Kalanthuba Chiefdom

A Baseline Development Study in Sierra Leone

Kasokira Village, Kalanthuba Chiefdom

A Houghton College Study in International Development

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Cover Photo: Kasokira Village, Historic Headquarters of Kalanthuba Chiefdom

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Errors that may remain in the report are the sole responsibility of the team leader. Version 1.1 reflects minor edits in the main text plus the addition of Appendix E.

Thanks Be to God!

Ron Oakerson on behalf of the Houghton College Research Team

Abstract

The baseline development study of Kalanthuba was conducted in May/June, 2017. After 64 years of amalgamation with a neighboring chiefdom, Kalanthuba was officially restored as an independent chiefdom later that year, part of a government de-amalgamation process throughout Sierra Leone. Composed of 5 sections and 40 villages in an area of almost 100 square miles, Kalanthuba is populated predominantly by members of the Limba tribe, numbering an estimated 9,350 inhabitants. The study uses an asset-based approach, distinguishing among natural, material, human, and social capital assets present in the chiefdom. Interviews were conducted with the leadership of all 40 villages, supplemented by on-site visits from 12 enumerators.

Kalanthuba is strategically located adjacent to the Bumbuna Dam and Reservoir on the Seli/Rokel River, near Bumbuna Town, in the northeast corner of Tonkolili District in the Northern Region. Compared to rural Sierra Leone in general, Kalanthuba is a much less developed area. Only the chiefdom's largest village, Kamankay, has a higher level of development, due to its location on the main road connecting Bumbuna Town to the City of Makeni, capital of the Northern Region. Nearly all of the chiefdom's residents live in households sustained primarily by subsistence farming using a rotational bush-fallow method, supplemented by fishing, trapping, and forest gathering. Forest and bush cover remains significant, estimated on average at one-third of village lands. Wildlife includes 229 bird species, 6 species of monkeys, and the endangered West African chimpanzee. The primates are concentrated in the 3,532 hectares Bumbuna Conservation Area, recently established near Bumbuna Dam.

Two of the five sections are upper sections, Kakalain and Folladugu, located in the north, while there are three lower sections, Kamakihila, Kamakatheh, and Kasokira. Kamankay is located in Kasokira, which lies closest to Bumbuna Town, just across the river from Kamankay. Folladugu and Kasokira sections are both adjacent to the reservoir.

The upper sections are less developed than the lower sections on most indicators. No villages in the upper sections have road access. Housing has mostly thatch roofing rather than metal, walls made of sticks and mud rather than mud bricks, and earth floors—indicators often used as a proxy for wealth. Until a primary school was opened in Folladugu section since the study was conducted, there were no schools in the upper sections. Births are likely to occur in the village, attended by a traditional birth attendant.

As a whole, the chiefdom exhibits symptoms of under-development. The adult literacy rate is estimated at 2 percent. With the notable exception of Kamankay, most villages throughout the chiefdom rely primarily on untreated surface water to drink. With restricted access to education, to health care, and to markets for agricultural produce, as well as no access to electricity, development has been slow to come.

Among the strengths of the chiefdom are its social capital, especially at the village level, where strong social ties enable villagers to work together in a large number of labor groups that assist farmers, maintain roads, footpaths, and water sources, and develop and maintain community schools without government assistance (five such schools at the time of the study, only one of which has received government funding). The chiefdom is committed to self-help, having already embarked on a program of road building by means of village labor using hand tools. Economic development potential lies primarily in opportunities for eco-tourism focused on the area wildlife and both forest-based and water-based recreation and in the strengthening of access to markets for agricultural products, especially tree-crops.

Acronyms

BCA	Bumbuna Conservation Area
BHP	Bumbuna Hydroelectric Plant
BWMA	Bumbuna Watershed Management Area
CHW	Community Health Worker
EIA	Environmental Impact Assessment
FFS	Farmer Field School
MCHP	Maternal and Child Health Post
PC	Paramount Chief
VIP	Ventilated Improved Pit (latrine)

Table of Findings

Natural Capital

Land Use

Water Resources

Wildlife

Finding I.E.1: **The Bumbuna Conservation Area (BCA) defines a protected area useful for preservation and restoration of forest cover and wildlife habitat, as well as eco-tourism, but it currently lacks both rules and resources for doing so effectively.**

Finding I.E.2: **More than half of villages report chimpanzees on village lands, and most villages report monkeys.**

Finding I.E.3: **Villages whose lands are located within the BCA are aware of BCA territory, but respond to it in various ways.**

Resilience

Finding I.F.1: **Just over half of Kalanthuba's villages report typical fallow periods of less than 7 years, suggesting possible upland degradation.**

Finding I.F.2: **Villages report up to a dozen or more varieties of rice seed in use.**

Finding I.F.3: **Almost half of the villages report a reliance on forest and bush products as food sources during times of food scarcity.**

Finding I.F.4: **Village reports indicate no evidence of wood harvested for charcoal production or that the collection of firewood currently poses a threat to forest sustainability.**

Finding I.F.5: **Most villages in sections bordering the reservoir report impact from the inundation, and at least two villages experienced major loss of land.**

Material Capital

Housing

Finding II.A.1: **Metal (zinc) and thatch roofs are roughly equal in number over the entire chiefdom, but in 4 out of 5 sections thatch roofs cover some two-thirds of houses.**

Finding II.A.2: **Wall materials split almost evenly between mud bricks and sticks-and-mud over the entire chiefdom, but in 3 out of 5 sections sticks-and-mud are used in more than 60 percent of houses.**

Finding II.A.3: **Low-type housing indicators predominate outside Kasokira section and, within Kasokira section, outside Kamankay village.**

Finding II.A.4: **A majority of villages report improvement in housing conditions over the last five years; only a few report that housing conditions have worsened.**

Technology

Finding II.B.1: **With a single exception, villages in Kalanthuba Chiefdom lack any access to electric power.**

Finding II.B.2: **Most villages have access to mobile phones within the village.**

Finding II.B.3: **Although few households have a working radio, most villages have access to a working radio within the village.**

Finding II.B.4: **Nearly all households throughout the chiefdom use an open fire for cooking.**

Finding II.B.5: **More than two-thirds of villages mainly use firewood for interior lighting.**

Sanitation

Finding II.C.1: **Most villages use common pit latrines for sanitation.**

Finding II.C.2: **With the exception of a single outlier, villages average 3.6 latrines per village.**

Finding II.C.3: **Most latrines are privately owned by households, but community access varies.**

Finding II.C.4: **In a majority of villages most residents use the bush rather than a latrine for sanitation.**

Water Supply

Finding II.D.1: **Most villages rely primarily on surface water to drink.**

Finding II.D.2: **Most water sources lie outside the inhabited portion of the village but are within walking distance.**

Finding II.D.3: **Many, perhaps most, water wells in the chiefdom are not fully operational.**

Community Facilities

Finding II.E.1: **Villages have few buildings for purposes other than housing.**

Finding II.E.2: **Community facilities for recreation or work are few in number.**

Finding II.E.3: **No market facility is located within the chiefdom.**

Transportation

Finding II.F.1: **Access to villages by means of a motorable road is extremely limited in Kalanthuba.**

Finding II.F.2: **Although all villages have access to footpaths, a majority considers them inadequate for their needs.**

Finding II.F.3: **Existing roads tend *not* to be adequately maintained.**

Finding II.G.1: **Villages have little or no access to vehicles *in the village* for transporting people, crops, or goods by road.**

Finding II.H.1: **The Bumbuna Reservoir has enhanced transport capacity by boat for Kalanthuba villages located adjacent to the reservoir, but it remains under-utilized.**

Finding II.H.2: **The impoundment of Bumbuna Reservoir has made it much more difficult for villagers to cross the river to Diang Chiefdom.**

Finding II.I.1: **The SalCost Camp at Bumbuna Dam offers potential accommodations for visitors.**

Human Capital

Literacy

Finding III.A.1: **Nearly half of the villages in Kalanthuba have no literate adult resident in the community.**

Finding III.A.2: **The adult literacy rate in Kalanthuba is estimated at approximately two percent.**

Finding III.A.3: **Among literate adults, men outnumber women by more than two to one.**

Finding III.A.4: **Evidence of literacy training for adults is almost non-existent in Kalanthuba.**

Finding III.A.5: **Most villages have no resident adult with a secondary education.**

Education

Finding III.B.1: **Only five primary schools (and no secondary schools) operate within the chiefdom.** ***[After the fieldwork was completed, one primary school and a junior secondary school have been opened.]***

Finding III.B.2: **A majority of school-age children in over half of Kalanthuba's villages do not attend primary school. [See Appendix E.]**

Finding III.B.3: **Distance to school is a major factor inhibiting school enrollment.**

Finding III.B.4: **The costs of schooling also inhibit attendance/enrollment.**

Finding III.B.5: **Shortage of farm labor inhibits school attendance/enrollment in some cases.**

Finding III.B.6: **Among children enrolled in school, school attendance tends to be irregular.**

Finding III.B.7: **Gender affects school enrollment and attendance, but not consistently.**

Finding III.B.8: **As reported by village leaders, all villages see the education of their children as an important investment.**

Finding III.B.9: **The knowledge base of Kalanthuba villages is derived mainly from traditional learning rather than formal education.**

Finding III.B 10: **Few villages see any negative effects from educating their children, but among them, labor shortage and cost of schooling dominate.**

Health Care

Finding III.C.1: **With only two health clinics located in Kalanthuba, access to professional health care is severely limited for most villages.**

Finding III.C.2: **For health care, villages rely on a variable mix of traditional healers and health posts.**

Finding III.C.3: **Distance to a health post is a major factor in determining the choice of health care provider.**

Finding III.C.4: **Villagers prefer traditional healers to health post professionals for some ailments.**

Finding III.C.5: **Affordability and distance from a pharmacy or health post deter use of medicines other than traditional herbs.**

Finding III.C.6: **In slightly more than half of Kalanthuba's villages, childbirth occurs mainly in the village rather than at a health post or clinic.**

Finding III.C.7: **In most villages, women have access to traditional birth attendants (TBAs) and receive support during pregnancy from health posts.**

Finding III.C.8: **Distance to a health post and lack of vehicular access to the village negatively affect the availability of maternal support, before, during, and after delivery.**

Finding III.C.9: **Villages report little knowledge of family planning.**

Finding III.C.10: **More than one third of villages report a decrease in the number of children considered ideal.**

Finding III.C.11: **Although most villages report at least one person with training in disease prevention, trained Community Health Workers (CHWs) are scarce** (see *Table III.C.3*).

Finding III.C.12: **Hand washing is a common practice in all Kalanthuba villages, but only slightly more than half of the villages use hand soap.**

Finding III.C.13: **Half of villages believe their water is unsafe to drink.**

Finding III.C.14: **The inhabitants of roughly two-thirds of Kalanthuba villages do little or nothing in the home to make their water safer to drink, such as boiling water.**

Finding III.C.15: **Bed nets are not frequently used among Kalanthuba villages as a means of malaria prevention.**

Finding III.C.16: **Childhood vaccination is common among most villages, though not universal.**

Finding III.C.17: **Kalanthuba was Ebola free during the epidemic of 2014-15.**

Finding III.C.18: **Health conditions have reportedly improved in a slight majority of villages over the past five years; only a few villages report that conditions have worsened.**

Livelihoods

Finding III.D.1: **Kalanthuba farmers are smallholders, cultivating 3.6 acres of upland per household, on average in a village, plus a smaller portion of swamp.**

Finding III.D.2: **Kalanthuba farmers grow food crops largely for subsistence and follow traditional subsistence practices, such as intercropping.**

Finding III.D.3: **Farmers in all villages grow food crops for both consumption and sale.**

Finding III.D.4: **Nearly all villages report farmers growing tree crops, comprising a substantial chiefdom-wide investment. [See Appendix E.]**

Finding III.D.5: **Livestock—mainly chickens, goats, and sheep—are an important, though threatened, asset for farmers.**

Finding III.D.6: **Nearly all villages supplement their agricultural output by trapping wild game and fishing in local streams or the Bumbuna Reservoir.**

Finding III.D.7: **Villages support few non-agricultural occupations, and most of these are related to agriculture, fishing, or trapping.**

Finding III.D.8: **Prior to the impoundment of the Bumbuna Reservoir, 11 villages were engaged in artisanal gold mining, but no villages are currently engaged in mining of any type.**

Finding III.D.9: **Few village residents are employed outside the village.**

Social Capital

Social Organization

Finding IV.A.1: **At least 91 rotational labor groups have been organized and operate within Kalanthuba's 40 villages.**

Finding IV.A.2: **Every village in Kalanthuba has traditional societies for men and for women.**

Finding IV.A.3: **Social groups other than rotational labor groups and traditional societies are few in number.**

Collective Action

Finding IV.A.4: **Collective action regularly occurs at the village level to maintain water sources, roads, footpaths, and bridges.**

Finding IV.B.1: **Inter-village cooperation on joint projects is possible but infrequent.**

Finding IV.B.2: **Inter-personal cooperation across villages is facilitated by family relationships and membership in traditional societies.**

Finding IV.B.3: **Only one-half of Kalanthuba's villages know the name of their district counselor for Tonkolili District.**

Finding IV.B.4: **Half of Kalanthuba's villages report having received no assistance from an NGO or development agency.**

Finding IV.C.1: **Villagers report relying on friends, relatives, and elders in time of need.**

Conflict

Finding IV.C.2: **The main source of conflict reported among village residents is lack of food—hunger—followed by disrespect in the form of abusive language.**

Finding IV.C.3: **The relationship between transhumant Fullah cattle herders and resident farmers is a major source of conflict in the chiefdom.**

Finding IV.C.4: **Two-thirds of Kalanthuba's villages report some significant level of crime in the village.**

Introduction

On August 29, 2017, President Ernest Bai Koroma presented the ceremonial staff of chieftaincy to the newly appointed Regent Chief of the restored Kalanthuba Chiefdom in Sierra Leone. The ceremony, held in Makeni, capital of the Northern Province, ended a sixty-four year period of amalgamation that had joined Kalanthuba with the historic Dansogoia Chiefdom to form the amalgamated chiefdom of Kalansogoia on 26th October**,** 1953. The amalgamation joined a Limba chiefdom—Kalanthuba—to a Kuronko chiefdom—Dansogoia—each with its own local language. Both the Limbas and the Kuronkos are among the smaller tribes in Sierra Leone. The de-amalgamation restores Kalanthuba as a Limba chiefdom, part of a general reorganization that created 41 newly independent chiefdoms, increasing the total number from 149 to 190—approaching the original number of 217 prior to the British-led amalgamation and Sierra Leone's independence in 1961.[1]

The restoration of Kalanthuba Chiefdom is a momentous event in the lives of its nearly 10,000 inhabitants, nearly all Limbas. Prior to the official act of de-amalgamation, but aware of its potential, Daniel Sara Turay, a prominent member of the historic ruling house of Kalanthuba, asked Houghton College to conduct a baseline development study of the Kalanthuba area. This report is the product of that study, conducted over a 3-week period in May and June, 2017.

Restoration of Kalanthuba Chiefdom

The Kalanthuba chiefdom traces its origin to a warrior, Bai Yembeh, who appropriated the area with the armed support of a powerful chief of Biriwa, a chiefdom that lies just to the north. Yembeh was the first recognized chief of Kalanthuba. The house of Thikirays (Turay), composed of Yembeh's descendants, is recognized as the ruling house of Kalanthuba; in the amalgamated chiefdom, however, it was one of two ruling houses.[2] The amalgamation agreement between the two former chiefdoms provided that in "all elections of a Paramount chief of the amalgamated chiefdom, the families which have a right to present candidates in the individual chiefdoms shall retain that right." The last Limba chief to head the amalgamated chiefdom, PC Alimamy Thallan Turay I, ruled from 1972 to 1998. The civil war that ravaged Sierra Leone for a decade, beginning in 1992, also prevented the election of a successor to the chieftaincy until 2002, when the present chief, PC Alamamy Bockarie Yallan Koroma III, a Kuranko, was chosen. The outcome was contested by the ruling house from Kalanthuba after their candidate, Daniel Sara Turay, was disqualified by the central government. Tensions continued for several years, but the two sides eventually achieved reconciliation. In 2013, signs picturing both the present Kuranko chief and the disqualified Limba candidate were erected in Bumbuna, proclaiming the unity of the amalgamated chiefdom.

[1] At the same time, the central government created four new districts, raising the total number to sixteen, and divided the Northern Province into new regions for a total of five, including the Western Area. *Concord Times*, 2 August 2017

[2] The foregoing account is based on information contained in Tristan Reed and James A. Robinson, *The Chiefdoms of Sierra Leone* (2013).

In 2016 the central government sponsored an inquiry into the performance of amalgamated chiefdoms and, in May 2017, Parliament enacted legislation giving final authorization for the de-amalgamation, including Kalansogoia.

At de-amalgamation, Kalanthuba joined eight other predominantly Limba chiefdoms located in an arc that reaches north and west of Kalanthuba along the Seli River, then southwest across the northern part of Bombali District. The river forms a natural boundary between Kalanthuba on the west bank and the historic Kuranko Chiefdom, Dansogoia, on the east bank. Bumbuna, the only major town in the amalgamated chiefdom, lies within the traditional bounds of Dansogoia on the east bank of the river, connected by bridge to Kalanthuba. The headquarters for Bumbuna Dam—housed at SalCost Camp—are located on the west bank within Kalanthuba. Dansogoia hosts another recent, large-scale development project, originally the African Minerals iron mine, now known as the Shan Dong Steel (SD Steel).

Kalanthuba Chiefdom and its principal village settlements are shown, alongside Dansogoia, in the map in Figure 1. It consists of three lower sections—Kamakihila, Kamakatheh, and Kasokira—and two upper sections—Kakalain and Folladugu. The Bumbuna Reservoir extends along the entire eastern border of Kalanthuba north of the dam, adjacent to Folladugu and Kasokira sections. The village of Kasokira, headquarters of Kasokira Section, is the historic chiefdom headquarters of Kalanthuba. For the present, the chiefdom headquarters is located in the village of Kamankay, Kalanthuba's largest village, directly across the river from Bumbuna Town.

At the time of the baseline study, the five sections that constitute Kalanthuba remained part of the amalgamated Kalansogoia Chiefdom, even though the impending de-amalgamation was widely known.

Theory and Methodology

As a snapshot of the level of development at a point in time, a baseline study can be used to measure the extent of future development at appropriate intervals. More importantly, it identifies the development base, the basis for future development, as well as deficiencies. Such a study thereby indicates sources of both strength and weakness, highlighting development potentials as well as critical needs.

A study of the development base is dependent on a conception of development and its values. This study takes a broad view of development as multidimensional—including economic, social, and institutional dimensions—which together define the essential attributes of sustainable, resilient communities, communities that have long-term viability. Community is understood as an area of human settlement where residents share a diverse set of resources in common. Development is therefore viewed as community-based in this study, both in terms of the primary resource base available for development and the community choices required to use those resources to pursue development objectives of community benefit. A community seeking development does so with a resource base that includes both constraints and opportunities. Development is a process that draws upon existing

resources to add sustainable value to community life by enhancing (restoring, maintaining, expanding, and diversifying) the resource base, over time.

The primary communities in Kalanthuba Chiefdom are its 40 villages (listed in Appendix A). Previous studies of the Bumbuna Dam watershed, which includes much of Kalanthuba, relied on sample surveys of households, treating the household as the unit of analysis. However, important resources are shared at the village level, including land and labor, as well basic social institutions. Farm households neither own the land they farm as freeholders nor supply a large portion of their farm labor. As a result, the households lack the degree of self-sufficiency that farm households may have in other contexts but, rather, are highly interdependent, holding important resources in common. Moreover, the paucity of many resources in the area increases the probability of household sampling error: household samples risk missing key resources present at the village level and potentially sharable among households. For these reasons, the village rather than the household is the better unit of analysis for a baseline development study of Kalanthuba.

Each village is a territorial subunit of a section, which is a subunit of the chiefdom. A typical village consists of a single compact settlement area (occasionally two or three separated settlement areas), where inhabitants make their homes, surrounded by the landholdings of village families. "Families" are not nuclear families but extended families or descent groups, which claim land originally appropriated by a common ancestor. Because villages are nested within sections, the section is an important secondary unit of analysis, and Kalanthuba Chiefdom, a tertiary unit. The study team collected data at the village level for 40 villages and aggregated the village data to section and chiefdom levels.

Data was collected in two ways. The principal method consisted of personal interviews with village leaders; generally included were the village headman, chairlady or "mammy queen," and youth leader, often in addition to others who accompanied the leaders. Villages were interviewed at accessible locations in four of the five sections over a period of eight days. Each interview was about three hours in length, assisted by locally knowledgeable translators fluent in Limba (the local language) and English. All 40 villages in the chiefdom participated in the interview process. The 100 percent rate of participation is all the more remarkable in that most village participants reached the interview site by footpath, some walking for four hours or more.

In addition to the village interviews, the study employed 12 local enumerators, one of whom visited each of the 40 villages to estimate the population of the village and count visible attributes of the village housing.

To conceptualize the development base in each village the study used an asset-based approach that distinguishes four types of capital assets—natural, material, human, and social:

- *Natural capital* is the endowment of nature, including land, water, forests, and wildlife.
- *Material capital* is created by the manufacture of physical assets: housing and other buildings, household technology, water supply and sanitation facilities, roads and footpaths, communication equipment, and vehicles.

- *Human capital* resides within individuals and consists of levels of education, training, and literacy; health; and the skillsets related to sources of livelihood.
- *Social capital* is the ability of individuals and households to draw on the assistance of others outside the household as needed, whether through extended family relationships, friendship circles, or organized groups and associations.

Rather than focusing on income, which is difficult to measure in a subsistence economy, an asset-based approach targets the sources of income and, more generally, human welfare. The study is thus designed to identify the composition of the resource base and assess the value of its main components, using widely accepted criteria. Development is understood as the growth of the asset base in its material, human, and social dimensions, while preserving the natural-capital dimension, using the natural resource base more sustainably and perhaps restoring some of its aspects that may have been depleted. Many studies of development focus on material and human capital; the inclusion of natural and social capital provides a more complete assessment of the resources available for broad-based development in a community.

For each type of capital asset, the study employed various metrics to measure its multiple dimensions. These metrics are discussed briefly below.[3]

Natural Capital

The principal dimensions of natural capital are land, water, and wildlife. Land in Sierra Leone can usefully be sorted into four categories: upland, inland valley swamp, bolilands, and forest. Upland is cultivated using a rotational bush-fallow system: farmers cultivate a plot for 2-3 years then allow the plot to lie fallow for a period while shifting cultivation to a different plot.

The study used a 10-seed technique[4] in two steps to derive rough estimates of land use by village. In step one, village leaders sort village lands into 3 components: upland, inland valley swamp, and bolilands (grasslands). In step two, the upland portion is again sorted into 3 components: land that is currently cultivated, land that is fallow, and land reserved as forest. The technique produces only rough approximations, but more precise measurement is difficult to come by. The development of land-use policy and programs would require further study.

Reported patterns of forest use indicate the contribution of forest resources to community wellbeing. The relative amount of fallow land together with land reserved as forest provides a measure of forestation at this point in time. The reported length of the fallow period is a key metric for measuring the fertility of agricultural land, here as elsewhere in Sierra Leone.

[3] The metrics used are similar to those used in the construction of the DHS Wealth Index used by USAID (see dhsprogram.com). Included are housing characteristics (roof, floor, and wall materials), drinking water source, toilet facility, cooking fuel electricity, radio access, and vehicles.
[4] Field researchers actually used 10 stones rather than 10 seeds.

Village reports of wildlife, in particular primates, provide a rough indication of their distribution around the chiefdom. Village access to fresh water streams and fish stocks is also noted.

Material Capital

The dimensions of material capital include housing and other buildings, household/community technology, energy sources, and infrastructure—water, sanitation, communication, and transportation.

Housing attributes are typically used in development studies as indicators of household wealth and, often, as a proxy for income. The study includes a count of houses per village as well as counts of widely used indicators: roofing, wall, and floor materials. These data, collected by enumerators, were checked against the more or less rough estimates made by village leaders in interviews.[5] While both sources are subject to potential inaccuracies, together they provide a largely consistent picture of housing attributes in the chiefdom that can form the basis for a confident overall assessment.

Energy sources measured were the availability of electricity, source of interior lighting, and fuel used for cooking. Water and sanitation measures include the water sources used for drinking and the number of latrines in the village. Access to means of communication is measured by the availability of mobile phones and radios in the village. Transport indicators consist of village accessibility by a motorable road, in addition to footpaths, as well as village use of vehicles.

Human Capital

Human capital is examined in three dimensions: literacy and education, health, and sources of livelihood. Included are measures of both *present levels of human capital* in a village and the *means of human capital formation* in use.

The study measured human capital in terms of the number of literate adults in a village, the levels of formal education achieved by village residents, and livelihood capabilities or skillsets including, but not limited to, farming, fishing, and trapping. The health dimension is not measured directly but is inferred from reported drinking water sources, sanitation facilities and toileting practices, hygiene practices (especially hand-washing), and common ailments.

Human capital formation, or investment in human capital, is measured in terms of access to and use of healthcare facilities and the enrollment and attendance of school-age children in school, as well as the availability of adult education and training. In addition to data collected from village interviews, separate interviews were conducted with nurses in two health clinics and teachers in two primary schools located in Kalanthuba.

[5] See Table II.A.2 for a comparison of the two data sources.

Social Capital

Theorists distinguish two types of social capital: *bonding* capital and *bridging* capital. Bonding capital connects persons who offer similar assistance to one another within a given group on a more or less reciprocal basis, while bridging capital connects persons to others outside the reference group who can offer more specialized assistance, on either a recurring or non-recurring basis. Bonding capital, we surmise, produces greater community cohesion in villages, while bridging capital connects villages to external sources of support and assistance.

The most common sources of bonding capital in the villages of Sierra Leone, including the Kalanthuba area, are the traditional men's and women's associations often referred to as "secret societies." To begin to assess the value added by traditional societies, the study focuses on two outcome indicators: the presence (and size) of sacred forests maintained by traditional societies and, qualitatively, the reported impact of societies on village wellbeing. Traditional societies also supply bridging capital by means of social occasions that bring together families from multiple villages within tribal areas. An important metric for measuring bonding capital is the number of organized groups and associations within villages, e.g., labor groups, savings/loan groups, and group farming associations or cooperatives; also important is the incidence of village-level collective action, including road and footpath maintenance as well as efforts to improve sanitation and hygiene. Because bridging capital connects villages to sources of assistance outside the village, the study inquired about political connections to the district council for Tonkolili District and to other government agencies and NGOs.

Given that social capital is thought to depend on trust, a series of questions asked leaders to report from whom villagers would ask assistance in time of need, including farmers in need of seeds to plant. The design of the study precluded asking about trust in village leaders—this would require a sample survey of villagers. Reported causes of conflict and the reported presence of crime in the village were collected as additional indicators of community cohesion.

Institutional Context

The primary institutional context of village life consists of the traditional authority structure found in the provinces of Sierra Leone. While Britain ruled Freetown and its immediate environs as a crown colony, the rest of the country was governed as a protectorate. British authorities ruled the provinces indirectly, through the agency of traditional chiefs. At the same time, however, the traditional authority structure was modified by British rule, in particular strengthening the position of paramount chiefs and weakening their accountability to local communities. To some extent, the British system extended well beyond independence, insofar as the central government in Freetown continued to rely on the traditional authority structure to provide the primary level of governance in the countryside. As a result, traditional rulers remain in positions of authority throughout the provinces.

Chiefdoms are composed of sections, which are in turn composed of villages. Each section has a section chief who reports to the paramount chief. Villages have a standard set of leaders: headman, chairlady ("mammy queen"), and youth leader, in addition to others that vary from village to village. The mammy

queen has responsibility for women's issues and mobilizes women to undertake various tasks. The youth leader similarly mobilizes youth, usually young men but, sometimes, young women as well, defined roughly to include any adult under the age of 40.

Within each village, inhabitants are associated as members of "families," which are common-descent groups led by a head of family, usually the oldest male family member. The family is a kin group that traces its origin, normally through a patrilineal line, to an original settler. Families are composed of households established by marriage, including polygamous marriages. While the family serves various social functions, it is highly relevant to village organization with respect to land tenure. The principal owners of village lands are families, not households or individuals. The head of family allocates farmland on a rotating basis among households, allowing a large portion of land to lie fallow. Usually, however, a village includes both landowning and non-landowning families. Individuals and households in non-landowning families can nonetheless gain access to land by means of a "token" payment given to a head of family.[6]

Chiefdoms are the highest level of traditional authority, nested in one of 16 districts, which are in turn nested in one of four regions. Kalanthuba lies in Tonkolili District in the Northern Region. Beginning in 2004, Sierra Leone has pursued a policy of decentralizing many responsibilities formerly assigned to central government ministries, enhancing the role of district governments and creating elected district councils and an elected district chairperson. Each district councilor is expected to create a ward committee to enhance local participation in district governance.[7] The recent de-amalgamation of chiefdoms together with the creation of new districts and one new region are expected to enhance the decentralization process by fostering greater cooperation between chiefdoms and the Local Councils that constitute the governing body in districts.[8]

In 2008, parliament created the Bumbuna Watershed Management Authority (BWMA), a semi-autonomous governmental unit within the Ministry of Energy, to protect the Bumbuna reservoir and maintain the land and water processes on which local communities as well as local flora and fauna depend. The eastern portion of Kalanthuba lies within the territorial jurisdiction of the watershed authority, which has responsibility for the regulation of land use and conservation practices. The watershed authority also is responsible for supporting the Bumbuna Conservation Area (BCA), a 3,532 ha protected area that lies entirely within Kalanthuba. The authority secretariat is based at the SalCost Camp near the Bumbuna Dam, also located in Kalanthuba.

