THE DECLINING COFFEE ECONOMY AND LOW POPULATION GROWTH IN MWANGA DISTRICT, TANZANIA

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ABSTRACT North Pare Mountains in Mwanga District of Tanzania's northern highlands are part of the Kilimanjaro coffee zone, and coffee has led the local economy of this district since at least the time of national independence in 1961. However, under the economic liberalization policies introduced in 1986, coffee production in Mwanga has decreased dramatically from approximately 700 tons in 1985/86 to 100 tons in 2004/05. The population of the district grew only by 1.23% annually from 1988 to 2002, a rate lower than the averages for Kilimanjaro Region and Tanzania Mainland as a whole. The mountain villages suitable for coffee production have had low growth, whereas those in the western plain area along a major road have had high growth rates. Adverse economic conditions may have accelerated the historical outmigration from the mountains. Concurrently, in the western plain, towns and suburbs have offered better economic opportunities since the introduction of the new national development policy, "Poverty Reduction Strategy" in 2000. Here, I use district-level data, as well as information from field surveys to examine the decline of the coffee economy and its relationship to low population growth in Mwanga District.

Key Words: Coffee; Livelihood strategy; Migration; Population growth; Tanzania.

INTRODUCTION

Mwanga District is one of six districts in Kilimanjaro Region of northern Tanzania. The district contains North Pare Mountains, which are part of "Kilimanjaro" coffee zone of Tanzanian Northern Highlands. Historically, the Pare people (the dominant ethnic group of this district) have lived in these relatively cool, moist, and easily defensible mountain areas (Photo 1-1). Like residents of other mountainous areas in the Northern Highlands, residents of North Pare Mountains have planted coffee and several varieties of banana in mountain fields (Photo 1-2), and maize in plain fields since the colonial era. Population pressures have pushed some younger generations to migrate from the mountains to other rural areas, including the drier plains within the Pare's homeland; income from coffee has allowed others to move to urban areas to seek higher education and associated careers.

However, the Structural Adjustment Program (SAP), economic liberalization policies that were introduced in 1986 have caused coffee production to decline in this and other districts of Kilimanjaro Region. Coffee growers have faced difficult conditions, and the district has experienced very low population growth in recent years. In the period between the two most recent national censuses in 1988 and 2002, the district's population rose only 1.23% annually, a rate lower than the average for Kilimanjaro Region (1.61%) and much lower than the average

for mainland Tanzania (2.92%). Low population growth is distributed unevenly among the villages of Mwanga District. Many villages in North Pare Mountains (hereafter referred to as "Mountain") that are suitable for coffee production have experienced negative population growth. In contrast, populations have growth faster than the district average in villages and towns on the plains below both sides of North Pare Mountains (hereafter referred to as "West Plain" and "East Plain"), especially along the major road from Dar es Salaam (Tanzania's primary city) to Arusha (the largest city in northeastern Tanzania). These patterns suggest substantial out-migration as a strategy for coping with the declining coffee economy and demographic movement within the district from Mountain to Plains.

Movement from Mountain to Plains is a historical trend, and thus the low population growth in Mountain is not so striking. However, the negative population growth over the last 20 years appears to be a new phenomenon. The weak coffee economy can support fewer people in Mountain, even less than the population at the time of prosperity. At the same time, rural-rural migration from Mountain to Plains is not preferable from the viewpoint of agricultural production. Mwanga District has suffered from chronic food shortages caused by droughts and floods. Compared with Mountain farms, those on Plains have more commonly suffered from serious crop failures. Additionally, much of the good arable land on Plains is already occupied by Plain residents or older generations of Mountain, leaving little land for newcomers. Few job opportunities exist in urban centers of Mwanga District, which serve mainly as centers for administration and small trade, not centers of large-scale industry and production. Despite such unfavorable conditions, migration from Mountain to Plains persists, and population growth on Plains is much higher than that in Mountain.

Here, I present recent socio-economic trends in Mwanga District, a subunit of Tanzanian Northern Highlands. The study is based on field surveys in Mountain and Pain villages and on various data from reports by the District Agriculture and Livestock Development Office (hereafter referred to as the "Kilimo Office") of Mwanga District.

TANZANIAN COFFEE ECONOMY AND THE NORTHERN HIGHLANDS

I. World Coffee Trends

Coffee production by members of the International Coffee Organization increased from an average of 4.5 million tons/year in 1976–1980 to 6.5 million tons/year in 2001–2005, despite the collapse of the International Coffee Agreement in 1989 and the price crisis of the early 2000s. Expanding production in Latin America (from 2,819.1 to 4,135.4 thousand tons) and Asia/Pacific (from 490.4 to 1,606.9 thousand tons) has contributed to this trend (Fig. 1). In contrast, production in Africa has decreased from 1,126.5 to 869.6 thousand tons yearly, placing Africa in a marginalized position in the world coffee market.

Among African countries, the trends of coffee production from 1976 to 2005 have varied. Of 25 African countries that are members of the International Cof-

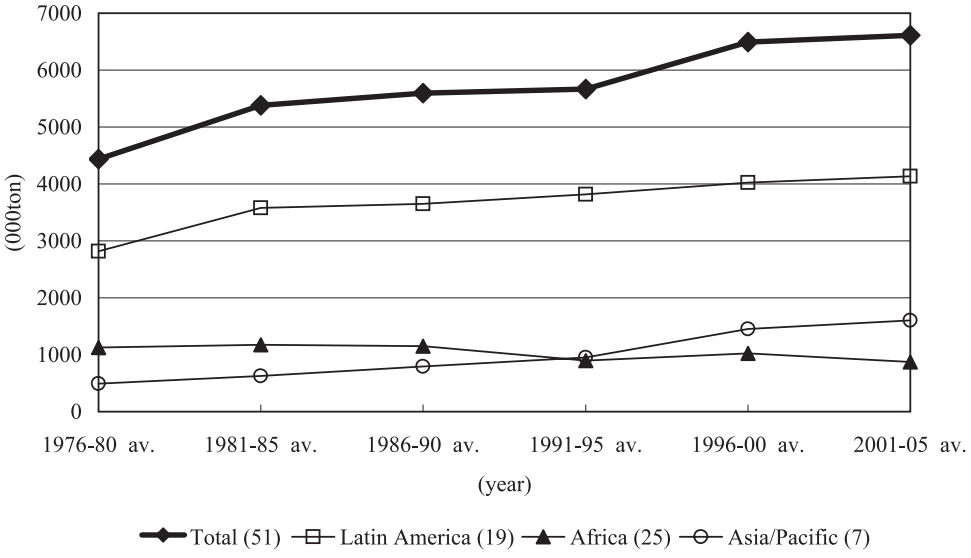


Fig. 1. Trend of Annual Coffee Production by Area.
Source: Calculation from ICO (International Coffee Organization). Online. http://www.ico.org/asp/display1.asp. (accessed on July 12, 2006).
Note: Figures in brackets show the number of countries.

Table 1. Percentage of Domestic Consumption to Total Demand in Crop Year.

(%)

	1976–1980 av.	1981–1985 av.	1986–1990 av.	1991–1995 av.	1996–2000 av.	2001–2005 av.
Ethiopia	55.7	54.9	52.5	50.9	46.8	48.5
Uganda	1.4	1.6	2.8	2.7	2.9	6.1
Cote d'Ivoire	4.8	4.7	3.3	1.5	2.4	12.4
Kenya	3.2	3.3	5.1	3.2	4.2	6.9
Cameroon	2.2	3.4	4.6	10.0	7.8	10.1
Tanzania	2.3	1.9	0.8	1.7	2.1	4.2
Congo, D.R. of	15.9	12.4	10.9	17.5	31.0	55.6
Madagascar	11.5	18.0	25.3	30.7	20.4	70.9
Burundi	0.8	0.2	0.3	0.3	0.5	0.6
Rwanda	0.6	0.2	0.2	0.3	0.8	0.3
Africa av.	8.9	9.7	12.9	20.6	17.7	28.6
L/America av.	30.8	27.7	26.9	31.7	35.3	43.4
Asia/Pacific av.	44.1	30.6	30.1	33.0	34.3	45.6
World av.	22.4	19.3	20.5	26.4	26.7	36.8

Source: Calculation from ICO (International Coffee Organization). Online. http://www.ico.org/asp/display1.asp. (accessed on July 12, 2006).
Note: Total Demand means total amount of demestic consumption and export.

fee Organization, production decreased in 16, but increased in 9. Production in Tanzania has decreased gradually since the late 1980s; in contrast, Ethiopia recovered and increased its production level and Rwanda increased its production once and has recently recovered following a long period of civil war (ICO, Online: http://www.ico.org/asp/display1.asp). The level of domestic consumption also differs among African countries. Of the top 10 production countries in 2001–2005, Ethiopia, the Democratic Republic of the Congo, and Madagascar had steady domestic markets, whereas Tanzania, Rwanda, and Burundi depended heavily on international markets (Table 1). Because of this dependence, Tanzania, Rwanda, and Burundi appear to have suffered more directly from fluctuating international prices. In general, African countries have depended on the world market more heavily than have Latin American and Asia/Pacific countries.

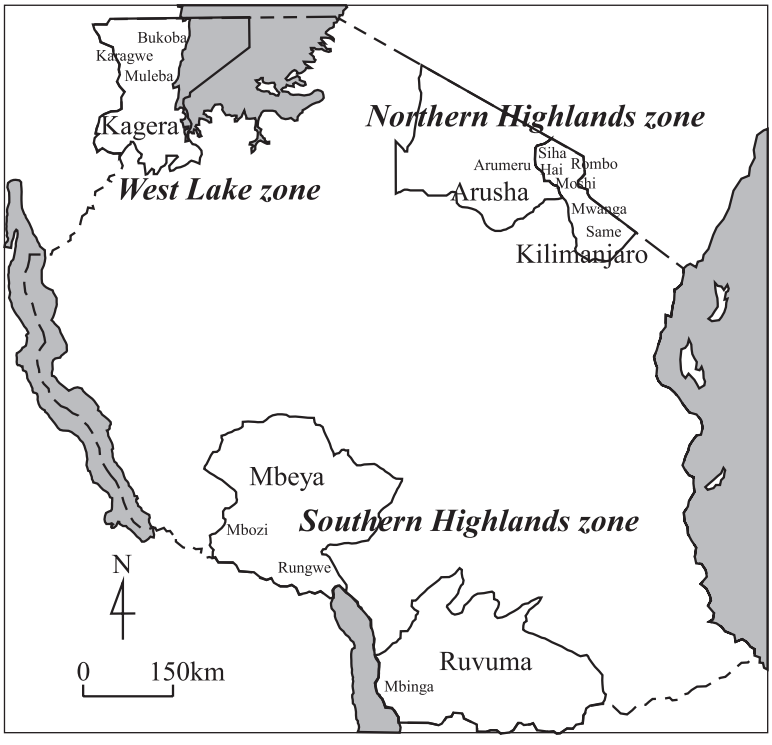
Tanzanian mild Arabica coffee called "Kilimanjaro" is particularly vulnerable because it is sold to only a small number of importing countries. Of the average annual export of 29.0 thousand tons in the recent 7 crop years from 1999/00 to 2005/06, 12.5 thousand tons and 9.0 thousand tons per year were exported to Germany and Japan respectively (TCB, n.d.2).

Some organizations in Japan have already begun to import "Fairtrade" Kilimanjaro coffee. Although the Fairtrade collaboration benefits producers, coffee farmers have had to engage in a wide range of coping strategies, including production decreases. I outline socio-economic conditions and related coping strategies below.

II. Policy Changes and Impacts on the Coffee Economy of Tanzania

Economic liberalization policies marked a turning point for Tanzanian coffee production. In 1986, Tanzania agreed with the World Bank and International Monetary Fund (IMF) to introduce the Structural Adjustment Program (SAP), which included the promotion of export commodity production and cutting of central government expenditures. Whereas these policy measures were considered necessary to recover the macro-level Tanzanian economy, Tanzania's coffee producers suffered from lower earnings, shortages of agricultural inputs, and greater cost sharing of educational and health expenses.

Tanzania has three main coffee production areas: the Northern and Southern Highlands zones for Arabica coffee, and the West Lake zone for Robusta coffee (Fig. 2). Administratively, the coffee production areas in the Northern Highlands zone are composed of all six districts (Rombo, Moshi, Hai, Siha, Mwanga, and Same) of Kilimanjaro Region, as well as Arumeru District of Arusha Region. Those in the Southern Highlands zone are mainly comprised of Mbozi and Rungwe districts of Mbeya Region and Mbinga District of Ruvuma Region, whereas the West Lake zone contains Bukoba, Karagwe, and Muleba districts of Kagera Region. Fig. 3 shows trends in coffee production by region. Mild Arabica coffee produced in Kilimanjaro and Arusha regions of the Northern Highlands by small-scale coffee farmers and large estates has decreased, whereas production has increased in the Southern Highlands among small-scale coffee farmers in the Ruvuma and Mbeya regions. Today, "Kilimanjaro" coffee is mainly produced in



legend: Mwanga=District's name Kilimanjaro=Region's name
Northern Highlands zone=collective name of area

Fig. 2. Main Coffee Production Regions/Districts in Tanzania.
Source: Tanzania, MOAC & NBS (Ministry of Agriculture and Cooperative & National Bureau of Statistics) 2001. *District Integrated Agricultural Survey 1998/99*, volumes for Kilimanjaro, Arusha, Mbeya, Ruvuma, and Karega regions. MOAC/NBS, Dar es Salaam.

the Southern Highlands, far from Mt. Kilimanjaro. Production increases in the Southern Highlands have offset declines in the Northern Highlands, so that Tanzania's average coffee production has not shown a dramatic drop since the late 1980s.

