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Youth in Tanzania's urbanizing mining settlements

Prospecting a mineralized future

Deborah Fahy Bryceson*

January 2014

Abstract: Over the last fifteen years many African countries have experienced a ‘mining take-off’. Mining activities have bifurcated into two sectors: large-scale, capital-intensive production generating the bulk of the exported minerals, and small-scale, labour-intensive artisanal mining, which, at present, is catalyzing far greater immediate primary, secondary and tertiary employment opportunities for unskilled African labourers. Youth residing in mining settlements, have a large vested interest in the current and future development of mining. Focusing on Tanzania as typical of the emerging ‘new mineralizing Africa’, this paper, examines youth’s role in mining based on recent fieldwork in the country’s northwestern gold fields. Youth’s current involvement in mining as full-fledged, as opposed to part-time, miners is distinguished. The attitudes of secondary school students towards mining as a form of employment and its impact on economic and social life in mining communities are discussed within the context of the uneasy transitions from an agrarian to a mining-based country, from rural to urban lifestyles, and the growing scope and power of foreign-directed, capital-intensive, corporate mining relative to local labour-intensive artisanal mining.

Keywords: Africa, artisanal mining, education, employment, generational change, gold

JEL classification: O17; O18; Q33; R23

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1 Introduction

Over the past decade, a clutch of studies of African youth has focused on urban male youth's role in national and local political economies (Trudell et al. 2002; Abbink and van Kessel 2005; Honwana and de Boeck 2005; Burgess and Burton 2010). Cast against a backdrop of unemployment and economic cutbacks, they tend to be portrayed as dissident urbanites disillusioned with the post-colonial state (Burgess and Burton 2010). Male youth, earning a bare economic survival in the informal sector, are seen to be prone to incipient violence, including vigilantism under the sway of one or another 'big men' or political parties, with destabilizing influences on the political and social order of the nation-state and city as exemplified in Kenya and West Africa (Anderson 2002; Meagher 2007; Jua 2010).

This paper questions the behavioural characterizations of African youth as either overly materialistic, alienated and nihilistic in reaction to their diminished economic prospects relative to that of their parents' generation; or alternatively forced or willingly in the pay of self-serving big men needing youthful strong-arm militias to back their policies or challenge rivals during elections or other decisive moments of power politics. In either case, the agency of youth is seen as thwarted or controlled by an older commanding generation.

Honwana (2012) has developed a notion of African youth's 'waithood', a period between childhood and adulthood in which young people are in a state of suspension before gaining adult responsibilities and rights, while nonetheless, acquiring political awareness and forming a critique of the context in which they live. Many feel their generation has been marginalized by corrupt, clientelist political elites and voice resentment against nepotistic practices. Most youth shun formal politics and are hesitant to become politically vocal for fear of being penalized by their elders and persons of authority.

After decades of economic stagnation, the 21st century has witnessed changing fortunes for Sub-Saharan Africa's economies, particularly those with mineral wealth. The existence of widespread poverty in a continent abundantly rich in mineral resources is paradoxical. Apart from a long history of mineral extraction in Southern Africa, the Democratic Republic of Congo and Ghana, it is thought that the rest of Sub-Saharan Africa has barely scratched the surface of its mineral wealth. At the turn of the century, a rapid rise in demand for mineral resources prompted primarily by industrializing countries, led to a surge in foreign corporate investment in African mining.¹ Over a third of the major metallic mineral-producing countries in the world are currently African (ICMM 2012). According to the World Bank (2012: 11), twenty-one African countries are already pegged as 'middle-income countries' with another ten in line to achieve that status by 2025. These are encouraging economic projections, but will they translate into improved work prospects and living standards for today's youth? In the following, I probe this question via consideration of the attitudes, expectations, and agency of youth revealed in recent survey findings from Tanzanian artisanal gold mining sites.

Tanzania has an impressive mineral endowment including gold, diamonds, several types of precious stones, and recently discovered off-shore natural gas reserves. Most attention is focused on the expansion of large-scale mining investments, which involves employment of thousands of mostly well-educated and skilled personnel. On the other hand, the artisanal mining sector is highly labour-absorptive with hundreds of thousands actively engaged as miners or raw material

¹ Existing mining companies from South Africa, Australia, Canada, and the United Kingdom were joined by China, India, and Brazil as new entrants in African mining.

processors of minerals, responding to a proliferation of mineral rushes over the last couple of decades (Bryceson et al. 2012).

Economic and social relational ties associated with mineral production differ profoundly from those prevailing in Tanzania's agrarian countryside. The country's village settlements were and continue to be structured by a division of labour and decision-making that privileges the power of male elders. In contrast, mining areas are populated primarily by men and women in their peak economically active years between 15 and 45 years of age, who take an active part in decision-making, distanced from gerontocracy. Economic life of the mining settlement is premised heavily on muscular strength and youthful vigour. Mineralizing economies are inclined towards urban agglomeration, which is attractive to youth stimulating their creative energies as cultural trendsetters (Bryceson et al. 2012).

This paper addresses how the rise of artisanal mining is altering youth's social relations and economic expectations and, it seems, providing an avenue for greater autonomy. Nonetheless youth mining or living in mining settlements confront constraints and trade-offs in their quest for decision-making autonomy and a new lifestyle. Despite the meteoric rise of mining over the last two decades, very little research on local economic and cultural change in mining communities has been undertaken. The attitudes and agency of mining settlement residents, and especially youth, remain largely undocumented. With this empirical gap in mind, this paper begins with a discussion of traditional occupational ascription and youth's historical role in work migration to plantations, urban areas and now mines, before turning to brief background history on Tanzania's mineralization, followed by consideration of data findings from the 2012 Urbanization and Poverty in Mining Africa (UPIMA) household survey of three Tanzanian artisanal and large-scale mining settlements and a 2007 survey of miners' migration and career development at two artisanal settlements in Tanzania. Youth's demographic presence in mining settlements is analysed alongside their educational and occupational activities. Through a content assessment of themes found in essays, poems, songs and plays created by youth for a 'Life in the Mines' (*Maisha Machimboni*) cultural festival hosted by the UPIMA research programme in July and August 2012, youth's perspectives on daily life in their communities and the trade-offs they face in gaining autonomy and occupational choice. The conclusion summarizes the broad trends and youth's future trajectory in artisanal mining.

