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# Turkana Survival Systems at Lake Turkana: Vulnerability to Collapse

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We have lost our livestock and much of our lands. Now we must fish, or we will die.  
[Turkana male elder from lakeside village near Ethiopia-Kenya border]

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## Abstract

The pastoral economy in transboundary Turkana lands has drastically declined in recent decades, largely due to the effects of colonial and post-colonial policies. Faced with radical herd losses, thousands of Turkana households have moved to Lake Turkana's western shoreline for fishing and/or herding. This population—largely uncounted—is extremely vulnerable to loss of accessible Lake Turkana water, fisheries resources, and lakeside grazing. The Gibe III dam and irrigated agricultural plantations along the Omo would cause major shoreline retreat and eliminate the Omo River's annual flood 'pulse' of fresh-water and nutrients into the lake. Major loss of fish reproductive habitat and fish stocks as well as potable water, along with desiccation of lakeside environments essential to livestock and people would result. As conditions worsen, a general movement of fishing and fishing/pastoral villages southward toward Ferguson's Gulf—itsself drying out—and around towns, in search of relief aid or survival opportunities, is likely. With no practical means of continued livelihood, hundreds of thousands of Turkana fishers and pastoralists would face region wide hunger and conditions for disease epidemics. Cross-border conflict between these Turkana and their northern neighbors would sharply escalate, especially in the face of regional arms trafficking. Northern and central Turkana protests and pleas for help have so far been ignored by the Kenyan government which continues to militarize the region.

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## Northern Turkana Pastoralists: The Long Decline and Migration to the Lake

- **The major human and livestock disease epidemics extending across the Sahel and eastern Africa during the latter years of the nineteenth century produced famines in Ethiopian, Kenyan and Sudanese drylands.** Both written and oral accounts of the period describe frequent raiding of Turkana livestock by their pastoral neighbors, including the Pokot and Dasanech (Fig. 1.3).

Colonial travelers describe major expropriations of Turkana lands as well as livestock during the British colonial administration (Gulliver 1955; Lamphear 1988, 1992; McCabe 1990, 2004; Collins 2006; Hogg 1982).<sup>1</sup> British domination of the Turkana unfolded largely from its colonial base in Uganda.<sup>2</sup> Its interests were largely focused around the Nile River region and as part of its strategy in the region Britain claimed the northern end of Lake Turkana.<sup>3</sup>

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<sup>1</sup>The bulk of literature regarding early Turkana history pertains to the southern and central regions.

<sup>2</sup>A small British post near the Uganda border (at Lokiriana) constituted an early foothold in the region, both for military and civil presence. Other military outposts followed.

<sup>3</sup>Lake Turkana was named Lake Rudolf by the explorer Count Teleki, after his patron, Prince Rudolf of the Austro-Hungarian empire (von Hohnel 1938).

Dispossession of the northern Turkana during the late nineteenth century and early decades of the 1900s occurred mostly at the hands of the British colonials, but fighting between the Turkana and neighboring ethnic groups in the transboundary region worsened the impacts of this dispossession. Pressures by Ethiopia's Menelik II, who had territorial ambitions extending to the south end of Lake Turkana, provoked a 'protective' response by the British, who furthered their militarization of the region.

The British defeated the Turkana in 1914–1915 and significantly increased their military presence in the northern region. British forces confiscated massive numbers of Turkana livestock, expropriated large portions of Turkana lands and thoroughly disrupted customary seasonal patterns of herding and exchange throughout the region. The colonials also disarmed the Turkana, greatly weakening their fighting capacity and placing them at strong disadvantage relative to their northern neighbors, particularly the Nyangatom and Dasanech, who had superior access to firearms through their connections in Ethiopia. According to northern Turkana elders' oral accounts, the Turkana experienced similar stresses in their relations with the Pokot and Jie peoples to the west and southwest.

Imposing a hut tax on the Turkana, the British administration used confiscation of livestock as the penalty for nonpayment. Unrest in the region—in part, a reaction by the Turkana to these and other aggressive policies by the government—provoked further reprisals and livestock seizures. Food insecurity for the pastoralists was extreme in these early years (Oba 1992). In their weakened state, the central and northern Turkana faced extreme hunger, even famine—especially during severe drought periods.