Differences in production trends in the Northern and Southern Highlands suggest different coping strategies among coffee farmers in reaction to the adverse coffee economy. In general, coffee growers have the following options:

1) No strategy (wait for producer prices to recover)
2) Strategy within the coffee subsector, such as
   2-1) Expanding the area of coffee production
   2-2) Differentiating one's produce from others' (e.g., organic, Fairtrade)
3) Strategy within the agricultural sector, such as
   3-1) Changing the cropping pattern
   3-2) Shifting to dairy farming
4) Strategy in another sector

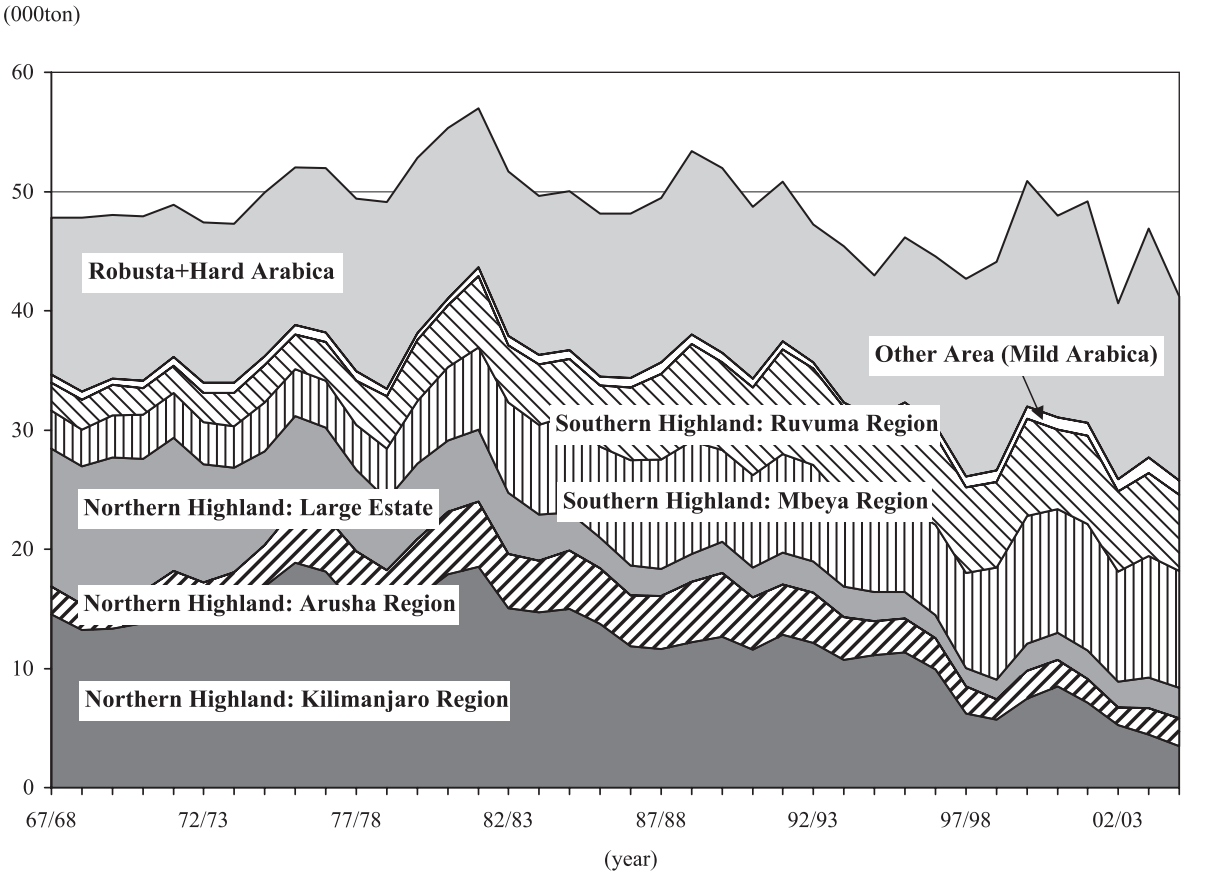


Fig. 3. Coffee Production by Region (1967/68–2004/05). (3-year shifting average).
Source: Data provided by TCB (Tanzania Coffee Board) on 11/Aug/2006, titled "Coffee Production by Type and Region (1967/68–2004/05)".

4-1) Engaging in nonfarm activities within villages and/or towns nearby
4-2) Engaging in migrant labor mainly in large cities
5) Complete household out-migration to another rural area.

Although option 1) (no strategy) is common, many Northern Highlands coffee farmers have adopted strategies other than 2) (changes within the coffee subsector), whereas Southern Highlands farmers have preferred option 2). This difference between the two Highlands zones reflects their differing historical, economic, social, and agro-ecological backgrounds. For example, the Northern Highlands are located within intensive road and railway networks between Tanzania and Kenya, whereas the Southern Highlands are still relatively remote. Proximity to transportation, as well as other factors, appears to have enabled farmers in the Northern Highlands to diversify economically, whereas farmers in the Southern Highlands have had to rely more heavily on coffee production.

III. Coffee Economy and Economic Diversification in the Northern Highlands

A national sample census reported 114,102 coffee-producing households and 41,573 ha of coffee farms in the Northern Highlands in 2002/03 (Tanzania, NBS & MAFS, 2006a: Appendix II Table 7.3.3), whereas there were 149,180 coffee households and 60,000 ha of coffee farms in 1998/99 (Tanzania, MOAC & NBS, 2001: Appendix A2 Table 13D). Tanzanian Northern Highlands, the so-called Kilimanjaro coffee zone, have historically been one of the richest rural areas in Tanzania; since the colonial era, farmers of the region have enjoyed relatively high living standards from their coffee income. Coffee produced a positive economic cycle. Coffee income allowed farm households to save money, which they could then invest in capital goods related to coffee production or other agricultural production, nonagricultural activities, and education. The highly educated younger generation migrated to large cities to seek jobs in the formal sector[(1)]. This migration pattern reduced population pressures on agricultural land, and urban migrants supported their home villages through remittances. Coffee income thus contributed to economic diversification in the Northern Highlands.

One example of economic diversification is dairy farming. The Tanzanian government promoted dairy farming in the late 1960s, when coffee prices declined. Smith noted as follows:

> The Government of Tanzania recognized the depression in the coffee economy and launched a nation-wide coffee diversification program as part of her second Five Year Development Plan in 1968, by means of assistance from the International Coffee Agreement. The ICA had set up a Coffee Diversification Fund to stimulate the introduction of new crops on land where coffee previously grew. To diversify the agricultural economy on Mt. Kilimanjaro the authorities were trying to develop commercial dairying based on high-grade dairy cows (mostly Jersey and Guernsey) (Smith, 1980: 33).

According to livestock censuses in 1984, 1994/95, 1998/99, and 2002/03, Tanzanian Northern Highlands (i.e., Kilimanjaro and Arusha regions) held more than half of the country's national total population of dairy cattle (Tanzania, MALD,

Table 2. Distribution of Household by Main Source of Cash Income (2000/01).

(%)

Main Cash Income Source / Region	Kilimanjaro	Arusha	Ruvuma	Mbeya	Kagera	Mainland Total
Sales of food crops	42	32	24	50	55	41
Sales of livestock	5	17	0	0	2	3
Sales of livestock products	1	1	1	0	0	1
Sales of cash crops	12	10	56	12	21	17
Business income	10	11	6	15	6	13
Wages or salaries in cash	6	16	6	6	5	9
Other casual cash earning	8	7	3	9	5	6
Cash remittances	11	1	2	3	2	4
Fishing	3	0	1	0	2	2
Other	2	5	2	4	2	4
Total	100	100	100	100	100	100

Source: Tanzania, NBS (National Bureau of Statistics) 2002. *Household Budget Survey 2000/01*, Table C25. NBS, Dar es Salaam.

1987: Table 12.1; Tanzania, MAFS, 2002: Table 10.1; Tanzania, NBS & MAFS, 2006b: Appendix II Table 18.6). Farmers in the Northern Highlands thus have not relied solely on coffee, having diversified their economic activities even before the introduction of the economic liberalization policies.

Careful examination of coffee production trends in the Northern Highlands (Fig. 3) indicates that the decline in coffee production actually began before the introduction of SAP policies in 1986, although these policies did accelerate the economic diversification trend. As a result, the percentage of households reporting "sales of cash crops" as their main cash income source was smaller in Kilimanjaro Region in 2000/01 than for Tanzanian Mainland average or in other regions (Table 2): only 12% of households in Kilimanjaro Region as opposed to 56% in Ruvuma Region, which contains one of the main coffee production areas, Mbinga District. Today, the share of "sales of food crops" in Kilimanjaro Region is similar to the national average. Although the "share of livestock products" appears too small given the number of dairy cattle mentioned above, the high share of "cash remittances" is remarkable in Kilimanjaro Region and reflects investments in education by households of the Northern Highlands. Out-migrants with higher education and resulting higher paid careers can send greater remittance amounts home to their families.

As noted above, such diversification of income sources began prior to the SAP introduction in the Northern Highlands; recently, however, this coping strategy has encountered limits. Table 3 lists some socio-economic indicators for rural Tanzania. Kilimanjaro Region has held a top position among the regions, according to indicators 1 to 8, which are assets reflecting past prosperity; however, the region lost its top position for indicators 12 to 15, which show the present economic situation. Further, indicators 9 to 11 show that the region has the most

Table 3. Some Socio-economic Indicators for Rural Area in Kilimanjaro (2000/01).

			Kilimanjaro Region		Tanzania Mainland Rural average
			Rural	Rank in regions*	
Housing	1	Households living in modern materials	84%	1/19	31%
	2	Households reporting connection to the electricity grid	13%	1/19	2%
Education	3	Secondary education (form 1–6) of adults (aged 15+)	8%	1/19	2%
	4	Adults literacy rate	84%	1/19	67%
	5	Mean distance to primary school	0.9 km	1/19	2.1 km
	6	Mean distance to secondary school	5.3 km	1/19	15.4 km
Health	7	Mean distance to a dispensary/health centre	2.0 km	1/19	4.7 km
	8	Source of drinking water - piped	60%	1/19	28%
Land	9	Mean area of land owned across all rural households	1.5 acre	19/19	5.3 acre
	10	Rural households owning any land for farming/ pastoralism	75%	19/19	89%
	11	Mean area of land owned for rural households that own any land	2.1 acre	19/19	6.0 acre
Income	12	Mean per capita household monthly income	TShs. 12,917	12/19	TShs. 14,128
	13	Mean expenditure per adult equivalent	TShs. 11,060	4/19	TShs. 10,064
	14	Households below the food poverty line (rural+urban)	11%	5/20	19%
	15	Households below the basic needs poverty line (rural+urban)	39%	7/20	36%

Source: Tanzania, NBS (National Bureau of Statistics) 2002. *Household Budget Survey 2000/01*, Table C2, C3, C9, C13, C15, C17, C18, C26, C27, C28 & C29. NBS, Dar es Salaam.
Note: * In most cases, Dar es Salaam Region is excluded, because data for rural area are not available.

serious land shortages in Tanzania.

Tanzania introduced the Poverty Reduction Strategy as a national development policy in 2000. Compared with the SAP, this policy emphasizes the educational and health sectors and presents farmers with new opportunities for improving their livelihoods, as well as the regional economy as a whole.

In the initial stage of our research (a 3-year research project from 2004 to 2006 supported by the Grant-in-Aid Scientific Research of the Japan Society for the Promotion Science. Project No. 16252005 of 2004 headed by Jun IKENO), we examined whether there were any collective coping strategies among farmers of the Northern Highlands in the same cash crop production area. However, that research showed only a weak movement. We thus focused our research on the variety of coping strategies within subunits of the Northern Highlands. Four mountainous areas comprise the Northern Highlands: Mt. Kilimanjaro, North Pare

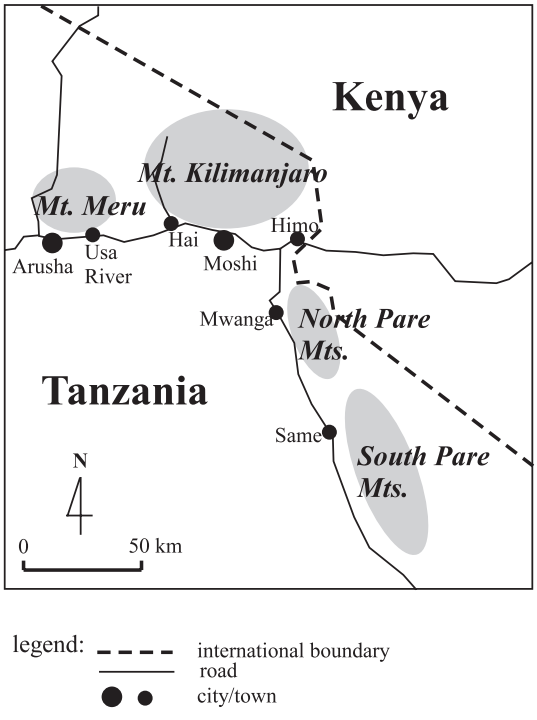


Fig. 4. Rough Image of Tanzanian Northern Highlands.

