Investigations of the livelihood strategies of young men and women in forested landscapes of eastern Cameroon

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SUMMARY

In rural African settings, people maintain diversified livelihood strategies to reduce risks and garner income. Although youth are currently the dominant demographic and an important group within forest communities of Central Africa, little is known about their dependence on the forest for their livelihoods. Given that young people are underrepresented in research studies, this study aimed to understand whether young people (aged 19–30) gain a large proportion of their livelihood from forest resources (including agroforestry). Focus groups and surveys were conducted in six villages in Eastern Cameroon to identify subsistence and income-driven activities of young people. In the context of many changes, young people continue to derive a large proportion of their livelihood from forest resources, especially agroforestry. Changes in livelihood activities were noted in the gender division of work and access to resources. Environmental pressure is likely to impact the livelihoods of these forest communities into the future.

Keywords: Cameroon, forest, livelihoods, rural, youth

Investigations des stratégies employées par les jeunes hommes et femmes dans les paysages forestiers du Cameroun de l'est pour générer des revenus

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Dans l'Afrique rurale, les autochtones maintiennent des stratégies diversifiées, visant à générer des revenus, afin de réduire les risques et d'assurer la rentrée des fonds. Bien que les jeunes soient actuellement le plus important groupe démographique, et un groupe important dans les communautés forestières de l'Afrique centrale, peu de faits sont connus quant à leur dépendance sur la forêt pour leurs revenus. Etant donné que les jeunes sont sous-représentés dans les études de recherche, cette étude s'est efforcée de saisir si les jeunes (tranche 19–30 ans) obtiennent une large proportion de leurs revenus à partir des ressources forestières (agroforesterie incluse). Des groupes de focus et des enquêtes ont été employés dans six villages de l'est du Cameroun, pour identifier la subsistance et les activités visant à générer des revenus chez les jeunes. Dans un contexte à changements multiples, les jeunes continuent à dériver une forte proportion de leurs revenus des ressources forestières, et de l'agroforesterie en particulier. Les changements dans les activités de travail étaient notés dans la division par sexe du travail et de l'accès aux ressources. Les pressions environnementales vont probablement impacter les revenus de ces communautés forestières dans le futur.

Investigaciones sobre las estrategias de medios de vida de hombres y mujeres jóvenes en paisajes forestales del este de Camerún

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Los habitantes de los entornos rurales africanos mantienen estrategias diversificadas en sus medios de vida para reducir los riesgos y obtener ingresos. Aunque actualmente la juventud es el grupo demográfico dominante y un grupo importante dentro de las comunidades forestales de África Central, se sabe poco sobre su dependencia del bosque en relación con sus medios de vida. Dado que la juventud no está suficientemente representada en los estudios de investigación, este estudio tuvo como objetivo averiguar si los jóvenes (entre 19 y 30 años) obtienen una gran parte de sus medios de vida de los recursos forestales (incluida la agroforestería). Se realizaron grupos focales y encuestas en seis aldeas del este de Camerún para identificar las actividades de subsistencia y de generación de ingresos de los jóvenes. En un contexto con muchos cambios, los jóvenes continúan obteniendo una gran parte de sus medios de vida de los recursos forestales, especialmente la agroforestería. Se observaron cambios en las actividades relacionadas con los medios de vida en cuanto a la división del trabajo por géneros y en el acceso a los recursos. Es probable que en el futuro la presión medioambiental afecte los medios de vida de estas comunidades forestales.

INTRODUCTION

In forested landscapes, local people are typically dependent on the forest for part or all of their livelihood – their reliance on forests being either difficult or impossible to replace for various environmental services, subsistence needs, safety net and gap filler functions, especially during lean periods (Ingram *et al*. 2017a and Sunderlin *et al*. 2005). Globally natural forests provide 21% of income compared to 29% from agriculture (Wunder *et al*. 2014), and up to 59% in Cameroon (Angelsen *et al*. 2014). Agriculture and agroforestry, hunting, fishing and non-timber forest product (NTFP) collection are common livelihood activities in the forested landscapes of Cameroon (Awono *et al*. 2009, 2016, Beauchamp and Ingram 2011, Lescuyer 2010, Levang *et al*. 2015, Tieguhong and Zwolinski 2008).

The livelihoods literature repeatedly concludes that income diversification is an important strategy for rural populations (Barrett, Reardon and Webb 2001, Loison 2015, McCusker 2002, Sunderlin *et al*. 2005). In sub-Saharan Africa, 30–50% reliance on non-farm income sources is common and growing (Barrett *et al*. 2001, Ellis 1999, Loison 2015). The reasons behind such diversification remain contested as either a response to economic stress or a pathway out of poverty (Ambrose-Oji 2003, Bryceson 2002). NTFPs are an important income generator for people living in and near the forest, contributing on average 20–25% of annual household income (Ambrose-Oji 2003, Awono *et al*. 2009, 2016, Ingram *et al*. 2017b, Lescuyer 2010, Levang *et al*. 2015). The livelihood strategies of men and women also differ, particularly in the production of cacao and coffee in agroforests and the collection of NTFPs and fishing (Awono *et al*. 2009, Ingram *et al*. 2016, Sunderland *et al*. 2014).

