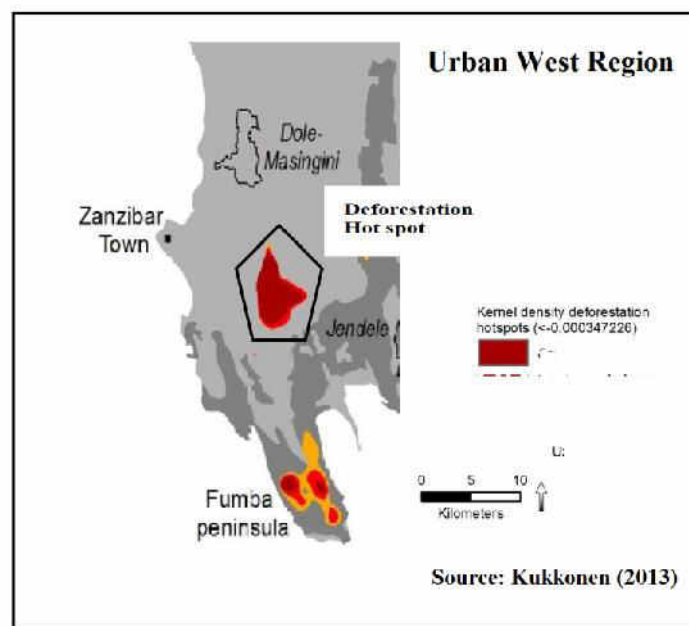


Figure 8: A Deforestation hot spot caused by urbanisation in Unguja, Zanzibar

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4.4.2 Reduction in Indigenous Species

However, this study noted that some respondents have started to plant *casuarina equisetifolia* trees for commercial purposes. 90 percent of respondents in Ukongoroni, and 61.5 percent at Charawe and Chaani, and 23.5 percent of the building poles depots owners indicated that they had planted *casuarina equisetifolia* as a source of income (Table 3).

Table 3: Planting of *Casuarina equisetifolia* as a Livelihood Strategy

Planted Casuarina	Chaani	%	Charawe	%	Kongoroni	%	Urban	%	Total	%
Yes	16	61.5	16	61.5	18	90	8	23.5	58	54.7
No	10	38.5	10	38.5	2	10	26	76.5	48	45.3
Total	26	100	26	100	20	100	34	100	106	100

Although this situation reduces poverty in the short-term, if it is not properly done, in the long term it may lead to reduction or disappearance of indigenous forests and expansion of exotic species, which is a threat to species diversity. Hence, the government needs to ensure that the indigenous species are conserved.

Conclusion

Spatial flow of building poles from rural to urban areas is important for poverty alleviation of both rural and urban households to meet the millennium development goals as urban residents get access to natural assets by exchanging them with financial assets. However, as the urban area expands it requires more building poles, which in turn requires more forest. Studies show that forests are disappearing in Zanzibar. In addition, exotic species such as *casuarina equisetifolia* are being planted and exchanged for financial assets. This points to the need for the government to conserve indigenous species for sustainable species diversity.

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