Mountains, South Pare Mountains, and Mt. Meru (Fig. 4). The Chagga people are the dominant ethnic group of the Mt. Kilimanjaro area; the Pare (or Gweno and Asu) are dominant in North and South Pare Mountains; and the Meru and Arusha are dominant in Mt. Meru area. Administratively, Mt. Kilimanjaro is located in Rombo, Moshi, Hai, and Siha districts of Kilimanjaro Region; North Pare Mountains are in Mwanga District; South Pare Mountains are in Same District; and Mt. Meru is in Arumeru District of Arusha Region. Cooperative unions have also worked in particular areas: Kilimanjaro Native Cooperative Union (KNCU) in Mt. Kilimanjaro area, Vuasu Cooperative Union in North and South Pare Mountains, and Arusha Cooperative Union in Mt. Meru area. These unions handled coffee monopolistically before marketing liberalization was instituted in 1994/95 and have had differing functions since that time. These differences from the viewpoint of geography, ethnicity, and marketing institutions are reflected in the various coping strategies among subunits within the Northern Highlands. Here, I focus on conditions and trends in Mwanga District.

OVERVIEW OF MWANGA DISTRICT

North Pare Mountains run from north to south in the center of Mwanga District (Fig. 5). To the east of Mountain lies “East Plain,” bordering the Republic

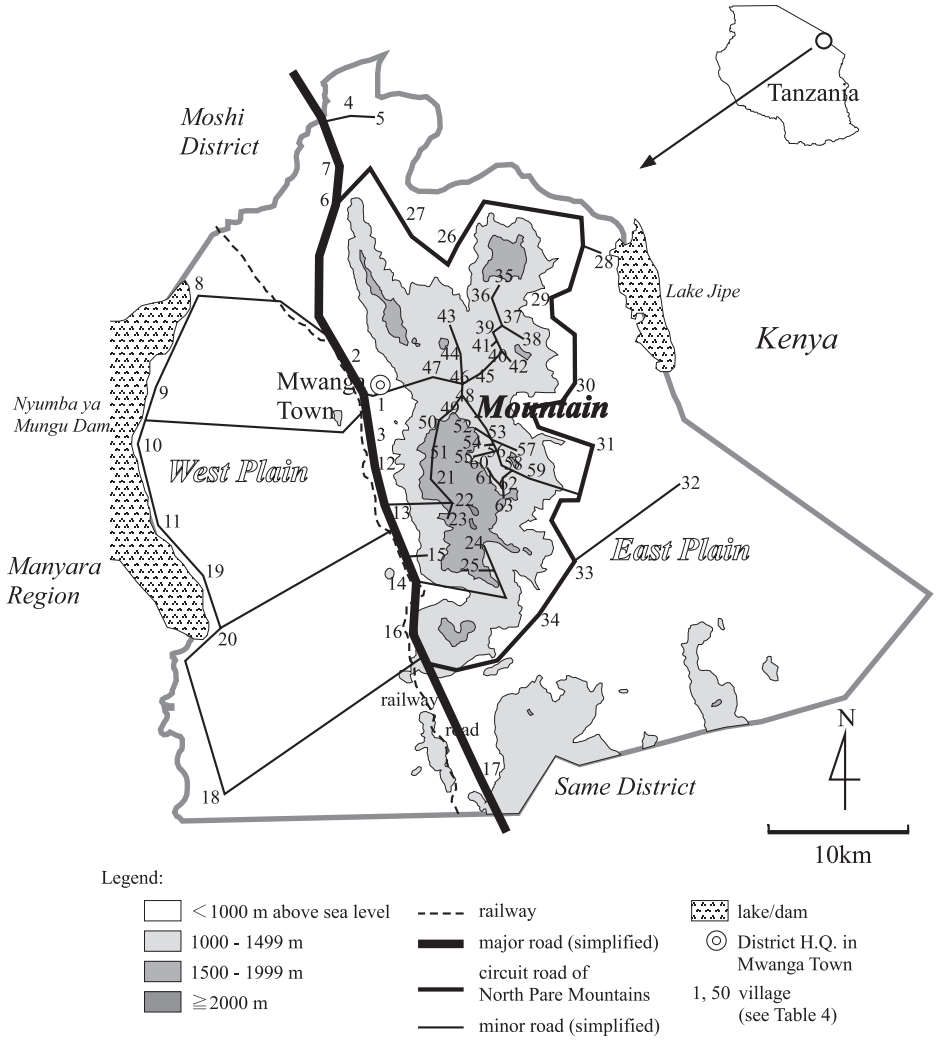


Fig. 5. Mwanga District.
Source: Base map: The Tanzanian-Finnish Multidisciplinary Research Project n.d. *Mwanga 1991–1994 Project: Local Actors in Development*. Unpublished Pamphlet.
Location of village (office) & road networks: Measured by Ikeno with the global positioning system in Aug. 2004.

of Kenya at Lake Jipe. To the west lies "West Plain," bordering Manyara Region at Nyumba ya Mungu Dam (Photo 1-3). Moshi District and Same District of Kilimanjaro Region are located to the north and south, respectively. The mountain ranges from 1,000 to 2,000 m above sea level. Of the 2,640 km^2 total area of Mwanga District, Mountain comprises 810 km^2, whereas East Plain and West Plain comprise 1,230 km^2 and 600 km^2, respectively. By land use, forests comprise 120 km^2, forest reserves 207 km^2, game reserves 445 km^2, cultivated land 443 km^2, residential areas 119 km^2, and grazing areas unsuitable for agriculture 1,207 km^2

Table 4. Names of Villages, Their Coffee Production and Population in Mwanga District.

Division	Ward	Village	No in Fig. 5	Zone*	Coffee Production Area (ha)			Population (person)			Population Growth of Unit Area (UA)***	
					1978/79	1986/87	1990	1978	1988	2002	1978–88	1988–02
Mwanga	Mwanga	Mwanga	1	WP				2,303	4,471	8,635	○	○
		Kisangiro	2	WP					1,043	1,364		
		Kiruru Lwami	3	WP				1,237	1,763	2,330	○	△
	Kifaru	Kileo	4	WP				2,507	3,221	2,973	△	△
		Kivulini	5	WP						1,597		
		Kifaru	6	WP				2,439	3,002	2,963	△	○
		Kituri	7	WP						2,933		
	Lang'ata	Handeni	8	WP				461	809	1,592	○	○
		Lang'ata Bora	9	WP				1,260	1,687	2,647	△	○
		Lang'ata Kagongo	10	WP				2,113	1,742	2,314	△	△
		Nyabinda	11	WP					787	1,266		
Lembeni	Lembeni	Kiruru Ibweijewa	12	WP				624	1,280	1,746	○	△
		Kisangara	13	WP	7			2,990	4,003	5,441	△	△
		Lembeni	14	WP	15			3,375	3,904	2,677	▲	△
		Mbambua	15	WP						980		
		Kiverenge	16	WP						1,373		
		Mgagao	17	WP				2,749**	2,249	3,167	○	△
	Kirya	Kirya	18	WP				1,436	1,217	3,828	△	△
		Kiti cha Mungu	19	WP				917	1,564			
		Njia Panda	20	WP								
	Ngujini	Songoa	21	M	10	95	34.8	897	516	614	▼	▲
		Ngujini	22	M	104	92	184.1	1,421	1,518	1,667	▲	▲
		Chanjale	23	M	71	36	62.3	631	769	726	△	▼
	Kilomeni	Kilomeni	24	M	63	94	73.7	1,850	2,144	2,443	▲	▲
		Sofe	25	M	122	106	80.9	1,500	1,666	1,798	▲	▲
Jipendea	Jipe	Kivisini	26	EP				400	862	885	○	▲
		Kwanyange	27	EP								
		Jipe	28	EP				1,049	990	961	○	▲
		Kambi ya Simba	29	EP					534	541		
		Butu	30	EP					609	738		
	Kwakoa	Kigonigoni	31	EP				980	1,632	2,153	○	△
		Toloha	32	EP				830	1,573	1,932	○	▲
		Kwakoa	33	EP				2,070	2,668	1,413	△	▲
		Ngulu	34	EP						1,742		
Ugweno	Mwaniko	Vuchama Ngofi	35	M	239	260	261.4	2,317	2,823	2,794	△	▼
		Mangio	36	M	93	109	173.6	1,361	1,549	1,528	▲	▼
		Mwaniko	37	M	146	189	225.4	2,731	3,136	1,907	▲	▲
		Mriti	38	M						1,237		
	Kifula	Raa	39	M	93	121	120.6	1,611	2,054	2,024	△	▼
		Kisanjuni	40	M	111	111	99.6	2,730	2,955	1,541	▲	▼
		Rangaa	41	M			127.1			940		
		Masumbeni	42	M	79	78	117.4	3,019	3,502	3,237	△	▼
	Msangeni	Simbomu	43	M	23	76	74.1	1,248	1,620	1,670	△	▲
		Mruma	44	M	49	60	57.5	1,505	1,696	2,058	▲	▲
		Msangeni	45	M	64	114	69.6	1,834	2,162	1,958	△	▼
		Mamba	46	M	35	74	53.0	1,073	1,278	1,033	△	▼
	Shighatini	Lambo	47	M	22	96	37.6	1,587	2,139	2,338	○	▲
		Shighatini	48	M	44	175	49.8	2,020	2,436	2,090	△	▼
		Mfinga	49	M	39	57	60.7	1,998	1,654	1,229	○	▲
		Mkuu	50	M						636		
		Vuchama Ndambwe	51	M	43	107	53.0		1,155	1,349		

(continued)

Table 4. (continued)

Usangi	Kighare	Kighare	52	M	25	30	60.3	1,375	1,550	1,313	▲	▼
		Ndanda	53	M	13	24	20.2	1,662	2,047	2,024	△	▼
		Kilaweni	54	M	10	38	9.3	1,496	1,663	1,596	▲	▼
		Kirongaya	55	M	28	40	36.8	1,096	1,112	1,048	▲	▼
	Kirongwe	Kiriche	56	M	4	56	5.7	969	1,017	940	▲	▼
		Mbore	57	M	9	20	23.5	1,328	1,657	1,423	△	▼
		Lomwe	58	M	10	45	11.7	1,404	1,370	1,185	▼	▼
		Vuagha	59	M	15	38	13.8	847	810	767	▼	▼
	Chomvu	Kimbale	60	M	15	43	14.2	1,223	1,421	1,396	△	▼
		Chomvu	61	M	25	57	27.1	1,387	1,532	1,604	▲	▲
		Mshewa	62	M	31	44	45.7	1,832	2,222	2,589	△	▲
		Ndorwe	63	M	43	47	57.5	1,619	2,221	2,252	○	▲
Total					1,700	2,532	2,342.0	77,311	97,002	115,145		

Source: 1) Kilimo (Mwanga District Agriculture and Livestock Development Office). *Food Position: Hali ya Chakula File [AGR/MW/FP/VOL. IV]*, Doc. No. 2 (19/Sept/2003) & *[AGR/MW/FP/VOL. V]* Doc. No. 106 (6/Jan/2006). Unpublished.
2) Do. *Sensa na Takwimu File [KI/S40]*, Doc. No. 18. Unpublished.
3) Do. *Coffee General File [C/GENERAL/VOL. I]*, Doc. No. 9 (n.d.) & Doc. No. 128 (n.d.). Unpublished.
4) Tanzania, BS (Bureau of Statistics) 1981. *1978 Population Census, Vol. II*, pp. 87–94. BS, Dar es Salaam.
5) Do. 1990. *Tanzania Sensa 1988: Pupulation Census Regional Profile: Kilimanjaro, pp. 256–265. BS, Dar es Salaam*.
6) Tanzania, NBS (National Bureau of Statistics) 2005. *2002 Population and Housing Census: Volume VII: Village and Street Statistics: Age and Sex Distribution: Kilimanjaro Region*, pp. 17–30. NBS, Dar es Salaam.

Note: * Zone: WP=village in West Plain, EP=village in East Plain, M=village in Mountain.
** Population of Mgagao in 1978 is including the population of Njoro in present-day Same District.
*** Unit Area (UA) will be used for the comparison of the population change in he main text.
Population growth: ○: ≥3.0%/year, △: 1.5%–2.9%/year, ▲: 0%–1.4%/year, ▼: < 0%/year.

(Kilimo, [AGR/C/EST/VOL. III]: Doc. No. 88). Mwanga Township, the capital of the district, is located on West Plain along the major road between Dar es Salaam and Arusha.

The Kilimo Office has classified 63 villages (or urban areas). Fig. 5 shows the locations of these villages by number, with the names of villages, wards and divisions listed in Table 4. The "villages" classified by the Kilimo Office differ slightly from the 63 villages listed in the Local Authorities Order 2000 (Tanzania, United Republic of, 2000) and the 58 villages indicated by the 2002 Population Census (Tanzania, NBS, 2005: Volume for Kilimanjaro Region, 17–30). For instance, Kisangiro (#2 in Fig. 5 and Table 4) and Kiruru Lwami (#3) villages of West Plain are independent villages on the Kilimo Office list, but were amalgamated into the Mwanga Township administrative unit (#1) in the Local Authorities Order 2000 list. In contrast, Karamba/Ndea and Butu/Ruru villages in East Plain referred to by the Local Authorities Order 2000 list were actually still subvillages of Toloha (#32) and Kigonigoni (#31) villages, respectively, when I conducted a field survey of villages in 2004. The 2002 Population Census did not include the names Kisangiro (#2), Kiruru Lwami (#3), Kiti cha Mungu (#19), Njia Panda (#20), and Kwanyange (#27). One of the reasons the Kilimo Office classifies villages is to allocate units of food relief. Therefore, for this need, former Kiruru Lwami and Kisangiro villages are still considered separate from the old urban

area of Mwanga Township. I follow the Kilimo Office classification method, by which there are 34 Mountain villages, 20 villages (including Mwanga Town) in West Plain, and 9 villages in East Plain. The 2002 population census identified 115,145 persons in the district, with 54,954 in Mountain, 49,826 in West Plain, and 10,365 in East Plain.