The success of a livelihood strategy can be based on a number of variables, including age, ethnicity, gender, marital status, being part of a kinship group, a network of clients or a patron, among others (de Haan and Zoomers 2005, Ingram *et al*. 2016). It is expected that the livelihoods of young people would differ from those of adults as young people are constrained by their access to assets (Waldie 2004) with a consequence of continued dependence on their parents or family. Angelsen *et al*. (2014) found that older heads of households have lower total and relative forest income due to accumulated assets and a higher reliance on crop and livestock income. In some cases younger heads of households have also shown a tendency to engage in activities outside agriculture (Bryceson 2002). Young people are more likely to undertake enterprises that need heavy and sustained physical effort, to engage in high-risk enterprises with high and quick returns, or to develop short term enterprises, especially where they lack clear rights of control over land and other key assets (Waldie 2004). Young people have also been shown to have less access to mobility and therefore markets for their goods (Porter 2008). In a report, FAO (2014) highlighted some of the challenges to increasing the participation of youth in agriculture such as access to knowledge and education, access to land, access to financial services and access to markets. The choice of a livelihood strategy is therefore, driven in part by preferences and priorities, but is also influenced by the policies, the formal and informal institutions, and the processes that impinge on people's everyday lives (Ali *et al*. 2007, Lescuyer 2013, Loison 2015).

The livelihood strategies of forest dependant populations are increasingly being impacted by changes such as improvement in infrastructure, for example, investment in logging roads leading to deforestation (Enadamana *et al*. 2010, Mertens *et al*. 2000). People are also impacted by larger macroeconomic policies and changes. In Cameroon, the fall of coffee and cacao prices (Awono *et al*. 2009) and the economic downturn in 2008–2009 (Endamana *et al*. 2010) both led to changes in livelihood strategies. The current increase in the export of forest products, especially of NTFPs which are increasing in popularity in larger urban areas, has changed the type and amount of these products being collected. Changes in resource access due to increased pressure has been documented by Brown and Lapuyade (2001), Fa, Currie and Meeuwig (2003) and Wunder, Angelsen and Belcher (2014). It has been noted that increased access to markets for agricultural commodities could negatively impact forest cover in the short run, as land-use expansion increases with increased income (Babigumira *et al*. 2014). Improved forest management, therefore, should recognise the importance of forests to the livelihoods of local people (Endamana *et al*. 2010, Levang *et al*. 2015, Sandker *et al*. 2011, Sunderlin *et al*. 2005).

In 2015, 226 million youth aged 15–24 years lived in Africa representing 19% of the global youth population. Projections indicate that the numbers of African youth will more than double by the year 2055 (United Nations 2015). Integration of this growing demographic into society has enormous economic, cultural, political and social consequences (Diouf 2003). In Cameroon, the Early Working Age (15–29) population represents approximately 40% of the labour force. Specifically, in East Cameroon the average age of the population is 21.2 (CNIS 2005) with an average age of the head of household of 42 years (Levang *et al*. 2015).

While youth and young people have been a growing area of interest in development literature for some time, the youth livelihoods and policy literature remains fragmented. For instance, livelihoods research tends to consider either women or youth, neglecting the intersection of these dimensions (Chant and Jones 2005). Furthermore, young people are often left out of decision making spaces (Porter 2008, Chant and Jones 2005). Developing youth focused research may provide an opportunity to better understand the livelihoods of younger people and therefore understand how policy and external pressures may impact them differently. This study seeks to fill that gap.

This research examined the role of forest resources in the livelihoods of young people (ages 19–30) in the humid zone of Cameroon. Using a mixed methodological approach, it sought to identify the different forest resources young people use to earn income or sustenance and to identify how important each of these resources is to the overall portfolio of livelihood activities. It further explores factors likely to have an impact on the livelihood decisions of young people.

METHODS

This research was conducted in six villages in the humid forest region near Yokadouma in the East Region of Cameroon during two research trips in 2013 and 2014. The research area was chosen to coincide with ongoing work by CIFOR (The Center for International Forestry Research) who provided preliminary results on initial research, including participatory mapping (using methods provided in Evans *et al*. 2006), of the region in which the research would take place. Four villages were selected to participate with the help of members of a local organisation, chosen based on number of households and distance from Yokadouma, the nearest commercial centre. Furthermore, permission was granted to work in these villages by the local authorities who were invited to a meeting to discuss the research prior to any work being carried out in the villages. Two additional villages were added to the study at the end of the first research trip in order to better understand

FIGURE 1 *Maps created using Google earth showing Cameroon and Yaoundé, the capital city. The town of Yokadouma, located in East province is identified. Map created using Google earth showing the town of Yokadouma and the study villages for this research. Villages are A=Mang, B=Bompello, C=Mopouo, D=Modoumo, E=Ndjalobekoe, F=Biwala.*

the differences between the villages immediately adjacent to Yokadouma and those further away that were originally part of this research. Though this region includes both Baka and Mbimou (Bantu) populations, only the Bantu villages were included in this research.