The colonial government declared a 'closed district' policy in the region that persisted until the 1970s. Meanwhile, the British moved their headquarters from Lorogumu to Lodwar (Fig. 1.1). A small trading center for decades, Lodwar grew to become the administrative capital of Turkana County—now the largest town in northwestern Kenya, with a population of more than 48,000. The British also established a key military post at Lokitaung (Fig. 1.1), which had been a satellite trading center in the far north of Turkana. Military operations from Lokitaung facilitated the colonials' subjugation of new segments of the Turkana. The post there was the launching point for the British routing of the Italians in the Ilemi Triangle and southwestern Ethiopia in World War II conflict and it became Kenya's center for administration of the Ilemi—long a disputed area between Kenya and South Sudan (see Chap. 4) and also the northernmost extent of the Turkana population.

- **Turkana territorial losses in the early decades of the twentieth century sparked overcrowding of herds, and therefore overgrazing and deterioration of their remaining pasturelands.** Region wide increases in stock mortality and herd decline followed. In the years surrounding World War II, northern Turkana elders describe their herd losses as particularly devastating, due to raiding by Dasanech and Nyangatom pastoralists who had acquired new arms from both the Ethiopians and the Italians during their respective occupations of the area.<sup>4</sup> Major herd composition changes accompanied the plummeting livestock numbers among the northern Turkana. For most stockowners, goats and sheep became key components of their herds, since small stock can survive conditions of deteriorated grasslands and diminished water sources far better than cattle. Even camel herds declined, according to Turkana accounts, despite the adaptation of camels to long treks for browse and far lengthier periods between watering (see Chap. 4).

There are different interpretations of the causes of Turkana hunger and herd losses during the post-war years. Most written reports pertain to the central and southern Turkana regions, where conditions vary considerably from those in the north. A combination of factors were at play in the herd declines of the northern Turkana, including the following.

- British seizures of livestock, including as punitive measures.
- Continued taxation
- Exclusion from territories by British colonial actions—causing overgrazing and heightened stock mortality.
- Raiding by neighboring ethnic groups
- Extended drought periods, worsening livestock disease/mortality

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<sup>4</sup>Accounts of these losses by Turkana elders are in agreement with details provided by a former British officer, Mr. Whitehouse, who figured prominently in the Ethiopia-Kenya-Ilemi Triangle border demarcation process. This writer held conversations with Mr. Whitehouse in the early 1970s.

➤ **Northern Turkana elders describe at least six types of responses to radical herd losses.**

- (i) **Natural reproduction of livestock with alteration of herd composition and herd mobility.** This recovery strategy includes using exchange relations to obtain new livestock—especially small stock. Rebuilding herds through reproduction, however, necessitates access to sufficient land in order to separate herds and expand their grazing areas, with reliance on customary social exchange and cooperation patterns. Many locales where Turkana had previously sent some or all of their livestock for pasture and water during times of severe hardship became inaccessible to them, either because of government restriction or the threat of livestock seizure by neighboring groups.
- (ii) **Increased reliance on production activities once subsidiary to herding.** Unlike the Dasanech and Nyangatom at the Omo River (and Turkana along the Turkwel River to the south), the northernmost Turkana have no practicable flood recession agriculture opportunities, since watercourses in their lands are relatively small and ephemeral. Along the Turkwel River to the south (Fig. 1.1), some Turkana undertook flood recession agriculture. The stresses noted above have forced the northern Turkana to rely far more on secondary production activities, especially wild food gathering, chicken raising (for both consumption and exchange—see Table 4.2), and charcoal production (primarily for marketing).
- (iii) **Livestock raiding.** Like all pastoral peoples in the transboundary region and beyond, the northern Turkana have initiated raiding and seizure of livestock as a customary means of economic recovery. In recent decades, this strategy has been less effective for several reasons, including increased Kenyan and Ethiopian military and government security presence in the region, the extreme violence in such raids since firearms have replaced spears and hand to hand combat, and the reality that all pastoral groups have reduced numbers of livestock.
- (iv) **Evacuation to towns and internally displaced persons (IDP) camps within the northern region.** Pastoral villagers have variously exercised this option as a temporary or long-term measure. For the northern Turkana, Lodwar and Kakuma (northwest of Lodwar) have been primary destinations. These ‘refugees’ seek assistance of any type possible in IDP camps and in nearby towns, but assistance is makeshift and temporary, at best. Thousands more Turkana have joined or formed spontaneous or temporary camps along roads near towns (especially Lodwar) and even in the most remote areas such as the Ilemi and border regions. Camps are few in number compared with the needs of tens of thousands of Turkana facing dire circumstances when their attempted recovery strategies have failed. For most of these Turkana families, the distances required to camps are simply too great for travel. Most northern Turkana seek access to international food aid. For the overwhelming majority of them, such aid is sporadic at best—statements by the government and impact assessments notwithstanding.
- (v) **Settlement in aid-funded agricultural projects near Lake Turkana and in other scattered locales.** Very few individuals from the northern region have been incorporated into schemes along the Turkwel; most of these have most of the other have failed—most of them having depended on rainfall which is simply too limited and erratic. (All such schemes visited by SONT members in the northernmost plains had failed.) Recently, foreign aid agencies and Kenyan non-profit organizations have introduced settlement and irrigated agricultural development, for a select number of Turkana, along the Turkwel River—reducing access to the river for other Turkana in that region.
- (vi) **Migration to Lake Turkana for fishing and last resort livestock raising.** Northern Turkana pastoralists (like the Dasanech) have long regarded fishing as a last resort means of survival. This attitude prevailed throughout Turkana society, despite their familiarity with El Molo fishers along the lake’s southern shores (Figs. 1.3 and 4.6). Since the 1920s, the British colonial government, foreign nationals, aid organizations and later, the independent Kenyan government, have all designed and implemented relatively small Turkana fisheries and settlement projects, particularly around Kalokol. Fishing related activities are now the main means of subsistence at the lake.