The rainfall pattern in Mwanga District is bimodal, with "short rain" (Vuli) from November to December/January and "long rain" (Masika) lasting from March to May/June. Rainfall amounts vary widely from year to year. Usually, the short rain season is the main agricultural period in Mountain, whereas the long rain season is important in West and East Plains. Although it is difficult to determine exact rainfall amounts from the varying figures reported by the Kilimo Office documents, Mwanga Town in West Plain receives approximately 800 mm of annual average rainfall, and Mountain areas receive approximately 1,200–1,400 mm (Kilimo, [AGR/MW/MET/VOL. I]: Doc. No. 162 & 163 and other documents in other files). Records by the Kilimo Office indicate that between 2001 and 2005, both the short and long rains failed, leading to acute food shortages throughout the district (Kilimo, [AGR/C/GEN/VOL. IV]: Doc. No. 147). But this is not an unexpected situation for Mwanga. This district has historically experienced chronic food shortages. For instance from 1992 to 2005/06, this district recorded the food aids of maize, maize flour, and kidney beans every years except 1996 and 2002/03 by organizations such as the Strategic Grain Reserve of the Tanzanian Government, the World Food Program through Caritas, the Tanzanian Red Cross, the Lutheran Church, and the Pentecostal Church. Food aid was distributed free of charge and/or at low prices to those in need (Kilimo, [AGR/C/EST/VOL. II]: Doc. No. 73 and various documents in Kilimo, [AGR/MW/FP/VOL. IV], [AGR/MW/FP/VOL. V] and [AGR/C/EST/VOL. III]). Although support from outside the district has been needed at times, it is reasonable to assume that farmers of the district have developed pre- and post-crop failure safeguards.

In general, the drier Plains of the study area are more vulnerable than Mountain to crop failures. However, crop failures in Plains affect both Plains and Mountain residents. Many Mountain residents also have fields on Plains, where they plant maize, a staple crop as well as banana on Mountain fields. Having fields in Plains creates close relationships between Mountain villages and associated Plain villages. Kinship and affine relationships further strengthen relationships formed by land ownership and use. As I discuss below, such a relationship has formed between Mkuu Village on the western mountain slope and Kiruru Lwami Village of West Plain.

All mountainous areas in Tanzanian Northern Highlands are similar from the viewpoint of agricultural production, but are individually distinct socio-economically. Mwanga District, for example, is a compact socio-economic entity composed of Mountain with coffee and Plains areas without coffee. Mwanga District is not only an administrative area, but also rather a socio-economic entity containing several smaller, loose socio-economic units that encompass the range of most residents' daily lives.

Table 5. Coffee Production in Mwanga District.

year	Production Area				Production		Procured by VCU	
	(ha)	source	(ha)	source	(t)	source	(t)	source
1977/78	1,700	(C1–9)			539			
1978/79					364	(C1–27)		
1979/80					503			
1980/81	2,319	(C1–27)			725			
1981/82					706	(C1–69)		
1982/83					736	(C1–99)		
1983/84					675	(C1–115)		
1984/85					580		675	
1985/86	2,100				687		767	
1986/87	2,100		2,532	(C1–128)	392		385	
1987/88	2,100				518		528	
1988/89	2,100				683		684	
1989/90	2,100	(E3–9)	2,342	(K40–18)	251		257	
1990/91	2,100		2,100		419	(C4–43)	416	
1991/92	2,100		2,472	(E2–29)	509		509	
1992/93	2,100		2,472		494		479	
1993/94	2,100		2,472		220		219	
1994/95			2,472	(E2–34)	500		65	(VCU)
1995/96	2,374		2,472	(E2–44)	566		276	
1996/97	2,374		2,472		393		41	
1997/98	2,374		2,472	(E2–62)	94	(E3–120)	19	
1998/99	2,478				163		21	
1999/00	2,428	(E3–120)	2,374		220		13	
2000/01	2,428		2,374	(E3–79)	441		2	
2001/02	2,374		2,374		171	(C4–189)	0	
2002/03	2,374		2,374		100		95	
2003/04	2,374		1,533	(E3–88)	75		51	
2004/05	2,374		1,533	(P4–156)	102		34	

Source: Various documents of the Kilimo Office (Mwanga District Agriculture & Livestock Development Office), and Vuasu Co-operative Union.
The meanings of abbreviations are as follows:
C1–9, C1–27, C1–69, C1–99, C1–115, C1–128: Do. *Coffee General File Vol. I [C/GENENERAL/VOL. I]*, Doc. No. 9, 27, 69, 99, 115 & 128. Unpublished.
C4–43, C4–189: Do. *Coffee General File Vol. IV [AGR/C/GEN/VOL. IV]*, Doc. No. 43 & 189. Unpublished.
E2–29, E2–34, E2–44, E2–62: *Crop Estimates File Vol. II [AGR/C/EST/VOL. II]*, Doc. No. 29, 34, 44 & 62. Unpublished.
E3–9, E3–79, E3–120: Do. *Crop Estimates File Vol. III [AGR/C/EST/VOL. III]*, Doc. No. 9, 79 & 120. Unpublished.
K40–18: Do. *Sensa na Takwimu K/Mifugo File [KI/S40]*, Doc. No. 18. Unpublished.
P4–156: Do. *Food Position File Vol. IV [AGR/MW/FP/VOL. IV]*, Doc. No. 156.
VCU: Vuasu Co-operative Union (1984) Ltd. 2006. *Makisio ya Mapato na Matumizi Msimu 2006/2007*, p. 3. Unpublished.

DECLINING COFFEE ECONOMY IN MWANGA DISTRICT

I. Coffee Production Trends in Mwanga District

Table 5 illustrates the decline of coffee production in Mwanga District, with data based on several documents from the Kilimo Office and one report of Vuasu Cooperative Union, which procured all the coffee from Mwanga District until 1993/94. The area of production changed little, ranging from 2,100–2,532 ha from 1980/81 to 2004/05, according to the Kilimo Office of Mwanga District with differing figures among documents. More detailed data in 1978/79, 1986/87 and 1990 are available. In 1978/79, there were 5,987 coffee farmers, 1,700 ha of coffee farms and 2,295,000 coffee trees in 31 Mountain villages and 2 Plain villages (Kilimo, [C/GENERAL/VOL. I]: Doc. No. 9). In 1986/87, 5,981 farmers in 31 Mountain villages have 2,532 ha of coffee farms (Kilimo, [C/GENERAL/VOL. I]: Doc. No. 128). According to a coffee census in 1990, 3,073,582 coffee trees were cultivated on 2,342 ha by 6,635 farmers in 34 villages (Kilimo, [KI/S40]: Doc. No. 18)[2]. The average cultivation area per farmer was 0.36 ha. Among the 34 Mountain villages, those in the relatively remote northern and southern North Pare Mountains were more active in coffee production (Table 4).

However, the figures mentioned above are not consistent with the results of the National Agricultural Sample Survey in 1998/99 conducted jointly by the Tanzanian Ministry of Agriculture and National Bureau of Statistics. This survey reported 3,323 coffee-producing households in Mwanga District in 1998/99, representing 33.6% of the total agricultural households. The average plot sizes were 0.27 ha/household out of a total of 884.43 ha (8.1% of the total agricultural land of this district). Compared with other districts in Kilimanjaro Region and Arumeru District of Arusha Region, Mwanga District was the least involved in the coffee economy (Tanzania, MOAC & NBS, 2001: Volumes for Kilimanjaro and Arusha regions, Appendix A2, Table 01, 09, 13D and 75 in each volume).

Although figures differ regarding the area of coffee production, data from the Kilimo Office of Mwanga District agree regarding the decline of coffee production from 600–700 tons in the late 1980s to nearly 100 tons annually by the mid-2000s (Table 5). As noted above, Vuasu Cooperative Union (VCU) purchased all the coffee from Mwanga District through primary cooperative societies until the 1993/94 growing season. There were eight primary cooperative societies under VCU in August 2006: Vuchama Ngofi Rural Cooperative Society (RCS; with an office in Vuchama Ngofi Village, #35 on Fig. 5 & Table 4), Mwakimama RCS (#37), Raa RCS (#39), Kamwala RCS (#45), Kindoroko RCS (#62), Ngujini RCS (#22), and Kinoko RCS (#24)[3]. After the 1994/95 season, private companies with permits from the Tanzania Coffee Board and local governments could engage in coffee procurement, and VCU became one of the buyers. The amount of coffee procured by the VCU and the amount of coffee produced in Mwanga District up to 1993/94 were almost the same in most cases (Table 5). However, after 1994/95, VCU only procured a small share of the coffee produced in Mwanga District.

Liberalization of coffee marketing as a part of the SAP economic liberalization policies was expected to create more effective marketing channels and thus higher

prices. However, both domestic and international factors hampered price increases, particularly the historic price lows of world markets in the early 2000s. At the same time, the prices of agricultural inputs such as artificial fertilizers and chemicals increased much faster than prices paid to producers. However, decreasing or not applying inputs such as fertilizers caused productivity to drop and caused a dramatic decrease in total coffee production in Mwanga District. A VCU officer that I interviewed said that VCU members were interested in establishing Fairtrade coffee systems, which could raise producer prices; however, they had not begun Fairtrade trials because they had no guarantee of sufficient amounts of high-quality coffee from Mwanga and Same districts(4).

To counter declines in coffee production, the Kilimo Office of Mwanga District launched a 5-year coffee revival program in 2004. The executive summary of the policy paper summarizes the project as follows:

> In over 50 years, Mwanga District, Kilimanjaro Region has been growing Coffee as the sole cash crop. In the last 5 years however, the Coffee crop has faced severe difficulties resulting from very low world prices, high prices of Coffee inputs, old and low yielding trees and poor extension services.
>
> In spite of these problems, Coffee remains the best possibility for the revival of the District economy and poverty reduction among the people. Therefore, the District plans a 5 years Coffee crop revival programme that will; (i) increase the area under Coffee production from the current 2,375 ha to 4,100 ha by 2008; (ii) increase Coffee yield from the current 190 kg/ha to 500 kg/ha and (iii) improve the quality of Coffee delivered for sale at the auction.
>
> This will be achieved through the delivery of 338,000 Coffee seedlings annually for replacement of old trees as well planning in new areas; establishment of 8 central pulperies; improving extension services and prompt delivery of inputs. (Kilimo, [AGR/C/GEN/ VOL. IV]: Doc. No. 147).

The Kilimo Office has already started an active coffee recovery program. However, the office may have overestimated the production area, which began to decline over 5 years ago due to both internal and external causes. Indeed, the movement away from coffee production may be far larger than the Kilimo Office expected, as farmers have responded to the faltering coffee market. Bringing farmers back to coffee production may also be more difficult than anticipated by the Kilimo Office, unless quite attractive conditions are ensured(5). In the next section, I discuss how and why farmers have moved away from the coffee economy.

II. Cases from Two Mountain Villages

I conducted field surveys in Mshewa Village (#62 on Fig. 5 & in Table 4) in 1992, and Mkuu Village (#50) in 2005. Both villages are located in Mountain and are home to coffee farmers. In Mshewa Village, on the eastern slope of North Pare Mountains, I examined the socio-economic status of 26 households, selected at random, in November 1992 (i.e., before the liberalization of coffee marketing). Mkuu Village on the western slope of North Pare Mountains was newly regis-

Table 6. Coffee Sale in Mshewa Village (1990/91 & 1991/92).

kg/year	Number of Farmer (person)		Total Amount of Sale (kg)		Average Amount of Sale (kg/person)		Total Value of Sale (TShs.)		Average Value of Sale (TShs./person)	
	90/91	91/92	90/91	91/92	90/91	91/92	90/91	91/92	90/91	91/92
≧500	2	0	1,381	0	690.5	0.0	214,055	0	107,028	0
400–499	2	3	859	1,276	429.5	425.3	133,145	293,480	66,573	97,827
300–399	3	6	982	2,070	327.3	345.0	152,210	476,100	50,737	79,350
200–299	7	15	1,710	3,673	244.3	244.9	265,050	844,790	37,864	56,319
100–199	21	22	2,808	3,048	133.7	138.5	435,240	701,040	20,726	31,865
50–99	31	29	2,099	1,892	67.7	65.2	325,345	435,160	10,495	15,006
25–49	24	33	833	1,091	34.7	33.1	129,115	250,930	5,380	7,604
10–24	32	37	509	573	15.9	15.5	78,895	131,790	2,465	3,562
5–9	19	17	128	113	6.7	6.6	19,840	25,990	1,044	1,529
<5	19	18	51	52	2.7	2.9	7,905	11,960	416	664
Total or Av.	160	180	11,360	13,788	71.0	76.6	1,760,800	3,171,240	11,005	17,618

Source: Calculation from the data in Kindoroko Rural Cooperative Society. Recited from IKENO, Jun 1995. Tanzanian Agriculture under Structural Adjustment Program (in Japanese). In (T. Haraguchi, ed.) *Structural Adjustment and Agriculture in Africa* (in Japanese), p. 46. Ajia Keizai Kenkyusho, Tokyo.

tered as a village in 1993 after being separated from Mfinga Village. In this village, I examined how 18 households were coping with the adverse coffee economy; this research was conducted in July 2005, after the coffee crisis. The sample households in Mkuu were selected from the households of the Village Chairperson, Village Executive Officer, Subvillage Chairpersons, and Ten Cell Leaders. I had visited Mkuu Village before conducting this research and had some idea of the socio-economic conditions there. According to my knowledge of the village, samples from households of village officers were not necessarily upwardly biased in terms of socio-economic conditions.