[6] For a full description of customary land tenure see, Oakerson, Bonanno, and Bonanno, et al, *How Subsistence Farmers Hold and Access Land in Sierra Leone* (2017).
[7] See Oakerson, et al, *'One Finger Cannot Lift a Stone': Decentralization and Development in Sierra Leone* (2009).
[8] *Concord Times*, 2 August 2017.

Population and Area

Based on the enumeration conducted for this study in each village in the chiefdom, the 2017 population of Kalanthuba is estimated at 9,390 people.[9] The size of the Kalanthuba area is approximately 96.2 square miles. (See the map in Figure 1.) Population and area vary among the five sections, as shown in Table Intro.1. The enumeration estimated the following population components (not including any who live outside the village):

- Children under age 5 25%
- Children ages 6-17 23%
- Male youth ages 18-40 15%
- Female youth ages 18-40 20%
- Adults over age 40 17%.

Table Intro.1: **Kalanthuba Population, Area, and Villages, by Section**

Section	Population	Area (square miles)	Number of Villages
Kasokira	4,371	21.0	11
Folladugu	1,794	27.6	9
Kamakihila	1,385	19.3	7
Kakalain	1,192	18.3	7
Kamakatheh[10]	702	10.1	6

The average village in Kalanthuba has 238 inhabitants. Average village population also varies by section:

- Kasokira section 392
- Kamakihila section 256
- Folladugu section 199
- Kakalain section 199
- Kamakatheh section 117

[9] Data are missing for one village in Kamakatheh section. The mean population for the five villages on which data are available in Kamakatheh is 117. Total population counted in 39 villages is 9273. The population estimate is the sum of the 39-village population count and the mean population of villages enumerated in Kamakatheh: 9273 + 117 = 9390. The population estimate for Kalanthuba in this study is 39.6% of the 2015 rural population of Kalansogoia, the amalgamated chiefdom. The 2015 Census of Population in Sierra Leone placed the total population of Kalansogoia Chiefdom at 35,864; the population of the rural part of the chiefdom was 23,582. Bumbuna Town, the largest urban area in Kalansogoia, is located outside Kalanthuba, and Kalanthuba is predominantly rural.

[10] Estimated population due to missing data for one village. The actual count for 5 villages is 585. See fn. 9 for estimation procedure.

The largest village by a wide margin is Kamankay, located in Kasokira section, with an estimated population of 1,901—20 percent of the population of Kalanthuba. Not including Kamankay, the average village in Kalanthuba has 195 inhabitants—43 fewer than the average size with Kamankay included. Kamankay is the most highly developed village in Kalanthuba, an outlier on most indicators of development. Its advantage is locational—situated just across the Seli River from Bumbuna Town on the main road connecting Bumbuna to Makeni, the capital of the Northern Region, roughly an hour away by car. The second largest village, Kamathor (also in Kasokira section) is about one-third Kamankay's size with an estimated population of 648, also located near Bumbuna Town.

At the other end of the scale, 10 villages have populations of less than 100 people—the smallest has just 13 inhabitants (also located in Kasokira section).

The population of Kalanthuba is both Christian and Muslim. Most villages are majority Christian:

- 12 villages report *all* inhabitants are Christian.
- 11 villages report inhabitants are *mostly* Christian.
- 12 villages report *more* Christian inhabitants than Muslim.
- 2 villages report *both* Christian and Muslim inhabitants.
- 1 village reports inhabitants are *mostly* Muslim.[11]

What Follows

The four numbered sections of the report explore, in turn, the natural capital, material capital, human capital, and social capital assets of Kalanthuba. The Table of Findings (which precede this Introduction) duplicates the findings that organize each of the four sections that follow, cross-referenced by section and sub-subsection. A middle section of figures—located between sections II and III—contains maps and photographs referenced in the text. Appendices contain a village list, summary data tables on which the narrative text is based, and descriptions of schools and health posts visited.

[11] Data are missing for two villages.

I. Natural Capital

Introduction

The people of Kalanthuba rely heavily on the area's natural-resource base for food, water, and raw materials. Foremost among the area's natural assets is land and its uses for agriculture and forestry—not to mention the natural beauty of its semi-mountainous landscape. The fertility of upland soil is dependent on the bush-fallow system in use by farmers, affected greatly by the length of the fallow period. Wildlife provides another valuable dimension of natural capital, not only by adding more meat to local diets, but also in creating a potential for eco-tourism. Abundant water resources, in some respects enhanced by the Bumbuna reservoir, have long sustained a culture of fishing in most local communities.

A. Climate and Climate Change

Sierra Leone's tropical climate is punctuated by a very wet rainy season and a hot dry season with dusty harmattan winds, which blow over West Africa from the Sahara Desert. From May to the end of October, Kalanthuba is very wet, with July to October being the rainiest months. The dry season begins in November and lasts through April.[12]

Although meteorological data collection has not been consistent in Sierra Leone, based both on available data and on trends throughout West Africa, Sierra Leone's average annual temperature is expected to increase by 7 to 9 percent (an increase of 1.8 to 2.5 degrees Celsius) by the year 2100. Precipitation as millimeters of rainfall is projected to increase by about 3 to 10 percent. The number of rainy days, however, is expected to decline. According to a UN report, "Sierra Leone is particularly vulnerable to the increasing frequency and severity of droughts, floods and severe storms (hail, thunder, lightning and violent winds), and their impacts on sectors such as agriculture, fisheries, as well as infrastructure and hydro-electric power production."[13] Kalanthuba will likely feel any climate change acutely as residents are highly dependent on agriculture and fishing as livelihood sources and the Chiefdom is home to the largest hydroelectric power plant in Sierra Leone.

B. Land Use

Land in Kalanthuba is sorted into three categories: upland, inland valley swamp, and boliland. Upland, the most prevalent of the three land types in the chiefdom, requires the use of a rotational bush-fallow system to sustain productive cultivation. The fertility of the soil depends on fallow periods after which the fallow bush is cleared and the land returned to cultivation. Because of the implementation of this rotational system, upland can be further divided into an additional three categories: upland currently under cultivation, upland that is resting (bush-fallow) and upland that is permanently reserved as forest. Although the figures reported in village interviews provide only a rough approximation of land-use

[12] Nippon Koei UK 2005 Appendices, p. 178

[13] United Nations Development Programme 2013, p. 2

percentages, using the 10-seed technique described in the Introduction, the proportions reported reflect the perception of village leaders and provide a useful overview.

As displayed in the chiefdom-wide percentages in Table I.B.1, a substantial amount of village upland in Kalanthuba is reserved as forest, which provides villagers with important forest products. The two remaining categories, inland valley swamp and boliland, are nourished by runoff from the upland and thus do not require fallow periods. Inland valley swamp forms in the valleys between hills and is permanently moist, flooding during the rainy season.[14] It is farmed more or less continually and is the most productive village land. Boliland is characterized by large flat expanses that flood during the rainy season but are cultivated in the dry season as the water evaporates. Boliland is not as fertile as inland valley-swamp and requires labor-intensive cultivation. Boliland does, however, support thick grasses and is the preferred pastureland of the transhumant Fullah for grazing their cattle.[15] This can limit access to boliland for cultivation as villagers and Fullah compete for access.

Forest Cover and Use

Finding I.B.1: **Forest cover varies widely among village lands but averages 16 percent chiefdom-wide.**

Across the five sections, the percentage of village lands reserved as forest is roughly 16 percent—an amount roughly equal to the percentage of village upland currently being cultivated. Forest cover varies from 4 percent to 50 percent among villages, and on average among sections from 10 percent in Kamakihila to 21 percent in Folladugu. The distribution is skewed: only five villages report forest reserves of 30 percent or more, while 18 villages report 10 percent or less.

Table I.B.1: **Village Land Use, Chiefdom Average**

Upland currently under cultivation	16%
Upland that is resting: bush-fallow	20%
Upland reserved as forest	16%
Inland valley swamp	29%
Boliland	20%

[14] Leach 1997, p. 138.
[15] Oakerson, et al, 2016, p. 12.

Finding I.B.2: **Forest and fallow bush (combined) cover, on average, roughly one-third of village lands.**

According to interviews, roughly 20 percent of village upland, on average, is currently bush-fallow. The proportion of bush-fallow varies widely, from 1 to 50 percent among villages, and on average from 17 to 25 percent among sections. The distribution is fairly symmetrical: nine villages report bush-fallow of 30 percent or more, while 8 villages report 10 percent or less.

The average percentage of village land devoted to forest and bush *combined* is about 36 percent. The percentage varies among villages from 7 to 70 percent (the latter in three villages). The distribution is skewed: only three villages report 20 percent or less of combined forest and bush-fallow, while 15 report 40 percent or more.

At the section level, forest and bush combined varies from 31 percent in Kakalain and Kamakihila to 42 percent in Kasokira, which includes the Bumbuna Conservation Area. Folladugu section, which, like Kasokira, borders the Bumbuna reservoir, reports an average of 38 percent. See the map in Figure 2 for an image of the canopy cover in the chiefdom in 2010.

Finding I.B.3: **All or nearly all villages rely heavily on the forest and bush as a source of building materials, firewood, food, and medicinal herbs.**

Open-ended village reports of resources extracted from the forest were fairly consistent across villages. Building materials gathered from the forest include thatch (grass and palm fronds), building sticks, and vines and fibers for ropes. Timber was often included under building materials. Locally milled planks are important for the construction of doors, windows and benches. Formerly, timber was harvested using only axes and hand tools; now, villagers often hire someone to come from Bumbuna with a power saw to harvest and mill the timber.

Table I.B.2: **Percentage of Land in Forest Cover and Fallow Bush, by Section**

Section	Bush-Fallow	Forest Cover	Combined
Kasokira	25%	17%	42%
Kamakatheh	19%	16%	35%
Kamakihila	21%	10%	31%
Kakalain	17%	14%	31%
Folladugu	17%	21%	38%

One village also mentioned that the forest is important as a source of wood for the construction of local dugout canoes. Fourteen villages mention the use of forests to extract firewood. Most firewood is obtained when clearing bush-fallow for planting. Among foods extracted from forest or bush-fallow, villages mentioned bush yams, fruit, honey, palm kernel, palm wine, kola, spices including alligator pepper, and locust. (See section IV, Human Capital, for the reliance of villagers on medicinal herbs.)

Finding I.B.4: **Nearly every village reports setting traps in cultivated fields, and roughly half report trapping in the forest.**

Trapping is common across the five sections. Traps in the forest are used to harvest deer, fretambo (Maxwell's duiker), bush fowl (double spurred francolin), helmeted guinea fowl, monkeys, bush hogs, stone/bush goats, squirrels and cane rats (grass cutters). Animals caught in the forest are primarily for household consumption, but a few villages report that, if a trap catches a large animal such as a deer or bush hog, the trapper may sell half of the meat and reserve the rest for his family's consumption. Sale does not seem to be the principal purpose for trapping, but a secondary benefit when a trapper has more meat than his household can consume. Trapping in cultivated fields serves as an important form of pest control as well as being a source of meat.

Agricultural Use

Finding I.B.5: **On average, 45% of village land is either currently cultivated upland or agricultural lowland (swamp).**

Although villages estimate, on average, that upland accounts for some 51 percent of their lands, they report that the amount of upland currently cultivated comprises only 16 percent of village lands. The remainder of the upland is either bush-fallow (20% of village lands) or forest (16% of village lands). Another 29 percent of village lands, on average, are reported as inland valley swamp, most of which is likely to be cultivated. Twenty percent of village lands is reported to be boliland, some of which is cultivated and some used for cattle grazing by Fullah people.

Finding I.B.6: **The percentage of boliland varies significantly among villages, as does the availability of boliland for cultivation.**

Boliland varies among villages from zero to 40 percent; on average, among sections, it ranges from 14 percent in Kasokira to 26 percent to 26 percent in Kakalain, around a mean of 20 percent. The extent to which village boliland is available for cultivation varies, depending on whether the land is currently being used by Fullah herders to graze cattle. Eighteen villages (45 percent) currently report Fullah use of village lands.

Finding I.B.7: **The Kalanthuba climate supports a variety of tree crops typically found in tropical climates.**

Agroforestry represents an important element of Kalanthuba's agriculture. Villagers reported cultivating a variety of crops including mango, kola nut, palm (for palm oil and palm wine), banana, guava, avocado, cashew and coffee. (See Section III.D for a discussion of tree crops).

C. Land Tenure

Land tenure in the provinces of Sierra Leone (exclusive of the Western Area, which includes Freetown, the capital) is based on a long history of possession by extended families or descent groups, i.e., groups of kin that claim land based on their descent (usually through the male line) from a founding ancestor, who was the initial appropriator. Though based on customary law, family claims are recognized as valid by Sierra Leone's judiciary.[16] The landowning "family" is represented by an elder, the "head of family," usually the oldest male member. Households, however, have separate farms. As a result, the rotational bush-fallow system requires that family land be reallocated annually or biannually among households or individuals. Farmers request land from the head of family, who decides on the allocation in consultation with family members. Although landowning families hold nearly all of the land in Kalanthuba, there are a few reported instances of land owned by individuals and some lands that are village-owned.[17]

Finding I.C.1: **Landowning families outnumber non-landowning families in Kalanthuba by a ratio of 1.5 to 1.**

Based on reports from 39 villages,[18] the number of landowning families is 136, compared to 88 non-landowning families—an average of 3.5 landowning families and 2.3 non-landowning families per village. Villages exhibit considerable variation: the number of landowning families ranges from 1 to 7, and the number of non-landowning families from 0 to 11. Members of non-landowning families typically request and obtain land from a landowning head of family. A non-landowning family member (sometimes also a member of the landowning family) provides the head of family with a "token," most frequently kola nut in Kalanthuba or sometimes palm-wine. In some cases, a small gift-in-kind is expected at harvest—more out of respect than as payment. Usually the non-landowning family member requests land from a head of family in the same village, but some village respondents mentioned requests from individuals in neighboring villages. Although the research team did not examine Kalanthuba land tenure arrangements in depth, a previous study in the Northern Province (which included Limba villages) indicated that the customary land tenure system is remarkably inclusive, seldom leaving any villagers without access to farmland.

[16] See Renner-Thomas, 2010.
[17] Two villages reported that the sacred bush in the village is village-owned, but researchers did not specifically inquire about the ownership of the sacred bush.
[18] Data are missing for one village.

D. Water Resources

Villages report heavy reliance on surface water as a source of drinking water and fish. The use of wells in the chiefdom is minimal, and many if not most of those present are not in full working order. Streams, ponds, swamps, and springs are for many villages the only water resources available. The Bumbuna Reservoir forms the eastern boundary of the Chiefdom and is a significant asset for the 10 villages it borders.

Finding I.D.1: Surface water is readily available and abundant, subject to seasonal variation.

The majority of villages report streams as their primary source of drinking water; springs are the second most commonly reported primary source. (See Material Capital section II.D for a discussion of drinking water.) The average reported walking time to the nearest water source is 25 minutes round trip, suggesting that villages are usually located close to surface water and that these resources are relatively abundant. However, the availability and abundance of water resources is subject to significant seasonal variation. Six villages, however, report that during the dry season their primary water source dries up, and they must dig for water. Other villages report that during the dry season they must go to streams further away to collect water. A few villages report their primary water source as a spring that turns into a stream during the rainy season.

Finding I.D.2: The groundwater resources of Kalanthuba are poorly defined and relatively under-utilized.

The heavy dependence on surface water and the limited presence of wells in Kalanthuba suggest a lack of knowledge about the groundwater resources of the chiefdom. The low number of wells in Kalanthuba increases the difficulty of monitoring groundwater resources, just as the lack of groundwater data increases the difficulty of siting wells. In August 2017, the Sierra Leone Ministry of Water Resources released the first comprehensive report on the hydrogeology of Sierra Leone.[19] The report provides a useful overview of hydrogeology in Sierra Leone, but it has little detail about water resources in Kalanthuba Chiefdom. It does indicate that groundwater resources in Kalanthuba, like surface water resources, are subject to seasonal variation. A 1994 study reported that in 18 boreholes in the "Bumbuna area," groundwater levels varied from 1.3 to 8.1 meters with a mean of 3.6.[20]

Finding I.D.3: Widespread fishing among villages suggests the presence of abundant fish stocks, both in streams and in Bumbuna Reservoir.

Nearly all villages report fishing, and the majority report fishing in nearby streams. Fishing practices are well adapted to seasonal variation in water resources. This suggests that fish stocks are abundant, though the study does not include data on species. A yearlong study on fish recorded a total of 62 species of which only 30 species were found above Bumbuna Falls. Villagers reported different

[19] Sierra Leone Ministry of Water Resources, 2017.
[20] Akiwumi, F.A. & Butler, 2008.

techniques employed in different seasons. The majority of villages report fishing in streams, where men typically fish during the wet season using a line and hook, and women fish during the dry season using traditional hoop nets. Eight villages report fishing in the reservoir, usually done by men when the water level is high. One village however, noted that as the reservoir recedes, fish are trapped in pools along the steep banks where women use traditional hoop nets to harvest them. (See photo in Figure 6.) Three villages report that no residents engage in fishing. Two of these villages do not have adequate streams in which to fish, and one village, located below the dam, reports that they no longer fish because of the danger of unexpected water releases from the dam.

Finding I.D.4: Both the Bumbuna Reservoir and Bumbuna Falls have ecotourism potential.

Although there is currently little ecotourism in the region, the Bumbuna Reservoir and Bumbuna Falls represent significant ecotourism resources. The Bumbuna Reservoir could quite easily be developed to support boating, wildlife viewing, and other recreational activities. Bumbuna Falls is one of Sierra Leone's most impressive natural features and is featured prominently on the website of Sierra Leone's National Tourism Board. The falls are located on the Seli River, which forms the border between the Kalanthuba and Dansogoia Chiefdoms, just downstream from the Bumbuna Hydroelectric Plant (BHP). The waterfalls are currently only accessible by motorable road from Bumbuna Town on the Dansogoia side of the Seli River, but the proximity of such an impressive natural feature is nevertheless a significant asset for Kalanthuba.

E. Wildlife

A variety of studies have been conducted regarding the wildlife resources of the Seli River Valley. An Environmental Impact Assessment (EIA) was completed for the Bumbuna Hydroelectric Project in 2005. This report noted the presence of West African Chimpanzees, an endangered species, and provided a basic summary of the flora and fauna of the region. A series of studies completed in 2006 supplemented the EIA and provided greater detail about the region's biodiversity. As part of this effort, a yearlong study on primates recorded four distinct communities of chimpanzees with a combined population of 33-58 individuals. Shorter, month-long studies were conducted reporting 450 species of plant, 444 species of butterflies, 31 species of small mammals, 229 species of birds, and 53 species of amphibians and reptiles. These reports, while not focused only on the Kalanthuba Chiefdom or the Bumbuna Conservation Area, provide a general idea of the breadth of biological diversity potentially present in the Chiefdom.

Finding I.E.1: The Bumbuna Conservation Area (BCA) defines a protected area useful for preservation and restoration of forest cover and wildlife habitat, as well as eco-tourism, but it currently lacks both rules and resources for doing so effectively.

As a result of the 2005 Environmental Impact Assessments, the Government of Sierra Leone established the Bumbuna Conservation Area (BCA) in an attempt to offset the negative ecological impacts of the

Bumbuna Hydroelectric Project. The BCA is meant to provide protected habitat for Kalanthuba's flora and fauna and, according to a 2013 study, supports one of four distinct Chimpanzee communities in the reservoir area. The protected area covers 3,532 hectares located within the Kasokira and Kamakatheh sections of Kalanthuba Chiefdom (see map in Figure 3). The Bumbuna Watershed Management Authority (BWMA) under the authority of the Ministry of Energy is responsible for the management of the BCA and has authority to restrict access. There are no written rules regulating the use of the BCA, but BWMA staff members verbally instruct villagers to refrain from certain actions such as burning bush and trapping.[21] The BWMA staff includes 2 Forest Rangers, 6 Emergency Action Unit Field Guards, and a Community Liaison, tasked with protecting the BCA.

The BWMA sees potential for the development of ecotourism in the Kalanthuba area. The 2008 Act of Parliament establishing the BCA and the BWMA emphasizes the need for ecotourism experience in the leadership of the BWMA. Thus far, the BCA has seen little development of its ecotourism potential, although it remains a significant resource.

Finding I.E.2: More than half of villages report chimpanzees on village lands, and most villages report monkeys.

Village reports confirm the widespread presence of primates, including both multiple species of monkeys and chimpanzees. The incidence of primates is highest in the two sections that border the Bumbuna reservoir: Folladugu and Kasokira. In Folladugu, 8 of 9 villages report chimps and 9 of 9 report monkeys; in Kasokira, 7 of 11 villages report chimps, and 10 of 11 report monkeys. Overall, 23 villages[22] (57.5%) report chimpanzees on village land, and 36 villages (90%) report monkeys. Figure 3 shows the spatial distribution of chimpanzees within the BCA in 2013. Wildlife species are reported throughout the five sections (see the discussion of trapping in section III.D, Human Capital/Livelihoods).

A 2013 study found that chimpanzees, five monkey species, and other large mammals (Maxwell's duiker, bushbuck, and the African civet) continued to inhabit the BCA, but at very low densities. The authors attributed the low density of chimpanzees to heavy pressure from human activities within and around the BCA and included a description of the type and frequency of human activities encountered. Activities with high encounter rates inside the BCA included farming, palm wine tapping, and footpaths, suggesting that the enforcement of regulations was ineffective. They recommended rigorous intervention to prevent further degradation.[23] A second group of chimpanzees was sighted in Folladugu section.

[21] Hawa Sesay, personal communication, November 10, 2017.
[22] The following villages report chimps, organized by section. **Folladugu:** Kawungulu, Kateneh, Kathengben, Kakuthan, Kamasaypayna, Kasankorie, Kabunban, Kamasapie. **Kasokira:** Kasokira, Kamathor, Kadala, Kamera, Kegbema, Kathombo, Kawonor, Kamasapie. **Kakalain:** Kabonka, Kamasikie, Kasasi. **Kamakatheh:** Kamasaypayna, Kafungia. **Kamakihila:** Kamaraypay, Kamarimbe.
[23] Samba, 2013

Finding I.E.3: Villages whose lands are located within the BCA are aware of BCA territory, but respond to it in various ways.

Although there are no obvious boundary markings, villagers seem to be aware of BCA territory. The residents of one village commented that, although some village land is located within the bounds of the BCA, they still have access to that land because the guards are far away. Another village responded that they no longer have access to land in the BCA. Effective monitoring and patrolling of the BCA would likely require additional personnel and funds.

F. Sustainability and Resilience

The sustainability of Kalanthuba's natural resources and the resilience of its communities depend on a variety of factors: population, climate, and rates of extraction or use. Resilience for subsistence households is generally enhanced by variety of crops grown, seeds used, fish harvested, and forest products available. The sparse population of chimpanzees in Kalanthuba, recognized as an endangered species internationally, is especially at risk.

Kalanthuba's system of agriculture is best understood as a "rotational bush-fallow" system rather than as "slash and burn." Both the 2005 Environmental Impact Assessment[24] and the 2010 Environmental and Social Management Plan[25] refer to the predominant agriculture of the region as "slash and burn." The authors of the 2007 Baseline Butterfly Survey[26] argue that, in contrast, "'slash and burn' should be reserved for the more opportunistic approach used in forest areas of low population densities." They describe the land-use system as a "sophisticated and effective planned rotation of land-use that works well in maintaining soil fertility when the population is not too large." The sustainability of the system depends on the length of the fallow period. A minimum fallow period of 7 years has been suggested as necessary to fully restore soil fertility on upland; Bergman and Butler (1985) refer to a bush-fallow system as "degraded" when the fallow period falls below 7 years.

Finding I.F.1: Just over half of Kalanthuba's villages report typical fallow periods of less than 7 years, suggesting possible upland degradation.

The typical fallow period reported by village leaders varies from 4 to 12.5 years around a *mean of 6.8 years* for all villages. A majority of villages are close to the 7-year mark often used as a rule of thumb to distinguish degraded from non-degraded soils. The distribution, however, is skewed: 21 villages report an average fallow period of less than 7 years, though 9 of those villages are just under at 6 or 6.5 years; only 8 villages report a fallow period *greater* than 7 years. Some villages also reported the *range* of fallow periods found within the village, indicating considerable intra-village variability. Five villages reported the upper end of that range lying between 15 and 20 years, but 8 villages reported the upper

[24] Nippon Koei UK, 2005
[25] Sierra Leone, Ministry of Energy and Water Resources (MoEWR), 2010
[26] Larssen, 2007.

end of the range as less than 7 years, suggesting the possibility of degraded upland soil throughout the village.

Table I.F.1: **Number of Villages with Potentially Degraded/Un-degraded Upland, by Section**

	Number of Villages with Typical Fallow Period of...	
Section	Less than 7 Years	7 years or more
Kasokira	6	5
Kamakatheh	3	3
Kamakihila*	2	4
Kakalain	5	2
Folladugu	4	5
Total	20	19

*Missing data in 1 village.

Fallow periods differ substantially based on a number of factors, two of the primary ones being insufficient land and labor shortage.[27] Fields fallow for longer periods require more labor to clear. Intra-village variation suggests that the correct unit for measuring and assessing the length of the fallow period is the land-holding family, not the village. Further research is required to determine both the causes of variation in the fallow period and the degree of land degradation.

Finding I.F.2: **Villages report up to a dozen or more varieties of rice seed in use.**

On average, Kalanthuba villages report seven seed varieties currently in use, including two new varieties. A few villages report as many as 12 or 13 varieties. The greater the number of seed varieties available in the chiefdom, the greater the resilience of rice farming in the event that some varieties fail to produce.

Finding I.F.3: **Almost half of the villages report a reliance on forest and bush products as food sources during times of food scarcity.**

The forest and bush-fallow are significant sources of food, especially when other food sources are unavailable. Based on responses, villagers gather food from the forest all year round, but they rely on the forest more heavily during times of scarcity. In response to the question "Who would you go to for help if you needed food?" 19 villages instead responded by indicating their reliance on the forest, saying

[27] Gleave 1996.

that they would go to the forest to gather bush yams. Villagers also mentioned bush meat obtained through hunting and trapping. Continued maintenance of forest and bush therefore contribute to food security and enhance community resilience.

Finding I.F.4: Village reports indicate no evidence of wood harvested for charcoal production or that the collection of firewood currently poses a threat to forest sustainability.

Firewood was frequently mentioned as a resource gathered from the forest, but seems to be harvested in a limited quantity that mainly supplements firewood harvested during the brushing of new farm plots. None of the forty villages made any mention of charcoal production. The BWMA has expressed concern about the potential threat that charcoal production may pose to the sustainability of forest resources within the area. According to the BWMA, charcoal was produced in the region in recent years but has been halted due to its efforts.

Finding I.F.5: Most villages in sections bordering the reservoir report impact from the inundation, and at least two villages experienced major loss of land.

In the two sections bordering the reservoir, Kasokira and Folladugu, most villages report some impact from the inundation (7 of 11 villages in Kasokira and 8 of 9 in Folladugu). Two villages report major loss of land. Kamathor in Kasokira section reports having lost 70 percent of its land area (40% to the reservoir and 30% to the BCA). Kathaywuna, located in the extreme northern portion of Folladugu section, reports losing more than half of its land area, while having to relocate its original settlement elsewhere on village land. Both sets of village leaders believe that they received insufficient compensation. Kamathor expects to lose more land in phase two of the hydroelectric project, leaving it with only 8 acres of land and forcing it to relocate a settlement of 28 homes. *Impacts of the size reported will be difficult for villages to absorb given their high level of dependence on shifting cultivation and forest products, threatening resilience.* The village of Keteneh in Folladugu section absorbed a number of new villagers who relocated from Diang Chiefdom across the river. The newcomers were members of a family that had previously lived in Keteneh and continued to own land in the village.

II. Material Capital

Introduction

The material or physical capital of a community consists of all of its durable human-made assets, including housing, equipment, buildings, roads, and vehicles. Because it is durable, supplying a stream of services over time, material capital depends on investment, which pays off over some future period of time. Durability has limits, however, so that material capital also requires maintenance and repair to sustain a flow of services over time. Thus, housing provides shelter but when the roof leaks, however, shelter is compromised, and the roof will need repair. Roads facilitate transportation, but roads require regular maintenance in order to sustain their transport services. The provision of material capital therefore depends on both initial investment decisions and a continuing program of maintenance.

The subsections that follow focus, in order, on Housing Types; Household Technology; Sanitation Facilities; Water Supply; Community Buildings and Facilities; Roads and Footpaths; and Transport Vehicles. These material-capital components are measured and examined on a village basis, aggregated to section and chiefdom levels. A separate subsection describes the facilities of the SalCost Camp at the site of Bumbuna Dam.

A. Housing Types

Housing type is commonly used as a proxy measure of household wealth.[28] The study used three indicators:

- Roof type: thatch or metal?
- Floor type: earth or non-earthen?
- Wall type: sticks-and-mud or mud brick?