In this study, the term 'forest resource' refers to the resources taken from the forest (bushmeat, NTFPs, firewood etc.). The term forested landscape also includes shifting cultivation and agroforestry. Descriptions of these forms of agriculture and their impact on the forests of the region has been well documented (Binam *et al*. 2004, Kotto-Same *et al*. 1997, Njomjang *et al*. 2010, Pérez *et al*. 2002 and Sikod, 2007). The term hunting is used as a general category for both hunting and trapping activities. The collection of NTFPs includes the collection of any non-wood products such as plants, fruit, nuts, and insects (Awono *et al*. 2016b, Levang *et al*. 2015). Please note that in this study the collection of firewood is considered separately from the collection of NTFPs.

Data were collected with a quantitative survey and focus groups with young people, defined as those between the ages of 19–30 for the purposes of this study. This age group varies in marital status, number of children, current state of education, dependence on parents or family, and position within society. It makes up a large section of the population and is a major contributor to the village labour force.

Twelve focus groups were held to gain a general understanding of livelihood strategies before conducting the surveys, in order to validate the content of the individual the survey, and to increase the researcher's knowledge base. In each village two focus groups were held, (one with young men, one with young women), at a convenient time and place. Participation ranged in number from eight to 20 depending on the size of the village and the availability of young people. Although focus groups often work best in groups of six to 12, and this is what was advertised as the need for the research, it was impossible to limit the number of bystanders when meetings were held in accessible locations. Levang *et al*. (2015) encountered similar issues while conducting such group interviews. The conversations were recorded using a digital recorder and a local research assistant took notes. After each focus group, the researcher also wrote notes on what was discussed and experienced.

Individual surveys were administered to young men and women in the selected villages. Questions included demographic information about age, gender, village, and marital status in order to understand how livelihood strategies vary among young people. Questions also identified livelihood strategies including the types of forest resources that are exploited and the contribution of each to overall income, including questions about known livelihood activities in the area such as agriculture and agroforestry (Levang *et al*. 2015) and strategies that were discussed during the focus groups. Questions also asked whether young people work independently or as groups and their impression of resource depletion. Participants were asked to outline their year-round livelihood activities. The survey also asked about the importance of these livelihood strategies. This question was left intentionally open-ended to provide space for respondents to explain why these strategies were important to them. Other questions specifically questioned the importance of certain strategies to income generation.

Upon entering a village, a coin toss was used to decide at which household to begin the surveying (Potts *et al*. 2011). From the first household, every fourth house was chosen to participate in the survey. If all potential village households had been visited but the minimum number of surveys had not been completed (15 for smaller villages, 20 for larger villages), the process was restarted to include every other household. Alternatively, if the minimum number of surveys were administered before reaching the end of the village, surveys continued until the whole village was completed. It was not necessary to approach every household to meet the survey requirements in any of the villages. While the preferred sample size for each village was 20 respondents, in the case of smaller villages it was not always possible to obtain a sample of 20. Therefore, a sample of 15 surveys was considered acceptable for statistical data analysis. A total of 120 individual surveys (60 young men and 60 young women) were administered in six villages. Of the 120 respondents, 73% of respondents considered themselves married (formally or informally).

General research results were shared with village members to verify conclusions and solicit feedback. Data were analysed using descriptive statistics and Chi-Square tests to assess significance. To ensure strength in the tests, no cases were included where the cells had an expected count less than 5 in more than 20% of the cells and no cells had an expected count of less than 1 (Yates, Moore and McCabe 1999). Prior to any tests, the variables were tested for correlation using a

TABLE 1 *Demographics of villages of interest and number of surveys and focus groups administered in each*

Village	Number of Households	Distance from Yokadouma (Km)	Number of Surveys	Number of focus groups
Mang	289	44	32	4
Bompello	138	39	17	4
Mopouo	147	14	21	4
Modoumo	119	12	15	4
Djalobekoe	201	7	20	4
Biwala	200	4	15	4

correlation matrix in order to ensure a more complete understanding of their relationship. This process showed which of the variables were statistically related, allowing the researcher to gain insight into the significance of each variable. For each survey question and mentioned livelihood activity, tests were conducted to assess the differences between villages and gender as well as marital status, number of children, level of education and household status (whether a person is the head of their household).

RESULTS

Livelihood Portfolio

Young people engaged in a variety of forest and non-forest dependent activities throughout the year. Of 120 survey respondents, agriculture (97%) and commerce (42%) were most often mentioned as livelihood activities by both men and women. Commerce included the making and selling of prepared food, wine and other products, or purchasing and reselling items such as oil, soap and salt. Other less mentioned livelihood activities included hunting, collecting NTFPs, fishing, and skilled and unskilled labour. A smaller percentage of young people were either students, dependent on savings and loan groups, or remained dependent on family members for income and/or sustenance. All activities that did not fall into another category were included in the group "other activities".