It is difficult to collect coffee production data at the micro level. Fortunately, I had access to the registration cards of members of Kindoroko Rural Cooperative Society (RCS) in Mshewa Village. Kindoroko RSC was and is a primary cooperative society under Vuasu Cooperative Union (VCU). The union dealt solely with all coffee from North Pare Mountains in Mwanga District and South Pare Mountains in Same District through primary cooperative societies such as Kindoroko RCS before coffee marketing liberalization in 1994/95. Since liberalization, VCU has had to compete with private companies. Therefore, Kindoroko RCS dealt with all coffee produced by 12 villages, including Mshewa Village of Usangi Division, in 1990/91 and 1991/92. At that time, the primary cooperative societies in North Pare Mountains were under steady management, and the cooperatives kept registration cards for each cooperative member, listing the date and amount of coffee purchases. I selected cooperative members of Mshewa Village from the files and calculated the total amount of annual coffee sales one by one (Table 6).

Interestingly, the number of coffee farmers was rather small. According to my field survey, Mshewa Village had 354 households in 1991. However, only 160

cooperative members sold coffee in 1990/91 and 180 sold coffee in 1991/92. Sometimes, several cooperative members belonged to a single household. Checking the 160 cooperative members who sold coffee in 1990/91 revealed that they belonged to 137 households. This means that less than half of the village's households were involved in coffee production, even before the adverse coffee economy began. Judging by the total amounts procured in Mshewa Village with records of the Kilimo Office (9,926 kg in 1978/79, 9,927 kg in 1980/81, and 14,312 kg in 1983/84), the number of coffee producing households in this village was not so changes since the late 1970s (Kilimo, [C/GENERAL/VOL. I]: Doc. No. 9, 29 & 115).

Further, there was a rather large difference in the amount of coffee sold among farmers. The total coffee sold in Mshewa Village in 1990/91 was 11,360 kg. Out of this amount, two persons sold 1,381 kg. The 14 persons who sold 200 kg of coffee or more accounted for nearly half of the total sales from Mshewa Village. The situation in 1991/92 was almost the same, with the top three sellers accounting for 9% of sales and the top 24 persons selling nearly half of the total amount from Mshewa.

During this same time, income from coffee was also rather small. In 1991/92, the minimum wage of civil servants was TShs. 3,500/month (TShs. 42,000/year). Only the 24 persons who sold ≥200 kg of coffee could obtain a coffee-based income that was greater than the annual minimum wage. Although daily expenses differ between urban and rural areas, it appears that coffee production was not as attractive as formal-sector jobs in urban areas. Thus, whereas villagers in Mountain were partly involved with coffee production even before marketing liberalization, the relatively low incomes derived from coffee might have pushed a more highly educated younger generation to migrate to urban areas.

To better understand situations in Mountain villages following coffee marketing liberalization and world price downturns, I conducted research in Mkuu Village in 2005. There are no longer convenient sources of data such as the registration cards kept by the primary cooperative societies. Coffee farmers in Mkuu Village can sell their coffee to private companies, the primary cooperative societies, or (if they meet minimum amount requirements) take their harvest directly to the Tanzanian Coffee Curing Company in Moshi City. Membership in primary cooperative societies has become looser, and the primary cooperative societies no longer keep detailed records of their members. Given these conditions, the socioeconomic data from Mkuu Village are more qualitative than quantitative.

Of 18 sample households in Mkuu Village, 17 had once engaged in coffee cultivation, but only 13 continued to do so in 2005. Of these 13 households, 9 sold coffee in the 2004/05 season. These households reported that they had sold 744 kg in total. As in Mshewa Village, the nine sample households varied widely in the amount of coffee they sold, ranging from 7 kg to 300 kg. Most farmers blamed a lack of agricultural chemicals for declines in coffee production in recent years. Of 13 households continuing their coffee production, all 9 households that had sold coffee in 2004/05 had used manure and only one had applied an artificial fertilizer and insecticide. Farmers complained of the high prices and low availability of agricultural chemicals. In recent years, farmers could receive a voucher

equivalent to TShs. 50 per 1 kg of coffee sold when they sold to VCU through primary cooperative societies. However, this voucher for purchasing agricultural chemicals was not enough to produce even 1 kg of coffee. Moreover, farmers generally have to go to Moshi City, the regional capital, to buy agricultural chemicals.

All 18 sample households reported that they could not find alternative, profitable crops to replace coffee, although three households sold staple crops, ten sold vegetables such as tomatoes and green peppers, and four sold other products such as cardamom and avocados in small amounts at weekly markets in Mwanga Town. Nonfarm activities made up a remarkable amount of cash income sources. Eleven households were involved in casual labor such as construction and agricultural labor, and six households made gravel for construction material. Although an exact estimation of cash income amounts is difficult, clearly many households have already diversified their cash income sources and depend little on coffee. Notably, many households bought bananas and maize as their staple foods and kidney beans for side dishes, although it was not clear whether this phenomenon was normal or the result of the serious drought in 2003/04. The 18 households owned 60 plots of land in Mountain and used 63 plots (including the plots of absent relatives). Thirteen households also owned 19 plots of land on Plains: 17 in Kirisi area mentioned later and 2 in other areas. However, only six households used these plots because commuting to such farms was difficult for elderly farmers from Mountain. Of 79 plots owned in total, 77 were acquired through inheritances, 1 was newly opened, and 1 was purchased. A land market has not yet been established, but land shortages may coincide with labor shortages in Mountain, as noted by Maghimbi (1992).

The above evidence suggests that former coffee incomes have not been recovered by other economic activities within or around Mountain villages. Out-migration is not only a historical solution for land shortages, but is also more preferable than coffee production for highly educated persons. Below, I examine out-migration trends using data from population censuses.

DEMOGRAPHIC CHANGES IN MWANGA DISTRICT

I. General View of Mwanga District

Following independence, the Tanzania government conducted population censuses in 1967, 1978, 1988, and 2002. Mwanga District was newly established in 1979, and therefore no population data exist for the specific “Mwanga District” in the 1967 and 1978 censuses. Because part of the former Pare District was similar to the present-day Mwanga District, I used data from Pare District to compile the population figures (Table 7). Between 1967 and 1978, annual population growth in the present-day Mwanga District was 3.79%, which was higher than the averages for Kilimanjaro Region (2.99%) and Tanzanian Mainland (3.27%). Between 1978 and 1988, growth dropped to 2.29%, which was still higher than the Kilimanjaro average (2.04%), but lower than the national average (2.80%).

Table 7. Annual Population Growth during 1967–78, 1978–88 & 1988–2002.

(%/year)

	1967–1978	1978–1988	1988–2002
Mwanga District	3.79	2.29	1.23
Kilimanjaro Region	2.99	2.04	1.61
Tanzania Mainland	3.27	2.80	2.92

Source: Kilimanjaro Region & Tanzania Mainland: calcurated from Tanzania, NBS (National Bureau of Statistics) 2003. *2002 Population and Housing Census, Vol. II*, Table 1. NBS, Dar es Salaam.
Mwanga District: calcurated from the below data.
1967: Tanzania, BS (Bureau of Statistics) 1969. *1967 Population Census, Vol. I*, pp. 290–291. BS, Dar es Salaam.
1978: Do 1981. 1978 *Population Census, Vol. II*, Table 1 & pp. 87–94. BS, Dar es Salaam.
1988: Do 1990. *Tanzania Sensa 1988: Pupulation Census Regional Profile: Kilimanjaro*, pp. 256–265. BS, Dar es Salaam.
2002: Tanzania, NBS (National Bureau of Statistics) 2003. *2002 Population and Housing Census: Vol. II,* Table 5B. NBS, Dar es Salaam.

Note: Mwanga District was newly created in 1979. Therefore, the population in 1967 and 1978 were parts of former Pare District fitting to present-day Mwanga District.

Growth then dropped even lower, to 1.23% between 1988 and 2002, a rate below both the Kilimanjaro average (1.61%) and the mainland average (2.92%)[6]. Thus, the declining population trend in this district was much faster than that in Kilimanjaro Region[7].

No special factors are assumed to have depressed the birth rate and/or increased the death rate in this district. Social factors may therefore account for low population growth, such as out-migration from this district, encouraged by the poor coffee economy. The examination of population trends at the village level provides a clearer picture. Population trends varied among the 63 villages in this district. To compare the population censuses, I combined the 63 villages into 47 "unit areas" (UAs; Table 4). During 1978 to 1988, many of the 12 UAs in West Plain and 5 UAs in East Plain showed high population growth. In the same period, 27 of 30 UAs in Mountain also maintained low but positive growth; only 3 UAs in Mountain experienced negative growth. From 1988 to 2002, most UAs in West Plain continued to have high population growth, but growth rates decreased in all East Plain UAs and rates in most Mountain UAs decreased even further, with 18 showing negative population growth. If we consider out-migration as a buffer for population pressures on land, the recent negative growth in Mountain is rather difficult to explain. Historically, rural-rural migration from Mountain to Plains was common, as was rural-urban migration. Recent lower population growth in East Plain and Mwanga District as a whole, however, indicate the weaker absorption capacity of Plains. Unstable rainfall conditions, especially since the early 1990s, have led to repeated food shortages in this district. Out-migrants from Mountain may hesitate to move to a worse agricultural situation on Plains. However, if this is the case, what accounts for high population growth in West Plain?

Table 8 shows the population structure per village for each zone in 1978, 1988, and 2002 and the growth ratio of age clusters from 1978 to 2002 and 1988 to

Table 8. Population Structure & Change by Zone in Mwanga District.

West Plain 12UAs

		0–4 yr.	5–9 yr.	10–14 yr.	15–24 yr.	25–34 yr.	35–44 yr.	45–54 yr.	55–64 yr.	65 yr.+	Total
	Male	187	161	137	155	113	92	79	54	45	1,023
1978 av.	Female	188	171	139	171	123	89	57	34	40	1,012
	Total	375	332	276	326	236	181	136	88	85	2,034
	Male	229	217	184	249	179	104	80	59	60	1,361
1988 av.	Female	230	216	185	275	190	101	68	47	56	1,368
	Total	459	433	368	525	369	205	148	106	116	2,729
	Male	294	298	302	420	274	186	109	67	88	2,037
2002 av.	Female	301	294	290	465	305	197	112	67	85	2,115
(person)	Total	595	592	592	885	578	383	221	134	173	4,152
1978–2002	Male	0.77	0.91	1.08	1.33	1.18	0.99	0.68	0.60	0.96	0.98
growth	Female	0.78	0.84	1.02	1.33	1.21	1.09	0.97	0.98	1.04	1.02
ratio	Total	0.78	0.87	1.05	1.33	1.20	1.04	0.80	0.75	1.00	1.00
1988–2002	Male	0.84	0.90	1.08	1.11	1.01	1.17	0.90	0.75	0.96	0.98
growth	Female	0.86	0.89	1.03	1.11	1.05	1.29	1.08	0.93	1.01	1.02
ratio	Total	0.85	0.90	1.06	1.11	1.03	1.23	0.98	0.83	0.98	1.00

East Plain 5UAs

		0–4 yr.	5–9 yr.	10–14 yr.	15–24 yr.	25–34 yr.	35–44 yr.	45–54 yr.	55–64 yr.	65 yr.+	Total
	Male	89	98	87	77	35	42	45	27	33	533
1978 av.	Female	96	94	78	85	52	49	37	19	21	533
	Total	185	192	165	162	87	91	82	46	54	1,066
	Male	159	155	127	151	92	61	61	48	60	914
1988 av.	Female	162	135	121	146	106	69	50	33	37	860
	Total	320	290	249	297	198	130	111	82	97	1,774
	Male	157	166	173	170	110	88	64	47	68	1,043
2002 av.	Female	156	166	157	164	130	90	74	43	51	1,030
(person)	Total	313	332	330	334	240	178	138	90	119	2,073
1978–2002	Male	0.91	0.87	1.02	1.13	1.63	1.09	0.73	0.89	1.06	1.01
growth	Female	0.83	0.90	1.03	0.99	1.29	0.94	1.03	1.13	1.23	0.99
ratio	Total	0.87	0.89	1.02	1.06	1.43	1.01	0.86	0.99	1.12	1.00
1988–2002	Male	0.85	0.92	1.16	0.96	1.02	1.24	0.90	0.83	0.97	0.98
growth	Female	0.82	1.05	1.11	0.96	1.05	1.11	1.26	1.09	1.17	1.03
ratio	Total	0.84	0.98	1.13	0.96	1.04	1.17	1.07	0.94	1.05	1.00