2 Youth, autonomy, and occupational change in Tanzania

Tanzanian history over a century and a half testifies to male youth's frontal role in economic sectoral change, as warriors, porters, and labourers strategically positioned over the country's sparsely populated terrain during pre-colonial slave raiding² and ivory portage, associated with the Zanzibar sultanate's commercial empire. Traditionally male youth served as warriors in tribal confrontations. With the rise of the ivory and slave trade, youth derived considerable freedom from gerontocratic authority in the course of their work. Ivory portage was preponderantly based on paid labour and constituted the early beginnings of a territorial wage labour force (Iliffe 1979: 45; Rockel 2000).³

² Iliffe (1979: 62-63) quotes the remark of Mirambo, the 19th century warlord and chief who terrorized the countryside with his extensive slave raiding: 'We never take middle aged men or old men to our wars, always youth not yet troubled with wives and children. They have keener eyes and lither limbs'.

³ It was a period of exceptionally widespread political insecurity and economic upheaval due to predatory slave raiding taking place alongside the environmentally depleting pursuit of ivory. Many agricultural tribes retreated into palisaded settlements and young women and children lived in fear of being seized by slave raiders (Wright 1993).

Arab ivory traders relied heavily on a youthful cadre of specialized Nyamwezi ivory porters. Historical accounts including that of Tippu Tip (Brode 2000), a renowned Zanzibari ivory trader, suggested that ivory porters were often undisciplined and unreliable, displaying a will of their own and large numbers to back the exercise of that will. While they earned wages and travelled enormous distances away from their home areas, nonetheless, it bears noting that one of the primary motivations for becoming a porter was a rite of passage: 'Not one of them was allowed to marry before he had carried a load of ivory to the coast, and brought back either calico or brass wire. It was the tribal stamp of true manhood, at once making him a citizen and warrior.' (Swann 1910 quoted in Rockel 2000: 179).

During the 1890s, the imposition of German colonial rule quelled the up-country violence and insecurity associated with slave raiding but engendered the widespread Maji Maji rebellion against German tax collection and colonial autocracy, involving thousands of young men in military activities. This was followed by military encounters between British and German-trained African troops on German East African soil during the First World War (Iliffe 1979). Reid (2010: 43) observes that the period witnessed 'the emergence of youth as potentially more strident, militarized (in the loosest sense of the word) sociopolitical group, more willing than even in the nineteenth century to challenge older generations and engage in new patterns of intergenerational conflict'.

After the defeat of the Germans in the First World War, German East Africa became Tanganyika Territory, a League of Nations-mandated territory under British rule. Its economy combined European-owned plantations employing African wage labour, and peasant agrarian subsistence and export crop production of cotton, coffee, tea, and cashew. Approximately 50 per cent of the territorial wage labour force was deployed in European sisal production on the basis of the *kipande* system in which male migrant labourers were contracted to labour a year and a half to two years away from their home areas (Bryceson 1990). Although the colonial migrant labour system was diverting youthful male labour from peasant smallholder farming, colonial officials and African male elders saw it as an interlude in the life of young men facilitating home-focused income-earning for bridewealth payment. Heavy Native Authority sanctions against young women's migration away from their home areas constituted the foundations for this labour management system (Mbilinyi 1989). Male wage-earning migrant labourers were afforded some degree of individual autonomy for male youths, but within the context of the demographic renewal of farming households in which rural patriarchs retained direct control over young women and indirect influence over young men. Not surprisingly, marriage and the setting up of autonomous households formed the dividing line between youth and adults.

2.1 Defining adulthood through new family formation

In Tanzanian agrarian society, spinsterhood was unthinkable for both women and men. Girls were traditionally considered marriageable soon after puberty. Older polygamous male patriarchs, who had accumulated wealth and were in a position to make large bridewealth payments, were in an advantageous position to marry young women (Wilson 1977; Bryceson 1995). Thus girls were likely to marry in their teens whereas boys, who had to gain sufficient means to pay bridewealth, married later.

Youth comprised an indefinite period beginning roughly at the age of 15. In Sukumaland, where the mining settlement case studies cited in this paper were conducted, Varkevisser (1973) documents that the young had traditionally been obliged to join the *kisumba*, a neighbourhood organization of young men and unmarried young women. The *kisumba* hired themselves out as a group for a collective wage of cash and beer. Girls left the *kisumba* at the time of their marriage, usually by the age of 16 whereas boys were likely to marry some five to ten years later.

Nonetheless, the achievement of full adulthood tended to be transitional for young married people who were obliged to spend the first years of their married life doing labour service for their in-laws, first the wife's family and later the groom's, in accordance with the terms of the negotiated bridewealth. Bridewealth obligations could last in perpetuity, however, there came a point when the married couple was considered ready to set up their own household, joining the 'old people' and gaining full autonomy (Varkevisser 1973).

A major theme of youth studies and indeed a dynamic for change in Tanzania economic history has been male youth's struggle for autonomy from the older generation related to bridewealth transfers and labour service demands (Giblin 2010; Iliffe 1979; Wilson 1977). Young men's earnings from migrant labour are likely to have eased the generational struggle over bridewealth. The transition from cattle and in-kind payments to a stronger cash component of bridewealth assisted young men to marry earlier in their life cycle and reduce the age imbalance between couples (Iliffe 1979: 531).

2.2 Attaining educational credentials for occupational flexibility

The off-farm avenues of work that youth had access to in the 19th century required heavy manual labour. The colonial labour market was structured by a racial three-tier system in which Africans were primarily agriculturalists, Asians were traders, service providers, and clerks and Europeans were government administrators and professionals. There was very little scope for other work aspirations for African youth. Over the long term, their residence in tribal villages and work in peasant agriculture under the control of rural patriarchs was ascribed. But in this restricted context, male youth came to value literacy and educational attainment as a means of gaining labour autonomy from their elders. Christian missionary activity during the German colonial period first made inroads amongst ex-slaves and other marginalized categories, but over time youth gravitated to Christianity as an alternative world view and catapult to non-agrarian occupational pursuits (Iliffe 1979). The numbers who gained literacy and some form of technical training, like carpentry or medical auxiliary, etc., were few but noticeable. They generally practiced their trade alongside farming in their home areas throughout adulthood.