The analysis assumes that, in general, metal roofs, non-earthen floors, and mud brick walls are a preferred housing type associated with greater household wealth and indicate a higher level of development.[29]

Two data sources are used to estimate the percentage of housing of each type: local enumerators, one of whom visited each village; and the research team's interviews with village leaders. Enumerators reported a count of the number of houses of each type; village leaders provided estimates of the proportion of housing of each type in the village. The estimates of village leaders ranged from providing exact numbers to the use of descriptors such as few, some, and most. These responses were coded on a 4-point scale: 0 (none of the village housing); 1 (a few houses defined as less than one-third); 2 (roughly half of the houses in the village or between one-third and two-thirds); 3 (most of the houses defined as

[28] See DHS Wealth Program, "Wealth Index Construction."

[29] This presumption is not expected to hold in every case, especially when the level of maintenance is taken into account, not to mention individual preferences.

more than two-thirds); and 4 (all of the village housing). At the chiefdom level the two data sources are in substantial agreement, as shown in Table II.A.2. The same is true for section-level estimates. The estimates diverge significantly, however, for a minority of villages, making village-level data less reliable.

Finding II.A.1: Metal (zinc) and thatch roofs are roughly equal in number over the entire chiefdom, but in 4 out of 5 sections thatch roofs cover some two-thirds of houses.

Enumerator reports show metal as *51 percent* and thatch as *49 percent* of all housing in the chiefdom. Village leaders on average estimate the proportion of metal roofs somewhat less (a mean score of 1.43 on a 4 point scale where 2 = roughly half). Kamankay, the largest village in the chiefdom (with an estimated 42 percent of the occupied housing in Kasokira section), has an enumerator score of *92 percent* for metal roofs, and village leaders report that *most* housing in the village has metal roofs. Otherwise, the roofing picture is much more mixed. Outside Kasokira section, enumerators report only *32 percent* of housing with metal roofs—a difference of 19 percentage points when compared to all five sections. Village leaders in the four sections excluding Kasokira estimate the proportion of metal roofs at between few and half (a mean score of 1.34 on the 4-point scale where 2 is a minimum of one-third).

Finding II.A.2: Wall materials split almost evenly between mud bricks and sticks-and-mud over the entire chiefdom, but in 3 out of 5 sections sticks-and-mud are used in more than 60 percent of houses.

Enumerator reports show mud bricks and sticks-and-mud at *50 percent* each over the entire chiefdom. Village leaders on average estimate the proportion of mud brick housing somewhat less at 1.41 on a 4-point scale (2 = roughly half). As in the case of roof material, Kamankay village is an outlier with *92 percent* of housing built with mud bricks according to enumerators, village leaders reporting that *most* housing has mud brick walls. Otherwise, mud brick is much less common. Village leaders in the four sections excluding Kasokira on average estimate the proportion of mud brick housing at 1.12 (where 1= few). However, there is more diversity among villages throughout the chiefdom: 5 villages report *all* mud brick, and another five report that *most* houses are made of mud brick.

Finding II.A.3: Low-type housing indicators predominate outside Kasokira section and, within Kasokira section, outside Kamankay village.

Outside of Kasokira section, earthen floors, thatch roofs, and stick and mud walls predominate: nearly all the housing has earthen floors, roughly two thirds has thatch roofs and (with the possible exception of Kakalain section) stick-and-mud walls.[30] See the summary in *Table II.A.1*. Excluding Kasokira section and its large outlier village of Kamankay, enumerator data is in broad agreement with the reports of village leaders, as shown in Table II.A.2.

[30] One village in Kakalain section reports converting entirely to mud brick because of the tendency of stick and mud to deteriorate rapidly.

Table II.A.1: **Percentage of housing with lower-development indicators, comparing Kasokira section with other sections.**

Housing Indicators	Chiefdom	Kasokira Section	Other Sections
Thatch Roof	49%	26%	68%
Stick and Mud Walls	50%	38%	60%
Earth Floor	80%	60%	98%

Table II.A.2: **Housing indicators outside Kasokira Section, comparing enumeration with village reports**

Housing Indicators	Enumerator Percentages	Average Village Reports
Metal Roof	32%	1.34: Few+
Mud Brick Walls	40%	1.12: Few+
Earth Floor	98%	3.96: ~All*

*Only a single village indicated "most" rather than all.

Finding II.A.4: **A majority of villages report improvement in housing conditions over the last five years; only a few report that housing conditions have worsened.**

Asked whether housing conditions in their village have worsened, stayed the same, or improved over the last five years, 24 villages (63%) report improvement. The replacement of thatch by zinc roofing is the improvement most often mentioned. Also mentioned are the replacement of stick-and-mud walls by mud bricks and the addition of a mud finish to walls, as well as new construction increasing the number of houses. Eleven villages (29%) report conditions remaining the same, and three villages (8%) report that conditions have worsened, one citing a loss of grass to make thatch due to the reservoir impoundment, another due to fire, and the third citing lack of money for repairs.

B. Household Technology

The availability or use of five types of household technology was studied in each village: electricity, mobile phones, radios, cooking equipment, and interior lighting. Household technology in Kalanthuba indicates for the most part a low level of development. Villages report that households have virtually no electricity, and only a few households have mobile phones or radios. *Importantly, however, most villages have access to mobile phones and radios among their households.* Nearly all households use an open fire for cooking, and a large majority of households use firewood for interior lighting.

Communication technology, such as mobile phones and radios, which stores the power source in a battery within the device, is more widespread, however, than other technology that requires an immediate power source. Nearly all villages continue to rely exclusively on firewood for cooking and mostly on firewood for interior lighting.

Electricity

Finding II.B.1: **With a single exception, villages in Kalanthuba Chiefdom lack any access to electric power.**

Electric power is available to residents only in Kamankay, but it is limited to 10 houses (3%). It was introduced by iron mine employees hired from outside the chiefdom. The remainder of the chiefdom is without electricity except for Sal-Cost Camp at Bumbuna Dam.

Communication

Finding II.B.2: **Most villages have access to mobile phones within the village.**

Thirty-one villages (77.5%) report some degree of access to mobile phones in the village.[31] Eight villages (20%) report no mobile phone. Three villages (8%) report half or more of the households in the village having a mobile phone, but only two villages—Kamankay and Kamathor in Kasokira section—report that most households have mobile phones, Kamathor citing "most of the youths." Access is limited, however, by the fact that charging a mobile phone generally requires a trip to Bumbuna or, in the case of some northern villages, to Fadugu, located in an adjacent chiefdom.

Finding II.B.3: **Although few households have a working radio, most villages have access to a working radio within the village.**

Across all villages, few households have a working radio; however, some three-fourths of the villages have at least one working radio. Thirty-one villages (77.5%) report at least one radio, and many report 2-4. Nine villages (22.5%) report no working radio. Many villages were able to report an exact count of radios in the village; on the basis of these data, there are at least 90 working radios in the chiefdom; when the count is combined with qualitative reports, the estimated number approaches 100.

Cooking Technology and Interior Lighting

Finding II.B.4: **Nearly all households throughout the chiefdom use an open fire for cooking.**

All villages report that all households in the village use an open (3-stone) fire for cooking—with the single exception of Kamankay, which reports a few households using "wonder stoves."

[31] Data are missing for one village.

Finding II.B.5: More than two-thirds of villages mainly use firewood for interior lighting.

Households use a mix of firewood and either battery or solar-powered torches to light interiors. The ratio varies by village.[32] Firewood is reported to be predominant in 27 villages (69%), while a torch is more common in 10 villages (26%). Two villages (5%) report using traditional oil lamps fueled by palm oil.

C. Sanitation Facilities

The assessment of sanitation facilities is focused on the availability of latrines in villages. Both the number of latrines per village and conditions of access are examined.

Finding II.C.1: Most villages use common pit latrines for sanitation.

Common pit latrines are found in most villages, but five villages (12.5%) report having no latrine. Only a single village reports ventilated improved pit (VIP) latrines in use. The village of Kateneh in Folladugu section is host to villagers resettled as a result of the completion of the Bumbuna Dam. The resettled households were provided with VIP latrines.

Finding II.C.2: With the exception of a single outlier, villages average 3.6 latrines per village.

Nearly all villages were able to estimate the number of latrines in the village. The resulting count of latrines (over 38 villages) is 333. However, 200 of those latrines are located in a single village—Kamankay. The remaining 133 latrines are spread over 37 villages for an average of 3.6 latrines per village.

Finding II.C.3: Most latrines are privately owned by households, but community access varies.

Household access to a latrine is affected not only by the number of latrines in the village but also by the institutional or social arrangement for gaining access. Access varies widely among villages. Seven villages (17.5%) report communal or general access to latrines; another 4 villages report that most have access, and a single village reports that "half" of the village has access. Seven villages (17.5%) report latrines accessible only (or mainly) by their household owners, and 5 villages report access by "neighbors" to household latrines.[33]

[32] Data are missing for one village.
[33] Ten villages (15%) report a number of latrines but do not specify accessibility.

Finding II.C.4: In a majority of villages most residents use the bush rather than a latrine for sanitation.

Access to latrines in nearly all villages is inadequate. Thirty-four villages (85%) affirm that most residents (in some cases, all residents) regularly use the bush for sanitation. Two of those villages qualify their report by noting that villagers have no alternative to the bush when working in the fields. Four villages report that only "some" or a "few" residents use the bush. Only Kamankay, the chiefdom's largest village with some 200 latrines, reports that "none" use the bush, citing heavy fines for doing so.[34]

D. Water Supply

Water sources include streams, ponds, springs, rainwater, and both hand-dug and drilled wells. Drilled wells are a superior source, better assuring safe water for drinking than either dug wells or surface water. Distance to a water source is also an issue of concern.

Finding II.D.1: Most villages rely primarily on surface water to drink.

Thirty-two villages (80%) report a primary reliance on surface water—mostly streams but occasionally a pond or swamp. Three villages supplement surface water with rainwater collection.

The only report of a fully functional well accessed by the community is in Kamankay, where it attracts long lines of users; a second well in the village is not functional. The school in Kathombo has a working well, but the chiefdom's two health posts in Kathombo and Kamasaypayna (Kamakatheh section) have wells that are not fully functional. Kathombo has a government-drilled well that was not yet operational at the time of the baseline study; Kamasaypayna's well is dry nine months out of the year, and aides report boiling surface water supplied by community members.

Seven villages report primary use of springs. BWMA reports[35] that *protected* springs are found in five villages—Kamathor I, Kasokira, Kadala,[36] Kasasie, and Kateneh—but only Kadala and Kateneh report primary use of springs. The spring box in Kateneh[37] was funded by the Global Environment Facility (GEF) and United Nations Development Programme (UNDP) project on strengthening climate information and early warning systems in November 2016, part of a relocation package for households displaced by the reservoir and relocated in Kateneh.[38]

Finding II.D.2: Most water sources lie outside the inhabited portion of the village but are within walking distance.

The average reported time to walk to and from a village's primary water source is 25 minutes.

[34] One village has missing data.
[35] Hawa Sesay, Team Leader, Bumbuna Watershed Authority, Personal Communication, August 5, 2017.
[36] Village leaders in Kadala reported use of a spring but commented that it is no longer protected.
[37] The research team observed that the spring was flowing but the tap handle was broken.
[38] Hawa Sesay, op. cit.

Finding II.D.3: **Many, perhaps most, water wells in the chiefdom are not fully operational.**

Although data on the availability of wells are incomplete, based partly on casual observation water drawn from wells appears to be scarce in Kalanthuba. The research team observed numerous dug wells with pumps throughout parts of Kalanthuba, but few appeared to be in working order. In Kathombo (which reports its primary water source as a stream) the research team observed a shallow well with a broken pump handle being used by lowering a bucket. Two villages (in additional to a second well in Kamankay) report wells that are no longer functional.

E. Community Buildings and Facilities

Buildings other than housing include those used for organizational, commercial, educational, recreational, and religious purposes.

Finding II.E.1: **Villages have few buildings for purposes other than housing.**

The only type of community building found in a majority of villages is a blacksmithing structure. Blacksmiths are important artisans in rural villages, supplying and repairing hand tools used in agriculture, but they also occupy important positions in the men's traditional societies (see Section IV, Social Capital). Missing from most villages are court barrays, important to facilitate village discussion and collective decision-making. The limited number of churches and mosques may inhibit the religious development of the area. The dearth of schools and health posts is discussed in Section III, Human Capital.

Building types or purposes in order of quantity are as follows:

- 26 villages (65%) report a *blacksmithing* structure.
- 11 villages (27.5%) have a *court barray*, used for village meetings.
- 8 villages (20%) have a *church building*, although 15 villages (38%) report an "informal" structure used for Christian worship. Twenty-three villages (57.5%) therefore have some sort of church facility, while 16 villages (40%) report having none.[39] Three villages report having had church buildings that are no longer standing.
- 4 villages (10%) report a structure used exclusively as a *school*, although only one village (Kathombo) has a government-style school building. Kamankay uses another facility in the village. One village (Kasokira) has a school building under construction.
- 2 villages (5%) have a *mosque*, and 7 villages (12.5%) report an altar or prayer floor.
- 2 villages (5%) have *health posts*.
- 1 village reports a community *storage* building for crops.
- 1 village—Kamankay—has a *petrol station*.

[39] Data are missing for one village.

Finding II.E.2: **Community facilities for recreation or work are few in number.**

- 15 villages (37.5%) report having *football fields*. Given the importance of football as a source of youth recreation in Sierra Leone, this number indicates a clear deficit.
- 5 villages (12.5%) have community *drying-floors* for crops. However, the research team observed widespread use of mats for drying rice, suggesting that the absence of community drying floors may not be an important shortcoming.

Finding II.E.3: **No market facility is located within the chiefdom.**

Missing from all villages are market facilities, important for farmers to sell cash crops and artisans to sell their handcrafted products. Bumbuna is in most cases the closest market town, easily accessible only for those villages nearby, including, however, the largest populated village—Kamankay.

F. Roads and Footpaths

Village access by road is an extremely important variable affecting development potential. Villages without motorable road access may not be viable settlements over the long-term future. Without motorable roads, farmers are severely constrained in their ability to sell farm products, and employment opportunities for village inhabitants are limited to the village and its immediate environs. Lack of roads tends to limit villages to subsistence agriculture and foraging as means of livelihood. Access to education and health care are also seriously limited. Access is affected not only by the presence of a road but also by road conditions that vary seasonally. Villages located along the Bumbuna Reservoir, however, also have the potential for access by watercraft.

Finding II.F.1: **Access to villages by means of a motorable road is extremely limited in Kalanthuba.**

Twenty-four villages (60%) lack any motorable road access and therefore depend entirely on footpaths. Although 16 villages (40%) have road access, only 8 villages (17.5%) have road access year-round. Eight villages (22.5%) report that access is limited or blocked at some point in the rainy season; 8 villages (22.5%) also report that the road is inadequate for their needs. *Table II.F.1* displays road access data by section: note that the two upper sections, Kakalain and Folladugu, have no road access.

Finding II.F.2: **Although all villages have access to footpaths, a majority considers them inadequate for their needs.**

All villages, however, have access to footpaths and use them to some extent. Twenty-five villages (62.5%) consider their footpaths inadequate for their needs: they report that footpaths are either inaccessible or difficult to use during the rainy season, especially if there are a number of streams to cross, and that footpaths may be rocky and steep.

Finding II.F.3: **Existing roads tend *not* to be adequately maintained.**

Kalanthuba roads are often extremely rocky and difficult to travel, especially, but not only, for trucks.

Table II.F.1: **Number of Villages with/without Road Access, by section**

Section	No Road Access	Seasonal Road Access	Year-Round Road Access
Kasokira	3 (27%)	2 (18%)	6 (55%)
Kamakatheh	1 (17%)	4 (67%)	1 (17%)
Kamakihila	4 (57%)	2 (29%)	1 (14%)
Kakalain	7 (100%)	0	0
Folladugu	9 (100%)	0	0
Total	24 (60%)	8 (20%)	8 (20%)

G. Transport Vehicles

The availability of vehicles also affects village accessibility. Possible vehicles include bicycles, motorcycles, cars, trucks, and boats or canoes for water transport.

Finding II.G.1: **Villages have little or no access to vehicles *in the village* for transporting people, crops, or goods by road.**

With a single exception, no cars, trucks, motorcycles, or motorboats were reported as accessible within villages. Kamathor, which is located near Bumbuna, reports six motor bikes owned by outsiders but used by village members. Two villages report access to bicycles. Asked how goods are transported into and out of the village, most villages indicate that transport is largely by footpath—individuals toting goods on their heads.

H. Bumbuna Reservoir

Finding II.H.1: **The Bumbuna Reservoir has enhanced transport capacity by boat for Kalanthuba villages located adjacent to the reservoir, but it remains under-utilized.**

Eleven villages—six in Folladugu section and five in Kasokira section—report lands adjacent to the reservoir. The impoundment has in some respects increased transport opportunities. The reservoir created a navigable body of water that is 23 km long.[40] Eight villages report the ownership of canoes, totaling 31 canoes reported in the Chiefdom; twenty-four of the canoes are found in Folladugu section and the remainder in Kasokira section.[41] While canoes are used to cross the reservoir, due to the length of the reservoir and the construction of local canoes, it is not feasible to travel from remote villages to

[40] Sierra Leone, Ministry of Energy and Water Resources (MoEWR) 2010

[41] One village in Kasokira section, Kadala, reports a boat, gifted by the BWMA.

Bumbuna Town without a motorboat. Large motorboats can easily and quickly move up and down the length of the reservoir, transporting both goods and people and increasing access to peripheral health facilities and market centers. At present, however, only two boats are available.

According to the Resettlement Action Plan produced in 2005, each of the three affected Chiefdoms would receive two motor powered boats and set up a Boat Management Committee equipped with a "basic tool package" to repair and build boats.[42] According to the BWMA, four boats were built. In 2013 each of the three Chiefdoms surrounding the reservoir received a boat; Kalanthuba Chiefdom did not exist in 2013 except as five sections within Kalansogoia Chiefdom. The Kalansangoia and Kasunko Chiefdom boats have not been operating due to reported management problems. The Diang Chiefdom boat, however, is operative and was observed by the research team carrying passengers and a motorcycle up the reservoir. The fourth boat, operated by the BWMA, offers transport services to villages along the reservoir for a fee.[43] Three villages bordering the reservoir mentioned the presence of the BWMA boat and reported that it cost them 10,000 Leones for a single trip. Two of these villages added that they considered travelling on the reservoir expensive.

Finding II.H.2: **The impoundment of Bumbuna Reservoir has made it much more difficult for villagers to cross the river to Diang Chiefdom.**

Prior to the impoundment of the reservoir, traditional bridges spanned the river, connecting Kalanthuba villages to villages in Diang Chiefdom. Now villagers are forced to use canoes to cross the river, which limits the number that can cross the reservoir in addition to being a slow and difficult process. In this respect, the impoundment of the dam has made inter-chiefdom travel much more difficult, creating greater isolation for Kalanthuba villages.

I. SalCost Camp

SalCost Camp is located in Kalanthuba (Kasokira section) at the site of Bumbuna Dam. It includes lodging and food preparation facilities, a large swimming pool, and a community meeting space available for public meetings and events. Unlike the rest of Kalanthuba, the compound has access to electricity. Entry is controlled to provide security. BWMA staff offices and housing are located at the Camp. Air-conditioned lodging is located in two major sections. One section consists of eight blocks of single rooms with bathrooms (suitable for singles or couples), totaling 69 rooms, plus a conference room. (BWMA is housed in one of the 8 blocks.) The other section consists of 12 houses, each with two bedrooms, living room, kitchen, and bathroom, suitable for families and groups. The compound also includes a resident engineers camp composed of six, two-bedroom houses.

[42]Government of the Republic of Sierra Leone and World Bank (2005).
[43] Hawa Sesay, personal communication, August 5, 2017.

Finding II.I.1: **The SalCost Camp at Bumbuna Dam offers potential accommodations for visitors.**

Although the lodging exhibits some wear-and tear from its use during the construction of the dam, some refurbishing and redecorating would make it usable for tourists. Potential tourist attractions are easily accessible from the compound. Chimps are found nearby in the Bumbuna Conservation area. The Bumbuna Reservoir can be accessed from the compound as well, and Bumbuna falls is a short drive. Bumbuna Town, located a 10 minute drive from the compound, provides access to supplies.

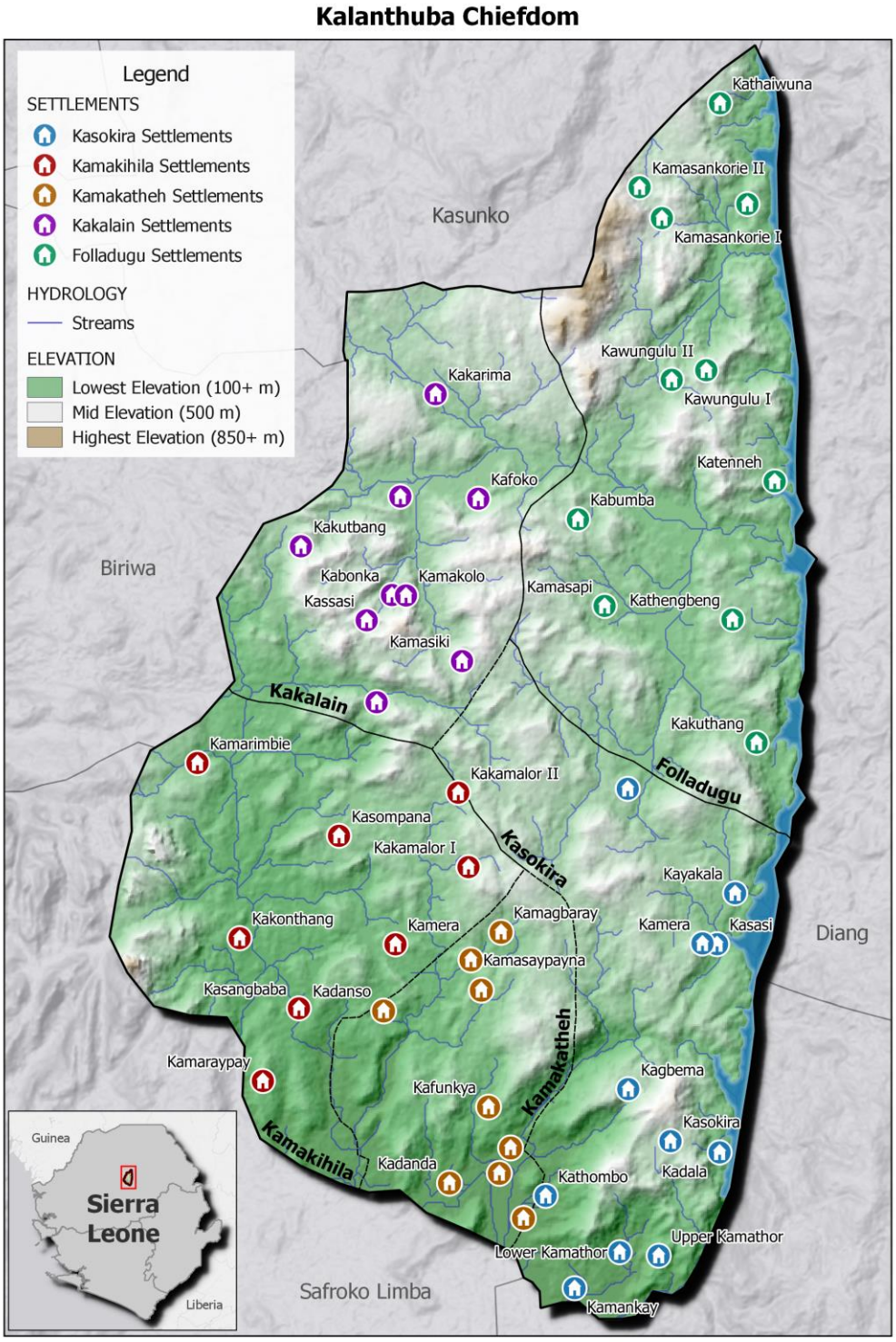
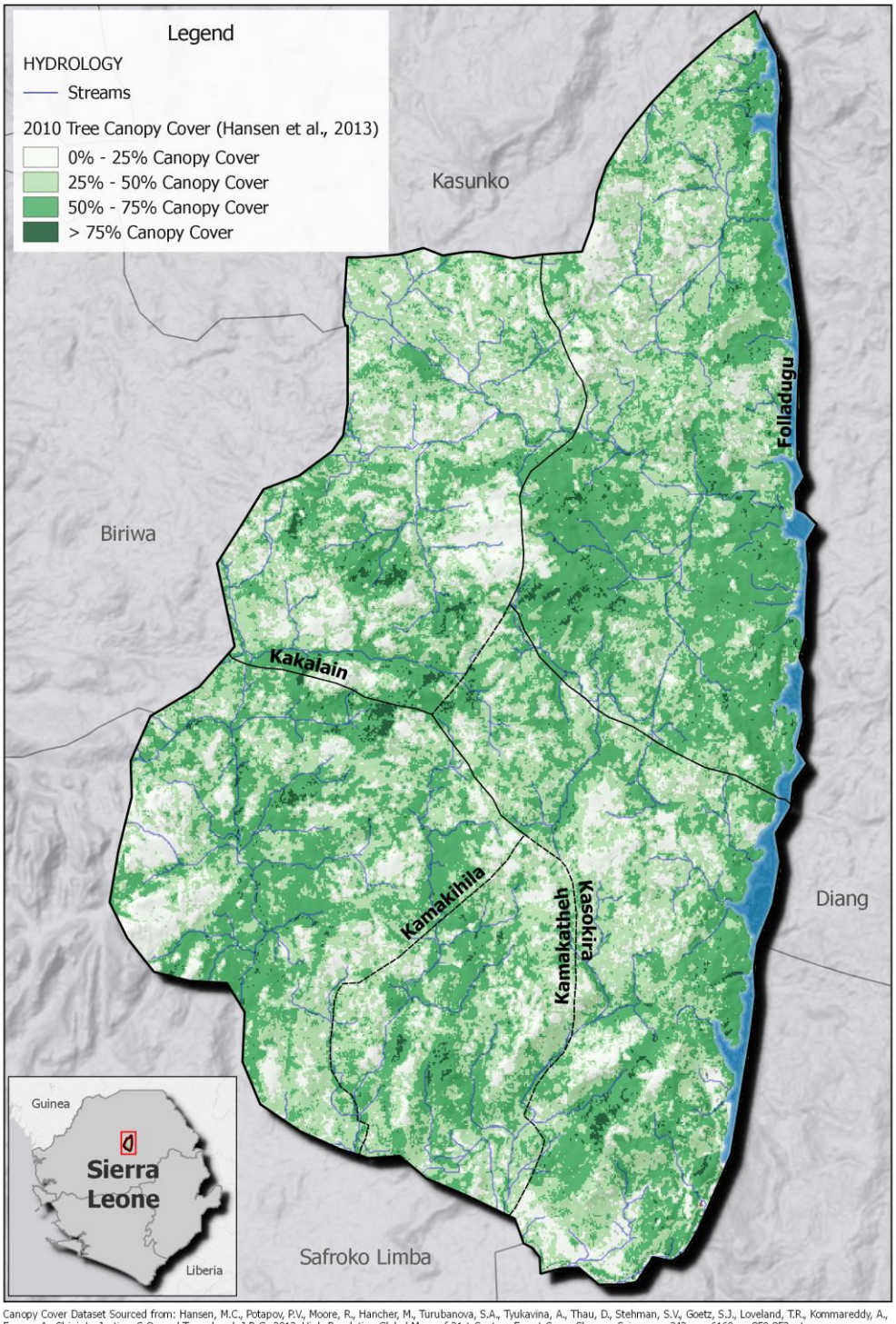
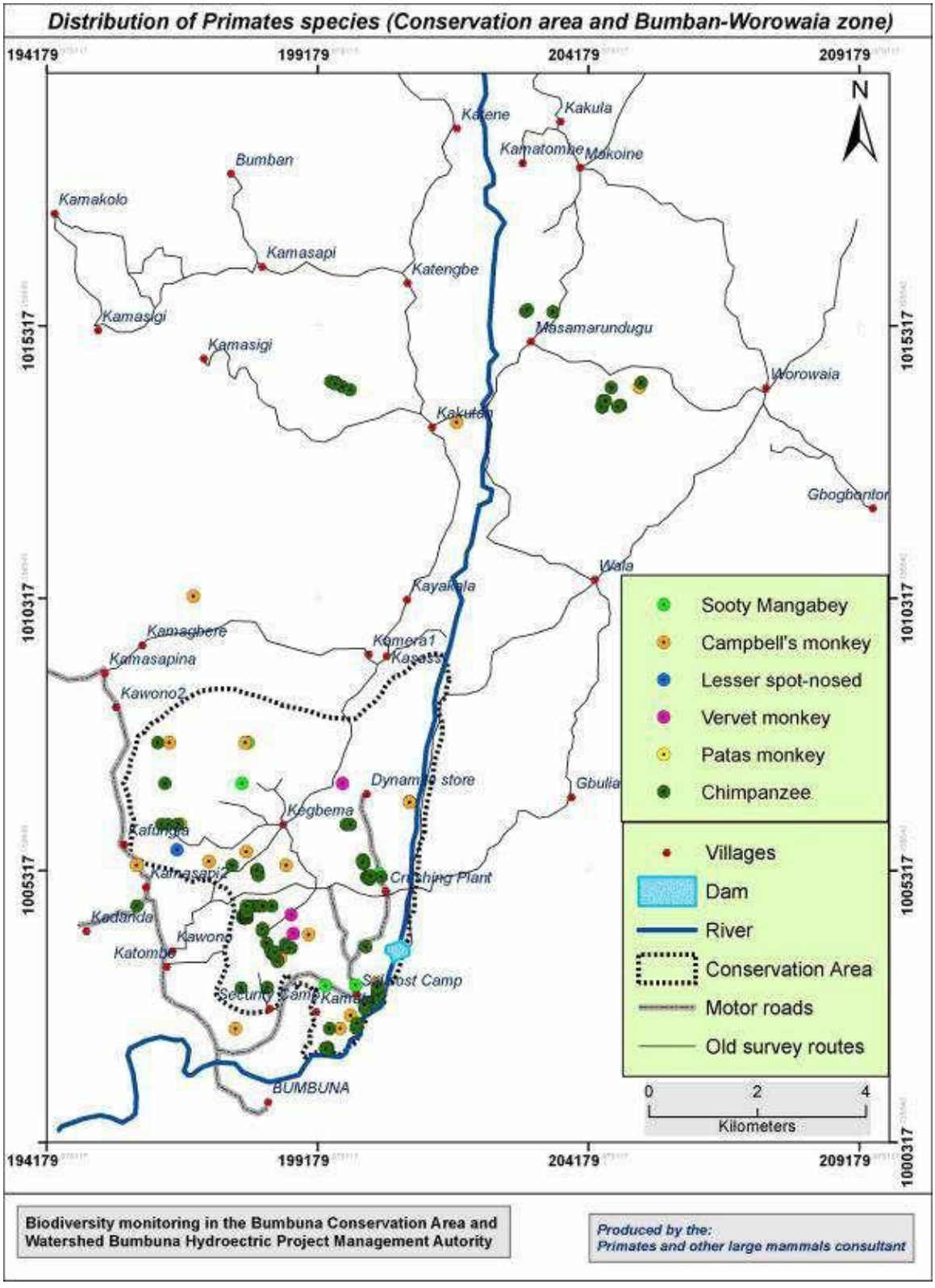


Figure 1: Settlements and Streams of Kalanthuba Chiefdom

Kalanthuba Chiefdom: Canopy Cover



Canopy Cover Dataset Sourced from: Hansen, M.C., Potapov, P.V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., Thau, D., Stehman, S.V., Goetz, S.J., Loveland, T.R., Kommareddy, A., Egorov, A., Chini, L., Justice, C.O., and Townshend, J.R.G., 2013, High-Resolution Global Maps of 21st-Century Forest Cover Change: Science, v. 342, no. 6160, p. 850-853, at http://www.sciencemag.org/content/342/6160/850.abstract.