To further explore livelihood strategies mentioned in the focus groups and to ensure non-income earning activities were included in the study, survey respondents were asked about specific livelihood strategies common to the region. When asked about these specific livelihood activities, agriculture remained the most cited livelihood activity (99% of respondents), while 88% said they collected NTFPs, 83% identified fishing, and 98% identified firewood collection as activities. The proportion participating in hunting activities was 35% while 22.5% participated in other activities, including artisanal gold and diamond collection, neither of which had been captured in the previous survey question. Seventeen percent of respondents indicated digging sand for construction materials as a livelihood activity (Table 2).

When the survey results were compared, there was little variation among the different subsets (village, marital status) of the respondents although some differences were noted. There were clear gender differences in livelihood activities, with women being significantly more likely to participate in fishing ($\chi^2 = 6.000$, df = 1, N = 120), $p = 0.014$) while men were more likely to participate in hunting ($\chi^2 = 52.894$, df = 1, N = 120, $p = 0.001$), digging sand ($\chi^2 = 6.000$, df = 1, N = 120, $p = 0.014$), and "other activities" ($\chi^2 = 8.076$, df = 1, N = 120, $p = 0.004$) as described above. Those who identified as heads of households were also statistically more likely to participate in hunting ($\chi^2 = 22.739$, df = 1, $p = 0.001$). To further understand livelihood strategies, the survey questions examined in more detail the collection of NTFPs, hunting and fishing, and agricultural activities as these activities had been mentioned in previous research and had been discussed in the focus groups.

Non-Timber Forest Products

According to survey results, NTFPs collected included a variety of fruit, plants, nuts and other products. The only significant difference related to the collection of okok (*Gnetum africanum)*, the leaf of an understory liana that is often cut into small strips and boiled for consumption, where more women than men were involved ($\chi^2 = 5.176$, df = 1, n = 106, $p = 0.023$). Other common NTFPs collected included

FIGURE 2 *Livelihood activities of young men and women survey respondents shown as a percentage. Note: * Signifies chi-square significance at p ≤ 0.05, ** Signifies chi-square significance at p ≤ 0.01*

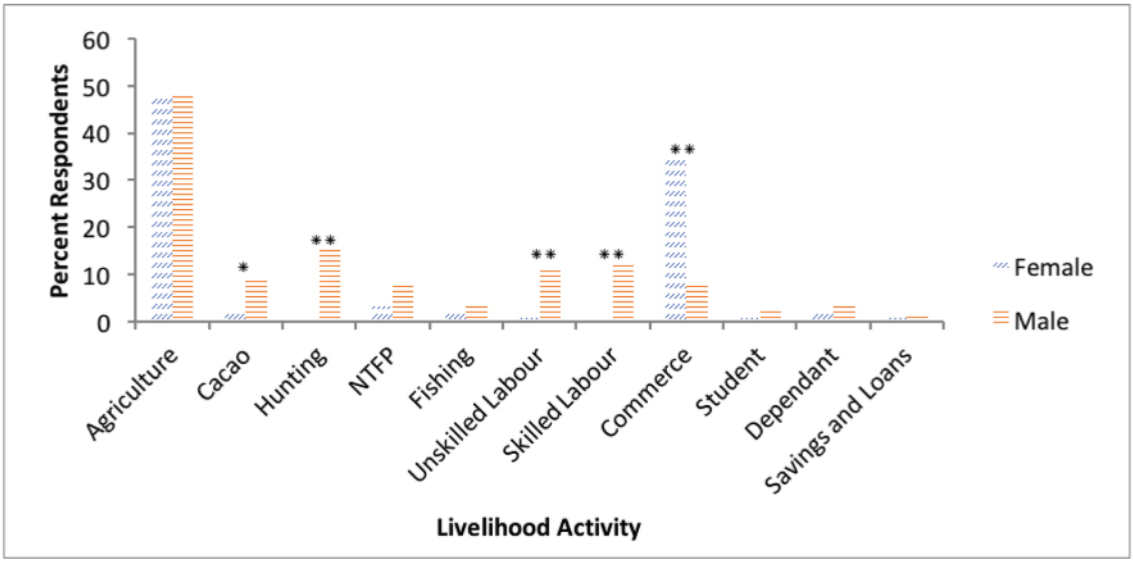


TABLE 2 *Table showing livelihood activities of youth survey respondents by gender and village. Results are from questions that asked directly about these activities. * Signifies chi-square significance at p ≤ 0.05, ** Signifies chi-square significance at p ≤ 0.01*

	Agriculture	NTFPs	Firewood	Hunting	Fishing	Digging Sand	Other
Women (%)	100.00	93.33	100.00	3.33	91.67*	8.33	11.67
Men (%)	98.33	83.33	96.67	66.67**	75.00	25.00*	33.33*
Total (%)	99.20	88.30	98.30	35.00	83.30	16.70	22.50
Mang (%)	96.88	68.75	100.00	28.13	71.88	3.13	15.63
Bompello (%)	100.00	94.12	94.12	52.94	94.12	29.41	35.29
Mopouo (%)	100.00	95.24	100.00	33.33	85.71	28.57	14.29
Modoumo (%)	100.00	86.67	93.33	40.00	86.67	0.00	13.33
Ndjalobekoe(%)	100.00	100.00	100.00	40.00	95.00	30.00	50.00
Biwala (%)	100.00	100.00	100.00	20.00	73.33	13.33	6.67
Total (%)	99.20	88.30	98.30	35.00	83.30	16.70	22.50

bush mango (*Irvingia gabonensis)*, njansang (*Ricinodendron heudelotii)*, kola nut (*Garcinia kola)*, and *balaka* (*Pentaclethra macrophylla),* among others. Firewood was collected by the majority of the respondents; all with the exception of three individuals surveyed collected firewood.