While many Christian missionaries clustered in the cooler highland areas of the country provided educational opportunities for youth in the immediate vicinity, the overall level of education provisioning in Tanganyika was abysmally low. Colonial government investment was restricted such that on the eve of independence in 1961 the country had only 12 African university graduates and a mere 16 per cent of the population were literate (Pratt 1978; Iliffe 1979). Table 1 presents the slow, uneven development of educational attainment in Tanganyika cum Tanzania, evidencing three notable spurts in primary school enrolments: (i) during the 1950s and 1960s, prompted by the spur of national independence; (ii) the implementation of Universal Primary Education (UPE) beginning in 1976, which progressed into the early 1980s before being reversed by IMF-enforced structural adjustment cutbacks by the mid-1980s; and (iii) the re-introduction of UPE in 2004 with a massive expansion of primary school education thereafter.

Table 1: Educational enrolments, selected years 1931-2010

Year	Primary		Secondary	
	no.	% male	no.	% male
1931	167523	66	0	
1946	115179	74	1446	98
1956	368924	70	2409	91
1961	506260	65	6031	86
1966	740991		27628	
1976	1954442		57143	
1981	3538183		67602	
1985	3169759		83077	
1989	3258601		139586	
		% school age pop. enrolled		
1995		55		
2000		59		
2004	4875764		379534	
2005		95		
2006	8166608			
2009		96	1466402	55
2010		95		

Source: 1931-89: compiled by Buchert 1994 (includes government, Native Authority, mission, and private schools); 1995-2010: United Republic of Tanzania (2009); United Republic of Tanzania (2010a); Wedgwood (2005).

Until independence, roughly two-thirds of all students were male. At secondary level, the imbalance rose to 86 per cent. Since independence measures to address the male bias have reduced the gender gap at both levels.

During the Nyerere period, priority was on expanding primary schools and in the process the rate of growth of secondary schools lagged behind to create a severe educational bottleneck. In 1985, the number of secondary school students was a mere 2.6 per cent of the numbers in primary education, creating an educational elite of mostly urban-born secondary school students eligible to take up the government-supported university places. During the late 1980s, the number of private secondary schools expanded. By 2004, the percentage of primary school leavers going on to secondary school had improved to 7.8 per cent. During the 2010s secondary educational prospects became even more promising for youth, being especially important as the agrarian economy gives way to mining and service sector expansion.

3 Mineralization of Tanzania

Mining has been a part of colonial and post-colonial 20th century Tanzania history, but it is only in the last couple of decades that the sector's growth has gained increasing momentum, impacting on youth in many localities. Having been a primarily agrarian-dominated country, Tanzania is undergoing a process of 'mineralization', defined as 'alteration in both the form and content of the African continent's social, political, and cultural foundations arising from the rising importance of mining in national, local, and household economies' (Bryceson and Jønsson 2014). This section traces the entwined development of large-scale and artisanal mining.

3.1 Evolution of the mining sector

During the 1980s and 1990s, in response to the contraction of peasant agriculture under structural adjustment policies, a rising tide of artisanal miners, living in mineral-rich parts of the country, started discovering minerals in their local areas (Bryceson 1999; 2002). At the same time, world gold prices were steadily rising following the removal of the international gold standard. Tanzania's post-independence government, like its colonial predecessor, did not sanction private artisanal mining, but in view of the economic crisis gripping the country, government officials tended to turn a blind eye to coalescing artisanal mining activity.

The Mining Act of 1979 accorded small-scale artisanal miners legal recognition, ending the Tanzanian government's insistence on mining being exclusively controlled by the state (Kulindwa et al. 2003). Citizens were afforded the possibility of posting mining claims in designated areas for prospecting and mining that did not require large expenditure or specialized equipment. By the mid-1990s, there were estimates of over a half million artisanal miners operating in Tanzania (Tan Discovery 1996).

Under pressure from the World Bank, the Tanzanian government promulgated a raft of legislation aimed at attracting foreign direct investment (FDI) at the end of the 1990s.⁴ Over the next decade, annual FDI trebled, amounting to US\$5.6 billion between 1999-2009, most of which was invested in the Tanzanian mining sector, notably that of gold (United Republic of Tanzania 2009). In 2010, 97 per cent of mineral exports were of gold with Tanzania's recorded gold exports valued at US\$1.56 billion (United Republic of Tanzania 2010b). Nonetheless, the corporate mining sector employed very few people. Roe and Essex (2009) estimated employment at between 6000 and 12000 between 2003 and 2009, most of whom were skilled or highly educated. In contrast, a recent World Bank-funded study conducted in 2011 estimates that there were 685,000 artisanal miners in Tanzania.⁵

Estimates of the artisanal mining sector's productive output are not available. However, extraction of gold, diamonds, and an array of precious minerals has clearly boosted Tanzania's export earnings, ushering in a new era of optimism about the future of the country and its citizenry, not least its youth. Artisanal gold makes its way primarily through informal market channels into the global gold market (Jønsson and Fold 2011). Increasingly, the Tanzanian government has favoured large-scale mining interests over that of artisanal miners, leading to contestation between the large-scale mines and artisanal miners' over their mining rights in specific areas (Bourgouin 2014).

3.2 Demographic growth, urbanization, and cultural lifestyle experimentation

Most of the known gold deposits are located in a 'ring of gold' south of Lake Victoria following the bifurcated contours of the East African Rift Valley (Bryceson et al. 2012). News of a gold strike travels fast with the near ubiquitous ownership of mobile phones in Tanzania. Particularly promising sites have been known to amass ten thousand or more people in the space of a few months (Jønsson and Bryceson 2009).

The spread of artisanal mining and the influence of mineral rushes are reflected in small town growth (Bryceson et al. 2012) in the mining regions. While the precise size and composition of the migration stream is not known, Jønsson and Bryceson's (2009) 2007 survey of 108 migrant

⁴ The 1997 Mineral Policy, the 1997 Investment Act, the 1998 Mining Act and the 1999 Mining Regulations.

⁵ According to Dr Crispin Kinabo, Geology Department, University of Dar es Salaam, member of the investigating committee. The report has yet to be published.

miners at two locations in the ring of gold revealed a diverse ethnic mix.⁶ Many of Tanzania's mining sites were originally remote rural locations, but the economic promise of a mineral rush attracts a youthful, cosmopolitan population. Although the majority of surveyed migrants came from rural birthplaces (77 per cent), the settlements had a strong urban character. The miners arrive first, but businessmen and women follow soon thereafter. Both the men and women are intent on material success (Bryceson, Jønsson, and Verbrugge 2013).