Distribution of Primates species (Conservation area and Bumban-Worowaia zone)
194179
199179
204179
209179
1015317
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N
Katene
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Kamatomhe
Makoine
Bumban
Kamakolo
Kamasapi
Katengbe
Kamasigi
Kamasigi
Masamarundugu
Worowaia
Kakutan
Gbogbanlor
Wala
Kayakala
Kamagbere
Kamera1
Kamasapina
Kawono2
Dynamite store
Gbulia
Kegbema
Kafuniga
Kamasapi2
Crushing Plant
Kadanda
Kawono
Katombe
Security Camp
Camp
BUMBUNA
Sooty Mangabey
Campbell's monkey
Lesser spot-nosed
Vervet monkey
Patas monkey
Chimpanzee
Villages
Dam
River
Conservation Area
Motor roads
Old survey routes
0
2
4
Kilometers
Biodiversity monitoring in the Bumbuna Conservation Area and Watershed Bumbuna Hydroectric Project Management Autority
Produced by the:
Primates and other large mammals consultant

Figure 4: **Court Barray, Keteneh** *[Photo by Rebekah Potts]*

Figure 5: **Community Primary School, Kamasaypana** *[Photo by Rebekah Potts]*

Figure 6: **Kathombo village women display their hand-woven fishing nets.**

Figure 7: **Village Housing** *[Photo by Rebekah Potts]*

III. Human Capital

Introduction

Human capital consists of all those assets internal to individual human beings, such as knowledge, skills, and health. Human capital creates livelihood potential for individuals and households—the ability to provide the essentials of food, clothing, and shelter for oneself and one's dependents.

Among the important skills from a development standpoint is literacy. Human capital formation consists of education, both formal and informal, as well as health care and good hygiene. Lack of formal education lies at the root of the inability to read and write. Most villages report only traditional education among resident adults —informal learning received from parents and elders. Both primary and secondary education are largely missing in the adult population. Traditional education, acquired in the daily course of village life, imparts important livelihood skills to villagers, but it does not impact the literacy rate.

This section assesses the following components of human capital and its formation: literacy; education; health and healthcare; and livelihoods—all measured at the village level and aggregated to section and chiefdom levels.

A. Literacy

The ability to read and write is a basic component of human capital. Literacy is an asset not only for individuals and their households but also for the communities in which they reside. A village without a literate adult is handicapped in numerous ways—affecting any aspect of life that requires reading and interpreting written materials.

Finding III.A.1: Nearly half of the villages in Kalanthuba have no literate adult resident in the community.

In Kalanthuba, 17 villages (42.5%) report having no literate adult resident in the village, while 19 villages (47.5%) report at least one literate resident adult.[44] Only 7 villages (17.5%) report *more* than a single literate person; of these, 3 villages (8%) report the number of adults in double figures: Kamathor reports 10 or more literate adults, and both Kamankay and Kasokira report 20 or more. *Table III.A.1* provides the literacy data by section. Villages with more than one literate adult are concentrated in Kasokira section.

[44] Literacy data is missing for 4 villages (10%).

Table III.A.1: **Number of Villages with Literate Adult Residents, by section**

Section	No literate adult	One literate adult	More than one literate adult
Kasokira	2 (18%)	3 (27%)	6 (55%)
Kamakatheh*	3 (50%)	2 (33%)	0
Kamakihila	4 (57%)	3 (43%)	0
Kakalain*	2 (29%)	3 (43%)	1 (14%)
Folladugu*	6 (67%)	2 (33%)	0
Total	17 (42.5%)	13 (32.5%)	7 (17.5%)

*One village has missing data.

Finding III.A.2: **The adult literacy rate in Kalanthuba is estimated at approximately two percent.**

The total number of literate adults reported as resident in Kalanthuba is 90. Given missing data (3 villages) and some numbers reported as minimal estimates (e.g., 20 or more), perhaps 100 literate adults is a reasonable estimate in total—roughly two percent of the estimated adult population of Kalanthuba (4,883 adult persons).

Finding III.A.3: **Among literate adults, men outnumber women by more than two to one.**

The composition of the literate adult population differs by gender: the villages report a total of 23 literate women and 66 literate men.[45] Sixteen villages (40%) report at least one literate male, while 8 (20%) villages report at least one literate female. Among literate males, at least two are pastors, and one is a section chief.

Finding III.A.4: **Evidence of literacy training for adults is almost non-existent in Kalanthuba.**

Only 3 villages report the presence of adults who have received training in literacy.

[45] One village reports a single literate adult without identifying gender.

Finding III.A.5: **Most villages have no resident adult with a secondary education.**

Only 5 villages report even small numbers of resident adults with a junior or senior secondary education. Kathombo reports six individuals with a college education. Persons who receive a secondary education mostly leave the village of their birth for employment elsewhere.

B. Childhood Education

The enrollment and regular attendance of children in primary school is a prime indicator of human capital formation, essential to literacy and numeracy, but it falls short in four out of Kalanthuba's five sections.

Finding III.B.1: **Only five primary schools (and no secondary schools) operate within the chiefdom.** ***[After the fieldwork was completed, one primary school and a junior secondary school have been opened.]***

Primary schools are located in Kamankay, Kasokira, Kamathor, and Kathombo—all within Kasokira section—and Kamasaypayna in Kamakatheh section.[46] All five villages have motorable road access. Only the school in Kathombo is a government-assisted school; the others are community schools, established at village initiative and managed locally. The research team visited two primary schools: the government-approved facility in Kathombo (Kasokira section), and a community school in Kamasaypayna (Kamakatheh section). **Appendix C** contains descriptive reports of the schools visited.

Finding III.B.2: **A majority of school-age children in over half of Kalanthuba's villages do not attend primary school. [See Appendix E.]**

Most school-age children (age 6 and up) in at least 22 villages (55 %) are *not* enrolled in primary school and do not attend. As shown in Table III.B.1, the villages are concentrated in 3 sections, including at least 7 of 9 villages in Folladugu, 6 of 7 in Kakalain, and 6 of 7 in Kamakihila.[47] The only children in these villages who attend school are those sent to live with relatives in Bumbuna or elsewhere, sometimes Makeni or Freetown.[48] The group attending school in this manner is usually a small minority of school-age children in a village; thirteen villages supplied estimates of the number enrolled outside the area, ranging from 0 (2 villages) to 50, around a mean of 12 children. In addition, all students attending secondary school must do so in towns or cities outside Kalanthuba. A partial count indicates at least 66 children attending school outside the chiefdom from Folladugu section and at least 57 from Kakalain.

[46] Since completion of fieldwork in 2017, a primary school was opened in Kawungulu (the first primary school in Folladugu section), and a junior secondary school was opened in Kamankay.

[47] Data do not provide a clear answer as to whether a majority do or do not attend primary school in four villages, two in Folladugu section, one in Kamakatheh section and one in Kamakihila section.

[48] Three other villages report a substantial number of children attending school outside the chiefdom, but whether the number is a majority or minority of school-age children in the village is unclear.

Table III.B.1: **Number of Villages where a Majority of Children Are Not Enrolled in School, by section**

Section	Majority of children not in school
Kasokira	0
Kamakatheh	3 (50%)*
Kamakihila	6 (86%)*
Kakalain	6 (86%)
Folladugu	7 (78%)**
Total	22 (55%)

* Unclear result in 1 village. **Unclear result in remaining 2 villages.

section. Kasokira section, where three of the chiefdom's four schools are located, is the only part of the chiefdom where primary school enrollment is the norm.

Finding III.B.3: Distance to school is a major factor inhibiting school enrollment.

Twenty-two villages (55%) report that primary schools are too far away for children to walk. No children in the two upper sections, Folladugu and Kakalain, are able to walk to school; they must relocate to a town or city outside the chiefdom to attend primary school. However, two villages where a majority of children reportedly do not attend school also report a school within one mile from the village, and a third such village reports a school two miles from the village. Proximity to school does not seem to guarantee enrollment. Among villages where at least a majority of children are enrolled in primary school, 9 villages (26.5%) report children walking 1-3 miles to school, and 2 villages (6%) report children walking more than 3 miles.[49]

Finding III.B.4: The costs of schooling also inhibit attendance/enrollment.

In response to open-ended questions,[50] 16 villages (40%) cite cost as a factor inhibiting school attendance or enrollment. Reported school fees vary widely. With a large number of children in a household, fees become a financial burden. Some households can support school enrollment only for some of their children. Costs also inhibit enrollment outside the chiefdom, depending on arrangements with the hosting households.

[49] Data are missing for six villages.
[50] The two questions were: (1) What are the main reasons why children miss school? (2) Are there any bad effects of children going to school?

Finding III.B.5: **Shortage of farm labor inhibits school attendance/enrollment in some cases.**

In addition to financial costs, schooling also has opportunity costs for households. Nine villages cite the shortage of farm labor as a factor inhibiting school enrollment. Children in school have less availability to assist with farming.

Finding III.B.6: **Among children enrolled in school, school attendance tends to be irregular.**

Enrollment in school does not guarantee regular attendance. In villages where the majority of children attend school, reported rates of absence range from 2-3 days per month to 2 days per week; two villages report the entire month of August is missed due to the rainy season. Among the reported reasons for absence, hunger and illness lead the list. Schools in Kalanthuba do not provide lunch, and health conditions in the villages may lead to frequent illness.

Finding III.B.7: **Gender affects school enrollment and attendance, but not consistently.**

Asked about gender differences in school enrollment and attendance, more villages reported a greater a number of boys than girls enrolled in school, though some reported the reverse. Several villages cited pregnancy and health issues as obstacles to girls' education. One village noted that girls are generally "weaker" than boys and have a more diverse set of needs that prevents them from maintaining the same attendance as boys. Other villages reported that girls were more inclined to perform well in school and were therefore more eager to attend.

Finding III.B.8: **As reported by village leaders, all villages see the education of their children as an important investment.**

When asked about the benefits of schooling, village leaders regularly describe the education of children as an investment in the future. Many noted that education will provide children with greater livelihood opportunities, which means, in turn, that they will eventually be able to provide assistance for their parents and for the village in the form of housing, food, and medical fees. Education was also often linked to advocacy and community development. Many villages cited the example of Daniel Sara Turay and his ability to promote the development of Kalanthuba. One village leader noted, "Daniel is able to serve as a 'shield' for the community and advocate for them at higher up levels."

Finding III.B.9: **The knowledge base of Kalanthuba villages is derived mainly from traditional learning rather than formal education.**

The livelihoods pursued in Kalanthuba depend on skillsets derived from traditional knowledge, transmitted from one generation to the next. Moreover, the preservation of traditional knowledge is an important source of community resilience and continuity in the face of adversity or disruptive changes. Traditional education is essential to the ways of life practiced in Kalanthuba villages. One village

commented that children who do not attend school "follow their parents to the fields." More than half of the villages report that traditional learning is the only form of education its residents have received. It is nonetheless a critical source of survival skills. The practice of traditional agriculture requires local knowledge of the environment and the specific requirements of a variety of crops, plus a number of skills—tool making, soil preparation, seed selection, intercropping, crop rotation, and diversified production of grains, tubers, vegetables, and tree crops.[51] Fishing, trapping, and gathering depend on similar local knowledge and skills. Processing, storing, and cooking foods are important household skills, including processing for commercial purposes, such as making palm oil. Tool making—hoes for various stages of cultivation, fishnets and traps, animal traps—requires knowledge and skill learned in the village.

Most villages are lacking in other forms of human capital formation—primary and secondary education and adult training programs. Moreover, when villagers do receive formal education, they tend to leave the village to find employment elsewhere. This leaves villages without key sources of human capital, such as literate persons and the diverse skillsets that literacy and numeracy can provide.

Finding III.B 10: **Few villages see any negative effects from educating their children, but among them, labor shortage and cost of schooling dominate.**

Only nine villages (22.5%) noted any negative consequences of their children receiving an education. All nine cited farm labor shortages,[52] in addition to the financial burden of paying school fees, borne by households. One village observed that education could create problems because "children who begin school but eventually drop out become a burden/nuisance on the village because they want to be outside the village but cannot support themselves outside."

C. Health

Good health is both a primary ingredient of human wellbeing and a major factor affecting other human capital components. For example, villages cite illness as a leading cause of absence from school (see the subsection on School Attendance, III-B, above), affecting human capital formation of a different type. Health also affects the productivity of labor in economic terms.

The main health issues reported by the villages are fever, malaria, diarrhea, vomiting, pneumonia, dysentery, general body pain, headache, coughs, dizziness, stomachache, tetanus, ulcers, convulsions, and hernias. The most frequent causes of illness cited by villages are poor water quality and mosquitoes. Other causes suggested by multiple villages include black flies, poor housing conditions, physical exertion (especially under the sun), poor hygiene, and worms.

[51] See Robert McC. Netting (1993), p. 56.

[52] This sentiment is not unique to Kalanthuba. Houghton researchers found similar sentiments in a recent study of customary land tenure in 32 villages located in three different Northern Province districts. Twenty-three villages cited farm labor shortage as a principal threat to food security, and among those villages, twelve cited compulsory schooling as a principal source of labor shortage. See Oakerson, et al (2017), p. 80.

General Health Care

Finding III.C.1: **With only two health clinics located in Kalanthuba, access to professional health care is severely limited for most villages.**

Both clinics are Maternal and Child Health Posts (MCHPs), one located in the village of Kathombo (in Kasokira section), staffed by two nurses, and one located in the village of Kamasaypayna (in Kamakatheh section), staffed by two health aides. The two posts serve 13 villages and 34 villages respectively. Catering mainly to women and to children under five, care includes pre-and post-natal care, care during delivery, health education, and vaccinations. See **Appendix D** for a description of both health posts.

Finding III.C.2: **For health care, villages rely on a variable mix of traditional healers and health posts.**

Based on qualitative reports, villagers use a combination of government-supplied health posts and traditional healers to obtain health care. All villages report the use of traditional healers, and most also report some use of health posts. Seventeen villages (43%) indicate that their residents regard traditional healers as their primary source of health care, more often seeking assistance from a traditional healer before going to a health post, compared to 14 villages (35%) that identify health posts as their primary source.[53] In the remaining 9 villages (23%) the choice is based on the specific ailment, sometimes preferring traditional healers and sometimes the health post.

Table III.C.1. **Number of Villages Primarily Relying on Traditional Healers or Health Posts, by Section**

	Primary Reliance on…		
Sections	Traditional	Health Post	Mixed
Kasokira	3 (27%)	7 (64%)	1 (9%)
Kamakatheh	1 (17%)	3 (50%)	2 (33%)
Kamakihila	0	4 (57%)	3 (43%)
Kakalain	6 (86%)	0	1 (14%)
Folladugu	7 (78%)	0	2 (22%)
Total	17 (43%)	14 (35%)	9 (23%)

[53] The numbers reported here are based on interpretation of qualitative data.

Finding III.C.3: **Distance to a health post is a major factor in determining the choice of health care provider.**

Villages relying more on traditional healers usually cite distance to clinics as the main reason. In Kasokira and Kamakelah sections, where health posts are located, villages tend to use health posts more frequently and are more likely to go to health posts for health issues before traditional healers. In Folladugu and Kakalain sections, located in the northern part of the chiefdom, many villages are too far from the health posts to use them frequently.[54] Seventeen villages served by the Kamasaypayna health post are more than 10 miles distant—some more than 25 miles away—frequently without road access.[55]

Finding III.C.4: **Villagers prefer traditional healers to health post professionals for some ailments.**

In most villages, residents go to traditional healers for ailments that they believe can be healed faster or more effectively by healers or when health professionals are unable to provide a diagnosis, as well as for ailments that cannot be cured by modern medicine, such as those caused by witchcraft. Most villages report that traditional healers can effectively treat health problems such as fractures, snakebites, general body pains, and witchcraft afflictions.

Finding III.C.5: **Affordability and distance from a pharmacy or health post deter use of medicines other than traditional herbs.**

Only 8 villages (20%) report that medicines prescribed by health professionals are *both* accessible and affordable, while 25 villages (62.5%) report that medicines are *either* inaccessible or unaffordable.[56] Eight villages (20%) report qualified affordability—sometimes able to purchase medicines but sometimes not—but two of those also report inaccessibility. One village leader commented, "If you don't have money, accept that you have to die."[57] Another noted that villagers often must sell crops to pay for medicines. By contrast, most villages report that traditional herbs and medications are readily accessible and affordable.

Accessibility and affordability vary significantly by section. The majority of villages reporting both accessibility and affordability are in Kasokira section, and the majority of those reporting qualified affordability are in Kamakihila section. All but two villages in the upper tier—Kakalain and Folladugu sections—report either or both inaccessibility and unaffordability. Responses in Kamakatheh section are mixed.

[54] One village, Kathaywuna, reports going to a health post in a different chiefdom (in Kagbasia) because the health post they are assigned to (Kamasaypayna) is farther away.
[55] See Appendix D.
[56] Two villages that otherwise found medicines unaffordable commented that children under 5 years receive medicines at no charge. One village has missing data.
[57] This village was coded "no" on affordability.

Maternal Health Care

With one of the highest maternal death rates in the world, the government of Sierra Leone is giving attention to maternal health care—before, during, and after childbirth. Highly relevant to maternal health care is the location of childbirth, whether in the village or at a health post, as well as the presence of trained birth attendants or medical personnel.

Finding III.C.6: **In slightly more than half of Kalanthuba's villages, childbirth occurs mainly in the village rather than at a health post or clinic.**

Twenty-one villages (52.5%) report that childbirth occurs mostly in the village; 15 of those villages (37.5%) report birth *always* occurring in the village. In 18 villages (45%) delivery is in a village home, but in Folladugu section, 3 villages (7.5%), report that birth occurs in the bush.

Twelve villages (30%) report that most women deliver in a health facility—6 of those villages (15%) report birth always occurring in a health facility; 6 villages (15%) report an undetermined mixture of delivery places, often depending on circumstances.

Table III.C.2: **Number of Villages Reporting Childbirth in Village or Clinic, by Section**

Section	All or mostly in Village	Mixed	All or mostly in clinic
Kasokira	4 (36%)	3 (27%)	3 (27%)
Kamakatheh	0	1 (17%)	5 (83%)
Kamakihila	3 (43%)	0	4 (57%)
Kakalain	6 (86%)	1 (14%)	0
Folladugu	8 (89%)	1 (11%)	0
Total	21 (53%)	6 (15%)	12 (30%)

The lowest percentages of villages with births all or mostly in the village are found in the two sections—Kamakatheh and Kasokira—where health posts are located; the highest percentage of village births are found in the two upper sections, Kakalain and Folladugu. Villages often report distance as the main factor determining whether a woman gives birth in a clinic.

Four villages report that women can be fined 50,000 Le for not giving birth in a health facility, although some also report that the fine is not assessed because the distance to the clinic is too far for pregnant women to go.

Finding III.C.7: **In most villages, women have access to traditional birth attendants (TBAs) and receive support during pregnancy from health posts.**

Thirty-one villages (77.5%) report that women have access to traditional birth attendants during childbirth (TBAs); the remaining 9 villages report no TBA present in the village. Most villages also report that some type of support is available to women during or after pregnancy, usually at health posts. Following delivery in the village, mothers are instructed to visit the health post with their newborn.

Finding III.C.8: **Distance to a health post and lack of vehicular access to the village negatively affect the availability of maternal support, before, during, and after delivery.**

Villages in the two upper sections, Folladugu and Kakalain, report both more village births and fewer TBAs: 11 of the 15 villages reporting that delivery occurs entirely in the village are found these two sections; the same is true for 8 of the 9 villages without TBAs. Villages that report no support for women during pregnancy say that they are too far from the health posts for women to use maternal services.

Finding III.C.9: **Villages report little knowledge of family planning.**

The number of children a woman bears and the frequency of pregnancy both play a large role in maternal health. The majority of the villages do not report any education on family spacing, that is, the interval between pregnancies; only 4 villages (10%)[58] specifically mention receiving education on the importance of child spacing, but none were able to say whether families actually practice spacing.

Finding III.C.10: **More than one third of villages report a decrease in the number of children considered ideal.**

Fifteen villages (37.5%) report a decrease in the number of children considered ideal. Two of those villages comment that women want fewer children now because they are more aware of the responsibility and/or cost of large families; one village notes that men usually want more children. An additional 4 villages (10 %) report the ideal number of children to be around 2-4. Another village added that women now have a greater say in deciding when to stop having children. These data suggest a growing desire for family planning. See the discussion of health services supplied by Maternal and Child Health Posts in Appendix D.

Preventive Health Care

Health training includes water, sanitation, and hygiene (WASH) training, Ebola prevention, and maternal and child care. The baseline study examined five types of preventive care: hand washing, boiling water, bed nets, childhood vaccination, and Ebola prevention.

[58] Kathengben, Kawungulu, Kamasaypayna (Folladugu section), Kabonka (Kakalain section).

Finding III.C.11: **Although most villages report at least one person with training in disease prevention, trained Community Health Workers (CHWs) are scarce** (see *Table III.C.3*).

Thirty villages (75%) report that at least one member of the community has been trained in disease prevention; however, only 14 villages (35%) report a trained CHW residing in the village.

Table III.C. 3: **Number of Villages with Trained Health Workers, by section**

Section	Trained CHW	Other training	No formal training
Kasokira	0	8 (73%)	2 (18%)
Kamakatheh	5 (83%)	0	0
Kamakihila	4 (57%)	2 (29%)	1 (14%)
Kakalain	3 (43%)	3 (43%)	0
Folladugu	2 (22%)	3 (33%)	4 (44%)
Total	14 (35%)	16 (40%)	7 (35%)

Finding III.C.12: **Hand washing is a common practice in all Kalanthuba villages, but only slightly more than half of the villages use hand soap.**

Although common around the home**,** hand washing is not possible when working in the fields. Interviewers recorded the materials used for hand washing: water alone, water and ash or soda, or water and soap. A slight majority of villages—21 villages (52.5%)—report the use of water and soap. Nine villages (22.5%) report use of water and ash or soda, and 10 villages (25%) report use of water only. Hand-washing practices vary among sections (see *Table III.C.4*).

Finding III.C.13: **Half of the villages believe their water is unsafe to drink.**

Twenty villages (50%) report that their water is unsafe to drink. This number seems small given that poor water quality (alongside mosquitos) is the most frequently cited cause of illness. There is also considerable uncertainty: 12 villages (30%) report their water as safe, but for various reasons; 6 villages (12.5%) report water as safe conditionally, again for various reasons; and 2 villages (7.5%) are unsure.

Table III.C.4: **Village Hand-Washing Practices, by Section**

Section	Soap and Water	Ash and Water	Water only
Kasokira	6 (55%)	4 (36%)	1 (9%)
Kamakatheh	5 (83%)	0	1 (17%)
Kamakihila	4 (54%)	0	3 (43%)
Kakallain	0	3 (43%)	4 (57%)
Folladugu	6 (67%)	2 (22%)	1 (11%)
Total	21 (52.%)	9 (22.5%)	10 (25.0%)

Finding III.C.14: The inhabitants of roughly two-thirds of Kalanthuba villages do little or nothing in the home to make their water safer to drink, such as boiling water.

Given the principal reliance of most villages on surface water for drinking (see section II, Material Capital), boiling water before drinking or use in cooking and food preparation is an important element of preventive care. Only 12 villages (30%), however, report any boiling of water, in many cases only by a few households; 6 villages (15%) report use of a straining cloth, most of which also report boiling.[59] The remaining villages—two-thirds of all villages—report that residents do little or nothing in the home to make water safer.

Finding III.C.15: Bed nets are not frequently used among Kalanthuba villages as a means of malaria prevention.

According to village reports, bed nets are not commonly used, even though malaria is widely reported among the villages as a serious health concern. *No village reports general or widespread use.* Only 15 villages (37.5%) report *any* use bed nets, including three villages that report use *only* by women during pregnancy. Though not specifically asked, seven villages cite pregnant women and/or nursing mothers as the principal bed net users. Seventeen villages (42.5%) report no use of bed nets. Many villages report having had bed nets in the past or having nets that are worn out or need repair.

[59] There is no reported use of filtration devices, such as sand filters; villages do, however, make concerted efforts to keep the water source clean (see discussion in section IV, Social Capital).

Finding III.C.16: **Childhood vaccination is common among most villages, though not universal.**

Twenty-seven villages (67.5%) report that *all* village children are vaccinated, and another 8 villages (20%) report that *most* children are vaccinated. One village reports that *half* of the children are vaccinated, and 3 villages (7.5%) report that only a f*ew* of the children are vaccinated.[60] Many villages report that vaccinators come to the village to inoculate children, usually administering oral vaccines. However, six villages (15%) report receiving no such visits because the distance to the village is too great— three located in Kakalain section, two in Folladugu section, and one in Kamakihila section. None of the villages without visits report all children vaccinated. Seven villages report mixed reliance on visits from vaccinators and trips to a health post.

Finding III.C.17: **Kalanthuba was Ebola-free during the epidemic of 2014-15.**

No village reports having an Ebola case, whereas Ebola caused the deaths of some 4,000 people throughout Sierra Leone. Most villages report observing some type of restriction, including restrictions on travel, handshaking, other bodily contact, and eating bush meat. Many villages report increased use of hand washing. Most villages received information via the radio and from health workers; some, from outside towns. Five villages in Kamakatheh section recall attending a meeting called by the paramount chief in Bumbuna to receive information. Only one village, located in Folladugu section, reports receiving no training on Ebola, but its residents are reported to be in training.

Finding III.C.18: **Health conditions have reportedly improved in a slight majority of villages over the past five years; only a few villages report that conditions have worsened.**

Twenty-three villages (57.5%) report that health conditions have improved over the last five years; 11 villages (27.5%) indicate that conditions remain the same, and 3 villages (7.5%) report that conditions have worsened, all three located in Folladugu section.[61] Ten of the 23 villages reporting improvement are located in Kasokira section. Villages with a resident CHW consistently report that village health conditions have improved because the CHW is able to help educate residents on disease prevention. Others also credit increased health education with the improvement of conditions.

D. Livelihoods

Subsistence agriculture is the principal source of livelihood in Kalanthuba. The common activities are farming (including field crops and tree crops) and raising livestock, supplemented by trapping, fishing, and gathering berries and herbs. Most of this work is for the purpose of household consumption, but some is done for sale in the market. Agricultural work is supported to varying degrees by three specialized vocations: blacksmithing, tree tapping, and basket weaving. In addition, villagers construct their housing, repair their footpaths, roads, and bridges, process their food and tree crops, butcher their

[60] One village has missing data.
[61] Data are missing for 3 villages.

livestock, build their animal and fish traps, and in some villages fashion canoes. Overall, Kalanthuba villages exhibit a high degree of self-sufficiency.