Mountain 30UAs

		0–4 yr.	5–9 yr.	10–14 yr.	15–24 yr.	25–34 yr.	35–44 yr.	45–54 yr.	55–64 yr.	65 yr.+	Total
	Male	147	152	134	114	43	41	39	28	34	733
1978 av.	Female	142	148	141	147	83	66	51	32	43	853
	Total	289	300	275	261	126	108	90	60	77	1,586
	Male	146	166	165	152	56	41	42	35	46	849
1988 av.	Female	141	159	163	194	100	77	63	43	58	998
	Total	287	325	328	345	155	118	105	78	104	1,846
	Male	110	142	162	166	69	56	44	42	63	856
2002 av.	Female	109	134	157	179	108	85	76	58	70	976
(person)	Total	220	277	319	345	177	142	120	99	133	1,832
1978–2002	Male	0.65	0.81	1.05	1.26	1.37	1.19	0.98	1.30	1.60	1.01
growth	Female	0.67	0.79	0.97	1.05	1.13	1.11	1.29	1.56	1.40	0.99
ratio	Total	0.66	0.80	1.01	1.15	1.22	1.14	1.15	1.44	1.49	1.00
1988–2002	Male	0.76	0.86	0.99	1.10	1.24	1.39	1.06	1.20	1.39	1.02
growth	Female	0.78	0.85	0.97	0.93	1.10	1.11	1.21	1.34	1.21	0.99
ratio	Total	0.77	0.86	0.98	1.01	1.15	1.21	1.15	1.28	1.29	1.00

Source: 1) Tanzania, BS (Bureau of Statistics). 1981. *1978 Population Census, Vol. II*, pp. 87–94. BS, Dar es Salaam.
2) Do. 1990. *Tanzania Sensa 1988: Pupulation Census Regional Profile: Kilimanjaro*, pp. 256–265. BS, Dar es Salaam.
3) Tanzania, NBS (National Bureau of Statistics). 2003. *2002 Population and Housing Census: Volume II: Age and Sex Distribution*, Table 5D. NBS, Dar es Salaam.
4) Do. 2005. *2002 Population and Housing Census: Vol. VII: Village and Street Statistics: Age and Sex Distribution: Kilimanjaro Region*, pp. 17–30. NBS, Dar es Salaam.

Note: UA=unit area.
Formula of the growth ratio=(increase rate of an age cluster/increase rate of total population of zone).

2002. Due to some differences in age cluster classifications among the 1978, 1988, and 2002 population censuses, the age clusters from 0 to 14 years old are shown in 5-year intervals, and those above 15 years old are shown in 10-year intervals. The growth ratio was calculated using the following formula: (rate of increase for an age cluster/rate of increase of the total population in a zone). A growth ratio over 1.00 indicates that the population of an age cluster is growing faster than the average for the total population.

In West Plain, where high population growth has continued, the absolute populations of all age clusters increased from 1978 to 1988 and from 1988 to 2002. The 15–24 and 25–34 age clusters increased faster over the long term from 1978 to 2002, whereas the 35–44 age cluster increased rapidly in the short term from 1988 to 2002. The 15–24 age cluster includes secondary school students and the young labor force. Compared with these age clusters, the 0–4, 5–9, and 55–64 clusters showed smaller growth. This suggests that population growth in West Plain was mainly caused by in-migration of students to newly established secondary schools and of young and middle aged workers. Because Mwanga Town has little industrial activity, migrants likely found work in the trade, service, and recently emerged construction sectors[8].

In East Plain, where population growth was high from 1978 to 1988 but decreased from 1988 to 2002, the populations of both sexes in the 0–4 cluster and males of the 55–64 cluster decreased from 1988 to 2002. Over the long term, notable growth was shown for the 25–34 age cluster, whereas over the short term, the 35–44 cluster had the highest growth; however, the absolute population total for 35–44-year-olds in 2002 (178) was smaller than that for 25–34-year-olds in 1988 (198). These data suggest that in-migration of young workers was still the main reason for population increases in East Plain.

In Mountain, where population growth was low from 1978 to 1988 and negative in the zone as a whole from 1988 to 2002, the absolute population of 0–4-year-olds decreased continuously and that of 5–9-year-olds started to decrease from 1988 to 2002. Compared with the low growth ratios of the 0–4, 5–9, 10–14, and 15–24 age clusters, growth ratios for the 25–34 cluster were relatively high. Male out-migration is shown in the smaller male than female populations in the 25–34, 35–44, and 45–54 age clusters. In 1978 and 1988, there were also fewer males than females in the 15–24 age cluster, but this difference was smaller in 2002. Male out-migration for secondary schooling may have decreased recently, as later discussed using the example of Mkuu Village. Despite adult male out-migration, the absolute population of male age clusters increased from 1978 to 2002. The main reason for negative population growth in many UAs in Mountain was not excess out-migration, but instead lower increases in the younger generation. In other words, reproductive rates in Mountain could not maintain and increase village populations.

East and West Plains also had relatively lower growth ratios for infants than for age clusters of adults[9]. Kilimanjaro Region, including Mwanga District, had a mortality rate for children under 5 years old of 104 per one thousand live births in 1988; this rate was the lowest among 20 regions in Tanzania Mainland and much better than the Tanzanian mainland average of 191 (Tanzania National Web-

site: Online). Although living standards in Mwanga District have worsened since 1988, the low mortality rate may continue[10]. If so, then low reproductive rates among married and unmarried women in the area would account for the lower increase in the infant population. There are no reliable birth rate data with which to track historical trends in Mwanga District. However, the available information does suggest that decreased birth rates, rather than accelerating out-migration, have depressed population growth in Mountain.

This is not to say that out-migration will not contribute to low population growth in this district over the long term. Below, I focus on out-migration trends in Mshewa Village and Mkuu Village in Mountain and Kirisi hamlet of Kiruru Lwami Village (#3 on Fig. 5 & in Table 4) in West Plain.

II. Out-migration and Secondary Education: Case Studies of Mshewa, Mkuu, and Kirisi

As described above, I surveyed 26 sample households in Mshewa Village in November 1992 and 18 sample households in Mkuu Village in July 2005. Over the past 10 years, I have also conducted research in Kirisi hamlet. Kiruru Lwami Village, to which Kirisi belongs, neighbors Mwanga Town and is located at the foot of Mkuu Village (Fig. 6). Kirisi hamlet is a part of Vudoi Subvillage in Kiruru Lwami Village. A "hamlet" is not an administrative unit, but the residents of Vudoi Subvillage identify two hamlets: Kirisi and Mramba. Locals describe the residents of Kirisi as coming from the direction of Mkuu Village and those of Mramba as coming from the direction of Mfinga Village during the early 1970s when the government encouraged villagization under the Ujamaa Socialism policy. My research in this hamlet has focused on socio-economic aspects of dry season irrigation farming. Concurrently, I have also examined other economic activities and social changes among Kirisi households, which numbered 45 in August 1998 and 54 in August 2005 and March 2006.

In this section, I discuss the siblings or children of the heads of sample households with regard to their education and out-migration; I look at persons ≥10 years

Table 9. Outline of Field Survey.

Research Site	Sample Household (HH)	Research Period	Target Person							
			Relation to Household Head	≥10 years old			≥15 years old			
				Total Population (person)	Average Age		Total Population (person)	Non-resident (person)	Average Age	
					Research (yr. old)	Mar./2007 (yr. old)			Research (yr. old)	Mar./2007 (yr. old)
Mkuu Village	18	Jul./2005	Siblings	119	43.9	45.6	118	114	44.2	45.9
Mshewa Village	26	Nov./1992	Children	146	20.5	34.8	111	80	23.5	37.8
Mkuu Village	18	Jul./2005	Children	80	20.8	22.5	58	46	24.1	25.8
Kirisi hamlet	54	Mar./2006	Siblings	186	42.4	43.4	181	177	43.4	44.4
	45	Aug./1998	Children	199	26.9	35.5	158	114	30.3	38.9
	54	Aug./2005	Children	250	26.4	28.0	203	151	29.8	31.4

Source: Field surveys by Ikeno (1992, 1998, 2005 & 2006).

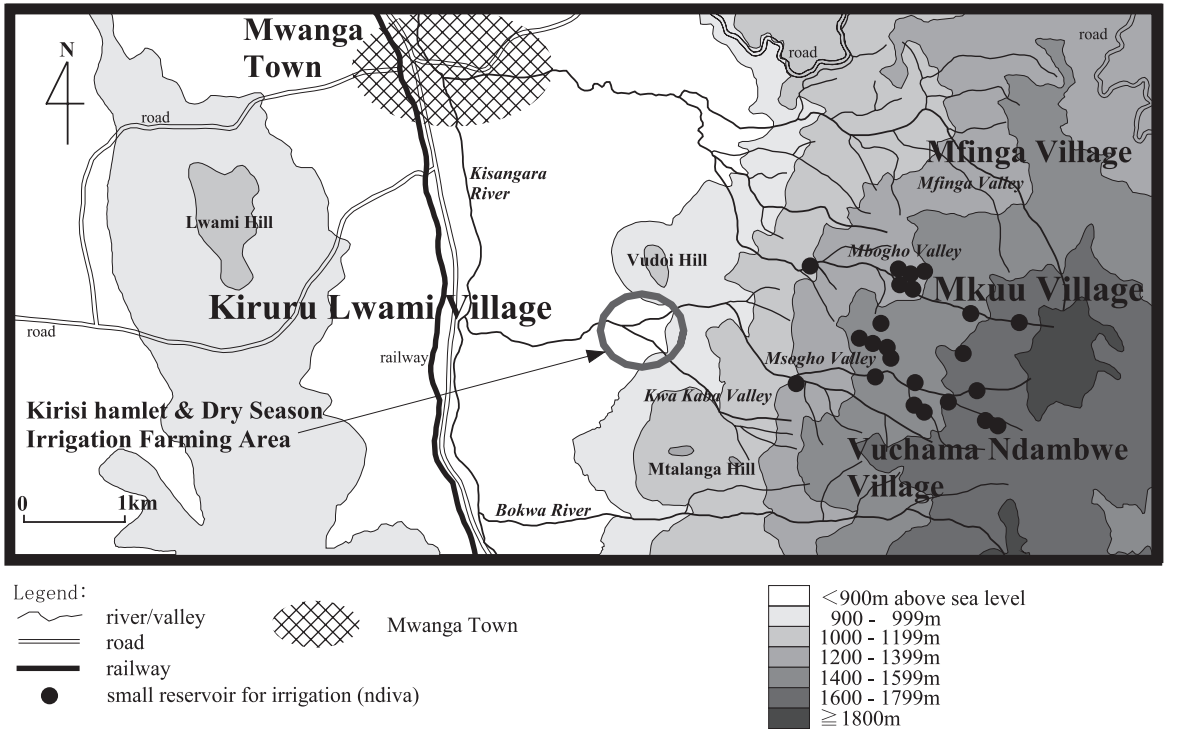


Fig. 6. Kirisi hamlet in Kiruru Lwami Village, Mkuu Village & Mwanga Town.
Source: Base map: Tanzanian, United Republic of. 1989. *Map: East Africa 1:50,000 Sheet 73/1: Mwanga*. Government of Tanzania, Dar es Salaam.
Locations of Ndivas were identified by Ikeno's field works with GPS in 2000, 2001, 2003, 2004, 2005 & 2006.
Note: Ndivas on/near Mfinga Valley were not surveyed.

old to investigate education and those ≥15 years old to examine out-migration. The heads of 18 sample households in Mkuu Village had 119 siblings ≥10 years old, of which 118 were ≥15 years old (Table 9). The average ages of these sibling groups were 43.9 years old and 44.2 years old, respectively, at the time of research (July 2005). Judging from their average ages, most were educated before the decline of the coffee economy. Like the siblings of Mkuu Village heads, the children of Mshewa Village and the siblings of Kirisi heads were also educated before the adverse economic conditions, even though there was no coffee production in Kirisi. In contrast, the children in Mkuu and Kirisi surveyed in 1998 and 2005 have been educated since the economic downturn (although, as discussed later, economic conditions in the 2000s differ slightly between Mountain and Plains).

Of the 118 siblings ≥15 years old in Mkuu, 114 did not currently reside in the sample households. "Non-resident" means that the person in question usually stays at a place other than the sample household for reasons such as employment, schooling, or marriage. Among the siblings sampled from Mkuu Village and Kirisi Hamlet, most "non-residents" were usually the heads or wives of their own households. According to the definition, I counted persons as "non-resident," even if they lived next door to the sample residence. Persons staying in the village are "non-resident," but are not out-migrants.

This method risks the multiple counting of siblings and rarely children. For instance, if the heads of two sample households were brothers and referred to another brother living in an urban area, there is a risk of counting them as "non-residents" within the village and of counting the brother twice as a "non-resident" in an urban area. That is, although there are only three people, they could be counted as six. In such a case, I counted one household head, one "non-resident" brother within the village, and one "non-resident" brother living in an urban area. The risk of over-counting was especially high in Kirisi, where I selected whole households. But, in this situation, I knew the kinship and affine relationships of Kirisi and could count accurately. This is why the number of target persons is relatively small in Kirisi compared with the number of sample households.

Using data collected in Mshewa, Mkuu, and Kirisi, I examined the out-migration of those ≥15 years old and the secondary educational careers of those ≥10 years old.