The miners, and especially the young ones, are generally known to 'work and play hard'. There are often tensions between the mining settlement and the neighbouring villagers who view the migrant population with consternation. While eager to sell food, goods, and services to the migrants, they fear that their way of life will set a bad example for their youth (Bryceson and Jønsson 2010).

4 Youth at the mining frontier

Studying a mining frontier with a continuous sequence of rush sites involved selection of study sites (described below) on the basis of large-scale versus artisanal mining and time duration of the settlement's existence. The UPIMA research team's fieldwork at three gold settlements in Geita region between May 2011 and March 2012 consisted of qualitative interviews with key informants and a random sample household survey of 108 household heads.⁷

Tanzania's current mineralization has to be understood as a continually dynamic frontier of artisanal mining sites being discovered, prospected, exploited and gradually diminishing in activity, alongside bigger sites of corporate capital investment. Youthful miners are well-represented at gold mining sites; but it is necessary to distinguish between those who dedicate most of their time to mining as opposed to those who attend school and mine part-time on the side.

⁶ Twenty-seven of Tanzania's approximately 125 tribal groups were represented in our random sample survey, the dominant group (22 per cent) being the agro-pastoral Sukuma whose home area is in the Lake Victoria region where the gold mines are concentrated.

⁷ Our survey research questions encompassed: migration patterns; family formation; livelihood and income; land access and food production; housing accommodation and living conditions; content and level of consumption; attitudes towards home and settlement; investment; and leisure activities. We conducted 97 semi-structured qualitative interviews with key informants, and six focus group discussions, five with students from primary and secondary schools located in the sites and one with small-scale miners at one site location. The qualitative interviewing focused primarily on settlement history, infrastructure and institutional development, but also touched upon specific topics related to the work and livelihood of the interviewees.

Table 2: UPIMA 2012 Tanzania study sites

Site type	Gold sites
Artisanal rush	Ikuzi, Geita region – estimated pop. 5,500. Originally a small agro-pastoralist village numbering only 3600. In July 2010, gold was discovered in a forested area approximately 2 km from the village centre bringing an influx of between 9,000-13,000 people into a crowded, deforested settlement without sanitary facilities. The post-peak gold rush population at the time of the study in 2012 numbered between 5,000 and 6,000 people.
Artisanal mature	Nyarugusu, Geita region – estimated pop. 11,000. Its gold mining activities date back to the colonial period, where an industrial gold mine operated in the vicinity of the village until the 1960s. In the 1980s, artisanal mining activities revealed multiple gold discoveries that attracted many miners. Since then Nyarugusu was divided into two villages in 2000. In 2009 the new Nyarugusu village, with a population of around 27,000 people, was again divided into three new villages with the newly designated Nyarugusu village having a population of around 11,000.
Large-scale	Geita, Geita region – estimated pop. 100,000. Geita town is the headquarters of the new Geita region, and one of the fastest growing towns in East Africa. It is the location of Geita Gold Mine (GGM), Tanzania's largest gold mining operation. The Germans discovered gold close to Geita in 1898. Large-scale production commenced in the 1930s and continued to 1966 followed by population decline. GGM operated by Anglo-Gold Ashanti commenced production in 2000. Geita is now a major commercial town in northwest Tanzania.

Source: 2012 UPIMA survey (Bryceson and Jønsson forthcoming).

4.1 Profiling young miners

Artisanal gold miners are generally men in their peak economically active years. Jønsson and Bryceson's (2007) random sample survey of miners at two sites in Tanzania's ring of gold cited above provides a localized indication of the structure of the artisanal mine labour force. Twenty-eight per cent of the miners were under 30 years of age, the overall average age was 36 years with a mean gold mining entry age of 24 years (Jønsson and Bryceson 2009). Some youth had been attracted to artisanal mining in their teens, with a minority (7 per cent) of pre-teens (10-12 year olds). The exceptionally young miners tend to be living in mining settlements as children and acquire their first experience of mining as assistants for family members or neighbours. For others, independent migration to mining sites began in their teens (Jønsson and Bryceson 2009; *Terres des Hommes Schweiz* 2012). The majority (77 per cent) of the surveyed miners were from rural backgrounds (Bryceson and Jønsson 2010). Only 23 per cent of the sampled miners had less than five years of schooling, suggesting that the majority of artisanal miners have basic literacy and numeracy.

Tracing the careers and income differentials between the 108 sampled miners, Bryceson and Jønsson (2010) found that miners who are 'early starters' with an average mining entry age of 17 years have higher mean monthly earnings than 'average starters' with an entry age of 22 years, while 'late starters' entering at an average age of 40 receive the lowest earnings. The early starters have the advantage of having not only longer but broader mining experience, having worked at more sites. The survey evidence suggests that success in mining is a cumulative process of career progression associated with increasing experience, skill, and mobility, which expands know-how and social networks for information exchange and pit access. It should be noted that 'early starter' miners tend to marry at an earlier age than other miners, presumably because they can afford to do so. Marriage and having children does not necessarily interfere with mine work.

Married men readily move to new mine sites leaving their wives and children behind (Bryceson, Jønsson, and Verbrugge 2014).

Table 3: Entry age of miners into artisanal mining

Age range	Percentage	Cumulative percentage
10-19 years	45.4	45.4
20-29 years	31.5	76.0
30-39 years	14.8	91.7
40-49 years	7.4	99.1
50-59 years	0.9	100.0

Source: 2007 artisanal miners' survey data (Jønsson and Bryceson 2009).

4.2 Youth's presence in the mining settlements

Tanzanian mining settlements have a hybrid character. While Geita has a population of over 100,000, the rest of the survey sites are located in rural settings but nonetheless, due to their migrant influx, they are demographically complex and represent extremely cosmopolitan concentrations of population with diverse occupational pursuits in mining and the service sector. It is generally assumed that mining sites will be male-dominated. In Tanzania, this is true only in the very early days of a mineral rush. Women service sector migrants quickly follow male mining migrants. There are a small number of children below 10 years and a preponderance of people in peak economically active age groups, as indicated by the age/sex pyramid in Appendix 1.