Farming

Finding III.D.1: **Kalanthuba farmers are smallholders, cultivating 3.6 acres of upland per household, on average in a village, plus a smaller portion of swamp.**

On average, villages report that a typical household cultivates 3.6 acres of upland in addition to swamp plantings. [62] The typical acreage varies among villages, mostly ranging from 1.5 to 6 acres per household.[63] The upper sections report somewhat larger farms (Folladugu averaging about 5 acres and Kakalain averaging about 4 acres), while two of the lower sections average around 3 acres and one averages almost 4 acres. All but a single village report farming in both upland and inland valley swamps.[64] Many farmers in Kalanthuba are increasing swamp cultivation: 12 villages report an increase, mostly due to better rice yields, though 5 villages report a decrease for various reasons.[65]

Finding III.D.2: **Kalanthuba farmers grow food crops largely for subsistence and follow traditional subsistence practices, such as intercropping.**

The main crops grown on upland are rice in the first year and groundnut in the second, after which the land lies fallow. Intercropping is extensively practiced: nearly all villages report intercropping rice with a wide variety of other food crops.[66] The variety likely helps spread risk, supports household food security, and somewhat reduces the need for markets to supply household consumption.

[62] Admittedly a rough estimate, this figure is an average of averages. Each village estimated the typical size plot farmed by a household; the mean village score for the chiefdom is 3.5 acres. Data are missing for 4 villages.
[63] One village reported an average of 9 acres with 6 acres attributed to land being farmed in other villages.
[64] One village in Folladugu section reports no upland farming, having lost a large portion of its holdings to the Bumbuna Reservoir.
[65] One village reports less water in their swampland due to the reservoir, two villages report a reduction because of use by Fullah to herd cattle, and one village cites both rat damage and labor shortage. Two other villages also report cattle damage, but this may increase their use of the swamp for agriculture rather than allowing it to lie fallow and attract cattle. Nineteen villages report their use of swamp remaining the same; eight cases are missing.
[66] Villages overall reported 22 different foods used in intercropping: beni, small, broad and black-eyed beans, cassava, corn, cotton, cucumber, egg plant, kren kren, kuncho, kuskus, pepper, pigeon peas, millet, pumpkin, okra, sesame, sorghum, tena, tomatoes, and yams. Only 2 villages report no intercropping; data are missing for 3 villages.

Finding III.D.3: **Farmers in all villages grow food crops for both consumption and sale.**

Measured by number of village-mentions,[67] groundnut (20 mentions), peppers (15 mentions), and a range of garden vegetables (15 mentions) lead the list of food crops grown for cash. Staples are not commonly sold: rice has only 5 mentions, and cassava only 4 mentions. Two villages mention the sale of tobacco. Villages also mention various tree crops, discussed immediately below. Some increase in cash cropping was noted, but many villages cite the limiting factors of distance from markets and lack of road access.

Finding III.D.4: **Nearly all villages report farmers growing tree crops, comprising a substantial chiefdom-wide investment. [See Appendix E.]**

All villages report growing tree crops with a single exception—a village that reports losing its trees to inundation by the Bumbuna reservoir.[68] Thirty-three villages supplied full or partial estimates of their tree crop acreage: the total number of tree crop acres reported is 292 acres, an average of nearly 9 acres per village.[69] Taking into account missing and incomplete data, the estimated number across all five sections is 363 acres.[70] Four villages report acreage of 20 acres or more. The greater reported number of acres are in three sections: Kasokira (84 acres), Folladugu (76.5 acres), and Kakalain (55.8 acres).

The most common tree types measured by the number of village-mentions are orange (33), kola nut (33), banana (27), oil palm (26), mango (22), and other palm[71] (17). Among other tree types mentioned, 5 villages report cashew, and 3 villages report coffee. Although tree crops are used both for consumption and sale, sale is common—only two villages report that tree crops are grown for consumption only.

Finding III.D.5: **Livestock—mainly chickens, goats, and sheep—are an important, though threatened, asset for farmers.**

The most common livestock reported in Kalanthuba are chickens (36 villages), goats (35 villages), and sheep (25 villages). No cattle are reported, although itinerant Fullah graze their cattle on village lands seasonally in parts of the chiefdom. Livestock are grown both for consumption and for sale—often working, like money in the bank, as a hedge against hard times or circumstances, such as illness, that

[67] Data are missing for 5 villages. The numbers of village mentions do not include 2 villages that report selling some of *all* the various food crops grown.
[68] The village also fears that newly planted seedlings will be eaten by cattle grazing on village lands.
[69] Providing acreage estimates is difficult for villagers when plantings are dispersed spatially and between households. The estimates reported here should be interpreted with caution.
[70] Some villages supply estimates only for certain types of trees, and some types of trees are scattered throughout the village making estimation difficult. Seven villages provided no estimate, yet six of them grow tree crops. The estimate is derived as follows: multiply the mean of 9 acres by 6 villages to estimate the tree crop acreage for missing villages; multiply 33 villages by 0.5 acres to estimate the acreage of trees not included in the count reported; add the two quantities calculated to 296 acres.
[71] Including 6 mentions of palm wine and 5 mentions of coconut.

entail extraordinary expenses. When asked to report the type of livestock raised in the village, 15 villages also report threats to livestock—mainly disease, predators, and theft—in some cases deterring farmers from raising one or another type of stock. Some mentioned pressure on their livestock from increased snake populations, which they attribute to the inundation of land by the waters of the reservoir.

Finding III.D.6: Nearly all villages supplement their agricultural output by trapping wild game and fishing in local streams or the Bumbuna Reservoir.

All but two villages report trapping small game, mostly rodents. Some report trapping deer. Trapping is done for pest control to reduce crop damage, as well as for food. Three villages refer to use of a rope and wire trap; one village also mentions using pits and stakes. No hunting with guns is reported; a national ban on firearms was put in place following the end of the civil war in 2002. One village reports hunting with dogs. Three villages have encountered problems with their traps snaring cattle, exposing them to liability and causing two villages to cease trapping.

All but three villages report fishing to varying degrees; qualitative data suggest that a large number of men and women engage in fishing in some 12 villages. On the whole, fishing seems to be declining somewhat: 10 villages report less fishing within the last 5 years. At the same time, 6 villages report increased fishing, four due to opportunities afforded by Bumbuna Reservoir, using canoes. Fishing equipment includes hook and line, baskets, and traps.

Non-Agricultural Occupations

Finding III.D.7: Villages support few non-agricultural occupations, and most of these are related to agriculture, fishing, or trapping.

Apart from the primary vocations of agriculture/horticulture, trapping, and fishing (in all of which most or all households are engaged), the only other livelihoods common to large numbers of villages are blacksmithing (35 villages, 87.5%), palm tree tapping (32 villages, 82.5%), and weaving (24 villages, 60%). All three are occupations that support the common sources of livelihood—agriculture, agro-forestry, and fishing:

- **Blacksmiths** (all males) make and repair the hand tools used to till the soil. Among the 35 villages that report having at least one blacksmith, 13 villages (32.5%) report having more than one—a few as many as 4 or 5. Most operate out of a shop, some work exclusively in their homes. The blacksmiths have access to traditional equipment, but many of them lack more efficient technology, such as bellows.

- **Tree tappers** (young males) extract the sap from palm trees used to make palm wine. *Limba* people are widely known as skilled tree tappers; one village commented that every household has a tapper. In Kalanthuba, however, most tappers do not sell their services outside the area: only four villages report tappers working both inside and outside the village.

- **Weavers** (all or mostly women) make baskets used to catch fish and mats used as drying pads for crops (also for sleeping), as well as spinning and weaving cotton fiber. Weaving is inhibited by lack of proper equipment, such as a loom or fiber, and inaccessibility to markets in which to sell woven goods. Some villages indicate that weaving skill is being lost as weavers die out without being replaced.

The only purely commercial occupation found among the residents of Kalanthuba is petty trading, reported in 7 villages (17.5%). Petty traders perform an important economic function by facilitating trade between villages, buying and selling foodstuffs and crafts, among other articles.

Finding III.D.8: **Prior to the impoundment of the Bumbuna Reservoir, 11 villages were engaged in artisanal gold mining, but no villages are currently engaged in mining of any type.**

Eleven villages report that they were at some time involved in small-scale gold mining along the Seli/Rokel River. Gold mining was never a primary source of livelihood, but it did in some cases provide important supplemental income. Because the impoundment of the Bumbuna Reservoir flooded mining sites previously available to these villages, none are currently engaged in mining operations. Although no villages in Kalanthuba reported current mining activities, three villages indicated interest in "prospecting" for minerals but lacked the necessary tools. Members of the research team did observe individuals engaged in artisanal gold mining on the Seli/Rokel River just upstream from Bumbuna Falls on the border between the Kalanthuba and Dansogoia Chiefdoms.

Finding III.D.9: **Few village residents are employed outside the village.**

Relatively few villages report villagers who work at occupations outside the village while continuing to live there. Only two villages report a village resident working in the mines; one village reports a resident carpenter who works outside the village; and another reports a resident who works at Bumbuna Dam compound. Relatedly, one village reports four university students, and two villages report a total of nine apprentices working outside the village.[72] Many villages, however, continue to regard persons who leave the village to accept employment in towns and cities as villagers.[73] One village cites unmarried young men who live in Makeni or Freetown, working in occupations such as driving, tailoring, mechanics, and carpentry. Some who live and work outside the village return to visit, and some provide financial support to village residents.

[72] The number of university students and apprentices is likely to be under-reported because interviewers asked about employment, not study, outside the village.

[73] Village responses to the research team's question about the number of villagers employed outside the village were therefore often difficult to interpret.

IV. Social Capital

Introduction

Social capital measured at the village level is the ability of villagers—individuals and households—to draw on assistance from others when needed. Overall, the findings indicate that social capital is high in Kalanthuba, providing a basis for inclusive and lasting development.

Social capital has two main sources: (1) social "bonding" among the members of a group or community and (2) social relationships that "bridge" between groups or communities, at the same or at different levels. To measure *bonding* capital the baseline study examines *group organization* in villages as well as *village-wide collective action*. To measure *bridging* capital the study looks at *connections* between villages and with outside agencies that represent groups wider than a village. Bonding facilitates collective action among individuals and households, while bridging brings the resources of a wider group to bear on smaller nested groups or communities. Because social capital relies on individual trust of others, the study also took note of indicators of trust and distrust.

A. Bonding Relationships

The social structure of villages consists of extended "families," common descent groups composed of households, some of which are polygamous. Social capital within the village thus bonds individuals in relationships that extend beyond the household. The two major sources of bonding are two institutions: the "family" and the village. Families are led by a head of family, usually the oldest male in the patrilineal line of descent, in addition to other elders, both male and female. Villages are led by a headman and assisted by a chairlady ("mammy queen") and a youth leader. Collective action occurs at both levels—family and village. The focus of the baseline study is on village-level collective action. This is of two types: collective action in *social groups* that extend across families within the village and collective action that is *village-wide*.

Social Groups

Finding IV.A.1: **At least 91 rotational labor groups have been organized and operate within Kalanthuba's 40 villages.**

The capacity to organize and take collective action at the village level is clearly demonstrated throughout Kalanthuba by extensive reliance on rotational farm labor groups—at least 91 such groups in the chiefdom. Due to the seasonal nature of many group activities, however, they do not all function simultaneously. In addition to individuals accessing labor rotationally through group membership, the study finds that those outside of the group are able to access group labor with relative ease, usually through the presentation of a token and provision of food for the group. The accessibility of group labor especially benefits community members who, for various reasons, may have less availability of household labor or face other hardship.

Arguably, the number of rotational labor groups indicates the ability of such groups to organize collectively, minimize shirking (i.e., not contribute to the group as expected, perhaps through tardiness, absence, or intentionally laboring less than one's capacity), resolve conflict, produce consistently reliable results, and exhibit a significant degree of mutuality—all of which are essential capacities for successful development undertakings of various sorts.

Finding IV.A.2: Every village in Kalanthuba has traditional societies for men and for women.[74]

The pervasive presence of traditional societies in Kalanthuba villages provides further demonstration of village-level capacity to organize and function collectively. Outside of extended families, the men's and women's societies constitute the principal social networks active in Kalanthuba. When asked, villages identified a number of specific benefits derived from society activities: mutual support between men's and women's groups; cultural orientation; education; a basis for social reunions and an opportunity to establish friendships; the exchange of food, money and other gifts; celebration; and a social platform to resolve conflict. The men's and women's societies each maintain a separate sacred bush or forest in all villages, contributing significantly to forestation. A few villages volunteered adverse effects: the fact that some girls are now refusing to join, the shame accorded to those who do not join, and the cost (in terms of food) of initiation celebrations. For development purposes, society membership brings people that might not otherwise be closely related into socially bonding relationships. Society membership thus provides a common ground and group mentality that could, even if only indirectly, support development activities.

Finding IV.A.3: Social groups other than rotational labor groups and traditional societies are few in number.

- Eight **savings/loan groups** operate, but in three villages.[75] Membership in these groups—where they operate—is nonetheless substantial: 320 people total, an average of 40 members per group. The high level of participation indicates strong community interest and utility. Expansion of savings/loan groups presents an opportunity for development. Such groups can serve a personal finance function, but could also operate to fund village, section, and chiefdom-level development initiatives.

- Villages report only one organized **farmers cooperative**, a Farmer Field School (FFS) in Kathombo. **Collective farming** by groups is also limited: only three villages cite collective-farming initiatives, one of which is an initiative of the FFS.

[74] Specific practices of the groups, some of which may or may not raise ethical concerns, were outside the scope of this study.
[75] Another village reported a revolving fund, now non-operational.

- **Recreational groups** reported include only three village football teams but at least eight music or dancing groups.[76]

Village-wide Collective Action

Finding IV.A.4: **Collective action regularly occurs at the village level to maintain water sources, roads, footpaths, and bridges.**

- **Water sources:** In 33 villages (82.5%)[77] village women are organized to clean the water source—usually a stream or spring—sometimes weekly, bi-weekly, or monthly—in most cases led by the Mammy Queen (reported by 30 villages). One village noted that the town crier summons all responsible women to do the work on the appointed day. Only 2 villages indicate no person or group responsible for this work.

- **Roads:** All 16 villages with road access (100%) assume responsibility for some level of road maintenance—most commonly brushing (cutting brush) but also sometimes filling gullies washed out by rain and cleaning and packing stones. The maintenance is carried out by youth and organized (in at least 5 cases) by the village youth leader.

- **Footpaths**: All villages (100 %) report provision for the maintenance of footpaths, in most cases carried out by youth, frequently under the direction of the youth leader. Five villages indicate a community-wide maintenance effort.

- **Bridges:** Thirty-five villages report bridges, and 27 of those villages (77%) report maintenance specific to bridges, especially in the rainy season, organized in the same manner as footpath maintenance. In some cases, however, footpath maintenance may include maintenance of traditional bridges. The most frequently mentioned maintenance group (17 mentions) is youth. Five villages report that maintenance is community-wide. Two villages refer to bridge "construction" by village youth under the supervision of village leaders. Some bridges may wash out during the rainy season and need to be rebuilt.

One village describes a compulsory process in mobilizing youth: the youth leader announces a footpath maintenance day the night before; if a youth refuses, the town chief (headman) assesses a fine; if he refuses to pay the fine, he is sent to the section chief. The study did not examine the extent to which villages use sanctions to enforce work-related rules.[78]

[76] Due to inconsistent phrasing of the interview question, music and dancing groups are likely far more prevalent.
[77] Three villages are missing. One village reports that the village health worker has this responsibility; another, the "vaccinator."
[78] The use of sanctions is common, however, in rural communities around the world that successfully maintain shared facilities, such as roads, bridges, irrigation facilities, and the like. See Elinor Ostrom, *Governing the Commons* (1990).

The research team came across notable instances of village-level collective action recently completed or in process:

- **Kasokira**, the village headquarters of Kasokira section, is nearing completion of a new, much enlarged community school building. Accomplished without government assistance, the project to some extent involves multiple villages, assisted by a field worker from the BWMA.

- **Kathombo**, a village in Kasokira section, recently completed construction of a new church building, with design assistance from engineers associated with the Bumbuna Dam and Hydroelectric Facility.

- **Kathaywuna**, a village in Folladugu section, has been working for a year on the construction of an access road. They expect to finish the road during the next dry season but report that they will need assistance, perhaps from the government, with bridge construction.

- **Kakamalor**, a village in Kamakihila section, recently finished construction of a road extension, providing the first-ever motorable access to the village.[79] Organized by the village headman, the work was done mainly by village youth using hand tools. Kalanthuba leaders envision an expanding road network in the area on the basis of village-organized construction.

B. Bridging Relationships

In general, bridging relationships in Kalanthuba are not as strong as bonding relationships. To obtain assistance collectively from outside the village, a village can draw on both horizontal linkages to other villages and vertical linkages to higher authorities. Vertical links can also facilitate horizontal collaboration; the hierarchy of traditional authority connects villages at the section and chiefdom levels. However, the existence of the hierarchy does not guarantee strong horizontal links among villages, connections that villages must work to build and sustain.

Horizontal Links

Finding IV.B.1: Inter-village cooperation on joint projects is possible but infrequent.

One village in Kamakihila section reports cooperative maintenance of a hammock (swinging) bridge with two other villages. The village construction projects listed at the end of the subsection above, not only affirm the ability of individual villages to act collectively, but also point to the need for collective action on a wider basis. Kakamalor reports, however, that efforts to involve other villages benefitted by its road extension did not produce results, even after seeking the assistance of the section chief and district

[79] When the research team visited this village to conduct interviews, villagers noted that the team's two vehicles were the first ever to visit the village.

council representative. At the same time, vertical links to the BWMA were fruitful for Kasokira and Kathombo, both located near Bumbuna Dam in Kasokira section.

Finding IV.B.2: **Inter-personal cooperation across villages is facilitated by family relationships and membership in traditional societies.**

In contrast to *inter-village* collaboration, which can require considerable time and effort to build and sustain project-specific relationships, *inter-personal* cooperation and social exchange more easily connects individuals and households in multiple villages by drawing on social bonds that cross village boundaries. Villages are intricately connected through extended family relationships and traditional men's and women's societies. These linkages facilitate individual and household access to resources such as farmland, streams for fishing, group labor, seeds, and assistance in times of need.

Vertical Links

Finding IV.B.3: **Only one-half of Kalanthuba's villages know the name of their district counselor for Tonkolili District.**

Horizontal connections between villages do not necessarily translate into strong vertical connections with political representatives and development agencies. Only 20 villages (50%) are able to name their district councilor, and only 13 villages (32.5%) report any form of contact with him.[80] The lowest percentages of villages naming the counselor are found in the two northern sections, Kakalain and Folladugu, as well as Kamakatheh.

Finding IV.B.4: **Half of Kalanthuba's villages report having received no assistance from an NGO or development agency.**

Fifteen villages (37.5%) report recent assistance from an NGO or development agency, mostly one-time assistance. Four villages (10%) cite assistance from the BWMA, three of which also report other assistance.[81]

[80] Data are missing for one village. The district counselor is Sara Nathaniel Koroma, known as AKK.
[81] Data are missing for 5 villages.

Table IV.B.1: **Number of Villages that Can Name District Councilor, by Section**

Section	Can Name District Councilor
Kasokira	8 (73%)
Kamakatheh	2 (33%)
Kamakihila	6 (86%)
Kakalain	2 (29%)
Folladugu	2 (22%)
Total	20 (50%)

C. Trust, Conflict, and Crime

Both horizontal and vertical links depend on trust. Within the village, conflict and crime might be expected to diminish trust. Hunger emerges as possibly the greatest threat to village cohesion, followed by disrespectful behavior, especially among youth.

Finding IV.C.1: **Villagers report relying on friends, relatives, and elders in time of need.**

Judging from those whom villagers go to in time of need, friends, relatives, and elders are the persons most trusted to provide assistance of various sorts —food, seeds, and advice.

Finding IV.C.2: **The main source of conflict reported among village residents is lack of food—hunger—followed by disrespect in the form of abusive language.**

Asked about sources of conflict in the village, hunger or lack of food has the most mentions by far: 26 mentions. This is followed by some combination of disrespect, bad or abusive language, and drunkenness, frequently involving youth (14 mentions). Village leaders have important roles in resolving conflict, sometimes also involving a section chief.

Finding IV.C.3: **The relationship between transhumant Fullah cattle herders and resident farmers is a major source of conflict in the chiefdom.**

Eighteen villages report the presence of Fullah cattle herders on village lands, including multiple villages in all sections except Kasokira, which reports cattle herding in only one village. The transhumant herders have gained access to village lands by virtue of agreements made between Fullah leaders and the Paramount Chief of Kalansogoia—the former amalgamated chiefdom.[82] Villages report a total of 27 Fullah settlements (worrehs) in the chiefdom. Six villages report serious and on-going conflict over crop destruction and non-payment of compensation. Another village reports having expelled the cattle herders.[83]

Table IV.C.1: **Number of villages reporting significant levels of crime, by section**

Section	Significant Crime	Little to no crime
Kasokira	6 (55%)	4 (36%)
Kamakatheh	6 (100%)	0
Kamakihila	6 (86%)	1 (14%)
Kakalain	6 (86%)	1 (14%)
Folladugu	3 (33%)	4 (45%)
Total	27 (68%)	10 (25%)

Finding IV.C.4: **Two-thirds of Kalanthuba's villages report some significant level of crime in the village.**

Twenty-seven villages (67.5%) report a significant level of crime, while 10 villages (25%) report little or no crime at all.[84] See *Table IV.C.1* for section-level detail. Relatively limited, most occurrences mentioned involve theft of livestock, abusive language, or witchcraft. Many villages hesitate to locate the blame for thievery, but most village leaders generally suspect outsiders. Seven villages specifically report significant crime levels perpetrated by outsiders.

[82] Agreements between Fullah herders and Paramount Chiefs are commonplace in Sierra Leone, based on a presumption that the transhumant herders have customary rights of access seasonally to graze their cattle on village lands. See Oakerson, et al (2017).

[83] This finding is based entirely on interviews conducted with village leaders. To gain a full account of what is apparently a serious source of conflict it would be necessary to conduct interviews with Fullah leaders and chiefdom officials.

[84] Data are missing for 3 villages, one in Kasokira section and two in Folladugu section.

Summary and Conclusion

Reading through a detailed account of the capital resources of the chiefdom in their various dimensions, it can be easy to miss the forest for the trees—to get lost in the details and miss the big picture. So, the summary and conclusion begins by looking at how assets tend to combine in typical sets of villages in the chiefdom—some assets characterizing all or nearly all villages, others concentrated in the upper tier of sections, others in the lower tier of sections, and some in the chiefdom's largest single village, Kamankay. Next, to get an even better understanding of the resource level in the chiefdom on some key development indicators, it is useful to make comparisons. How is Kalanthuba like or like other places in Sierra Leone? For this perspective, the Census of Population and Housing conducted by the central government in 2015 is especially useful. Finally, despite the interesting diversity that is present within Kalanthuba and the uniqueness of each village and its particular situation, it is also important to generalize—to draw some broad conclusions that apply to the Chiefdom as a whole. On this basis the Chiefdom can begin to consider some future possibilities that may offer development potential, building on Kalanthuba's important assets.

Typical Village Assets in Kalanthuba

Some village resources are typical of all or nearly all villages in the Kalanthuba, including Kamankay, the chiefdom's largest village. On many important characteristics, however, Kamankay is distinctively more developed, warranting separate discussion. Overall, the five sections differ in important ways, depending on location. The two upper-tier sections, Kakalain and Folladugu, share important resource characteristics that stem from their greater distance, as do to a lesser extent the three lower-tier sections, Kasokira, Kamakatheh, and Kamakihila.

All (or Nearly All) Villages

The following account sorts village resources by (1) natural resources, (2) livelihoods and livelihood resources, (3) infrastructure, (4) human services and resources, and (5) social action resources.

Natural Resources. All villages have access to agricultural land, including varying proportions of upland, swamp, and boliland, as well as significant forest cover and fallow agricultural land that quickly grows back as bush. The condition of agricultural land varies among villages with half of the chiefdom's villages reporting possibly degraded upland where the typical fallow period is less than seven years. Villages generally have access to nearby streams, an important water source for washing clothes, bathing, and even drinking, as well as a food source from fishing. Wildlife is also common, though species vary, and include both nuisance-species and a source of food from trapping.

Livelihoods. Throughout Kalanthuba, most men and women earn their living by means of subsistence farming, using bush-fallow rotation on land owned by their extended family or by another extended family in the village. All farmers are smallholders, cultivating on average 3.5 acres of upland plus swamp gardening. Farmers use traditional methods of intercropping and prepare fields with hand tools made by the village blacksmith. Rice is their primary crop, along with groundnuts and cassava, in addition to a

wide range of vegetables, many of which also serve as cash crops to provide supplementary income. Livestock include chickens, goats, and sheep. Village farmers also have invested significantly in tree crops, especially orange, kola nut, banana, oil palm, and mango. Most villages also have access to streams for fishing, often conducted by women using baskets they have woven. Most villages also have significant forest cover as well as bush (farmland that is fallow), which provide them with important food sources and materials for housing. There are few sources of employment for village residents outside the village, and those who do obtain employment elsewhere must relocate.

Infrastructure. Villages uniformly lack electricity. Food is prepared outside over an open fire. There is no plumbing, and villagers must rely on a common water source (usually surface water). Most villages have common pit latrines (VIP latrines are found in only a single village), but the number per village is low, often leaving villagers to use the bush. Housing is one of two main types: either mud brick houses with zinc roofs or stick-and-mud structures with thatch roofs. Most floors are made of earth. All villages are connected by a network of footpaths, but not, in a majority of cases, by roads. For communication, nearly all villages have access to a mobile phone or working radio somewhere in the village. There are no market facilities in the chiefdom.

Human Resources/Services. Most villagers cannot read or write. Because the literacy rate in Kalanthuba is only approximately two percent of the adult population, most villages have few literate adults, or none. There are no secondary schools in the chiefdom, and villages uniformly lack access to adult literacy training. With only five primary schools in the chiefdom, access to primary education has been highly variable. Access to health services, with only two health posts in the chiefdom, is equally variable. Traditional healers and traditional birth attendants, however, are available in all or nearly all villages and widely used (though to varying degrees). Most children have been vaccinated to protect against a range of diseases. Although malaria is reported to be a common health problem, bed nets are either unavailable or little used.

Social-Action Resources. All villages share a common leadership structure composed of a headman, chairlady or "mammy queen," and youth leader. Heads of family are also an important part of the leadership structure in every village. Most conflicts within villages are settled by recourse to village leaders. Men and women are organized separately in traditional societies; each one maintains a sacred bush or forest and socializes young adults. Although households carry out farming separately, farm labor is shared by means of village rotational labor groups—at least 91 such groups in the chiefdom. Labor groups of young men also generally tend to footpath maintenance (also roads when present), and women's groups are usually responsible for the maintenance of surface water sources. There is little or no collective farming by village groups and little or no access to farm cooperatives. Although bonding relationships are strong with villages, bridging relationships between villages and between villages and agencies outside the chiefdom are much weaker.

The Upper-Tier Sections: Kakalain and Folladugu

A typical village in the two upper sections of the chiefdom has a number of characteristics that set it apart from most villages in most of the other sections. Upland farms tend to be somewhat larger—5

acres in Folladugu and 4 acres in Kakalain. Housing is predominantly made of sticks-and-mud with thatch roofs and virtually all earthen floors—with some mud-brick houses and zinc roofs mixed in. Both sections completely lack road access; all villages rely entirely on footpaths. Most villages lack a single literate adult. There have been no schools [until one addition after the date of the study] and no health posts. The majority of school-age children in most villages do not attend school. Those that do attend school—whether primary or secondary—relocate to a town or city to live with relatives. For health care, villagers rely primarily on traditional healers, rarely making the long trip to a health post. Childbirth typically occurs in the village, but villages report fewer trained birth attendants than found elsewhere in the chiefdom. In all but two villages medicines other than traditional herbs are inaccessible and/or unaffordable. Villages rely almost exclusively on untreated surface water to drink (with some very limited reliance on protected springs), and most villagers use the bush for toileting most of the time.[85] Children are somewhat less likely to be vaccinated than the children in the lower tier due to distance from health posts. In interviews, village leaders were not acquainted with the name of their elected representative on the local council for Tonkolili District.

The Lower-Tier Sections: Kasokira (exclusive of Kamankay), Kamakatheh, and Kamakihila

Some characteristics are shared between the lower and upper tier of sections. Housing is mostly constructed of sticks-and-mud with thatch roofs and virtually all earth floors. Lower tier villages also share with the upper tier a primary reliance on surface water; to a lesser extent, most villages also report widespread use of the bush for toileting.

Although there is greater diversity among the three lower sections, there are shared characteristics that distinguish them from the upper tier. Upland farms are somewhat smaller—averaging 3 acres in villages across the lower tier. Road access to villages is mixed: greatest in Kamakatheh, least in Kamakihila, the western section. Only Kasokira section has significant literacy (three villages reporting the number of literate adults of 17, 20, and 30), while most villages in the other two sections have no literate adult (never more than one). All five schools in the chiefdom and both of the two health posts are located in the lower sections, affording more or less greater access to villagers, depending on village location. Medicines other than traditional herbs tend to be more accessible and affordable. Only in Kasokira section, however, do villages report that the great majority of school-age children attend primary school. Moving westward from Kasokira across the southern tier, half of Kamakatheh's villages report a majority of children *not* in school, and in Kamakihila section a majority of villages report a majority of children *not attending*. All three sections report a greater reliance on health posts than on traditional healers for medical care. The location of childbirth is much more likely to occur in a health post in

[85] There are also some important differences between the two sections. Folladugu has access to the reservoir, and villages report the presence of chimpanzees in their forests. Kakalain's villages report somewhat more, possibly degraded upland (less than 7 years fallow) but has more boliland. Kakalain also reports greater adult literacy and a greater incidence of mud brick/zinc roof housing, but also somewhat more crime.

Kamakatheh but is more evenly divided among villages in Kasokira and Kamakihila. Village leaders in Kasokira and Kamakihila were acquainted with the name of their elected representative on Tonkolili District council.