Table 10 lists the destinations of "non-resident" persons ≥15 years old. Siblings in Mkuu, presently in their 40s, could move within the village or neighboring villages, and 50 of 114 stayed near the sample households. However, land shortages caused 20–30-year-olds of children in Mkuu and Mshewa to leave those areas. Some went to Moshi City, the regional capital of Kilimanjaro Region, but many went to larger cities such as Arusha and Dar es Salaam. Even though there is still room for in-migration in Kirisi in West Plain, many persons chose Dar es Salaam. Mwanga Town, the district capital, could absorb only part of the out-migrants from Kirisi and Mkuu, and none of the out-migrants from Mshewa in 1992 stayed in Mwanga Town.

Next, Table 11 lists trends in secondary schooling. In Mountain, nearly 20% of study subjects now in their 40s in Mkuu and in their 30s in Mshewa had

Table 10. Destination of Non-resident Persons.

Research Site		Research Period	Sample House-hold	Target Person ≧15 year old			Place of Stay of Non-resident Person						
							within District			within Region		other Regions etc.	
				Total Pop. (person)	Non-resident (person)	Age in Mar./2007 (yr. old)	within or neighb. Villages	Mwanga Town (District capital)	other	Moshi City (Regional capital)	other	Dar es Salaam or Arusha	other
Mkuu Village	(S)	Jul./2005	18	118	114	45.9	50	11	8	3	14	22	6
Mshewa Village	(C)	Nov./1992	26	111	80	37.8	13		3	10	12	25	14
Mkuu Village	(C)	Jul./2005	18	58	46	25.8	5	3	2	1	2	29	4
	(S)	Mar./2006	54	181	177	44.4	62	12	22	2	17	36	26
Kirisi hamlet	(C)	Aug./1998	45	158	114	38.9	32	5	12	4	19	28	14
	(C)	Aug./2005	54	203	151	31.4	28	13	17	9	6	57	21

Source: Field surveys by Ikeno (1992, 1998, 2005 & 2006).
Note: (S)=siblings, (C)=children.

Table 11. Secondary Education.

Research Site		Research Period	Sample House-hold	Target Person		Person with Secondary School Education and above					
				A) Population ≧10 yr. old (person)	Age in Mar./2007 (yr. old)	Schooling (person)	Graduate or Drop-Out			B) Total (person)	B/A (%)
							within Village (person)	Out-migration (person)	Sub-total (person)		
Mkuu Village	(S)	Jul./2005	18	119	45.6	1	3	17	20	21	17.65
Mshewa Village	(C)	Nov./1992	26	146	34.8	16	0	12	12	28	19.18
Mkuu Village	(C)	Jul./2005	18	80	22.5	3	0	4	4	7	8.75
	(S)	Mar./2006	54	186	43.4	1	9	16	25	26	13.98
Kirisi hamlet	(C)	Aug./1998	45	199	35.5	5	8	12	20	25	12.56
	(C)	Aug./2005	54	250	28.0	13	9	22	31	44	17.60

Source: Field surveys by Ikeno (1992, 1998, 2005 & 2006).
Note: (S)=siblings, (C)=children.

some secondary education, even though some did not graduate or had dropped out of school[11]. In contrast, less than 10% of those in their 20s from Mkuu Village had had secondary school education. The percentage of educated persons has improved for Kirisi in West Plain. Mountain villagers may have had higher education levels than Plain villagers because of the historically high coffee incomes in Mountain villages. By 2004, however, educational opportunities were improving in Plains; there were 13 secondary schools in Mountain and eight in Plains (Kilimo, [AGR/MW/FP/VOL. IV]: Doc. No. 69). The senior generation in Kirisi had slightly higher education levels than the average for Plain residents because Kirisi is located near a national secondary school. Today, the educational level of younger generations in Kirisi is also higher than that for Mkuu. This change may reflect the settlements' differing socio-economic situations, e.g., the stagnant economy in Mountain.

WEST PLAIN ECONOMIC GROWTH

Kirisi is a part of Kiruru Lwami Village closest to the North Pare Mountains (Fig. 6), and dry season irrigation farming is carried out adjacent to Kirisi hamlet (Photo 1-4). Farmers irrigate using water from small reservoirs (called "ndiva" in the Pare language) built on/near mountain streams. Reservoirs are located in Mkuu and Vuchama Ndambwe villages in Mountain. This situation means that residents of Kirisi and the two Mountain villages must collaborate on water use. In addition to such cooperation, many Mkuu residents have fields on Plain lands around Kiruru Lwami Village. As noted above, most of these fields are in Kirisi, where there are 17 plots owned by the sample households from Mkuu. The residents of Kirisi sometimes care for plots owned by Mkuu residents. Relationships between the two villages are further strengthened though close kinship and affine relations. Within only 3 weeks during my research in Kirisi in July and August 2006, four ceremonies were performed and many relatives from Mkuu Village attended.

Dry season irrigation farming in Kirisi began around 1990, with farmers using small-scale irrigation facilities (Ikeno, 1999; 2004). The Pare people used small-scale reservoirs (ndiva) in Mountain for irrigation farming even before the colonial period (Kimambo, 1991: 22). In interviews, elders from Kirisi recalled that canals from the ndivas reached Plain in the 1940s, allowing for cotton cultivation. After low prices led to the abandonment of cotton cultivation in Kirisi, the canals were rarely used. However, the economic liberalization policies since 1986 have increased living costs by raising the cost sharing required for education and health care. Even though Kirisi residents were not directly affected by low coffee prices, they were affected by higher prices for daily necessities. Some considered using the irrigation facilities again for kidney beans production during the dry season from July to October to maintain their standard of living. Because irrigated plots are relatively small, such production would only be for home consumption.

Irrigation agriculture appears to have been disappearing in recent years. Whereas 67 persons were engaged in irrigation agriculture in 1998, the number today is less than 20. Rainfall during the long rain period (March-June), which is the main source of mountain reservoir supplies, may have been lower than the long-term average in recent years. Unfortunately, rainfall data from the meteorological station at Shighatini Primary School nearest to the reservoirs are unavailable for recent years, and records from Mwanga Town in several files of the Kilimo Office give conflicting values; therefore, I could not confirm a decline in rainfall.

Even if there has been lower than average rain, a shortage of water for irrigation may not be the main cause of the decline in dry season farming. Instead, the emergence of other more profitable income sources may have drawn farmers away. Mwanga Town has experienced a construction boom and an increasing population. For instance, in 1995, the area around one national secondary school was still bush land, but today, that area has housing for teachers and more new houses under construction. One private girls' high school established at the site of a defunct hotel has expanded over 10 years, with more classrooms and a teacher

training college built on adjacent fields. In the newly developed northern part of town, one primary school and one national secondary school were founded within a couple of years. The Roman Catholic Church has also acquired land for a new secondary school and has already started construction. The marketplace in the town center is also being renovated and will have a permanent building for use in the rainy seasons. Such a construction boom requires building materials and construction workers. Further, these new facilities and opportunities have attracted more people, requiring more food from surrounding rural areas.

Villagers of Mkuu and other neighboring Mountain villages come to the weekly market in Mwanga Town on foot. Some of the sample households in Mkuu Village that grow tomatoes and green peppers have found that they have more customers, as well as more competitors. Residents of Kirisi have also received more orders for gravel and fired bricks to be used for construction (Photo 1-5 & 1-6); additionally, they have more opportunities to work at school and residential construction sites and to sell milk and meats. One Kirisi household with fields on the Kisangara River basin (Fig. 6) began to produce vegetables such as tomatoes and Chinese cabbages for sale, as do field owners from other parts of Kiruru Lwami Village. In 1998/99, 2003/04, and 2005/06, Mwanga District recorded serious food shortages and received food aid; therefore, activities in these years might differ from those in normal years. Table 12 lists economic activities that occur mainly in the dry seasons in Kirisi. Kirisi in West Plain is drier than Mountain, and during the dry season, no profitable crops can be grown unless a household has fields along the Kisangara River. Given these conditions, few households sold crops. More households in Plains kept indigenous and/or mixed varieties of cattle, goats, and sheep, as opposed to the dairy cows favored in Mountain. Spe-

Table 12. Income Sources in Kirisi Hamlet.

(household)

year	Total number of House-hold	Cash Income Source										
		sale of crop	sale of animal	sale of milk	non-farm activity							remit-tance
					Total	some important activities (multiple counting)						
						formal employ.	brick making	gravel making	charcoal making	casual labor	sale of clothes	
1998/1999	46	2	23	18	36	6	12	3	6	5	5	9
1999/2000	49	1	8	13	38	5	7	7	6	5	5	11
2003 dry season	55	0	n.a.	n.a.	25	6	12	6	0	0	4	1
2004 dry season	53	0	n.a.	14	28	6	9	8	4	0	4	1
2005 dry season	54	0	14*	15	44	6	13	15	3	4	5	8
2006 dry season	55	1	16*	12	41	6	20	15	3	3	3	4

Source: Field survey by Ikeno (1999, 2000, 2003, 2004, 2005 & 2006).

Note: 1) Data for 1998/99 & 1999/2000 are activities for one year, while data for 2003–2006 except those of "sale of animal" are activities during dry season (Jul. to Oct.) only.

2) Non-farm activities includes all economic activities except farming on fields managed by a household in question.

3) For instance, if one household is inviolved in brick making and sale of clothes, it is counted in both columns.

cialized livestock-raising households sold animals periodically, whereas ordinary farms with livestock only sold their animals in emergency situations such as times of food shortage or to pay school or hospital fees. Many households were also involved in nonfarm activities such as formal employment, brick making, and gravel making. Because Kirisi is near a town, some teachers and staff of the Department of Water Supply of the Mwanga District Council commute from Kirisi. These are the richest households in Kirisi and have electrical appliances such as TV sets. Their success has encouraged younger generations to seek jobs in the formal sector. Households supplying construction materials such as fired bricks and gravels have increased significantly. In 1995, there were only narrow footpaths around Kirisi, but now large tracks passable by heavy vehicles form a network at the expense of fields. Customers for bricks and gravel prefer buying from Kirisi suppliers, rather than from more remote Plains or Mountain suppliers.

Incomes from sources other than formal employment and livestock sales are small. However, an individual household is often involved in more than one economic activity, which increases opportunities for earning cash income. Many households invest part of their income into their children's secondary education (Fig. 7). Fortunately, secondary schooling opportunities have widened with the

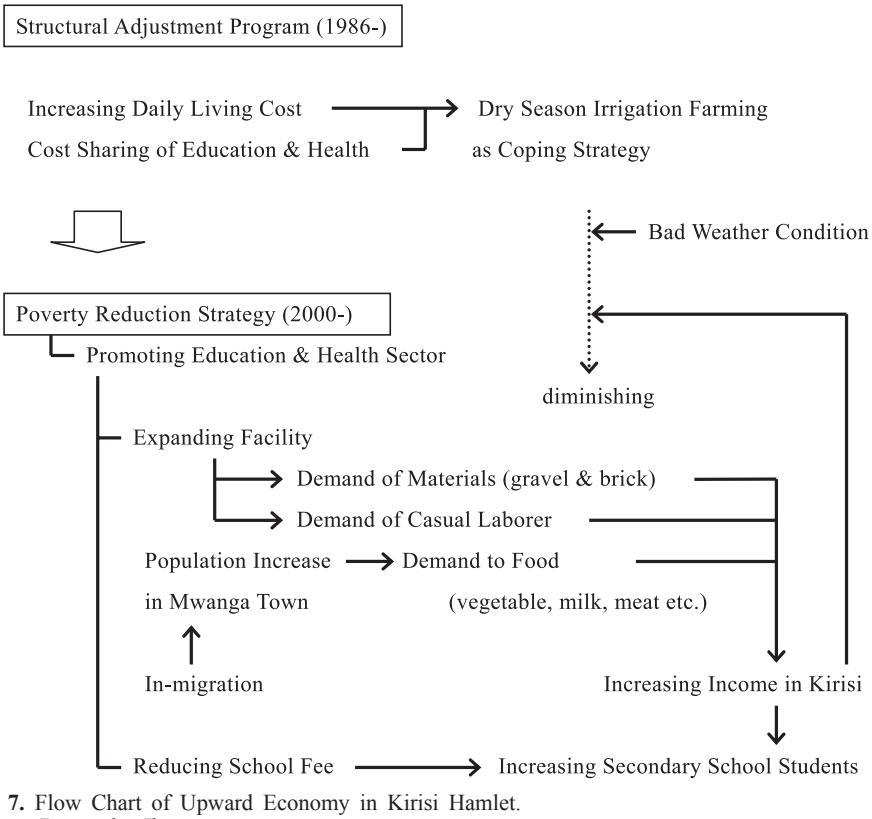


Fig. 7. Flow Chart of Upward Economy in Kirisi Hamlet.
Source: Drawn by Ikeno.

promotion of secondary education under the Poverty Reduction Policy of 2000. New national and private secondary schools have opened in Mwanga Town, and the educational level of the younger generation in Kirisi now slightly exceeds that of the older generations. As in Mkuu Village, some young people have migrated out of Kirisi; others have remained because fields and other income sources are available.

As a result, Kirisi's population increased from 282 persons in 1997 to 323 persons in 2006. Except for few household in Kirisi, all others were connected through kinship and affine relationships. A few nonrelatives live in Kirisi as agri-

Table 13. Population Change in Kirisi (1998–2006).