Hunting and Fishing

The survey also indicated that respondents regularly caught a variety of animals ranging from small and midsize rodents and other mammals to large mammals such as the Western Gorilla (*Gorilla gorilla*). Regardless of age or location, many respondents stated that they hunt and trap any animals that are available to them. These activities remain gendered, with women participating very little in hunting and young men participating to a lesser extent in fishing activities.

Agriculture/Agroforestry

All survey respondents except one mentioned agricultural activities as a part of their livelihood portfolio. Coffee and cacao production were mentioned less often than the cultivation of food crops. This is interesting as during the focus groups, cacao and coffee production were mentioned generally as important livelihood activities in the region. The most commonly grown crops included staple foods such as peanut (*Arachis hypogea)*, plantain (*Musa paradisacia)*, *macabo* (*Xanthosoma sagitifolum)*, maize (*Zea mays)*, and cassava (*Maniot esculenta)* although many respondents also grew a variety of other fruits and vegetables.

Importance of Livelihood Activities

Survey respondents were also asked to rate the importance of all livelihood strategies in which they engaged. When asked to rate their importance, in total 73% of respondents chose agriculture as the most important while 13% chose cacao production. When asked why the chosen activity was the most important, 43% of respondents said it was for income, 25% said it was for food, and 13% said it was for both food and income. For both young men and women, income and food were the most common responses for why these activities were important. When asked specifically about income, the majority of respondents said they were dependent on the forested landscape for their primary source of income (Figure 3).

Among agricultural products, 62% of respondents said cassava was the most important for income generation and 15% chose cacao. Young people also planted a variety of other crops that were said to be of importance for income generation, such as maize and plantain. Ten percent of respondents said that all crops contribute to income and they could not rank them. There was a similar divide in NTFPs when focusing on income generation. Sixty-one percent of respondents chose bush mango as the most important followed by caterpillars. Other responses included fruit bearing trees such as *njembe* (*Afrostyrax lepidophyllus*), njansang (*Ricinodendron heudelotii*) and snails among others. Again, 11% stated that all NTFPs were important for income. For both agricultural and NTFP products, women were more likely to state they were all important for income generation. However, these gender differences were not significant.

Factors Affecting Livelihood Activities

Market Factors

It was expected that distance from Yokadouma would impact access to markets and therefore the livelihood activities of young people (Pérez *et al*. 2002). Access to markets mainly had an impact on the sale of firewood. Among the four villages furthest from Yokadouma, the regional centre, only one respondent was selling firewood, whereas the sale of firewood was an important livelihood strategy in the two villages closest to the town. The sale of NTFPs, bushmeat, and agricultural products also showed similar tendencies based on the proximity to Yokadouma. In all villages, with the exception of Biwala, the village closest to Yokadouma, the vast majority of

FIGURE 3 *Percentage of total income gained by combined forest resources (NTFPs, firewood, bushmeat, fish, and agricultural products) by gender as determined through individual surveys*