Kamankay Village: An Important Outlier

The village of Kamankay in Kasokira section is by a wide margin the most highly developed village in Kalanthuba. Located on a main road connecting Bumbuna Town to Makeni City, it enjoys superior road access. In fact, it has the Bumbuna area's only petrol station. The largest village in the chiefdom by a factor greater than four, with an estimated population of some 1,900, it sits next to the river, across the bridge from Bumbuna Town, affording residents easy access by foot to shopping (including pharmaceuticals) and health care. Residents of Kamankay live mainly in mud-brick houses with zinc roofs; more of them have non-earthen floors than in most villages around the chiefdom. Most households have mobile phones.

The village has a primary school (a majority of school-age children attend primary school in the village), and unlike the remainder of the chiefdom its common water source is a well. For sanitation, the village has access to an estimated 200 common pit latrines; residents who instead use the bush are subject to a fine. Health posts are nearby, in Bumbuna and Kathombo, and childbirth regularly occurs at a health post. The village reports more than 30 literate adults, giving it a literacy rate of an estimated 2.6 percent or more, greater than the whole chiefdom by some 23 percent. Some village residents have completed secondary education, choosing to remain in the village after completing their education. In contrast to the rest of the chiefdom, a reported 10-12 residents of Kamankay find employment outside the village, including persons employed as masons, mechanics, and carpenters.

The primary school is a prime indicator of social capital and its relationship to development in Kamankay. A community school, it was organized six years ago at the initiative of village leaders and elders. Four teachers, supported by the parents of students with in-kind contributions, provide instruction to more than 100 students entirely from Kamankay, in grades 1-5. The school meets in a facility shared with a village church. Village leaders, including both male and female elders, continue to provide leadership. Primary school graduates are able to continue in the secondary school located in Bumbuna Town. Also indicating social-capital development, the village has a functioning savings and loan group (initiated by an NGO) as well as organized recreational teams.

How Kalanthuba Compares

The Census of Population and Housing conducted in Sierra Leone in 2015[86] affords an opportunity to compare selected housing and village characteristics of Kalanthuba to Sierra Leone as a whole, to rural Sierra Leone, and to Tonkolili District.

[86] Statistics Sierra Leone (2015).

Housing Characteristics

	Sierra Leone	Rural Sierra Leone	Tonkolili District	Kalanthuba
Roof Type				
Zinc	81.8%	73.3%	75.0%	51.0%
Thatch	12.8%	22.6%	21.0%	49.0%
Other	5.5%	-	-	-

	Sierra Leone	Rural Sierra Leone	Tonkolili District	Kalanthuba
Wall Type				
Mud Brick	42.9%	55.7%	52.4%	49.6%
Mud & Wattle[87]	14.9%	24.9%	26.0%	50.4%
Cement Block	24.8%	6.4%	8.5%	-
Floor Type				
Cement/Other	53.6%	21.2%	27.4%	19.7%
Mud (Earth)	46.4%	74.4%	67.7%	80.3%

Kalanthuba trails the comparison areas on all three housing indicators, most markedly on roof material and wall construction: in particular, Kalanthuba exhibits much more mud and wattle (or sticks and mud) construction with thatch roofing than does rural Sierra Leone overall as well as more than Tonkolili district as a whole.

[87] Village respondents in Kalanthuba refer to this type as sticks and mud.

Community Facilities[88]

	Sierra Leone	Rural Sierra Leone	Tonkolili District	Kalanthuba
Lighting				
Electric	17.8%	-	-	-
Battery	76.8%	93.0%	90.7%	~25.0%
Wood	-	2.6%	3.3%	~67.5%
Cooking Fuel				
Charcoal	32.3%	3.9%	6.0%	~01.3%
Wood	64.7%	95.8%	92.3%	~98.7%
Toilet Facility				
Pit Latrine	73.8%	73.3%	83.4%	~62.0%
Bush	12.9%	20.8%	11.0%	~38.0%
Water Source				
Stream	19.2%	32.6%	34.7%	~80.0%
Distance to Health Facility				
5+ miles	15.3%	25.7%	20.1%	~49.0%

Although the comparison of community characteristics above are rough, due to the baseline study's use of a village as the unit of analysis rather than a household, the differences are often quite large. Kalanthuba clearly makes much greater use of wood for lighting than their rural counterparts, greater use of the bush for toileting, and much greater use of local streams for drinking water. Kalanthuba

[88] While the Census numbers reflect a count of households, the Kalanthuba numbers are estimated from village-level characteristics. The difference in the unit of analysis makes the comparison somewhat inexact. If the differences were minor, one could attribute it to measurement error; but the differences are not minor. Within Kalanthuba, the dramatic difference between the largest village, Kamankay, and the rest of the chiefdom facilitates the estimation: first taking account of Kamankay, then adding an estimate based on the predominant characteristic of the other villages. In the case of the distance to health facilities, we also take into account the number of villages likely to be within a 5-mile radius of a health post (utilizing data from one health post as a guide).

villagers also must clearly travel further, on average, than their counterparts in rural Sierra Leone or Tonkolili District to reach a health facility.

Assessing Kalanthuba's Capital Assets

Kalanthuba's wealth lies in the areas of natural and social capital, while the areas of material and human capital show serious levels of deprivation.

Land and water, plus forests and wildlife, are important natural assets, both for subsistence and for potential development. The use of those natural resources to sustain a livelihood has made Kalanthuba villagers highly interdependent, nourishing a culture of reciprocity and collective action, apparent in the large number of farm labor groups in the chiefdom and regular village attention to community tasks such as road and footpath maintenance and keeping water sources clean.

At the same time, material deprivation—the number of villages with no road access, few working wells, and a limited number of latrines outside Kamankay—all pose serious liabilities for economic and human development potentials. The shortage of human capital, in particular an adult literacy rate of roughly two percent, has left multiple villages without a single literate adult, creating a serious handicap in the ability of villagers to pursue development opportunities. The shortage of schools within walking distance of a great number of villages greatly restricts human capital formation, consigning the literacy rate to a very low number, and the shortage of employment opportunities unrelated to subsistence farming in the chiefdom means that those who do manage to get an education soon leave.

Moreover, deficiencies in different areas reinforce one another. Isolation due to lack of roads compounds the absence of literate persons in remote villages and increases the difficulties created by long distances to health facilities and both primary and secondary schools.

Development is not the only criterion relevant to the evaluation of capital assets, however. There is also resilience, the ability to withstand external shocks that threaten to disrupt village livelihoods. War, disease, pestilence, drought, or loss of land for one reason or another—all represent threats that villagers must be able to respond to effectively. The watchword for resilience is redundancy—fallback strategies: a large number of seed varieties so that when one fails, others are available; differing soil conditions between upland, swamp, and boliland; the availability of the bush and forest when cultivation fails to produce adequate food stocks; multiple cash crops to accommodate changing markets. Much is designed to keep food on the table as much of the time as possible. It is supported by a wealth of traditional knowledge and skills, passed on from one generation to the next without the support of formal education.

Even so, there are threats to resilience on the horizon. Climate change may necessitate adjustments in farming practices. An average fallow period among villages of close to 7 years suggests possible degradation of upland soils at present. Given the shifting cultivation practiced in a bush-fallow system, farmers must act collectively within a landholding family to improve soil quality. More generally, development efforts must be chosen with care, not only so as not to diminish resilience but also to reinforce resilience and make it stronger. Development should not be allowed to reduce significantly

the diverse traditional skillset of Kalanthuba's farmers on which they have relied and may need to continue to rely, given the unpredictability of problems that the future may bring. This means sustaining the culture of interdependence among farmers that has given rise to important sources of social capital in every village. At the same time, development can add to that skillset and, moreover, increase the diversity of means available to villagers to survive hard times, should they come.

At the present there are no large groups of people in the chiefdom unable to access land or obtain shelter. This is a high-value social characteristic that most "highly developed" nations of the world cannot claim. The culture of inclusion that characterizes Kalanthuba's villages, as well as many other rural villages in Sierra Leone, is a social asset to be protected and nourished, never taken for granted.

Looking to the Future

Kalanthuba has a resource base on which to build a better future. It consists primarily of key natural resources, which need to be well managed, and social relationships within a culture that teaches how to act collectively on a daily basis. The construction of Bumbuna dam, while it inundated some valuable land, also creates opportunities, including the personnel attached to the BWMA and BCA, as well as the physical facilities of Sal-Cost Camp. Add to this the restoration of the independent chiefdom, able to offer leadership and planning as well as scale in the implementation of development initiatives.

Consider the following possible initiatives:

- *An eco-tourism initiative entered into as a collaboration among the BWMA/BCA, Sal-Cost, and Kalanthuba chiefdom, in particular, villages on whose lands primates and large mammals are present.* The BWMA offers access to expertise and training; Sal-Cost, access to facilities; the Chiefdom, leadership and planning; and villages, stakeholders who stand to gain from preserving and growing the primate population, including chimpanzees, as well as participating as guides for visitors from around the world.

- *A chiefdom-wide farmers' cooperative to provide limited processing of tree crops and other cash crops in addition to transport, marketing, and extension assistance to farmers.* Although villagers are skilled in collective action through the formation and operation of farm labor groups, there are few instances of collective farming and agriculture cooperatives. The skillset is there, however, for farmers to work together, and the chiefdom can offer the scale needed to process and market crops.

- *A chiefdom-level association of community schools with the scale needed to do planning, curriculum development, and teacher training, spreading community schools ultimately throughout the chiefdom.* In addition to primary schools, the association can also train trainers who bring adult literacy training and instruction in hygiene directly to villages. Dovetailing with the eco-tourism project, a curriculum in environmental education and wildlife management could be made a priority. It would also be interesting if villages could offer traditional skills training to other Sierra Leoneans who may not have access to this knowledge – perhaps weaving and ethno-botany. Reciprocal education could perhaps support the continued transmission of

culturally important skills and recognize the value of what villagers have maintained in Kalanthuba.

The chiefdom has already launched a major self-help initiative in road-building with solid results thus far. Although self-help is fundamental to the success of each and every development initiative, the ideas sketched above will need seed money—start-up funds—as well as technical assistance. Grant-writing and project design will become one of the major tasks of the newly restored chiefdom personnel.

Whatever the specific development initiatives the Chiefdom chooses to pursue, it is important that initiatives be community-based, pursuing development at the village level; broad-based, not focused entirely on infrastructure, for example, but aimed at developing the wide set of assets needed to sustain a developing community—natural, material, human, and social; and resilient, increasing or at least preserving the resilience of community institutions and practices. There is much to build upon in Kalanthuba, just as there is much work to do to improve the wellbeing of the nearly 10,000-strong population of Limba people in Kalanthuba.

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Appendix A: Kalanthuba Sections and Villages

Kasokira Section
[11 villages]

Kasokira*†

Kegbema

Kamera

Kayakala

Kasasie

Kadala

Kathombo*

Kamathor

Kamankay

Kawonor

Kamasapie

Folladugu Section
[9 villages]

Kateneh*

Kathengben

Kakuthan

Kamasapie

Kawungulu†

Kabunban

Kamasaypayna

Kathaywuna

Kasankorie

Kakalain Section**
[7 villages]

Kaibana

Kabonka

Kamasikie

Kasasie

Kakarima†

Kakuthan

Kafogo

Kamakatheh Section
[6 villages]

Kadandan*†

Kafugia

Kamasaypayna

Kawornor II

Kamagbarain

Kadanso

Kamakihila Section
[7 villages]

Kamera*†

Kasonpona

Kakonthan

Kakamalor*

Kamarimbe

Kamaraypay

Kasangbanba

Legend

*Interview location

**Interviewed in Kakamalor, Kamakihila section

†Section headquarters

Natural Capital Table B1		Land Ownership		Fullah	Other land ownership		
		Number of land-owning families	Number of non-land-owning families		Individual	Village	Non-Family/ Association
Chiefdom							
	Kalanthuba	136	88	18	1	5	
Section							
Kalanthuba	**Folladugu**	37	26	6		1	
	Kakalain	18	7	4		2	
	Kamakatheh	21	8	3			
	Kamakihila	27	16	3		2	
	Kasokira	33	31	2	1		
Village							
Folladugu	**Kabumban**	4	2	X			
	Kakuthan	7	2			X	
	Kamasapie	1		X			
	Kamasaypayna	5	3	X			
	Kasankorie	1	3				
	Kateneh	4	3				
	Kathaywuna	3	2	X			
	Kathengben	5	6	X			
	Kawungulu	7	5	X			
	Total	**37**	**26**	**6**		**1**	
Kakalain	**Kabonka**	1	1				
	Kafogo	3	1	X			
	Kaibana	2	2			X	
	Kakarima	3	0	X			
	Kakuthan	4	0			X	
	Kamasikie	3	1	X			
	Kasasie	2	2	X			
	Total	**18**	**7**	**4**		**2**	
Kamakatheh	**Kadandan**	5	3				
	Kadanso	4	2				
	Kafungia	4	0	X			
	Kamagbarain	3	0	X			
	Kamasaypayna	4	1				
	Kawornor 2	1	2	X			
	Total	**21**	**8**	**3**			
Kamakihila	**Kakamalor**	4	2	X			
	Kakonthan	7	0				
	Kamaraypay	2	3				
	Kamarimbe	4	3	X			
	Kamera	3	3				
	Kasangbanba	3	0			X	
	Kasonpona	4	5	X		X	
	Total	**27**	**16**	**3**		**2**	
Kasokira	**Kadala**	2	0				
	Kamankay	4	4				
	Kamasapie	4	2				
	Kamathor	6	0	X			
	Kamera						
	Kasasie	2	3				
	Kasokira	3	4		X		
	Kathombo	5	11				
	Kawornor 1	3	3				
	Kayakala	2	1				
	Kegbema	2	3	X			
	Total	**33**	**31**	**2**	**1**		

Natural Capital Table B2		All Land					Rice Varieties		# Years upland farmed	Fallow Period (years)		
		Cultivated %	Upland Fallow %	Forest %	Swamp %	Boli %	Current	New		Typical	Longest	Shortest
Chiefdom												
	Kalanthuba	16	20	16	29	20	7	2	2	7	9	5
Section												
Kalanthuba	**Folladugu**	18	17	21	23	21	9	1	2	8	10	7
	Kakalain	16	17	14	26	26	6	2	2	6	12	5
	Kamakatheh	15	19	16	32	20	7	2	2	7	8	5
	Kamakihila	14	21	10	33	21	5	1	2	7	7	5
	Kasokira	16	25	17	31	14	8	2	2	6	10	6
Village												
Folladugu	**Kabumban**	18	12	30	20	20	12		2	12.5	15	10
	Kakuthan	20	20	50	10	0	2	0	4	4	4	4
	Kamasapie								2	11	12	10
	Kamasaypayna	10	10	20	30	20	10	1	2	6		4
	Kasankorie	30	18	12	10	30	5	0	2	9.5	10	6
	Kateneh				20	30	9	3	2	7	10	
	Kathaywuna	20	30	10	20	20	8		2	6		
	Kathengben	16	12	12	30	30	13	1	2	5.5	10	5
	Kawungulu	10	20	10	40	20	10	1	2	6		
	Average	**18**	**17**	**21**	**23**	**21**	**9**	**1**	**2**	**8**	**10**	**7**
Kakalain	**Kabonka**	16	12	12	30	30	4		2	6		
	Kafogo	10	10	20	30	30	5	1	2	5	10	4
	Kaibana				20	20	5		2	4	5	3
	Kakarima	15	30	5	30	20	8		1	6		
	Kakuthan	15	15	10	30	30	8		2	6		
	Kamasikie	18	24	18	20	20	8	3	2	7	20	7
	Kasasie	20	10	20	20	30	3		2	10		
	Average	**16**	**17**	**14**	**26**	**26**	**6**	**2**	**2**	**6**	**12**	**5**
Kamakatheh	**Kadandan**	10	20	10	30	30	9	2	2	9	9	5
	Kadanso	20	10	20	30	20	7	2	2	5.5	8.5	4.5
	Kafungia	18	24	18	20	20	7	2	2	10	10	5
	Kamagbarain	10	10	20	40	20	4	1	2	5	5	4
	Kamasaypayna	20	20	10	30	30	8		2	7	10	
	Kawornor 2	10	30	20	40	0	5	1	2	6	6	5
	Average	**15**	**19**	**16**	**32**	**20**	**7**	**2**	**2**	**7**	**8**	**5**
Kamakihila	**Kakamalor**	8	8	4	40	40	9	2	2	5	7	5
	Kakonthan	10	10	20	30	30	5	1	2	5.5	6.5	3.5
	Kamaraypay	20	30	10	30	10	4		2			
	Kamarimbe	15	25	10	30	20	5	2	2	7	7	5
	Kamera	20	30	10	30	10	5		2	8		
	Kasangbanba	15	25	10	30	20	3	0	2	7		
	Kasonpona	12	20	8	40	20	3	0	2	7		
	Average	**14**	**21**	**10**	**33**	**21**	**5**	**1**	**2**	**7**	**7**	**5**
Kasokira	**Kadala**	0	40	30	30	0	8	1	2	5.5	6	5
	Kamankay	12	9	9	50	20	11	1	2	4	4	3
	Kamasapie	20	30	10	30	10	9	5	2	7	10	7
	Kamathor	3	1	6	60	30	8	2	2	4		
	Kamera				30	30	3			7		
	Kasasie	30	40	30	0	0			2	6	7	5
	Kasokira	20	20	20	40	0	8	2	2	7	15	7
	Kathombo	30	20	10	20	20	7	2	2	7	15	5
	Kawornor 1	20	20	10	30	20	10	4	2	10	20	10
	Kayakala	15	15	30	20	20			2	6	7	5
	Kegbema	10	50	10	30	0	8	1	2	6.5	7	6
	Average	**16**	**25**	**17**	**31**	**14**	**8**	**2**	**2**	**6**	**10**	**6**

Natural Capital Table B3		Villages inside Bumbuna Watershed Management			Do villages border the reservoir?		Chimpanzees	Monkeys
		Outside	Partially Inside	Completely Inside	Yes	No		
Chi								
	Kalanthuba	18	5	17	11	25	23	36
Sec								
Kalanthuba	Folladugu	0	2	7	6	1	8	9
	Kakalain	7			0	7	3	6
	Kamakatheh	3		3	0	6	2	4
	Kamakihila	7		0	0	7	3	7
	Kasokira	1	3	7	5	4	7	10
Vill								
Folladugu	Kabumban			X			X	X
	Kakuthan			X	X		X	X
	Kamasapie			X			X	X
	Kamasaypayna			X	X		X	X
	Kasankorie		X		X		X	X
	Kateneh			X	X		X	X
	Kathaywuna			X	X			X
	Kathengben		X		X		X	X
	Kawungulu			X		X	X	X
	Total	**0**	**2**	**7**	**6**	**1**	**8**	**9**
Kakalain	Kabonka	X				X	X	X
	Kafogo	X				X		X
	Kaibana	X				X		
	Kakarima	X				X		X
	Kakuthan	X				X		X
	Kamasikie	X				X	X	X
	Kasasie	X				X	X	X
	Total	**7**				**7**	**3**	**6**
Kamakatheh	Kadandan	X				X		X
	Kadanso	X				X		X
	Kafungia			X		X	X	X
	Kamagbarain			X		X		
	Kamasaypayna	X				X	X	X
	Kawornor 2			X		X		
	Total	**3**		**3**	**0**	**6**	**2**	**4**
Kamakihila	Kakamalor	X				X		X
	Kakonthan	X				X		X
	Kamaraypay	X				X	X	X
	Kamarimbe	X				X	X	X
	Kamera	X				X	X	X
	Kasangbanba	X				X		X
	Kasonpona	X				X		X
	Total	**7**		**0**	**0**	**7**	**3**	**7**
Kasokira	Kadala			X	X		X	X
	Kamankay			X		X		X
	Kamasapie		X			X	X	X
	Kamathor			X			X	X
	Kamera			X	X			
	Kasasie			X	X			X
	Kasokira			X	X		X	X
	Kathombo		X			X	X	X
	Kawornor 1		X			X	X	X
	Kayakala			X	X			X
	Kegbema	X					X	X
	Total	1	3	7	5	4	7	**10**

Material Capital Table B4		Electricity		Households with working cellphone					Households with working radio					Households using open fire for cooking					Most common source of lighting			Improvement in Housing Conditions		
		Yes	No	None	Few	Half	Most	All	None	Few	Half	Most	All	None	Few	Half	Most	All	Firewood	Torch	Oil Lamp	Improved	Worsened	Stayed the Same
Chiefdom																								
	Kalanthuba	1	39	8	28	1	2		9	30	1						1	39	27	10	2	24	3	11
Section																								
Kalanthuba	**Folladugu**		9	1	7				1	8								9	9			7	1	1
	Kakalain		7	2	5				3	4								7	4	1	2	6	0	1
	Kamakatheh		6	1	5					6								6	4	2		2	0	4
	Kamakihila		7	3	3	1			3	3	1							7	4	3		5	0	2
	Kasokira	1	10	1	8		2		2	9							1	10	6	4		4	2	3
Village																								
Folladugu	**Kabumban**		X		X					X								X	X			X			
	Kakuthan		X						X									X	X			X			
	Kamasapie		X		X					X								X	X					X
	Kamasaypayna		X		X					X								X	X			X		
	Kasankorie		X	X						X								X	X				X	
	Kateneh		X		X					X								X	X			X		
	Kathaywuna		X		X					X								X	X			X		
	Kathengben		X		X					X								X	X			X		
	Kawungulu		X		X					X								X	X			X		
	Total		**9**	**1**	**7**				**1**	**8**								**9**	**9**			**7**	**1**	**1**
Kakalain	**Kabonka**		X		X					X								X			X	X		
	Kafogo		X		X					X								X	X					X
	Kaibana		X	X					X									X	X			X		
	Kakarima		X		X				X									X		X		X		
	Kakuthan		X		X				X									X	X			X		
	Kamasikie		X	X						X								X	X			X		
	Kasasie		X		X					X								X			X	X		
	Total		**7**	**2**	**5**				**3**	**4**								**7**	**4**	**1**	**2**	**6**	**0**	**1**
Kamakatheh	**Kadandan**		X		X					X								X		X				X
	Kadanso		X		X					X								X	X					X
	Kafungia		X		X					X								X		X		X		
	Kamagbarain		X	X						X								X	X					X
	Kamasaypayna		X		X					X								X	X			X		
	Kawonor 2		X		X					X								X	X					X
	Total		**6**	**1**	**5**					**6**								**6**	**4**	**2**		**2**	**0**	**4**
Kamakihila	**Kakamalor**		X	X					X									X		X		X		
	Kakonthan		X		X					X								X	X					X
	Kamaraypay		X		X							X						X		X		X		
	Kamarimbe		X		X					X								X	X			X		
	Kamera		X			X				X								X		X		X		
	Kasangbanba		X	X					X									X	X					X
	Kasonpona		X	X					X									X	X			X		
	Total		**7**	**3**	**3**	**1**			**3**	**3**	**1**							**7**	**4**	**3**		**5**	**0**	**2**
Kasokira	**Kadala**		X		X					X								X	X				X	
	Kamankay	X					X			X				X						X		X		
	Kamasapie		X		X					X								X		X		X		
	Kamathor		X				X			X								X		X		X		
	Kamera		X		X					X								X						X
	Kasasie		X		X				X									X	X					
	Kasokira		X		X					X								X	X				X	
	Kathombo		X		X					X								X	X					X
	Kawonor		X		X					X								X	X			X		
	Kayakala		X	X					X									X	X					
	Kegbema		X		X					X								X		X				X
	Total	**1**	**10**	**1**	**8**		**2**		**2**	**9**							**1**	**10**	**6**	**4**		**4**	**2**	**3**

Material Capital Table B5		Primary source of water used in the village							Number of Latrines				Is the water believed to be safe?				Do residents use the bush for toileting?			
		Stream	Swamp	Pond	Spring	Mixed Unimproved	Surface + Rain	Well	General Access	Neighbor Access	Household Only	Access Unknown	No	Conditional	Yes	Unsure	Yes/All	Most	Some or Few	No
Chiefdom																				
	Kalanthuba	22	1	1	7	5	3	1	248	32	25	28	21	5	11	3	15	19	4	1
Section																				
Kalanthuba	**Folladugu**	5			2		2		18	16		2	5	1	3		5	4		
	Kakalain	5			1	1			12		7	4	2	1	4		4	3		
	Kamakatheh	2	1		2	1			12		12	4	4			2	1	4	1	
	Kamakihila	3			1	2	1			1	1	7	4		3		3	4		
	Kasokira	7		1	1	1		1	206	15	5	11	6	3	1	1	2	4	3	1
Village																				
Folladugu	**Kabumban**				X					4					X			X		
	Kakuthan	X											X					X		
	Kamasapie	X										0			X		X			
	Kamasaypayna						X			7			X				X			
	Kasankorie	X										0			X		X			
	Kateneh				X				3				X				X			
	Kathaywuna	X										2	X					X		
	Kathengben	X							15				X				X			
	Kawungulu						X			5				X				X		
	Total	**5**			**2**		**2**		**18**	**16**		**2**	**5**	**1**	**3**		**5**	**4**		
Kakalain	**Kabonka**	X							6						X			X		
	Kafogo	X							6						X			X		
	Kaibana					X						0		X			X			
	Kakarima	X									4		X				X			
	Kakuthan	X										2			X			X		
	Kamasikie				X							2	X				X			
	Kasasie	X									3				X		X			
	Total	**5**			**1**	**1**			**12**		**7**	**4**	**2**	**1**	**4**		**4**	**3**		
Kamakatheh	**Kadandan**	X									6		X					X		
	Kadanso					X						4				X		X		
	Kafungia	X							9							X			X	
	Kamagbarain				X						2		X					X		
	Kamasaypayna				X				3				X				X			
	Kawonor 2		X								4		X					X		
	Total	**2**	**1**		**2**	**1**			**12**		**12**	**4**	**4**			**2**	**1**	**4**	**1**	
Kamakihila	**Kakamalor**	X										3	X				X			
	Kakonthan						X					0			X		X			
	Kamaraypay					X						3	X					X		
	Kamarimbe	X										0	X				X			
	Kamera					X						1	X					X		
	Kasangbanba	X									1				X			X		
	Kasonpona				X					1					X			X		
	Total	**3**			**1**	**2**	**1**			**1**	**1**	**7**	**4**			**3**	**3**	**4**		
Kasokira	**Kadala**				X							4	X					X		
	Kamankay							X	200							X				X
	Kamasapie					1						2	X						X	
	Kamathor	X								15			X						X	
	Kamera	X												X						
	Kasasie	X										3		X			X			
	Kasokira			X							5		X					X		
	Kathombo	X							2				X					X		
	Kawonor	X							2				X						X	
	Kayakala	X										2		X			X			
	Kegbema	X							2						X			X		
	Total	**7**		**1**	**1**	**1**		**1**	**206**	**15**	**5**	**11**	**6**	**3**	**1**	**1**	**2**	**4**	**3**	**1**

Material Capital Table B6		Church			Mosque			School Building		Health Facility		Blacksmith shop		Market/ Shops		Football Pitch		Court Barrays		Crop storage		Gas Station	
		No	Not permanent	Yes	No	Prayer floor/altar	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Chiefdom																							
	Kalanthuba	16	15	8	31	7	2	36	4	38	2	14	26	40		25	15	29	11	39	1	39	1
Section																							
Kalanthuba	**Folladugu**	6	2		8	1		9		9		3	6	9		8	1	6	3	9		9	
	Kakalain	2	5		2	4	1	7		7		1	6	7		4	3	4	3	7		7	
	Kamakatheh	2	3	1	6			5	1	5	1	2	4	6		2	4	6		6		6	
	Kamakihila	3	4		5	2		7		7		1	6	7		3	4	3	4	7		7	
	Kasokira	3	1	7	10		1	8	3	10	1	7	4	11		8	3	10	1	10	1	10	1
Village																							
Folladugu	**Kabumban**	X				X		X		X			X	X		X		X		X		X	
	Kakuthan	X			X			X		X		X		X		X		X		X		X	
	Kamasapie	X			X			X		X			X	X		X			X	X		X	
	Kamasaypayna		X		X			X		X		X		X		X		X		X		X	
	Kasankorie				X			X		X			X	X		X		X		X		X	
	Kateneh	X			X			X		X			X	X		X			X	X		X	
	Kathaywuna		X		X			X		X			X	X			X	X		X		X	
	Kathengben	X			X			X		X		X		X		X		X		X		X	
	Kawungulu	X			X			X		X			X	X		X			X	X		X	
	Total	**6**	**2**		**8**	**1**		**9**		**9**		**3**	**6**	**9**		**8**	**1**	**6**	**3**	**9**		**9**	
Kakalain	**Kabonka**	X					X	X		X			X	X			X		X	X		X	
	Kafogo		X			X		X		X			X	X		X		X		X		X	
	Kaibana	X				X		X		X			X	X		X		X		X		X	
	Kakarima		X		X			X		X			X	X			X	X		X		X	
	Kakuthan		X			X		X		X			X	X			X		X	X		X	
	Kamasikie		X		X			X		X			X	X		X		X		X		X	
	Kasasie		X			X		X		X		X		X		X			X	X		X	
	Total	**2**	**5**		**2**	**4**	**1**	**7**		**7**		**1**	**6**	**7**		**4**	**3**	**4**	**3**	**7**		**7**	
Kamakatheh	**Kadandan**			X	X			X		X		X		X			X	X		X		X	
	Kadanso		X		X			X		X			X	X			X	X		X		X	
	Kafungia		X		X			X		X			X	X		X		X		X		X	
	Kamagbarain	X			X			X		X			X	X			X	X		X		X	
	Kamasaypayna		X		X				X		X		X	X			X	X		X		X	
	Kawonor 2	X			X			X		X		X		X		X		X		X		X	
	Total	**2**	**3**	**1**	**6**			**5**	**1**	**5**	**1**	**2**	**4**	**6**		**2**	**4**	**6**		**6**		**6**	
Kamakihila	**Kakamalor**	X				X		X		X			X	X			X	X		X		X	
	Kakonthan		X		X			X		X			X	X			X	X		X		X	
	Kamaraypay	X			X			X		X			X	X		X		X		X		X	
	Kamarimbe		X			X		X		X			X	X			X		X	X		X	
	Kamera	X			X			X		X			X	X		X			X	X		X	
	Kasangbanba		X		X			X		X		X		X		X			X	X		X	
	Kasonpona		X		X			X		X			X	X			X		X	X		X	
	Total	**3**	**4**		**5**	**2**		**7**		**7**		**1**	**6**	**7**		**3**	**4**	**3**	**4**	**7**		**7**	
Kasokira	**Kadala**	X			X			X		X			X	X		X		X		X		X	
	Kamankay		X				X			X			X	X			X	X		X			X
	Kamasapie	X			X			X		X		X		X		X		X		X		X	
	Kamathor			X	X			X	X	X			X	X			X		X	X		X	
	Kamera			X	X			X		X		X		X		X		X		X		X	
	Kasasie			X	X			X		X		X		X		X		X			X	X	
	Kasokira			X	X				X	X			X	X		X		X		X		X	
	Kathombo			X	X				X		X	X		X			X	X		X		X	
	Kawonor	X			X			X		X		X		X		X		X		X		X	
	Kayakala			X	X			X		X		X		X		X		X		X		X	
	Kegbema			X	X			X		X		X		X		X		X		X		X	
	Total	**3**	**1**	**7**	**10**		**1**	**8**	**3**	**10**	**1**	**7**	**4**	**11**		**8**	**3**	**10**	**1**	**10**	**1**	**10**	**1**