(person)

year	1998	1999	2000	2003*	2004	2005	2006
Population of Last Research	282 (1997)	290 (1998)	283 (1999)	298 (2000)	337 (2003)	305 (2004)	318 (2005)
Reasons of Population Increase							
Birth	4	17	8	28	7	8	7
In-migration							
Married-in Wife**	3	6	3	11	2	1	2
Return of Devorced Female	0	2	0	2	1	3	0
Return by Leaving Job	2	3	7	7	1	8	6
Return by Finishing School	0	2	1	1	1	1	0
Accompanying child	0	4	9	24	0	8	6
In-coming Worker and Boarding Student***	0	0	1	8	4	2	1
Other Reason	0	5	1	3	4	2	4
Total	9	39	30	84	20	33	26
Reasons of Population Decrease							
Death	0	4	2	3	0	1	1
Out-migration							
Married-out Female**	0	9	2	6	4	0	3
Devorce of Wife	0	2	1	6	0	0	1
Seeking/Getting Job	1	14	5	17	22	6	6
Schooling in other place	0	1	0	2	6	2	3
Accompanying child	0	15	3	9	13	2	3
Out-going Worker and Boarding Student***	0	0	0	1	2	7	1
Other Reason	0	1	2	1	5	2	3
Total	1	46	15	45	52	20	21
Population of the Year	290	283	298	337	305	318	323

Source: Field survey by Ikeno (Sept.1997, Aug.1998, Aug.1999, Aug.2000, Aug.2003, Aug.2004, Aug.2005 & Aug.2006).

Note: * Data for 2001 and 2002 are not available. Therefore, figures for 2003 include the 3 years change from 2000.
**Wives moving with husbands are included.
*** Workers (herdmen and maids) and boarding students staying at Kirisi households are non relatives.

cultural and domestic laborers or as secondary school students boarding at Kirisi households. Most people moving to and from the hamlet were family members of the original residents. Within this rather closed circle, the population growth rate was only 1.52%/year. Table 13 shows population change for 7 years. The trend in population growth fluctuated, but peaked in 2003. Serious droughts in 1998/99 and 2003/04 seem to have affected population movements, with greater out-migrations in 1999 and 2004. Interestingly, even in Kirisi, which has benefited greatly from urban development, the birth rate has been low, as in the Mwanga District in general. However, I do not consider Kirisi to be an exceptional location of lower population growth in West Plain. The annual population growth in Kiruru Lwami Village (to which Kirisi hamlet belongs) from 1988 to 2002 was actually rather high, at 2.01%/year. This suggests that only areas nearest to the urban center experienced high population growth due to in-migration. This may indicate that households, as well as villages as a whole, in the drier Plains are still vulnerable to environmental changes affecting agriculture, despite new and favorable economic opportunities.

CONCLUSION

The Kilimo Office of Mwanga District has expected that coffee production will revive the district's economy. In part, I agree that coffee is still an important income source and should be revived. However, declines in coffee production must also be understood as coping strategies by farmers in response to the poor coffee economy. These coping strategies are not limited to the coffee subsector or even agriculture in general. In fact, Mountain farmers had diversified their economic activities even before the economic liberalization policies of 1986 and the downturn in the coffee market. In 1991 and 1992, more than half of all households in Mshewa Village were not involved in coffee production. By the mid-2000s, most households in Mkuu Village were engaged in noncoffee cash crop production, as well as nonfarm activities. Although data for previous years are unavailable, it is remarkable that many households have bought staple foods and have not used their fields in Plain. In 2000, the Tanzanian government changed the national development policy from the Structural Adjustment Program to the Poverty Reduction Strategy; however, this new policy aimed at the rural poor has not yet had a great impact in Mountain villages.

At the same time, Mwanga District experienced very low population growth, although rates vary among villages. Villages and urban areas in West Plain have had relatively high population growth, whereas half of Mountain coffee-producing villages have had negative population growth. The situation suggests that farmers over-adapted to the adverse coffee economy by excess out-migration. However, census data indicate that the main reason for such low and negative growth may actually be low birth rates, which would affect population growth for a longer period than out-migration. Precise data on birth rates are lacking, and further research should investigate this.

Out-migration serves not only as a way to deal with land shortages, but also

to seek better cash income sources. Out-migrants from Mountain have had better employment than out-migrants from Plains because of the former's generally higher educational backgrounds. When the coffee economy was strong, Mountain households could spend some of their income on education for their children. Highly educated persons often migrated out of the area to pursue careers in urban areas. However, this practice may decline with the weakening coffee economy because Mountain households have less money for education. In contrast, the case study of Kirisi indicates that villages adjacent to urban areas in West Plain have increased secondary education enrollment rates. This phenomenon reflects the relatively higher population growth and the construction boom in these areas. Demands for construction materials, laborers, and food have provided additional incomes to Kirisi residents. Part of this new income has been invested in education, which has also been promoted by the Poverty Reduction Strategy.

Economic prosperity appears to have shifted from Mountain to urban areas of West Plain in recent decades, with the engine of economic growth switching from coffee to construction. Urban demands, instead of coffee, now lead the local economy in Mwanga District. Declining coffee prices have pushed farmers in Mwanga District to migrate to large cities and have reorganized the local economy. Fairtrade coffee is a hope that is yet not fully realized in Mwanga, a relatively marginal coffee production area within Tanzanian Northern Highlands. Thus, farmers have selected coping strategies beyond coffee.

The sustainability of such an urban-centered economy is unknown. Foreign aid money may support the construction boom indirectly. Mwanga District has also not yet solved its chronic food shortages. Despite new economic opportunities, out-migration from Kirisi has continued in years of drought, showing that households on the drier Plains are still economically vulnerable to hardships in the agricultural sector. For out-migrants from Mountain, Mwanga Town and the Plains area in general are not practical destinations. Mwanga's economy cannot support a large number of migrants from Mountain. Moreover, towns such as Mwanga have not been able to expand their infrastructures (such as piped water supplies) rapidly enough to keep pace with population increases. Further surveys of Mwanga's economy are needed to better understand its transformation.

ACKNOWLEDGEMENTS

I greatly appreciate the Ministry of Education, Science, Sports, Culture and Technology of Japan and the Japan Society for the Promotion of Science to fund our research works for 2004 to 2006 academic years (Grant-in-Aid for Scientific Research Project No. 16252005 of 2004 headed by Jun IKENO). I also express sincere gratitude to Tanzania Commission for Science and Technology (COSTECH), Kilimanjaro Regional Office, and Mwanga District Office to allow me to conduct research in the Northern Highlands of Tanzania. I am also indebted to Mr. B.S.F. Matunda, DALDO, and other officers of Mwanga District Agriculture and Livestock Development Office, the staff of Vuasu Cooperative Union, the staff of Kindoroko Rural Cooperative Society and other primary cooperative societies in

North Pare Mountain, and village officers of all villages in Mwanga District. Last but not least, thanks also to residents of Mshewa Village, Mkuu Village, Kirisi hamlet, Mr. Hamisi Omari as my main informant, and Mr. Saidi H. Mndeme as my excellent research assistant.

NOTES

(1) Tanzania, NBS & KRCO (2002) noted on the secondary education and migration as follows: “In education sector, Kilimanjaro has always had largest number of secondary schools and vocational training centres for the period after Independence.” “During the 10 year period of 1978 to 1988 analysis of the 1988 census showed that the region experienced a negative Net Lifetime Migration figure of –124,383. This was the biggest negative Net Lifetime Migration figure in Tanzania Mainland... The shortage of fertile arable land for agriculture relative to the population has tended to push many Kilimanjaro residents out to other regions. The lack of alternative means of livelihood inside the region is also to blame” (Tanzania, NBS & KRCO, 2002: x, 20).

(2) The original data report 3,073,578 trees and 6,841 farmers, which differs slightly from the sum of village figures. In the main text, I use the sum of the village figures.

(3) I tried to interview officers from all the primary cooperative societies; however, the Mwakimama RCS has been closed for several years.

(4) Interview with an officer of VCU Headquarters in Same City on August 1, 2006.

(5) The Kilimo Office also recommended that farmers plant alternative cash crops. For instance, Kilimanjaro Regional Administrative Secretary sent official letters on 05/Oct./2004 to five District Executive Directors (DEDs, Head of the development affairs in each district) of Kilimanjaro Region promoting vanilla cultivation and noting that “vanilla inaweza kustawi vizuri eneo linalolimwa kahawa na migomba” (vanilla grows well on areas planted with coffee and banana) (Kilimo, [AGR/C/EST/VOL. III]: Doc. No. 103). In Mwanga District, the District Agriculture and Livestock Development Officer (DALDO; Head of the Kilimo Office) responded to the DED on 02/Nov./2004 that vanilla trials would begin in 11 Mountain villages (Kilimo, [AGR/C/EST/VOL. III]: Doc. No. 105). The DALDO also sent a letter to the DED on 20/May/2005 regarding the possibility of vanilla, paprika, grape, and Artemisia cultivation (Kilimo, [AGR/C/EST/VOL. III]: Doc. No. 113).

(6) The District Profile of 2002 Population Census reports that “the district average rates of population growth for the period of 1978 to 1988 and 1988 to 2002 showed a drastic decline from 4.7 percent in the period of 1978–1988 to 1.2 percent in the period of 1988–2002” (Tanzania, NBS, 2004: Volume for Mwanga District, 7). I consider this population growth rate for 1978 to 1988 to be an overestimation. Specifically, the population in 1978 appears to be underestimated. The administrative area of present-day Mwanga District was part of Pare District in 1978. To clarify the population in 1978, we must differentiate the area of Mwanga District from that of present-day Same District. My estimate is shown in Table 4.

(7) Population growth in Kilimanjaro Province (an administrative unit during the colonial period, which is quite same as Region after the independence) has declined continuously. Although the various censuses have differing figures and accuracy, the annual population growth in this region from 1948 to 1957 was generally 3.31%/year, which is the second highest rate in Tanganyika (the present-day Tanzania Mainland) after that of the Dar es Salaam Province. Annual growth from 1957 to 1967 was 3.25%/year (calculated from data from Tanzania, MEADP, 1968: Table 1). Here, I followed the figures mentioned in

Table 7. Annual growth during 1988–2002 was the second lowest among 20 regions of mainland Tanzania. Until 1978, the decrease in the population growth rate was moderate, but it accelerated after 1978. This phenomenon coincided with declining coffee production in Kilimanjaro Region. No population growth data from 1948 to 1967 are available for the area that is the present-day Mwanga District.

(8) According to the District Profile of 2002 Population Census, the urban area containing Mwanga Town had a total population of 28,851, of which 24,692 persons were ≥5 years of age. Of these, 11,198 were usually economic active and engaged in some kind of economic activity: 2,461 in agriculture; 3,958 in forestry, fishing, and other; 144 in manufacturing; 175 in raw food sales (uncooked); 3,741 in trade and commerce; and 305 in public administration and education. Out of the "usually economically inactive" population, 753 were attending secondary schools (Tanzania, NBS, 2004: Volume for Mwanga District, Tables 1.8, 6.9 & 7.23).

(9) The National Bureau of Statistics of the Tanzanian Central Government is also aware of this strange age structure at the district level, which it mentions as "a smaller number of both females and males in the age groups 0–9; a bigger population (both males and females) in age group 10–14" (Tanzania, NBS, 2004: Volume for Mwanga District, 4). There is a similar tendency in the age structure for all districts in Kilimanjaro Region, where the number of persons aged 0–4 is smaller than the number of 5–9-year-olds (Tanzania, NBS, 2004: Volumes for Rombo, Moshi, Hai, and Same districts, 4 in each volume). However, in Arumeru District of Arusha Region in the Northern Highlands as well as Mbinga, Mbozi and Rungwe districts in the Southern Highlands, and Bukoba, Karagwe and Muleba districts in West Lake zone (see Fig. 2), the age structure has a normal-shaped distribution (Tanzania, NBS, 2004: Volume for Arumeru District, 4; Volume for Ruvuma Region, 40; Volume for Mbeya Region, 57, 103; Volume for Kagera Region, 1, 25, 59).

(10) In 2002, Mwanga District was one of 10 districts out of 129 in Tanzania which have already reached the set target for IMR (Infant Mortality Rate) of 50 infant deaths per 1,000 live births and U5MR (Under 5 Mortality Rate) of 79 deaths by 2010 (Tanzania, NBS, 2006: 27, 38).

(11) At the district level, there were 82,806 persons ≥10 years of age in 2002. Of these, 8,433 (10.18%) were attending, had completed, or had dropped out of school above the secondary level (Tanzania, NBS, 2004: Volume for Mwanga District, Tables 2.4, 6.7, 6.12 & 6.17).

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———— Accepted December 15, 2006

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Photo 1-1: Landscape of Mountain with Mt. Kilimanjaro (Aug.2000).

Photo 1-2: Coffee planted with banana in Mkuu Village (Jul.2005).

Photo 1-3: A view of West Plain with Nyumba ya Mungu Dam from Mountain (Nov.2002).

Photo 1-4: Dry season irrigation farming in Kirisi (Aug.2006).

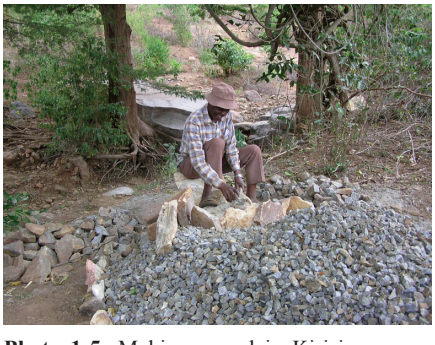

Photo 1-5: Making gravel in Kirisi (Aug.2005).

Photo 1-6: Selling fired bricks in Kirisi (Aug.2003).