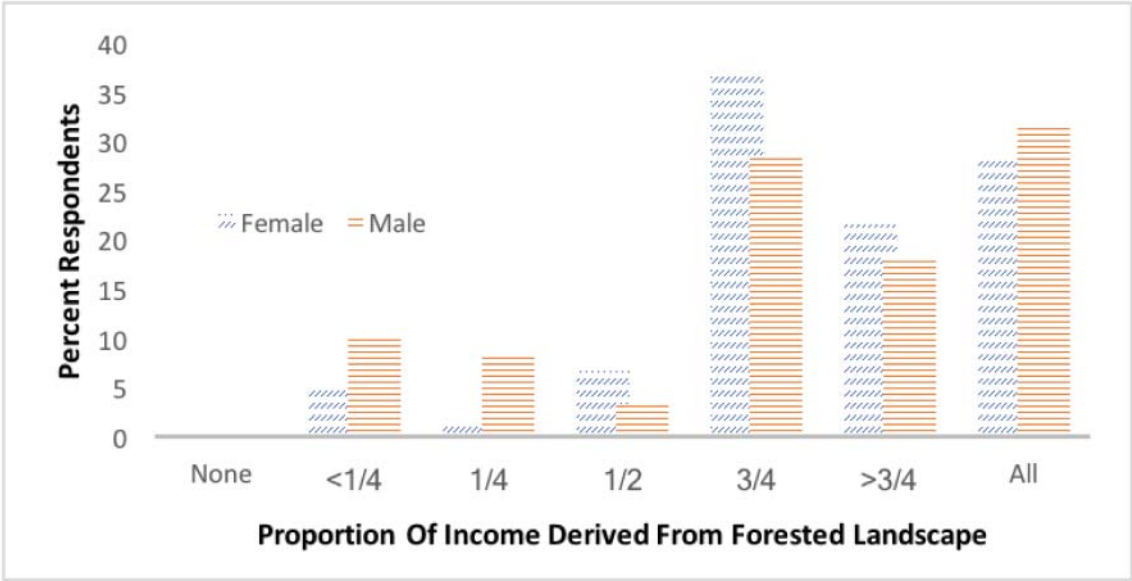
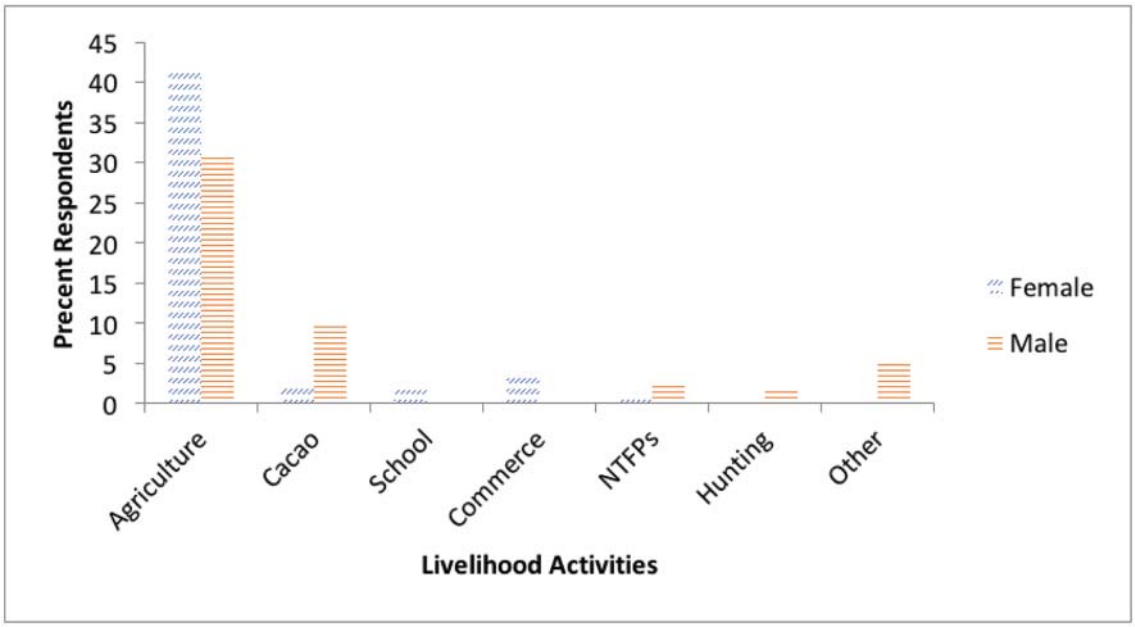


FIGURE 4 *Livelihood activities deemed most important to young men and women survey respondents shown as a percentage*



participants sold their products to *buyam-sellam* merchants, who travel to villages and purchase forest products to be re-sold in Yokadouma or other urban centres. In the village of Biwala, participants sold their products to both *buyam-sellams* and directly in the market in Yokadouma.

Environmental Factors

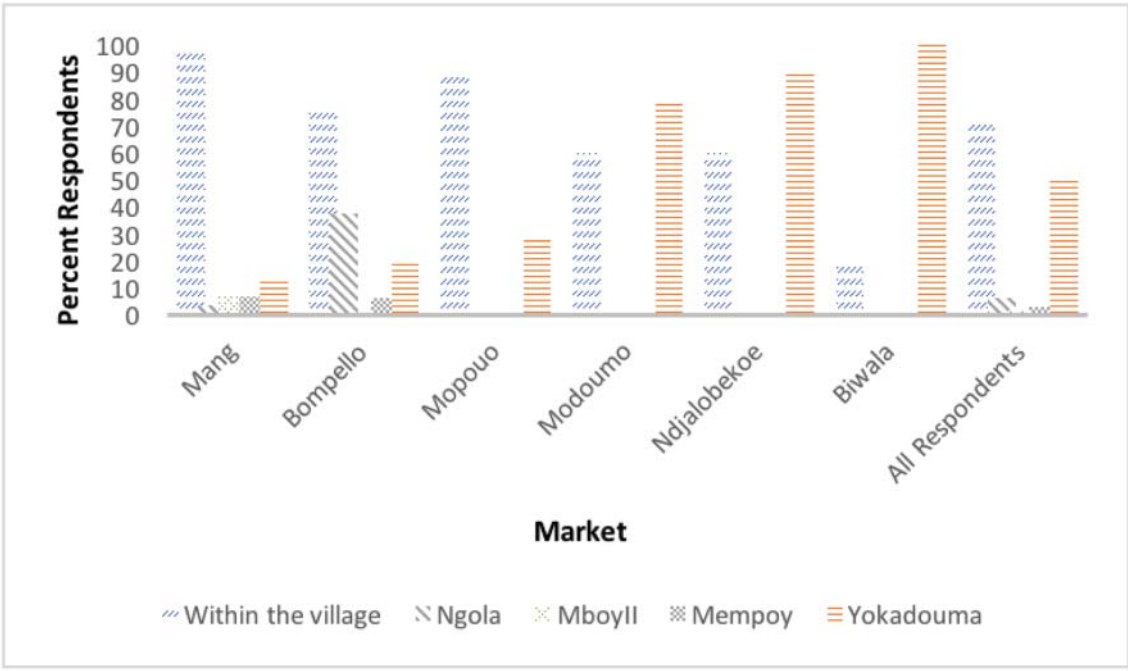
Of those that mentioned hunting as a livelihood strategy in the survey, 81% of stated that the number of animals available to be caught had decreased in the recent past, whereas only 9% claimed the numbers had stayed the same and 9% said it had been variable. Of those who fish, 58% identified that fish resources were depleted in comparison to the recent past, 27% identified variation from year to year, while only 13% stated that the resource had stayed the same and 2% stated that numbers had increased.