In mining sites, it cannot be assumed that all houses accommodate 'households' in the conventional sense. There are at least three types of housing with distinct household compositions, namely: (i) dwellings housing households comprising a reproductive couple and children, (ii) bachelor housing in the form of single room rental, room clusters, or dormitories for men, notably miners living individually; and (iii) houses that accommodate some combination of family households as well as paying lodgers. The UPIMA sample survey of 2012 was biased towards categories: (i) and (iii) given that the survey took place during working hours when single and dormitory-housed miners and others were at work.

Thus the age/sex pyramids of the surveyed settlements are likely to reflect the more stable family-based population of the settlements who live in housing units where there are occupants on the premises during daylight hours.⁸ However, unlike Tanzanian agrarian settlements characterized by high dependency ratios consistent with a broad-based age/sex population pyramid, households in the surveyed mining sites have a lower number of child dependents and erratic differences between age groups and their respective sex ratios due to selective migration (Appendices 1 and 2).

Appendix 2 infers the marked differences in household formation between the three types of gold settlements. Ikuzi, the active gold rush site has an exceptionally small household size, a high incidence of non-family members lodging in the household and a heavily male biased sex ratio. The numbers of sons and daughters within the Ikuzi households is under one with double the number of sons relative to daughters. Ikuzi is essentially a mining camp populated primarily by

⁸ Achieving even coverage in sampling mining populations poses logistical difficulties given the array of residential housing units and the variation of occupants' occupational composition and temporal presence in the dwellings. Surveying miners at their place of work can be trying for the enumerators and intrusive for the households. The problem can be offset by interviewing miners during their leisure time, generally at bars and recreational centres like pool halls during evening hours.

male miners. Also it is apparent that schooling is not a priority with roughly half of sons and only a quarter of daughters studying.

The mature artisanal site has above average household sizes and substantial numbers of sons and daughters attending school. Nonetheless the sex ratio is still tipped towards males and there is greater investment in the education of sons. The bulge in the female 10-14 years category in Nyarugusu (Appendix 1) may relate to the common practice of relying on the labour of young migrant girls from their extended family to assist with childcare and domestic labour. In this case this would facilitate mothers' involvement in service sector and mineral processing work outside the home. Parents in mining settlements tend to work long hours and lack time to devote to their children.

The households in the large-scale mining settlements are quite different. Geita is a town experiencing rapid growth through in-migration. It is class-stratified with a wealthy educated elite working at the Geita Gold Mine (GGM) and, at the opposite end of the spectrum, there are many people working in the informal service sector and artisanal mining. The high sex ratio is likely to reflect the presence of male artisanal miners and male contract workers for GGM. School attendance is high with a considerable male bias. There is a noticeable bulge in young women in the 15-19 age bracket (Appendix 1). They are likely to be helping with childcare and working in the service sector.

Bearing in mind that our UPIMA household survey data is biased towards the more settled households in the community, we must distinguish between 'working' youth and 'schooling' youth. There is clearly a trade-off between youth who decide to specialize in mining after primary school as opposed to those who attend secondary school. In Tanzania, primary schools involve seven years of education (Standards 1-7), followed by secondary schools of six years split into Forms 1-4, and students showing academic promise are encouraged to move on to Forms 5-6. Generally, primary school children are aged 7-15 years old and, as in the case of the surveyed Form 4 secondary school students, they ranged in age from 16 to 22. Many Tanzanian children start school well after their 7th birthday, which delays the completion of both their primary and secondary education. School attendance in our surveyed households differs quite markedly across the three sites, with almost all sons (98 per cent) and three-quarters of daughters studying in Geita town, falling to 62 and 65 per cent in Nyarugusu, down to only half of sons and roughly a quarter of daughters at the Ikuzi gold rush site. Having a chance to attend school is heavily conditioned by family circumstances as documented in the following section.

5 Youth mining narratives: the good, the bad, and the ugly

Seeking to gain insight into youth's views on artisanal mining life, the *Maisha Machimboni* (Life in the Mines) arts festival was held under the auspices of the UPIMA project at government secondary schools in the combined large-scale and mature artisanal site and at the rush site's primary school, given that there was no secondary school. There was generally a fairly even representation of male and female students at the festivals. After close consultation and collaboration with their teachers, the students were asked to express what it is like to live in a mining settlement in an artistic medium of their choice: poem, short story, essay, song, dance, sculpture, drawings, or plays.⁹

⁹ At Geita and Nyarugusu secondary schools the performances of students' plays, poems, and short stories were accompanied by written scripts, which was not the case at Ikuzi primary school, so analysis of the students' narratives will be restricted to Geita and Nyarugusu.

I will focus on the work of the secondary school students who wrote essays analysing the impact of mining generally enumerating an array of both pros and cons with a heavy weighting to the latter. The students were in their late teens or older with a mature appreciation of the complexities of social and political processes taking place in Tanzanian mining at local, regional, and national levels. They were acutely aware of living in pioneering settlements whose boom and bust economies made for a great deal of opportunities and excitement as well as poverty and pathos, many felt that they were the 'lucky ones' residing in a place where they were availed both a secondary school education and opportunities to earn cash. Uppermost in their minds was a sense of relativity and awareness about the inequalities associated with large-scale and artisanal mining.

In their daily lives, Honwana (2012) sees youth gravitating towards associational ties with like-minded youth, spending time in leisure-time pursuits that may have political undertones such as rap music that forcefully expresses disenchantment with the status quo. Composing rap songs as an outlet for expressing their feelings of exclusion and neglect, youth share a sub-culture of muted protest that instils a sense of solidarity and empowerment. At the same time, many youth, from a position of marginality and need, have to engage in economic activities on the border between legality and illegality. As daily survival practices, such activities are generally tolerated by the elites, but if threatened, youth are capable of rising up in mass protest and fighting for their rights to subsistence, not unlike peasants' protests insisting on a moral economy when they encounter barriers to the pursuit of adequate household food production (Bryceson 2010).

The poems, stories, and plays written by Form 4 students combined youthful political indignation with a pragmatism moulded by the economic realities and opportunities of their mining settlements, affirming Howana's (2012) argument. Attitudes are conditioned by the location and unfolding nature of the specific mining sites. In Geita, students weighed the expansion of business opportunities, the availability of employment and more social services against the impact of mining's deforestation, environmental pollution and weak government administration in matters related to ownership, control and contestation of mining areas and mineral rights sometimes leading to serious and occasionally deadly conflicts. While critical of the Geita Gold Mine and miners generally, the students stressed that the allure and sometimes corrupting influence of mining affected most of the settlements' residents, including themselves. This was evident in the repeated theme of being torn between pursuing one's studies as opposed to male youth becoming miners, and female youth becoming 'good time' girls engaged in a search for love, fun, and economic security with miners. The following story is illustrative of the moral dilemmas that students-cum-miners face, as well as the resort to illegal activities in the contentious divide between large-scale and artisanal mining.