**As early as 1924, the British Colonial administration formed a settlement (commonly termed ‘famine camp’ in written and oral accounts) at Kalokol, near Ferguson’s Gulf. There they taught fishing to ‘displaced’ Turkana pastoralists.** This new livelihood mode absorbed more Turkana over the next few decades through Kenyan government, missionary and aid efforts as well as by the Turkana’s own initiatives (Bayley 1982). At Kalokol, nets and other simple

technologies were issued, but little follow-through assistance was given so the project failed, leaving a large number of Turkana stranded. Other fisheries development projects sprang up at Ferguson's Gulf and northward from Kalokol along the lake, at Eliye Springs and near the terminus of the Kerio River (Figs. 1.3 and 4.6).

Programs introduced by Kenyans, Norwegians and Italians were ambitious but mostly ill conceived and short-lived. Despite the high failure rate of the projects themselves, many Turkana became skilled fishers. Most of these Turkana began fishing with simple basket nets, though some soon turned to harpoons and began constructing rafts by lashing together the trunks of doum palm trunks—a technology that persists to the present time. Gill nets eventually became dominant among the fishers and wooden boats are now widespread and in strong demand (see below). Kalokol remains the center of fish collection and trading for the region.

The severe droughts of the 1960s disenfranchised huge numbers of Turkana pastoralists. Many northern Turkana from displaced persons camps ('famine camps') were settled at Lowarengak, a lakeside town near the Kenyan border post at Todenyang (Fig. 1.3). Thousands more Turkana households migrated to this area in subsequent years. Many of them took up fishing or fishing related activities. This northernmost population fluctuated greatly, particularly in response to shifting relations with the Dasanech, with whom conflicts intensified. Lowarengak has remained a key fishing center along the northernmost shoreline.

**By the 1980s, when major prolonged droughts and widespread hunger conditions occurred, impoverishment among the northern Turkana pastoralists increased markedly.** Major numbers of households, even groups of villages, relocated to Lake Turkana—sometimes moving in stages over years. Villages generally moved in a southward direction along the lake (see map in Fig. 4.6), settling anywhere between Lowarengak (near Todenyang; see Fig. 1.1) very close to the Kenya border, and Ferguson's Gulf. The arriving Turkanas' options for settlement were often determined by their social ties with households already established there. According to accounts by Turkana elders in villages along the northwestern shoreline of the lake, the number of households settling there increased sharply during the almost rainless years between 2007 and 2009—a nearly unprecedented drought in the memory of local residents.

➤ The dire economic situation facing northern Turkana pastoralists in the upland plains is evident from SONT interviews with 90 Turkana household heads in the dryland plains west and north of Lokitaung in 2010 and 2011 (Figs. 1.3 and 9.1). A series of common features of life in this northern region emerged from this survey.<sup>5</sup>