DISCUSSION

Livelihood Portfolio

The results of this research indicate that the majority of young people in this region derive their livelihoods from the forested

FIGURE 5 *Location of market sales of agricultural and forest products, by village, based on survey results from young men and young women*



landscape. They rely heavily on agriculture (shifting cultivation) and are engaged in a number of forest and non-forest activities such as agroforestry, NTFP collection, fishing, hunting, commerce, and labour. Young people in this region could therefore be considered forest-dependent, based on the definition of Sunderlin *et al*. (2005). For the majority, agriculture, collection of NTFPs and firewood, and hunting and fishing, were the main sources of income and/or sustenance. Young people who are engaged in non-forest activities, such as commerce and waged labour as the primary source of income, remained dependent on forested landscapes, particularly for food crops and NTFPs. These results are consistent with other aggregate studies which have suggested that rural populations in the developing world maintain diversified livelihood strategies in order to reduce risks and relieve poverty (Barrett *et al*. 2001, Loison 2015, Sunderlin *et al*. 2005).

Agriculture and agroforestry, hunting, fishing and NTFP collection are common activities in the forested landscapes of East Cameroon (Levang *et al*. 2015) and continued forest dependence can be expected into the future. Agriculture, in the form of shifting cultivation, agroforestry and cacao production, is the primary livelihood activity, not only because nearly all young people surveyed participated in it, but also because it was deemed the most important by respondents. Agriculture was important to the overall portfolio as the main and most consistent source of food and main source of income for most respondents. This research is in line with livelihoods research from Cameroon which suggests that agriculture and other forest-based livelihood activities are major contributors to income (Awono *et al*. 2009, Lescuyer 2013, Levang *et al*. 2015, Nkem *et al*. 2013).

Livelihood differences observed in this research concern increasing diversification, changing gender roles, and resource availability. Improved road networks are believed to facilitate the development of livelihood activities (Levang *et al*. 2015). This seemed to influence access to motorcycles (*moto-taxis*), and Yokadouma, particularly in villages closer to the town and provided alternative livelihood activities. Young men sometimes drive a *moto-taxi* or work for a business which increases their access to goods for commerce. Such non-forest based activities were shown to be important to the overall livelihood portfolio of some young people, including young women who also participated in commerce activities. Within this sector, food marketing was particularly important. The importance of food marketing to women's livelihoods has also been noted by Pérez *et al*. 2002. Such opportunities may allow for a more diversified livelihood portfolio among young people.

Though coffee and cacao are considered the main cash crops in the region (Levang *et al*. 2015), coffee production not a significant part the livelihood strategy of young men. They were also less likely than their older counterparts to own livestock or cacao fields, especially those that are producing fruit. This could be the result of external economic factors, such as the decrease in export crop prices, which have made these activities less appealing to young people (Awono *et al*. 2016a). This could also be a response to the system of land tenure and a lack of assets among young men. Angelsen *et al*. (2014) has shown that an increase in the age of the head of household results in lower forest income due to reliance on crop and livestock income. While a comprehensive examination of the role of land tenure to income generation was beyond the

scope of this study, it is important to acknowledge its potential influence on livelihood strategies. While it is difficult to understand all of the drivers, the results of this study clearly indicate that young people have a very diversified livelihood portfolio – one where a primarily agricultural livelihood is supplemented by a diverse range of forest and non-forest activities that play an important role in income generation and sustenance.

The livelihood strategies discussed in this work also included young men collecting NTFPs and women engaging in cacao production. This is similar to other aggregate research which indicated that gender constructs within forest use are more nuanced than previously suggested (Awono *et al*. 2009, Sunderland *et al*. 2014) and likely to become more complex as the resources and economy change. The marked increase in participation of young men is likely due to the increase in market value of particular NTFPs such as the bush mango and njembe. Furthermore, the collection of NTFPs is considered more important for those who have fewer assets or land (Ingram *et al*. 2016), which is often the case for young people. For example, Ingram *et al*. (2017b) found that men made up 84% of collectors of bush mango in East Cameroon which is likely due to the high commercial value of the species. Similarly, fishing, traditionally considered a female activity, is attracting significantly more young men, who fish not only among themselves, but also in groups with women. While done primarily as a way to supplement their diet, this is of interest as previous research has often indicated that NTFP collection and fishing are livelihood activities of women, not men (Awono *et al*. 2009 and Brummett *et al*. 2008). However, young women were more likely to suggest that fishing was a more consistent and important activity as they used the fish to feed their families.