Box 1: Geita town short story: 'Wealth without trace'

Omary arrived in Geita at half past nine in the morning and without wasting time, he boarded a bus that was going to the mines. After arrival, he headed to a *genge* (small restaurant) to order some food. While eating he heard three young people roughly his age talking nearby.

'I have put everything in order. After we arrive it is about collecting the waste rock fast and getting out quickly. If we succeed, then we are out of poverty' he said.

'OK when?', one of them asked. 'We'll go at night-time so that we are not visible. You know we are entering without permission.'

Omary thought: Aha..! They are going to the mines, I should go with them. He approached them and asked: 'How are you?' They answered: 'Fine, how about you?'

There was a silent hesitation then he continued, 'My name is Omary. I'm going to the mine. Can I join you as I am new to the mines?'

'Where are you from, and what makes you come here? I am a Form 4 student, but I failed to pay for my examination fees, so I decided to leave school and come to look for money, so that I can pay the fees as I like to study very much.'

'Who gave you the idea of coming here?' they queried.

'One day I heard some people talking about mining, and how successful they were, so I became interested and here I am.'

'Where are you staying?'

'I have just arrived.'

'OK, no problem. We have a room just nearby and we will stay together. We will prepare to go to the mine tomorrow night and everybody will take his share if we are successful'

'Thank you very much for your kindness.'

'Don't worry.'

The next day, at ten in the evening they started their journey to the mine. They used shortcut paths and went straight to the area where the company kept its waste rock (*magwangala*). They collected the rocks and filled their bags. Without wasting time they left quickly using the same paths that they had passed earlier. They were moving carefully but at high speed. After managing to get out they went to the wash and ball mill to process the minerals. To their delight the extracted gold was considerable and it was worth a good price. They divided the money between themselves.

Omary was very happy, congratulating himself that indeed he had escaped poverty. He thought to himself: 'There's no need to go back to school. I am going to rent a room in Geita town and start a business'. He announced to his friends 'I'm not returning to school.' His new friends seemed to be totally in agreement with his thinking.

He went to Geita and rented a room and opened up a small shop selling hardware equipment. He started drinking alcohol and enjoying the ladies. He became well known in the various dance clubs in Geita. One day he met a girl called Tina, who he fell in love with. She started living with him and he entrusted all his belongings to her. One night he didn't make it home. Angry, Tina promptly sold all his goods and disappeared. The following morning Omary arrived at home still drunk and opened the door to find the house empty. He could not do anything because of his drunken state and slept on the floor.

When he woke up in the afternoon, he tried calling Tina but she was unreachable. As he sat feeling sorry for himself, he heard somebody knocking at the door. It was the landlord demanding the rent. Unable to pay, Omary was instructed to surrender his room. Thinking about his options as he vacated the house, he decided he had to get back to the mines to look for money.., 'and if I succeed I will shun women and shun luxury...'

He started the journey of going back to the mines, this time he was alone, he followed the same short cut paths. He managed to enter the mine and collect the *magwangala*, filling his bags and moving quickly to get off the mine premises. But alas he heard a big sound 'puuu' followed by a bullet penetrating his chest. He cried out 'Aaaahh I am dying'. He collapsed on the spot and became still like water in a pot, already his soul had left his body.

Source: UPIMA Maisha Machimboni festival, written by Zainabu Rashid, Form 4 female student, Geita Secondary School, 1 August 2012, translated by Elard Mawala.

Unlike Geita, where large and artisanal mining exist side by side, Nyarugusu was an artisanal settlement experiencing booms and lulls in gold mining for over thirty years. Some mining families had witnessed the entire period, and had 'mining in their blood'. Artisanal mining is a quick option for getting cash and, during boom times it can be a route out of poverty. The Form 4 secondary students were both lured towards mining and wary of its consequences, as evidenced in the following essay as illustrated in extracts from an essay by a 'mining-student':

Mining is my livelihood. I am the oldest one in our family and our parents died when we were very young. I am now the father and mother of the family. So

minerals help to meet our needs ... I sell the gold that I dig to get income to use for buying food and other necessities for myself and my young brother and sisters. Mining has helped me to gain income that assists me in paying my school fees ... However, mining activities have interfered with my education. When I need money I mine and find myself missing classes. I failed to perform well in my exams last term (Form 4 male student, 19 years, Nyarugusu Secondary School, 30 July 2012).

While boys are drawn to working in the pits, girls are distracted by the prospects of enjoying the good life as girlfriends of miners. There are many bars in and around Nyarugusu where young girls can find employment as barmaids and meet men, often several years older than themselves (Bryceson, Jønsson, and Verbrugge 2014). The tensions that young women face are reflected in the following poem written by three female students.

Box 2: Nyarugusu poem: 'Life in the mines is entering our minds'

We attend school, but it takes time and doesn't pay,
We don't value studying, we think about minerals,
When we go to the mines, we find temptations,
Life in the mines is entering our minds.

Our academic studies are falling, the mines are ruling,
Teachers instruct, but students don't listen,
We miss classes, gold is ruling us,
Life in the mines is entering our minds.

When we leave school, to go home,
Our parents are at work, we end up cooking
The food is poor, at school and at home
Life in the mines is entering our minds.

The mines are disturbing us, especially us girls,
We surrender to temptations, failing to avoid them,
And we see our studies suffer,
Life in the mines is entering our minds.

Girls are getting pregnancies and HIV/AIDS
We are confronted with the mines' effects,
Problems we can never erase,
Life in the mines is entering our minds.

There are also deaths, people are buried in the pits,
We see orphans, roaming the streets,
We lack someone to take care of us,
Life in the mines is entering our minds.

We are now at the end, but not our end,
It is true that we face temptations and threats,
We live here, we need to fight against,
Life in the mines entering our minds.

Source: UPIMA Maisha Machimboni festival, by Justina Tano, Pili Juma, and Diana Shinde, Form 4 female students, all 17 years old, Nyarugusu Secondary School, 30 July 2012, translated by Elard Mawala.