Material Capital Table B7		Does a motorable road(s) connect this village to other villages?			# of Cars	# of Trucks	# of Tractors	# of Motorcycles	# of Bicycles	# of Motorboats	# of Canoes
		No	Seasonal	Year-Round							
Chiefdom											
	Kalanthuba	24	8	8	0	0	0	6	2	0	31
Section											
Kalanthuba	**Folladugu**	9									28
	Kakalain	7									
	Kamakatheh	1	4	1							
	Kamakihila	4	2	1							
	Kasokira	3	2	6				6	2		3
Village											
Folladugu	**Kabumban**	X									
	Kakuthan	X									
	Kamasapie	X									
	Kamasaypayna	X									3
	Kasankorie	X									4
	Kateneh	X									2
	Kathaywuna	X									14
	Kathengben	X									3
	Kawungulu	X									2
	Total	**9**									**28**
Kakalain	**Kabonka**	X									
	Kafogo	X									
	Kaibana	X									
	Kakarima	X									
	Kakuthan	X									
	Kamasikie	X									
	Kasasie	X									
	Total	**7**									
Kamakatheh	**Kadandan**		X								
	Kadanso	X									
	Kafungia		X								
	Kamagbarain		X								
	Kamasaypayna			X							
	Kawonor 2		X								
	Total	**1**	**4**	**1**							
Kamakihila	**Kakamalor**			X							
	Kakonthan	X									
	Kamaraypay	X									
	Kamarimbe	X									
	Kamera		X								
	Kasangbanba	X									
	Kasonpona		X								
	Total	**4**	**2**	**1**							
Kasokira	**Kadala**			X							2
	Kamankay			X				6	1		
	Kamasapie			X							
	Kamathor			X							
	Kamera	X									
	Kasasie		X								
	Kasokira		X								
	Kathombo			X					1		
	Kawonor			X							
	Kayakala	X									
	Kegbema	X									1
	Total	**3**	**2**	**6**				**6**	**2**		**3**

Material Capital Table B8		Livestock			
		Goats	Sheep	Chickens	Ducks
Chiefdom					
	Kalanthuba	35	25	36	7
Section					
Kalanthuba	**Folladugu**	7	8	7	1
	Kakalain	7	5	6	
	Kamakatheh	6	2	6	1
	Kamakihila	7	4	7	1
	Kasokira	8	6	10	4
Village					
Folladugu	**Kabumban**	X	X	X	
	Kakuthan	X		X	
	Kamasapie		X		
	Kamasaypayna	X	X	X	
	Kasankorie	X	X	X	
	Kateneh	X	X	X	
	Kathaywuna	X	X	X	
	Kathengben		X	X	
	Kawungulu	X	X		X
	Total	**7**	**8**	**7**	**1**
Kakalain	**Kabonka**	X	X	X	
	Kafogo	X		X	
	Kaibana	X		X	
	Kakarima	X	X		
	Kakuthan	X	X	X	
	Kamasikie	X	X	X	
	Kasasie	X	X	X	
	Total	**7**	**5**	**6**	
Kamakatheh	**Kadandan**	X	X	X	X
	Kadanso	X		X	
	Kafungia	X		X	
	Kamagbarain	X		X	
	Kamasaypayna	X	X	X	
	Kawornor 2	X		X	
	Total	**6**	**2**	**6**	**1**
Kamakahila	**Kakamalor**	X		X	
	Kakonthan	X	X	X	
	Kamaraypay	X	X	X	
	Kamarimbe	X		X	
	Kamera	X	X	X	
	Kasangbanba	X		X	X
	Kasonpona	X	X	X	
	Total	**7**	**4**	**7**	**1**
Kasokira	**Kadala**			X	
	Kamankay			X	X
	Kamasapie	X	X	X	
	Kamathor	X	X	X	X
	Kamera				
	Kasasie	X		X	
	Kasokira	X	X	X	X
	Kathombo	X	X	X	
	Kawornor 1	X	X	X	X
	Kayakala	X		X	
	Kegbema	X	X	X	
	Total	8	6	10	4

Enumerator Data Table B9		Occupied Houses		Roof material				Floor material				Wall material				Unoccupied	
		Total	%	Natural	%	Zinc	%	Earth	%	Other	%	Mud bricks	%	Sticks & Mud	%	Total	%
Chiefdom																	
	Kalanthuba	1652	100.0%	790	49.0%	821	51.0%	1308	80.3%	320	19.7%	750	49.6%	763	50.4%	282	14.6%
Section																	
Kalanthuba	**Folladugu**	417	25.2%	259	65.7%	135	34.3%	374	95.9%	17	4.3%	97	25.4%	285	74.6%	75	15.2%
	Kakalain	214	13.0%	154	72.0%	60	28.0%	213	99.5%	1	0.5%	148	69.8%	64	30.2%	39	18.2%
	Kamakatheh	137	8.3%	88	66.7%	49	33.3%	135	98.3%	2	1.8%	40	36.3%	70	63.6%	19	13.3%
	Kamakihila	163	9.9%	111	67.3%	54	32.7%	163	100.0%	0		61	37.4%	102	62.6%	56	25.6%
	Kasokira	721	43.6%	188	26.1%	533	73.9%	443	59.6%	300	42.0%	404	62.5%	242	37.5%	92	11.3%
Village																	
Folladugu	**Kabumban**	21	5.0%													8	27.6%
	Kakuthan	65	15.6%	50	76.9%	15	23.1%	60	100.0%	0		15	23.1%	50	76.9%	5	7.1%
	Kamasapie	43	10.3%	33	76.7%	10	23.3%	43	100.0%	0		8	18.6%	35	81.4%	16	27.1%
	Kamasaypayna	40	9.6%	32	80.0%	8	20.0%	40	100.0%	0		3	7.5%	37	92.5%	4	9.1%
	Kasankorie	25	6.0%	24	96.0%	1	4.0%	25	100.0%	0		0		25	100.0%	5	16.7%
	Kateneh	40	9.6%	18	45.0%	20	50.0%	25	71.4%	15	45.7%	15	37.5%	11	27.5%	8	16.7%
	Kathaywuna	43	10.3%	34	79.1%	9	20.9%	61	141.9%	0		5	11.6%	38	88.4%	10	18.9%
	Kathengben	61	14.6%	40	65.6%	21	34.4%	43	70.5%	0		11	18.0%	50	82.0%	11	15.3%
	Kawungulu	79	18.9%	28	35.4%	51	64.6%	77	97.5%	2	2.5%	40	50.6%	39	49.4%	8	9.2%
	Total	**417**	**100.0%**	**259**		**135**		**374**		**17**		**97**		**285**		**75**	
Kakalain	**Kabonka**	23	10.7%	13	56.5%	10	43.5%	23	100.0%	0		17	78.3%	6	26.1%	3	11.5%
	Kafogo	35	16.4%	26	74.3%	9	25.7%	35	100.0%	0		26	74.3%	9	25.7%	6	14.6%
	Kaibana	12	5.6%	6	50.0%	6	50.0%	12	100.0%	0		6	50.0%	6	50.0%	4	25.0%
	Kakarima	40	18.7%	30	75.0%	10	25.0%	39	97.5%	1	2.5%	20	50.0%	20	50.0%	7	14.9%
	Kakuthan	72	33.6%	50	69.4%	22	30.6%	72	100.0%	0		50	69.4%	20	27.8%	10	12.2%
	Kamasikie	12	5.6%	10	83.3%	2	16.7%	12	100.0%	0		10	83.3%	2	16.7%	3	20.0%
	Kasasie	20	9.3%	19	95.0%	1	5.0%	20	100.0%	0		19	95.0%	1	5.0%	6	23.1%
	Total	**214**	**100.0%**	**154**		**60**		**213**		**1**		**148**		**64**		**39**	
Kamakatheh	**Kadandan**	37	27.0%	22	59.5%	15	40.5%	35	94.6%	2	5.4%	15	40.5%	15	40.5%	0	
	Kadanso (interview)	20	16.0%	10	50.0%	10	50.0%	20	100.0%	0		10	50.0%	10	50.0%	4	16.7%
	Kafungia	21	15.3%	11	52.4%	10	47.6%	21	100.0%	0		11	52.4%	10	47.6%	0	
	Kamagbarain	10	7.3%	6	60.0%	4	40.0%	10	100.0%	0		4	40.0%	6	60.0%	4	33.3%
	Kamasaypayna	43	31.4%	36	83.7%	7	16.3%	43	100.0%	0		7	16.3%	36	83.7%	10	18.9%
	Kawonor 2	6	4.4%	3	50.0%	3	50.0%	6	100.0%	0		3	50.0%	3	50.0%	1	14.3%
	Total	**137**	**101.4%**	**88**		**49**		**135**		**2**		**50**		**80**		**19**	
Kamakihila	**Kakamalor**	26	16.0%	20	76.9%	6	23.1%	26	100.0%	0		6	23.1%	20	76.9%	6	18.8%
	Kakonthan	26	16.0%	20	76.9%	6	23.1%	26	100.0%	0		2	7.7%	24	92.3%	8	23.5%
	Kamaraypay	24	14.7%	21	87.5%	3	12.5%	24	100.0%	0		3	12.5%	21	87.5%	10	29.4%
	Kamarimbe	18	11.0%	15	83.3%	3	16.7%	18	100.0%	0		6	33.3%	12	66.7%	6	25.0%
	Kamera	25	15.3%	6	24.0%	21	84.0%	25	100.0%	0		20	80.0%	5	20.0%	12	32.4%
	Kasangbanba	20	12.3%	19	95.0%	1	5.0%	20	100.0%	0		10	50.0%	10	50.0%	7	25.9%
	Kasonpona	24	14.7%	10	41.7%	14	58.3%	24	100.0%	0		14	58.3%	10	41.7%	7	22.6%
	Total	**163**	**100.0%**	**111**		**54**		**163**		**0**		**61**		**102**		**56**	
Kasokira	**Kadala**	15	2.1%	7	46.7%	8	53.3%	15	71.4%	6	28.6%	4	26.7%	11	73.3%	6	28.6%
	Kamankay	305	42.3%	25	8.2%	280	91.8%	50	17.0%	255	83.6%	280	91.8%	25	8.2%	18	5.6%
	Kamasapie	6	0.8%	1	16.7%	5	83.3%	6	100.0%	0		4	66.7%	2	33.3%	0	
	Kamathor	169	23.4%	6	3.6%	163	96.4%	160	94.7%	9	5.3%	57	33.7%	112	66.3%	30	16.1%
	Kamera	24	3.3%	6	25.0%	18	75.0%	24	100.0%	0						10	29.4%
	Kasasie	19	2.6%	14	73.7%	5	26.3%	15	78.9%	4	21.1%	14	73.7%	5	26.3%	5	20.8%
	Kasokira	46	6.4%	42	91.3%	4	8.7%	46	100.0%	0		12	26.1%	34	73.9%	3	6.1%
	Kathombo	80	11.1%	50	62.5%	30	37.5%	70	87.5%	10	12.5%	30	37.5%	50	62.5%	10	11.1%
	Kawonor	6	0.8%	2	33.3%	4	66.7%	6	100.0%	0		3	50.0%	3	50.0%	0	
	Kayakala	6	0.8%	6	100.0%	0	0.0%	6	100.0%	0						0	
	Kegbema	45	6.2%	29	64.4%	16	35.6%	45	73.8%	16	26.2%					10	18.1%
	Total	**721**	**100.0%**	**188**		**533**		**443**		**300**		**404**		**242**		**92**	

Human Capital Table B10, part 1		What do community members wash their hands with?				Water treatment		Primary location of childbirth					Are traditional birth attendants available to village women?		During the recent Ebola outbreak, were there any cases of Ebola in the village?	
		Nothing	Water	Water and Ash/Soda	Water and Soap	Some boil	No Boling	All in village	Mostly in village	Equal or Undetermined	Mostly at MCHP/clinic	All at MCHP/clinic	No	Yes	No	Yes
Chiefdom																
	Kalanthuba		10	9	21	12	28	15	6	6	6	6	9	31	40	
Section																
Kalanthuba	Folladugu		1	2	6	4	5	6	2	1			4	5	X	
Kalanthuba	Kakalain		4	3			7	5	1	1			4	3	X	
Kalanthuba	Kamakatheh		1		5	4	2			1	1	4		6	X	
Kalanthuba	Kamakihila		3		4		7		3		4		1	6	X	
Kalanthuba	Kasokira		1	4	6	5	6	4		3	1	2		11	X	
Village																
Folladugu	Kabumban		X				X	X						X	X	
Folladugu	Kakuthan			X			X	X						X	X	
Folladugu	Kamasapie				X		X			X				X	X	
Folladugu	Kamasaypayna				X	X		X					X		X	
Folladugu	Kasankorie			X		X			X				X		X	
Folladugu	Kateneh				X		X	X					X		X	
Folladugu	Kathaywuna				X		X		X				X		X	
Folladugu	Kathengben				X		X	X						X	X	
Folladugu	Kawungulu				X	X		X						X	X	
Folladugu	**Total**		**1**	**2**	**6**	**3**	**6**	**6**	**2**	**1**	**0**	**0**	**4**	**5**	**9**	**0**
Kakalain	Kabonka		X				X	X					X		X	
Kakalain	Kafogo		X				X			X			X		X	
Kakalain	Kaibana			X			X	X					X		X	
Kakalain	Kakarima			X			X	X					X		X	
Kakalain	Kakuthan			X			X	X						X	X	
Kakalain	Kamasikie		X				X	X						X	X	
Kakalain	Kasasie		X				X		X					X	X	
Kakalain	**Total**		**4**	**3**			**7**	**5**	**1**	**1**	**0**	**0**	**4**	**3**	**7**	**0**
Kamakatheh	Kadandan				X		X					X		X	X	
Kamakatheh	Kadanso		X			X				X				X	X	
Kamakatheh	Kafungia				X	X					X			X	X	
Kamakatheh	Kamagbarain				X	X						X		X	X	
Kamakatheh	Kamasaypayna				X		X					X		X	X	
Kamakatheh	Kawonor 2				X	X						X		X	X	
Kamakatheh	**Total**		**1**		**5**	**4**	**2**	**0**	**0**	**1**	**1**	**4**	**0**	**6**	**6**	**0**
Kamakihila	Kakamalor				X		X				X			X	X	
Kamakihila	Kakonthan		X				X				X		X		X	
Kamakihila	Kamaraypay				X		X				X			X	X	
Kamakihila	Kamarimbe				X		X		X					X	X	
Kamakihila	Kamera				X		X				X			X	X	
Kamakihila	Kasangbanba		X				X		X					X	X	
Kamakihila	Kasonpona		X				X		X					X	X	
Kamakihila	**Total**		**3**		**4**		**7**	**0**	**3**	**0**	**4**	**0**	**1**	**6**	**7**	**0**
Kasokira	Kadala			X			X	X						X	X	
Kasokira	Kamankay				X		X					X		X	X	
Kasokira	Kamasapie				X	X				X				X	X	
Kasokira	Kamathor				X	X					X			X	X	
Kasokira	Kamera			X			X			X				X	X	
Kasokira	Kasasie			X		X		X						X	X	
Kasokira	Kasokira		X				X	X						X	X	
Kasokira	Kathombo				X	X						X		X	X	
Kasokira	Kawonor				X	X				X				X	X	
Kasokira	Kayakala			X			X	X						X	X	
Kasokira	Kegbema				X		X				X			X	X	
Kasokira	**Total**		**1**	**4**	**6**	**5**	**6**	**4**	**0**	**3**	**2**	**2**	**0**	**11**	**11**	**0**

Human Capital Table B10, part 2		Children receiving vaccinations					Health Contidtions			Is the water believed to be safe?				Affordability and Accessibility of Non-traditional Medicine			Use of Bed Nets		
		None	Few	Half	Most	All	Declining	Staying the same	Improving	No	Conditional	Yes	Unsure	Affordable	Sometimes Affordable	Not Affordable or Not Accessible	Expectant Mothers	Few	None
Chiefdom																			
	Kalanthuba		3	1	8	27	3	11	23	20	6	12	2	8	8	25	7	12	17
Section																			
Kalanthuba	**Folladugu**		2	1	1	5	3	1	4	4	2	3		0	1	9	2	5	4
	Kakalain		1		4	2	0	4	2	2	1	4		0	1	7	0	2	5
	Kamakatheh					6	0	3	3	4			2	1	1	4	1	0	5
	Kamakihila				2	5	0	3	4	4		3		2	4	1	2	2	
	Kasokira				1	9	0	0	10	6	3	2		5	1	4	2	3	3
Village																			
Folladugu	**Kabumban**			X					X			X			X	X		X	
	Kakuthan					X	X			X						X	X	X	
	Kamasapie					X	X					X				X			X
	Kamasaypayna		X								X					X			X
	Kasankorie					X		X				X				X			X
	Kateneh		X				X			X						X		X	
	Kathaywuna					X			X	X						X	X	X	
	Kathengben					X			X	X						X		X	
	Kawungulu				X				X		X					X			X
	Total	**0**	**2**	**1**	**1**	**5**	**3**	**1**	**4**	**4**	**2**	**3**		**0**	**1**	**9**	**2**	**5**	**4**
Kakalain	**Kabonka**				X				X			X			X	X		X	
	Kafogo					X		X				X				X			X
	Kaibana				X			X			X					X			X
	Kakarima		X					X		X						X			X
	Kakuthan				X				X			X				X			X
	Kamasikie					X		X		X						X		X	
	Kasasie				X							X				X			X
	Total	**0**	**1**	**0**	**4**	**2**	**0**	**4**	**2**	**2**	**1**	**4**		**0**	**1**	**7**	**0**	**2**	**5**
Kamakatheh	**Kadandan**					X		X		X						X			X
	Kadanso					X			X				X			X			X
	Kafungia					X			X				X		X		X		
	Kamagbarain					X		X		X						X			X
	Kamasaypayna					X			X	X				X					X
	Kawonor 2					X		X		X						X			X
	Total	**0**	**0**	**0**	**0**	**6**	**0**	**3**	**3**	**4**			**2**	**1**	**1**	**4**	**1**	**0**	**5**
Kamakihila	**Kakamalor**				X				X	X					X				
	Kakonthan					X		X				X				X			
	Kamaraypay					X			X	X				X			X	X	
	Kamarimbe				X				X	X					X				
	Kamera					X			X	X				X			X	X	
	Kasangbanba					X		X				X			X				
	Kasonpona					X		X				X			X				
	Total	**0**	**0**	**0**	**2**	**5**	**0**	**3**	**4**	**4**		**3**		**2**	**4**	**1**	**2**	**2**	
Kasokira	**Kadala**					X			X	X				X					X
	Kamankay					X			X			X			X			X	
	Kamasapie					X			X	X				X			X		
	Kamathor					X			X	X				X					X
	Kamera										X								
	Kasasie					X			X		X					X			
	Kasokira				X				X	X						X		X	
	Kathombo					X			X	X				X				X	
	Kawonor					X			X	X				X			X		
	Kayakala					X			X		X					X			
	Kegbema					X			X			X				X			X
	Total	**0**	**0**	**0**	**1**	**9**	**0**	**0**	**10**	**6**	**3**	**2**	**0**	**5**	**1**	**4**	**2**	**3**	**3**

Human Capital Table B11		What distance do village children walk to get to their school?				Factors Inhibiting School Attendence		Are the majority of children enrolled in primary school?		At least one literate adult female:		At least one literate adult male:		# of Literate Adults		Typical number of acres cultivated per household
		In village	1 to 3 miles	3+ miles	Cannot wal	School Fees	Labor Shortages	Yes	No	None	At least one	None	At least one	Male	Female	
Chiefdom																
	Kalanthuba	4	9	2	22	16	9	14	22	29	8	20	16	66	23	3.6
Section																
Kalanthuba	**Folladugu**	0	0	0	9	1	1	0	7	7	1	7	1	1	1	5
	Kakalain	0	0	0	7	4	2	1	6	5	2	3	3	3	2	4
	Kamakatheh	1	3	1	0	3	1	2	3	4	1	4	1	1	1	4
	Kamakihila	0	1	0	6	5	2	0	6	6	0	4	2	2	0	3
	Kasokira	3	5	1	0	3	3	11	0	7	4	2	9	59	19	3
Village																
Folladugu	**Kabumban**				X				X							5.5
	Kakuthan				X		X			X		X		0	0	1.5
	Kamasapie				X				X	X			X	1	0	
	Kamasaypayna				X				X	X		X		0	0	4
	Kasankorie				X				X		X	X		0	1	3
	Kateneh				X					X		X		0	0	5
	Kathaywuna				X				X	X		X		0	0	4
	Kathengben				X				X	X		X		0	0	6
	Kawungulu				X	X			X	X		X		0	0	9
	Total	**0**	**0**	**0**	**9**	**1**	**1**	**0**	**7**	**7**	**1**	**7**	**1**	**1**	**1**	**5**
Kakalain	**Kabonka**				X				X		X		X	1	1	6
	Kafogo				X	X		X		X		X		0	0	
	Kaibana				X	X	X		X	X			X	1	0	0
	Kakarima				X	X			X	X			X	1	0	4
	Kakuthan				X	X	X		X	X		X		0	0	5
	Kamasikie				X				X							4
	Kasasie				X				X		X	X		0	1	5
	Total	**0**	**0**	**0**	**7**	**4**	**2**	**1**	**6**	**4**	**2**	**3**	**3**	**3**	**2**	**4**
Kamakatheh	**Kadandan**			X				X			X	X		0	1	3
	Kadanso													0		5
	Kafungia		X			X	X		X	X		X		0	0	3
	Kamagbarain		X			X			X	X		X		0	0	
	Kamasaypayna	X							X	X			X	1	0	4
	Kawonor 2		X			X		X		X		X		0	0	
	Total	**1**	**3**	**1**	**0**	**3**	**1**	**2**	**3**	**4**	**1**	**4**	**1**	**1**	**1**	**4**
Kamakihila	**Kakamalor**				X	X	X		X	X			X	1	0	2
	Kakonthan				X											6
	Kamaraypay				X	X			X	X		X		0	0	4
	Kamarimbe				X	X	X		X	X		X		0	0	2
	Kamera		X			X			X	X			X	1	0	4
	Kasangbanba				X	X			X	X		X		0	0	2
	Kasonpona				X				X	X		X		0	0	2
	Total	**0**	**1**	**0**	**6**	**5**	**2**	**0**	**6**	**6**	**0**	**4**	**2**	**2**	**0**	**3**
Kasokira	**Kadala**		X					X		X			X	1	0	3
	Kamankay	X				X	X	X			X		X	20	10	5.5
	Kamasapie			X				X			X		X	1	2	2
	Kamathor		X					X			X		X	10	7	2
	Kamera							X		X			X	2	0	2.5
	Kasasie		X					X		X		X		0	0	1.5
	Kasokira	X				X	X	X			X		X	20		2
	Kathombo	X						X		X			X	3	0	6
	Kawonor		X			X		X		X			X	1	0	2
	Kayakala		X					X		X		X		0	0	1.5
	Kegbema						X	X		X			X	1	0	3
	Total	**3**	**5**	**1**	**0**	**3**	**3**	**11**	**0**	**7**	**4**	**2**	**9**	**59**	**19**	**3**

Human Capital Table B12		Palm Tree Tapping		Fishing		Petty Traders		Blacksmithing		Basket-weaving		Mining		Clerical Workers		Cooking for Hire		Beekeeper		Driver		Security		Est. Tree Crop Acreage
		None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	None	At least one	
Chiefdom																								
	Kalanthuba	8	32	3	35	33	7	5	35	16	24	40		39	1	40		37	3	38	2	40		291.8
Section																								
Kalanthuba	**Folladugu**	4	5		9	8	1	1	8	4	5	9		9		9		8	1	9		9		76.5
	Kakalain	1	6	1	7	5	2	1	6	3	4	7		7		7		7		7		7		55.8
	Kamakatheh		6		4	6			6	2	4	6		6		6		6		6		6		39.5
	Kamakihila		7	1	6	7			7	3	4	7		7		7		7		7		7		36
	Kasokira	3	8	1	9	7	4	3	8	4	7	11		10	1	11		9	2	9	2	11		84
Village																								
Folladugu	**Kabumban**	X			X	X			X		X	X		X		X		X		X		X		3
	Kakuthan	X			X		X	X		X		X		X		X		X		X		X		1
	Kamasapie		X		X	X			X		X	X		X		X			X	X		X		
	Kamasaypayna		X		X	X			X		X	X		X		X		X		X		X		1.5
	Kasankorie		X		X	X			X	X		X		X		X		X		X		X		1
	Kateneh		X		X	X			X	X		X		X		X		X		X		X		10
	Kathaywuna	X			X	X			X	X		X		X		X		X		X		X		
	Kathengben	X			X	X			X		X	X		X		X		X		X		X		35
	Kawungulu		X		X	X			X		X	X		X		X		X		X		X		25
	Total	**4**	**5**	**0**	**9**	**8**	**1**	**1**	**8**	**4**	**5**	**9**	**0**	**9**	**0**	**9**	**0**	**8**	**1**	**9**	**0**	**9**	**0**	**76.5**
Kakalain	**Kabonka**	X			X	X			X	X		X		X		X		X		X		X		8
	Kafogo		X		X	X			X		X	X		X		X		X		X		X		9
	Kaibana		X		X	X		X		X		X		X		X		X		X		X		1.8
	Kakarima		X		X		X		X		X	X		X		X		X		X		X		12
	Kakuthan		X		X		X		X	X		X		X		X		X		X		X		9
	Kamasikie		X		X	X			X		X	X		X		X		X		X		X		11
	Kasasie		X	X		X			X		X	X		X		X		X		X		X		5
	Total	**1**	**6**	**1**	**6**	**5**	**2**	**1**	**6**	**3**	**4**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**55.8**
Kamakatheh	**Kadandan**		X		X	X			X		X	X		X		X		X		X		X		5
	Kadanso		X		X	X			X		X	X		X		X		X		X		X		9
	Kafungia		X		X	X			X	X		X		X		X		X		X		X		10
	Kamagbarain		X			X			X		X	X		X		X		X		X		X		3.5
	Kamasaypayna		X		X	X			X	X		X		X		X		X		X		X		9
	Kawonor 2		X			X			X		X	X		X		X		X		X		X		3
	Total	**0**	**6**	**0**	**4**	**6**	**0**	**0**	**6**	**2**	**4**	**6**	**0**	**6**	**0**	**6**	**0**	**6**	**0**	**6**	**0**	**6**	**0**	**39.5**
Kamakihila	**Kakamalor**		X		X	X			X		X	X		X		X		X		X		X		2
	Kakonthan		X		X	X			X		X	X		X		X		X		X		X		6
	Kamaraypay		X		X	X			X	X		X		X		X		X		X		X		3
	Kamarimbe		X		X	X			X	X		X		X		X		X		X		X		1
	Kamera		X		X	X			X	X		X		X		X		X		X		X		15.5
	Kasangbanba		X		X	X			X		X	X		X		X		X		X		X		5
	Kasonpona		X	X		X			X		X	X		X		X		X		X		X		3.5
	Total	**0**	**7**	**1**	**6**	**7**	**0**	**0**	**7**	**3**	**4**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**36**
Kasokira	**Kadala**		X		X		X		X		X	X			X	X		X		X		X		
	Kamankay	X			X		X		X	X		X		X		X		X			X	X		27
	Kamasapie		X		X	X		X		X		X		X		X		X		X		X		10
	Kamathor	X		X			X		X	X		X		X		X		X			X	X		20
	Kamera	X			X	X			X	X		X		X		X		X		X		X		
	Kasasie		X		X	X			X		X	X		X		X			X	X		X		
	Kasokira		X		X	X			X		X	X		X		X		X		X		X		10
	Kathombo		X		X	X		X			X	X		X		X		X		X		X		10
	Kawonor		X		X	X		X			X	X		X		X		X		X		X		7
	Kayakala		X		X	X			X		X	X		X		X			X	X		X		
	Kegbema		X		X		X		X		X	X		X		X		X		X		X		
	Total	**3**	**8**	**1**	**10**	**7**	**4**	**3**	**8**	**4**	**7**	**11**	**0**	**10**	**1**	**11**	**0**	**9**	**2**	**9**	**2**	**11**	**0**	**84**