Some female respondents participated in hunting, labour, and cacao production, activities traditionally considered the work of men in Cameroon (Ingram *et al*. 2016). In one village, some young women were renting cacao plantations in adjacent villages as a means of increasing their income. In this case, when they have the means to rent, they were able to access plantations of older men who were no longer able to participate in heavy labour and who would receive a portion of the revenue when the product was sold. This demonstrates a significant shift in the ability of young women to access income which was unavailable in the past. Ingram *et al*. (2016) found that women farmers with access to inputs had the ability to influence decisions, though made no reference to women controlling the entire process and income related to cacao production. These changes in gender roles suggest that young people are further diversifying livelihood strategies to include activities outside of the gender norms in order to increase their incomes.

It was difficult to assess any statistical findings for hunting because the subset of the population who participated in hunting activities was small. The laws surrounding the hunting and sale of bushmeat also made it difficult to get clear results. Villagers are legally able to hunt for sustenance but it is illegal to sell bushmeat. It was difficult to get a real understanding of how many young people are hunting and to whom they are selling the meat. This difficulty has also been noted in other work on livelihoods in Cameroon (ex. Ambrose-Oji 2003, Lescuyer and Nasi 2016).

Importance of Livelihood Activities

Agriculture, in the form of shifting cultivation and cacao production, is the primary livelihood activity, not only because all but one youth surveyed participate in agriculture but also because it was deemed the most important by respondents. Income generation was considered to be dependent on the forested landscape as a large proportion of survey respondents indicated that the majority of their income came from these sources. Levang *et al*. (2015) found that in the East region of Cameroon, activities directly related to natural resources contributed close to 84% of total income. Angelson *et al*. (2014) found that in Cameroon, 59% of total income came from forest sources. Though they contributed less to total income, NTFPs were also considered to be important to young people in the region. The important role of NTFPs in household livelihoods in Cameroon has been explored by Levang *et al*. (2015) and Awono *et al*. (2016a, b). It should also be noted that some young people are contributing unpaid labour to their household for which they receive no income. These activities include transportation of goods, farming, hunting and gathering, and chores, among others (Porter 2008).

Factors Affecting Livelihood Activities

Although the distance to Yokadouma had an impact on where and to whom survey respondents sold forest products, being far from Yokadouma did not exclude participants from the market. Through *buyam-sellams* schemes, young people were able to sell their goods without having to leave the village. Though all of the villages studied were linked to Yokadouma by the same road, these results suggest that the distance to the physical markets is less important when such schemes are in place. This is especially true as all villages are along the same road indicating that transport costs wouldn't be significantly different for traders as was observed in other studies (Bryceson 2002). It was beyond the scope of this research to assess the prices of goods at the various markets though others have looked at the absolute income of forest products in Cameroon (Angelsen *et al*. 2014).

The majority of survey respondents stated that fish and bush meat resources had decreased in the recent past. Increased pressure on forest resources have also been documented by Brown and Lapuyade (2001), Fa, Currie and Meeuwig (2003), Wunder *et al*. (2014) and Ingram *et al*. (2016, 2017). Respondents did not mention that NTFPs were becoming scarcer in the region which could be due to the still relatively low level of commercialisation of NTFPs in this area (Brown and Lassoie 2010). However, with increased

road access and infrastructure, the longterm environmental situation that young people are facing is different than the situation faced by an older generation. Changing availability of resources now and into the future is likely to lead to increased competition over these resources, or a change in livelihood strategy. In the East of Cameroon, where isolation and lack of infrastructure limits alternative livelihood activities, this issue is likely to be exacerbated (Levang *et al*. 2015, Sandker *et al*. 2015).

CONCLUSION

The results of this study indicate that young people in East Cameroon maintain diverse livelihood strategies that are largely composed of shifting agriculture supported by agroforestry, forest, and non-forest activities. Young people appear largely dependent on the forested landscape for both income and sustenance, with food and cash income being of utmost importance. Since young people also indicated that they are experiencing changing availability of resources, particularly fish and bushmeat, this may have an impact on their ability to meet their livelihood needs in the long term. Though traditional gender divisions of labour were observed in the livelihoods of young people, there was also evidence that these roles are changing. Such changes included the increased participation of young men in NTFP collection and fishing, and young women gaining income from renting cacao plantations.

The observed differences suggest that forest-dependent communities are not homogenous in their use of resources in forest landscapes. This is particularly relevant as youth are a large and growing segment of the population and will be responsible for resource management in the long term. Due to a lack of youth focused research, it is not known how this large segment of the population will continue to adapt to changing situations, particularly in the face of climate change and increased globalisation. It is therefore imperative that local, national, and international policies aimed at addressing poverty, forest management, and climate change take into account the changing livelihood activities and challenges experienced by young people. Those involved in macroeconomic and conservation policies in this region should engage young people in dialogue so that they can contribute their knowledge and improve decision-making for all forest-dependent people into the future.

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