This poem alludes to the frequent absence of parents from the home. Some students extended their critique of the status quo beyond the government and mining companies to their parents. Either the parents were seen to be too engrossed in their mining and other cash-earning activities, prone to separation and divorce related to the migratory movements of miners, or absent due to death connected with mining accidents or HIV/AIDS. Children and youth may be orphaned without extended family support given that they have been members of mining households, which are distanced from the natal homes of the parents.

Such complaints mark a radical twist in generational tensions. Preceding cohorts of youth were characterized by attempts to gain autonomy from parental control and elders' bridewealth impositions, whereas now, in the case of youth from families living *in situ* in mining settlements, there is regret that their parents are not on hand to give them care and concern. It should be added that the traditional generational contract has been broken with most people in mining settlements no longer marrying formally or paying bridewealth. Sexual relationships veer heavily towards casualization, a tendency found elsewhere in urban Tanzania, but not to the extent found in mining communities (Bryceson, Jönsson, and Verbrugge 2013; 2014; Rwebangira and Liljeström 1998).

5.1 Paradoxical expectations for youth's future careers

Despite the pre-occupation with mining on the part of youth and their parents, the 2012 UPIMA survey revealed that occupations requiring a high level of education were preferred by heads of household when they were asked about what aspirations they had for their children's future work lives. Curiously, mining was barely mentioned. Most hoped that their children would gain high status professional jobs. Interview findings from a total of 108 heads of households who commented on the career expectations of their children overwhelmingly revealed preferences for their pursuit of professional careers (68 per cent) requiring educational qualifications, followed by work in defence (9 per cent), semi-skilled, skilled, or natural talent fields (11 per cent), politics (4 per cent) with one budding president predicted, religious leadership (4 per cent), business (1 per cent), and farmers, housewives, waitresses or miners (4 per cent) (Appendix 3).

Only 1 per cent of the children were projected to become future miners. While parents worldwide are prone to wishful thinking in regard to their children's future, it is telling that such a minute percentage of children were expected to become miners, service sector workers and business people, occupational categories that overwhelmingly prevail in the mining settlements. This, however, accords with the fact that economically well-off parents in the mining settlement, who had money to invest in their children's futures, endeavoured to send their children to secondary schools in the regional towns away from the distracting influences of the gold-mining settlement (Bryceson, Jönsson, and Verbrugge 2013). People avidly worked in mining but most did not see it as a lifetime career from which they could gain personal fulfilment and social status.

6 Conclusion

Tanzania's mineralization, notably the expansion of the artisanal mining sector over the last twenty years, has provided enhanced employment prospects for youth. Migration from the countryside to the country's urbanizing mine settlements has been pronounced on the part of men. Young men have sought mining as well as tertiary service sector work in the booming mining settlements, while young women have concentrated primarily on service provisioning. This paper has distinguished youth who pursue mining as a full-time activity as opposed to those who mine part-time in combination with their studies.

Regarding the latter, raising children in mining settlements is posing several developmental dilemmas. First, there is a high incidence of family instability in which one or both parents may be absent; and second, youth face the dilemma of allocating their time between school and mining. Although they are not mutually exclusive, it is difficult to excel in both. There is a striking contrast between the immediate attraction of mining and its dismissal as a desirable occupational pursuit over the longer term. For many, artisanal mining is an interlude in their life and indeed an interlude in Tanzanian history that they know will pass. However, it offers an

economic opportunity that they are eager to grab while they can, hoping to later move on to work with fewer physical risks and social costs. This bears some resemblance to youth's participation in new sectors of the Tanzanian economy that arose in the past, notably the ivory and slave trade during the 19th century and migration and work in colonial plantations during the first half of the 20th century. In each of these cases youth were target workers who left the work once they had accumulated enough earnings.

Honwana's (2012) and Jua's (2010) stress on youth's disenchantment with the status quo is readily observable in Tanzanian mining settlements. Youth's censure of corrupt politicians extends to foreign mining corporations. Both are viewed as actors in an unholy alliance for mutual enrichment. In many cases, youth are also critical of their parents for insufficient care and attention to their upbringing and welfare. But they also engage in brutally honest self-criticism about the lure of mining for themselves in the here and now. For a number of reasons, Honwana's concept of 'waithood' bears reconsideration in the Tanzanian mining context.

Artisanal mining has opened a window of economic opportunity for youth. In artisanal mining areas, young people are likely to be experiencing greater economic empowerment than youth in rural and urban settings elsewhere in Africa. However there are serious trade-offs between: (i) pursuing education with long-term benefits versus mining with short-term benefits; (ii) gaining autonomy from parents and elders versus a lack of parental oversight; and (iii) traditional family coherence reinforced by bridewealth and strong ties to rural kin versus physical mobility, casual relationships, and urban lifestyles.

By taking on economic responsibility in a risk-filled occupation, and/or living in families where parents employed in the mining sector and associated service sector are so heavily pre-occupied, it is likely that youth, rather than postponing full adult maturity are being catapulted into premature adulthood. Is the loss of a relatively carefree and innocent adolescence worth the gain in economic autonomy? Most young Tanzanian miners would defiantly answer yes (Terres des Hommes Schweiz 2012).

The issue of youth employment in mining settlement is both delicate and complex. Young people who are full-time miners are likely to be identified as 'miners' rather than as 'youth'. They would be wary of being distinguished from other miners because of their young age since the vast majority are there by their own independent volition and are intent on being accepted as full-fledged miners and striking gold. Secondary school students, on the other hand, lured into part-time mining are responding to the need for cash, but they are clearly torn between that immediate goal and their desire to study to secure a professional job in the future. At present, they have little support when facing this dilemma. In contrast to the policy measures directed at HIV/AIDS awareness in mining communities and youth, identification of policy measures to help students cope with the school fee dilemma as well as other educational constraints they encounter rarely exists. The formulation of effective policies to address this problem would need to be grounded in in-depth dialogue with students and educational personnel about possible solutions. Above all, at this point, there is need for expanding general awareness about the on-going economic, social, and cultural transformation in mining settlements in which youth are playing a central role.