Social Capital Table B13		Villages with Labor Groups		Collective/ Group Farming		Business Associations, Farmer Cooperatives, Farmer Field Schools?		Recreational Groups or Teams		Villages with Savings or Loan Groups		Number of Labor Groups			Village Maintenance of Surface Water Source			Village Maintenance of Roads, Footpaths, and Bridges								Recent or Present NGO Activity	
															Women's group	Other	None	Roads		Footpaths		Bridges						
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	1	2 to 5	>5				Youth	NA	Youth	Community	Men	Youth	Community	NA	Yes	No
Chiefdom																											
	Kalanthuba	40		2	37	1	39	10	30	4	36	10	23	6	34	2	1	16	24	35	5	5	17	5	5	15	20
Section																											
Kalanthuba	Folladugu	9			9		9		9		9	2	7		7		1		9	7	2	1	3	1	1	4	4
	Kakalain	7		1	6		7		7		7		4	2	7				7	6	1		6	1		1	5
	Kamakatheh	6			6		6	4	2		6	2	4		6			5	1	6			3		3	5	1
	Kamakihila	7			7		7	4	3	1	6	2	4	1	7			3	4	5	2	3	1	3		1	6
	Kasokira	11		1	9	1	10	2	9	3	8	4	4	3	7	2		8	3	11		1	4		1	4	4
Village																											
Folladugu	Kabumban	X			X		X		X		X		X		X				X	X		X					X
	Kakuthan	X			X		X		X		X	X			X				X	X					X		X
	Kamasapie	X			X		X		X		X	X			X				X		X		X				X
	Kamasaypayna	X			X		X		X		X		X		X				X	X						X	
	Kasankorie	X			X		X		X		X		X		X				X	X			X				X
	Kateneh	X			X		X		X		X		X						X	X						X	
	Kathaywuna	X			X		X		X		X		X		X				X	X			X				
	Kathengben	X			X		X		X		X		X				X		X		X			X		X	
	Kawungulu	X			X		X		X		X		X		X				X	X						X	
	Total	**9**			**9**		**9**		**9**		**9**	**2**	**7**		**7**		**1**		**9**	**7**	**2**	**1**	**3**	**1**	**1**	**4**	**4**
Kakalain	Kabonka	X		X			X		X		X		X		X				X	X			X				X
	Kafogo	X			X		X		X		X		X		X				X	X			X				X
	Kaibana	X			X		X		X		X		X		X				X	X			X				X
	Kakarima	X			X		X		X		X			X	X				X		X			X		X	
	Kakuthan	X			X		X		X		X			X	X				X	X			X				X
	Kamasikie	X			X		X		X		X		X		X				X	X			X				
	Kasasie	X			X		X		X		X		X		X				X	X			X				X
	Total	**7**		**1**	**6**		**7**		**7**		**7**		**4**	**2**	**7**				**7**	**6**	**1**		**6**	**1**		**1**	**5**
Kamakatheh	Kadandan	X			X		X	X			X		X		X			X		X			X			X	
	Kadanso	X			X		X	X			X		X		X				X	X					X	X	
	Kafungia	X			X		X		X		X		X		X			X		X			X				X
	Kamagbarain	X			X		X	X			X	X			X			X		X					X	X	
	Kamasaypayna	X			X		X		X		X		X		X			X		X			X			X	
	Kawonor 2	X			X		X	X			X	X			X			X		X					X	X	
	Total	**6**			**6**		**6**	**4**	**2**		**6**	**2**	**4**		**6**			**5**	**1**	**6**			**3**		**3**	**5**	**1**
Kamakihila	Kakamalor	X			X		X	X			X		X		X			X			X			X			X
	Kakonthan	X			X		X	X			X		X		X				X	X		X				X	
	Kamaraypay	X			X		X		X		X	X			X				X	X				X			X
	Kamarimbe	X			X		X	X		X				X	X				X		X			X			X
	Kamera	X			X		X		X		X		X		X			X		X			X				X
	Kasangbanba	X			X		X		X		X	X			X				X	X		X					X
	Kasonpona	X			X		X	X			X		X		X			X		X		X					X
	Total	**7**			**7**		**7**	**4**	**3**	**1**	**6**	**2**	**4**	**1**	**7**			**3**	**4**	**5**	**2**	**3**	**1**	**3**		**1**	**6**
Kasokira	Kadala	X			X		X		X		X	X			X			X		X			X				X
	Kamankay	X		X			X	X		X				X			NA	X		X					X	X	
	Kamasapie	X			X		X		X		X		X		X			X		X			X				X
	Kamathor	X			X		X		X	X				X	X			X		X							X
	Kamera	X			X		X		X		X	X			X				X	X							
	Kasasie	X			X		X		X		X		X					X		X						X	
	Kasokira	X			X		X	X			X	X			X			X		X			X				
	Kathombo	X		X		X			X	X				X		X		X		X			X			X	
	Kawonor	X			X		X		X		X		X		X	X		X		X							X
	Kayakala	X			X		X		X		X		X						X	X						X	
	Kegbema	X			X		X		X		X	X			X				X	X							
	Total	**11**		**2**	**9**	**1**	**10**	**2**	**9**	**3**	**8**	**4**	**4**	**3**	**7**	**2**	**0**	**8**	**3**	**11**			**4**		**1**	**4**	**4**

Social Capital Table B14		Do you know who your representative is in the district council?		Crime in Village?			
		Yes	No	No	Little	Yes	From outside
Chiefdom							
	Kalanthuba	20	19	5	5	20	7
Section							
Kalanthuba	**Folladugu**	2	7	2	2	3	
	Kakalain	2	5		1	5	1
	Kamakatheh	2	4			4	2
	Kamakihila	6	1	1		6	
	Kasokira	8	2	2	2	2	4
Village							
Folladugu	**Kabumban**		X		X		
	Kakuthan		X				
	Kamasapie	X			X		
	Kamasaypayna		X			X	
	Kasankorie		X	X			
	Kateneh		X	X			
	Kathaywuna		X				
	Kathengben	X				X	
	Kawungulu		X			X	
	Total	**2**	**7**	**2**	**2**	**3**	
Kakalain	**Kabonka**		X			X	
	Kafogo		X		X		
	Kaibana	X				X	
	Kakarima		X			X	
	Kakuthan	X				X	
	Kamasikie		X				X
	Kasasie		X			X	
	Total	**2**	**5**		**1**	**5**	**1**
Kamakatheh	**Kadandan**		X			X	
	Kadanso		X			X	
	Kafungia	X					X
	Kamagbarain		X			X	
	Kamasaypayna	X					X
	Kawonor 2		X			X	
	Total	**2**	**4**			**4**	**2**
Kamakihila	**Kakamalor**	X				X	
	Kakonthan		X	X			
	Kamaraypay	X				X	
	Kamarimbe	X				X	
	Kamera	X				X	
	Kasangbanba	X				X	
	Kasonpona	X				X	
	Total	**6**	**1**	**1**		**6**	
Kasokira	**Kadala**	X			X		
	Kamankay	X				X	
	Kamasapie	X					X
	Kamathor	X					X
	Kamera						
	Kasasie		X	X			
	Kasokira	X			X		
	Kathombo	X					X
	Kawonor	X					X
	Kayakala		X	X			
	Kegbema	X				X	
	Total	**8**	**2**	**2**	**2**	**2**	**4**

Population Data Table B15		Population		Children				Youth from 18 to 40				Adults over 40		Christians / Muslims				
		Total	%	5 & under	%	Six to 17	%	Male	%	Female	%	Total	%	Most Muslim	More Christian	Most Christian	All Christian	Both
Chiefdom																		
	Kalanthuba	9390	100.0%	2334	25.2%	2128	22.7%	1401	15.1%	1812	19.5%	1616	17.4%	1	12	11	12	2
Section																		
Kalanthuba	Folladugu	1794	19.1%	465	25.9%	422	23.5%	250	13.9%	309	17.2%	356	19.8%		4	2	1	1
	Kakalain	1192	12.7%	285	23.9%	333	27.9%	166	13.9%	207	17.4%	192	16.1%	1	3	3		
	Kamakatheh	702	7.5%	143	24.0%	127	21.7%	118	20.2%	125	21.4%	72	12.3%			3	3	
	Kamakelah	1385	14.7%	360	26.0%	358	25.8%	163	11.8%	171	12.3%	333	24.0%		3	2	2	
	Kasokira	4317	46.0%	1081	25.0%	888	20.6%	704	16.3%	980	22.7%	663	15.4%		2	1	6	1
Village																		
Folladugu	Kabumban	124	6.9%	27	5.8%	41	9.7%	15	6.0%	20	6.5%	20	5.6%					X
	Kakuthan	176	9.8%	35	7.5%	60	14.2%	20	8.0%	18	5.8%	43	12.1%				X	
	Kamasapie	162	9.0%	35	7.5%	32	7.6%	28	11.2%	33	10.7%	34	9.6%			X		
	Kamasaypayna	162	9.0%	47	10.1%	36	8.5%	23	9.2%	24	7.8%	41	11.5%		X			
	Kasankorie	88	4.9%	27	5.8%	16	3.8%	9	3.6%	16	5.2%	20	5.6%		X			
	Kateneh	177	9.9%	49	10.5%	37	8.8%	18	7.2%	33	10.7%	40	11.2%		X			
	Kathaywuna	304	16.9%	73	15.7%	63	14.9%	56	22.4%	59	19.1%	53	14.9%					
	Kathengben	153	8.5%	48	10.3%	32	7.6%	20	8.0%	29	9.4%	24	6.7%			X		
	Kawungulu	448	25.0%	124	26.7%	105	24.9%	61	24.4%	77	24.9%	81	22.8%		X			
	Total	**1794**	**100.0%**	**465**	**100.0%**	**422**	**100.0%**	**250**	**100.0%**	**309**	**100.0%**	**356**	**100.0%**		**4**	**2**	**1**	**1**
Kakalain	Kabonka	139	11.7%	42	14.7%	25	7.5%	23	13.9%	18	8.7%	31	16.1%	X				
	Kafogo	152	12.8%	33	11.6%	46	13.8%	17	10.2%	28	13.5%	29	15.1%		X			
	Kaibana	46	3.9%	8	2.8%	8	2.4%	8	4.8%	10	4.8%	12	6.3%			X		
	Kakarima	273	22.9%	63	22.1%	87	26.1%	37	22.3%	42	20.3%	44	22.9%		X			
	Kakuthan	399	33.5%	93	32.6%	115	34.5%	56	33.7%	89	43.0%	46	24.0%			X		
	Kamasikie	87	7.3%	33	11.6%	14	4.2%	14	8.4%	7	3.4%	9	4.7%		X			
	Kasasie	96	8.1%	13	4.6%	38	11.4%	11	6.6%	13	6.3%	21	10.9%			X		
	Total	**1192**	**100.0%**	**285**	**100.0%**	**333**	**100.0%**	**166**	**100.0%**	**207**	**100.0%**	**192**	**100.0%**	**1**	**3**	**3**		
Kamakatheh	Kadandan	237	33.8%	56	39.2%	54	42.5%	39	33.1%	47	37.6%	41	56.9%			X		
	Kadanso*	117	16.7%													X		
	Kafungia	107	15.2%	32	22.4%	21	16.5%	19	16.1%	24	19.2%	11	15.3%			X		
	Kamagbarain	74	10.5%	20	14.0%	16	12.6%	19	16.1%	15	12.0%	4	5.6%				X	
	Kamasaypayna	110	15.7%	25	17.5%	20	15.7%	30	25.4%	25	20.0%	10	13.9%				X	
	Kawonor 2	57	8.1%	10	7.0%	16	12.6%	11	9.3%	14	11.2%	6	8.3%				X	
	Total	**702**	**100.0%**	**143**	**100.0%**	**127**	**100.0%**	**118**	**100.0%**	**125**	**100.0%**	**72**	**100.0%**			**3**	**3**	
Kamakelah	Kakamalor	204	14.7%	67	18.6%	47	13.1%	28	17.2%	21	12.3%	41	12.3%		X			
	Kakonthan	194	14.0%	36	10.0%	52	14.5%	24	14.7%	28	16.4%	54	16.2%				X	
	Kamaraypay	149	10.8%	31	8.6%	42	11.7%	15	9.2%	13	7.6%	48	14.4%		X			
	Kamarimbe	156	11.3%	46	12.8%	44	12.3%	15	9.2%	17	9.9%	34	10.2%		X			
	Kamera	226	16.3%	57	15.8%	62	17.3%	27	16.6%	33	19.3%	47	14.1%			X		
	Kasangbanba	148	10.7%	34	9.4%	39	10.9%	17	10.4%	19	11.1%	39	11.7%			X		
	Kasonpona	308	22.2%	89	24.7%	72	20.1%	37	22.7%	40	23.4%	70	21.0%				X	
	Total	**1385**	**100.0%**	**360**	**100.0%**	**358**	**100.0%**	**163**	**100.0%**	**171**	**100.0%**	**333**	**100.0%**		**3**	**2**	**2**	
Kasokira	Kadala	69	1.6%	24	2.2%	15	1.7%	11	1.6%	6	0.6%	13	2.0%		X			
	Kamankay	1901	44.0%	429	39.7%	296	33.3%	317	45.0%	589	60.1%	270	40.7%		X			
	Kamasapie	42	1.0%	15	1.4%	4	0.5%	8	1.1%	10	1.0%	5	0.8%				X	
	Kamathor	648	15.0%	175	16.2%	150	16.9%	105	14.9%	106	10.8%	112	16.9%				X	
	Kamera	220	5.1%	60	5.6%	53	6.0%	27	3.8%	31	3.2%	49	7.4%					
	Kasasie	110	2.5%	27	2.5%	32	3.6%	15	2.1%	15	1.5%	21	3.2%				X	
	Kasokira	416	9.6%	115	10.6%	93	10.5%	69	9.8%	77	7.9%	62	9.4%				X	
	Kathombo	447	10.4%	124	11.5%	127	14.3%	92	13.1%	62	6.3%	42	6.3%				X	
	Kawonor	50	1.2%	24	2.2%	4	0.5%	8	1.1%	10	1.0%	4	0.6%			X		
	Kayakala	13	0.3%	2	0.2%	3	0.3%	1	0.1%	3	0.3%	3	0.5%					X
	Kegbema	401	9.3%	86	8.0%	111	12.5%	51	7.2%	71	7.2%	82	12.4%				X	
	Total	**4317**	**100.0%**	**1081**	**100.0%**	**888**	**100.0%**	**704**	**100.0%**	**980**	**100.0%**	**663**	**100.0%**		**2**	**1**	**6**	**1**
		Enumerator Data												Research Team Data				

Appendix C: Descriptions of Two Primary Schools

The research team visited two of the four primary schools in Kalanthuba to observe the facilities and conduct staff interviews. The following are descriptive accounts based on those visits. Photos by the research team.

St. George Primary School in Kathombo

St. George Primary School is a partially government-supported school located in Kathombo village, Kasokira section, founded by the Roman Catholic Church in 1964. The school has a total of 158 students currently enrolled, 81 girls and 77 boys. Staffed by three teachers, one female and two male, the school offers instruction for five primary classes. However, Class 1 is the only one taught separately; Classes 2 and 3, and 4 and 5, are taught jointly due to shortages in both staff and classroom space.

The current school building was provided by the Sierra Leonean government in 2006. It has concrete walls, cement floors, and a metal roof. Inside the school are three classrooms and an adjoining office that serves as the living quarters for one of the teachers. Each classroom contains blackboards, educational posters (many of them pertaining to disease prevention), and benches or desks, though there are not enough to provide seating for all of the students. The school grounds include a football field.

Exterior to the school building are two blocks of VIP latrines (4 stalls), each of which has an attached hand washing station supplied by RCS, though these stations are in now in disrepair. Both the latrines and hand washing stations are handicap-accessible. Additionally, a shallow well, dug by the government, is also located on the school property and remains in use today. One of the three teachers is responsible for maintaining the pump.

The school is governed by a School Management Committee (SMC) that was established by the national government. Consisting of seven members, including the head teacher (who is automatically the group's secretary), a chairman, community stakeholders, and one other teacher, the committee elects a chairperson and treasurer from among themselves. The SMC is responsible for making all decisions related to the operations of the primary school. Three of the seven officials on the SMC are signatories to the institution's financial accounts.

The current school fee of 100,000 Le per year fails to provide sufficient funding. Only the head teacher receives a salary, paid by the national government, rather than by the school. The other two teachers, who are from the local community, only receive payment when parents contribute funds that are specifically intended for them. The school has a limited supply of textbooks but is unable to purchase more. As for meals, the school lacks a feeding program, thereby requiring students to bring a lunch from home.

St. George Primary School, Kathombo

Despite its inadequacy, the school fee inhibits enrollment. According to one of the teachers, the main reason that some children do not attend the school is cost. In addition, early pregnancy and relocation contribute to lack of enrollment and attendance. Concerning pregnancy, one of the teachers reported that girls as young as 12 and 13 have become pregnant and left school.

Kamasaypayna Primary School

Kamasaypayna Primary School, located in Kamakatheh section, was established in 1999 by Daniel Sara Turay as a Roman Catholic community school. It serves children from six local villages. A total of 53 students (28 boys and 25 girls) in Classes 1-4 receive instruction from the school's sole teacher, an unpaid volunteer who has taught there since 2008. Many families are unable to pay the school's relatively small annual admissions fee of 3,000 Leones (approximately $0.40 USD). As a community school, Kamasaypayna school is governed by a local School Management Committee (SMC), which meets on a monthly basis. It includes a chairman who lives in Kamasaypayna village, the school's teacher, and several other members.

Located next to a Maternal and Child Health Post on about an acre of land, the primary school is a small, one-room structure consisting of a metal roof and partially finished stick-and-mud walls. [See Figure 5 for a photo of a completed section of the school's walls.] Although the surrounding communities had initially hired a local contractor to oversee its construction, insufficient funding caused the work to cease prematurely. Consequently, the building has long remained in its incomplete state, though the teacher reported that a local community group recently began the process of adding mud to the stick-and-mud construction. Additionally, while the school recently attempted to add a latrine to its facilities, the

project was unable to be finished after the digging process uncovered a large rock that prevented the team from progressing further. Consequently, all students who attend the school must use the bush to relieve themselves. The nearest source of drinking water is over a kilometer away from the school.

Appendix D: Descriptions of Maternal and Child Health Posts

Two health clinics are located in Kalanthuba chiefdom. Both are Maternal and Child Health Posts (MCHPs), one located in the village of Kathombo (in Kasokira section) and one located in the village of Kamasaypayna (in Kamakatheh section). The two MCHPs serve 13 villages and 34 villages respectively, mainly supporting women and children under five. Care provided includes pre- and post-natal care, care during delivery, health education, and vaccinations. The research team visited both health posts and interviewed staff members in order to get a sense of the scope of care provided, as well as the challenges that face each clinic.

Kathombo MCHP (Kasokira section)

Construction of the health post began 10 years ago; however, building was halted for some time, and the clinic has only been operational for 4 years. It consists of an office, a drug store, and a labor room for childbirth. Thirteen villages, including all of the villages in Kasokira section, receive care from the clinic, which is staffed by 2 nurses. Upon our visit, only one nurse was present and interviewed about the clinic. She lives in a house across the road from the clinic in order to be accessible when patients come. She has been working at the clinic for 3 years.

The clinic provides a number of services, mainly to women and children. Women receive care during childbirth and education on a range of topics during and after pregnancy. These topics include hygiene and how to keep care of themselves and their children, as well as childhood nutrition. Nurses educate women on the importance of breastfeeding their child for the first 6 months before adding food and water to their diet. Women are also taught to boil their water before consumption. When asked about prevalence of deliveries in the clinic, the nurse reported that most women in the area come to the clinic for childbirth rather than giving birth at home. [This is supported by village interviews in Kasokira section; see Tables III.C.1 and III.C.2.] Traditional birth attendants (TBAs) also come to the health post to aid with childbirth. Upon leaving after childbirth, mothers are supplied with mosquito nets.

In addition to the care provided for women, free care is provided to children between the ages of 0 to 5. Vaccinations and medications are provided at the clinic for children, both in the form of oral vaccinations and injections. Children are vaccinated against tetanus, whooping cough, yellow fever, measles, and polio. Medications at the clinic are provided by the government, and consist of anti-malarial medications, parasite medications, and various other drugs. Before distributing anti-malarial medications, a test is always performed. All medications are free for children under 5; however, children over 5 also come to the clinic for anti-malarial and parasite medications. Adults who come to the clinic are able only to access first aid and are instead referred to Bumbuna for health care.

Located outside of the clinic is a shallow well with a pump. UNICEF dug the well about one year previous, but it is no longer functional. The well still contains water, which can be accessed by bucket; however, the water has not been treated for drinking and is therefore used only for laundry. More recently, a borehole was drilled by the government, but it is not yet in use. A tower is currently under

construction, which will house a water tank. A solar pump will run to the tank, in order to provide tapped running water in the clinic.

Also under construction are a new latrine block, showers, and laundry area, as well as a placenta pit and a burning pit for sharps. The burning pit will include a roof. There is currently an old latrine block in use. This clinic has no electricity, which the nurse reported as their biggest challenge. There is no lighting for childbirth when women come at night, and the nurses are forced to resort to Chinese lanterns.

Kamasaypayna MCHP (Kamakatheh section)

Kamasaypayna clinic was constructed 9 years ago and consists of an office, a drug store, two admission rooms, a labor room, and a waiting room. Thirty-four villages are served by this health center, which is staffed by 2 MCH aides. The current aides have been working at the clinic for 4 years; they live in a compound next to the clinic in order to be accessible, but they reported not having received a salary since starting. Both were present during the interview.

A wall poster inside the clinic lists the 34 communities in its catchment area—including the great majority of all villages in the chiefdom. Distances from the clinic recorded on the poster range from ½ mile to 31 ½ miles; the mean distance is 10.9 miles. Seventeen communities lie 10 miles distant or more from the clinic. An estimated 10-15 women come to use the facility daily; however, the health aides report that many women in the villages are unable to come to the clinic because of long distances and poor road conditions [see Findings III.C.3 and III.C.8].

A number of services are provided by the clinic. The health center provides free treatment for pregnant women, lactating mothers, and children under 5; however, the health aides report that they will treat anyone who comes, often allowing them to pay what they can.

Care for women includes medical attention during childbirth, as well as education during and after pregnancy and family planning education. In the four years since the 2 health aids began working there, they have reported no maternal deaths from delivery at the clinic. The aides stressed the importance of early referral to Bumbuna when complications arise, though they note the difficulty of travel, stating that women often have to be carried to the clinic. Various educational workshops are provided for women. Antenatal care workshops are provided on Mondays, where women are educated on personal hygiene, hand washing, nutrition (emphasizing the importance of “green leaves”), signs and symptoms of illness, and the importance of immunizations. On Fridays, workshops for suckling mothers are provided, when the nurses teach mothers to breastfeed exclusively from 0-6 months before adding food from 6-9 months, stressing that solid food needs to be appropriate for the child and not the same as adults eat. Mothers are able to leave with a new mosquito net on their first visit [see Finding III.C.15].

Children under 5 are vaccinated by the MCH aides, who provide vaccinations both at the clinic and by traveling to villages. The vaccines provided are BCG (against tuberculosis), a two-part measles vaccine (the first is provided at 9 months and the second at 15 months), OPV (against polio), yellow fever, and whooping cough—a total of 5 vaccines. Vaccines are provided free of charge. Children under 5 can also receive treatment for malaria, diarrhea, and pneumonia at the clinic. Other cases are referred to

Bumbuna as necessary, especially cases that require blood work. The main illnesses that the aides report seeing in children are malaria, diarrhea, vomiting, and pneumonia. In the case of pneumonia, aids reported that insecure roofing and unsafe housing contribute to children becoming unable to breath. Malaria tests are administered before medications are distributed. Medications in the clinic are obtained from the district medical store, and the aides report not having an adequate supply of medications or adequate funds with which to purchase them.

Family planning education is increasing. Aides report increasing use of contraceptives, which are provided free of charge. The most commonly used are Depo injections and pills, with other available methods including implants and the patch. Condoms have been introduced too; however, few people choose to use them. There has been an effort to include men in family planning education, and an increasing number of men are starting to come voluntarily with their wives. The MCH aides also report that sexually transmitted infections (STIs) are an issue, especially among polygamous households. It is necessary to treat STIs in pairs to be effective, but they stated that men are not always cooperative, and women sometimes have to go to the chief in order to get their husbands to come for treatment.

The clinic does not currently have its own consistent source of water. Outside the clinic is a well that operates with a hand pump. This well is dry in the dry season and is only functional during certain months of the rainy season (July, August, and September). The MCH aides said that the community collects water from streams for the clinic that the aides then boil to purify. Sometimes aqua-tabs are used, but only when they are supplied with them. Two years earlier, SNAP provided a bio sand filter for the clinic; however, this only worked for a year before becoming dysfunctional.

There is a latrine block located outside of the clinic; however, the aides report that they are not adequate, and new facilities are needed. Electricity at the clinic is supplied by solar energy, which enables lights to function. Aides stated that none of the rooms are adequate for clinic needs. The two admission rooms are furnished with single beds and double as storage spaces, as there is not enough room elsewhere in the clinic for storage. The labor room does not have an adequate delivery bed and lacks sufficient delivery kits and other necessary supplies. The aides voiced a need for more space and rooms, especially citing the need for a birth waiting room (for women who come early from long distances to deliver) and observation rooms (for women to stay following delivery to ensure no complications arise). Other difficulties reported include road access and clinic maintenance. Aides state that the DHMC is supposed to help with clinic repairs and upkeep, but that they receive no aid. The road has poor drainage, making it impassable during the rainy season.

Despite difficulties, the aides also cite some positive trends in communities. They report that awareness throughout villages is increasing, especially regarding the importance of immunization and sanitization. People are also coming to a greater understanding of the importance of going to the clinic. Aides report that people used to ignore the clinic when it was first built, believing that it was not for them; however, more village residents are starting to make use of it. Moreover, no cases of Ebola were reported to the clinic.

Aides report that an increase in Community Health Workers (CHWs) is making a difference in communities. CHWs receive training in Bumbuna, and aides said that they act as the "first front liners" for health care in the villages. In many cases, CHWs are starting to receive drugs to administer to children ages 1-5. This helps the clinic not to have too many cases, as children can now be treated for certain ailments within the villages. The MCH aides also cite the importance of traditional birth attendants (TBAs). They report that each village has 1 resident TBA, trained in Bumbuna, and that there are 2 TBAs that work with the clinic during childbirth. The role of the TBAs is to help educate women and to mobilize and bring women to the clinics. Every month, on the 29th, the clinic hosts a meeting with the village TBAs to provide additional education and training.

Appendix E: Corrections to the 2017 Baseline

Field research conducted in May and June 2018 produced the following corrections to the 2017 baseline data and findings.

Finding III.B.2: **A majority of school-age children in over half of Kalanthuba's villages do not attend primary school.**

Researchers found *two additional villages*, both in Kasokira section, where a majority of school-age children do not attend school: Kasasie, which reports that the Kasokira school is a 3-hour walk, and Kadala, which reports that the school in Kamathor is 3.5 miles away. Interviews conducted at the schools in Kasokira and Kamathor indicate students enrolled in both schools from both Kasasie and Kadala. The Kamathor school reports that students attending from Kasasie may stay in Kamathor or nearby. *The number of villages reporting that a majority of school-age children do not attend school is therefore 24 (60%) rather than 22 (55%).* In addition, it is unlikely that a majority of school-age children in Kegbema village (Kasokira section) attend primary school because the village lacks road access, although Kasokira school reports students from Kegbema.

The data in **Table III.B.1** is therefore modified: Kasokira section has at least 2 villages where a majority of children are not enrolled in school. In **Appendix B, Human Capital Table B11** Kasasie and Kadala villages in Kasokira section report "no" to the question, "Are the majority of children enrolled in primary school?" Kegbema village in Kasokira section should be shown as missing data. For Kalanthuba, the table should show no more than 11 villages (8 located in Kasokira section) reporting a majority of children enrolled in primary school and 24 reporting a majority of children not enrolled.

Finding III.D.4: **Nearly all villages report farmers growing tree crops, comprising a substantial chiefdom-wide investment.**

Researchers found *three additional villages growing coffee*, raising the total number in the chiefdom from three to six. One of the additional villages, Kamera in Kamakahila section, is a substantial producer, reporting 247 coffee trees. The others are Kasangbanba in Kamakahila (30 trees) and Kathombo in Kasokira (15 trees). Researchers confirmed coffee holdings in Kasasi (96 trees) and Kegbema (134 trees), both in Kasokira section. Previously reported was Kamankay (not studied in 2018). The coffee grown in Kasasi is confirmed to be Arabica.