In conclusion, as in previous eras, youth are playing an active role in the emergence of new economic sectors and are currently engaging in and shaping the artisanal mining sector. Nonetheless, there is a discontinuity with the past in terms on the part of full-time, youthful miners, intent on improving their lives and gaining autonomy, who tend to be completely removed from elder or parental control and are rarely planning to return to their home areas. They are no longer endeavouring to earn bridewealth payments and return to their home areas to

farm, which marks a distinct break in the inter-generational contract between older and younger generations. So too, secondary school students' criticisms of their parents' absence from the home and their lack of parental care, can be interpreted as a new tension between the young and older generation.

Artisanal mining, particularly that related to mineral rushes, places high demands on male mobility and has an erosive effect on family life. There are several other drawbacks: artisanal mining is physically dangerous, its excavation depth is technically limited and as large-scale mining expands, it is bound to contract spatially as government-granted large-scale mineral rights increasingly gain precedence over those of artisanal miners, displacing artisanal miners and fuelling their conflictual incursions on large-scale mining. Most miners and mining settlement residents see artisanal mining as an opportunity of the moment, not one that can be counted on far into the future. Thus Tanzanian youth, whether they are full-time or part-time miners think of artisanal mining as a temporary fix or more optimistically a stepping stone to gaining capital to invest in another occupation elsewhere. In other words, for most youth, despite all its pitfalls, mining can be a means to a better future but not their chosen future.

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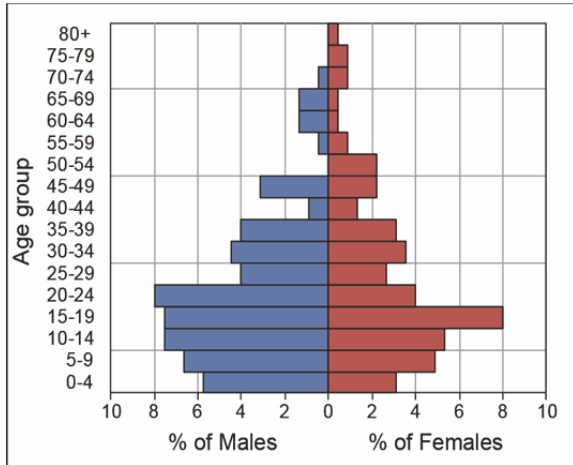
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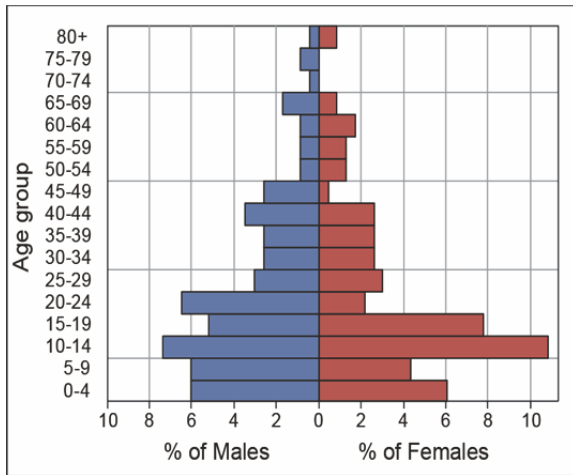
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Appendix 1: Age/sex pyramids for Tanzanian gold mining sites

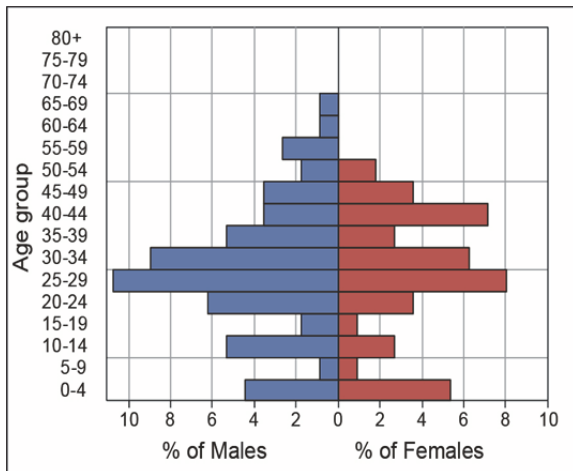
Large-scale mine site: Geita



Artisanal mature site: Nyarugusu



Artisanal rush site: Ikuzi



Appendix 2: Tanzanian mining settlements' household membership, gender composition, and student offspring

Mean averages	All settlements	Geita large-scale	Nyarugusu mature artisanal	Ikuzi rush artisanal
Household members	5.26	6.25	6.42	3.11
No. of non-family	0.15	0.03	0.08	0.44
No. of males	2.78	3.44	3.28	1.75
No. of females	2.48	2.78	3.14	1.36
Sex ratio	112	123	104	129
No. of sons	1.24	1.36	1.89	.42
No. of daughters	1.07	1.11	1.58	.25
No. of students	1.68	2.17	2.04	.28
Male students	0.96	1.33	1.17	0.22
Female students	0.72	0.83	1.03	0.06
M/F education ratio	133	160	114	367
% sons studying	77%	98%	62%	52%
% daughters studying	67%	75%	65%	27%

Source: 2012 UPIMA mining settlement survey.

Appendix 3: Parents' expectations children's future careers (213 children)

Anticipated occupation of offspring	% of total	Educated, professio-nal	Defence	Semi-skilled, skilled, talented	Business	Politics	Religion	De facto work
Doctor	15.5	15.5						
Nurse	17.4	17.4						
Teacher	18.0	18.0						
Police, soldier	8.7		8.7					
Lawyer, judge	5.0	5.0						
Engineer, scientist	3.7	3.7						
Semi-skilled*	5.0			5.0				
Journalist, broadcaster	3.7	3.7						
Pilot	2.5	2.5						
Religious leader: pastor, sheik	3.7						3.7	
Banker, accountant	0.6				0.6			
Skilled**	3.1			3.1				
Regional politics***	3.1					3.1		
Public service****	1.9	1.9						
National politics: President	0.6					0.6		
Business administration & management	0.6				0.6			
Talent: artist, footballer	2.5			2.5				
Farmer	1.2							1.2
Housewife, waitress	1.9							1.9
Miner	1.2							1.2
TOTAL	100.0	67.7	8.7	10.6	1.2	3.7	3.7	4.3

Notes: *Semi-skilled: mechanic, tailor, secretary, mason, driver; **Skilled: technician, computer programmer, electrician, plant operator, communications, artisan; ***Regional politics: Member of Parliament, Councillor, District Commissioner; ****Public service: civil servant, agronomist, land surveyor.

Source: 2012 UPIMA survey.