- **Nearly all households remaining in pastoral areas owned inadequate numbers of livestock.** Many attempt to remain actively pastoral, despite having only (many with only a few to 10 or 20). What animals they had were often sent to stock camps—many of them at great distances in search of pasture and water.
- **With most young men off herding, households typically consisted of women, children and older men, at least during much of the year** (Fig. 9.1). Many villages had relocated near towns, including for security reasons or for access to periodically delivered food aid. Most households surveyed relied on a few milk animals—mostly goats (some had a few camels; none surveyed had cows present), chicken raising (typically for selling or consuming eggs), other household or village based commodity production. Wild food gathering accounted for a substantial portion for these villagers. Many Turkana men have sought wage labor opportunities, though few have succeeded in this effort.
- **Two major responses of herd owners to serious livestock losses—increased separation and geographic distribution stock animals (often utilizing new labor and other cooperation arrangements) and various exchange strategies for rebuilding livestock numbers** (particularly those involving small stock). Both of these have been entirely inadequate, however, especially in the face of extreme ecological degradation of upland pastures from overgrazing as well as drought, major threat of attack by neighboring groups, and government restrictions—in the Ilemi region and elsewhere.<sup>6</sup> Raiding of Dasanech and Nyangatom livestock by northern Turkana pastoralists—previously an important component of herd

<sup>5</sup>A detailed account of these interviews is the subject of a forthcoming report.

<sup>6</sup>Together with elders from the region, SONT researchers constructed a map of the northernmost lands—particularly the narrowly defined border lands and disputed Ilemi area, and villagers stressed that the “best grazing lands” (mostly slightly higher elevation plains with higher rainfall and grass development) are effectively off-limits to them because of government policy enforcement or danger of losing both livestock and lives. The area around the Kibish River, at the Ilemi/Ethiopia border, is another sought after area for water and livestock grazing by all three groups—Dasanech, Turkana and Nyangatom and was heavily settled by Nyangatom during SONT investigations.



**Fig. 9.1** Pastoral life in northern Turkana. *Top* Villagers requesting help for repair of broken water well—a well built by the Catholic Church, which also requires villagers in the region to pay for repairs. *Bottom* Hand-dug well serving thousands of livestock in northern Turkana, near the Ilemi Triangle

recovery—is also insufficient. All of the transboundary area’s groups now own firearms, so both the incidence and level of violence level of raiding are extreme in certain localities, particularly those that are indicated in Fig. 5.3. Kenyan and Ethiopian security forces in the region impede some of this violence, but the general trend persists—in fact, escalates, since it *stems from the desperate living conditions of all three groups*. The effects of this conflict are devastating for all concerned.

- **Stock mortality with radical herd decline initiated a major exit of northern villagers toward Lake Turkana.** Most household heads in the upland plains region knew of at least one or two nearby villages whose residents had already departed for the lake. A few said that they too were considering moving in that direction, as well. (Some village heads indicated that they might instead move to a town in order to increase their chances of receiving food aid.)
- **Food and other essentials available in local markets are priced beyond the reach of most households—even those fortunate enough to generate income from household/village based commodity production.**
- **Internal social problems accompanying such economic stress are also on the increase.** Many elders flatly state that they no longer have authority over the actions of their young men and that such problems are a radical departure from earlier times. The decline of customary traditional authority relations most likely results from a combination of influences including government administrative systems imposed on the Turkana, economic disenfranchisement and displacement of communities, access to weapons (providing young Turkana men with a new sense of power and independence), and privatization of Turkana lands and resource ‘commons’.

## Adaptation from Pastoral to Fishing Livelihood

The Kenyan government (GOK) has failed to officially acknowledge the major migration by pastoralists to Lake Turkana, nor does it openly recognize the vulnerability of this population to lake level drop—a predictable effect of the Gibe III dam and dam enabled irrigated agricultural development.<sup>7</sup> Development banks also have failed to take these major changes into account in their environmental and socioeconomic impact assessments or other publically available reports. This matter is detailed in Chap. 6

- **Tens of thousands of Turkana pastoralists from the upland plains now make seasonal treks to Lake Turkana for livestock watering and for whatever shoreline graze and browse is available** (Fig. 4.7). During severe drought periods, the lake provides last option survival for the tens of thousands of livestock. Countless numbers of small stock are brought to the lake's shoreline when distant areas are no longer available. Except for female camels (cows) with young calves, most camels are herded in the western plains and other upland localities with sufficient browse, although they too are often brought to the lake for watering (Fig. 9.2).

The lakeside environment is so severely degraded that large numbers of livestock perish from the long trek to the lake or the trip back to upland grazing areas (Fig. 4.4), especially during severe droughts. The problem is compounded by the recent introduction of one of the most destructive invader plant species in the world—*Prosopis juliflora* (or ‘mesquite’).<sup>8</sup> The recently unpalatable *Prosopis* accelerates pasture deterioration (Fig. 9.2) and it is spreading rapidly throughout the transboundary region.

- **Lakeside Turkana arrive from a wide variety of upland pastoral areas. Nearly all of them now engage in fishing or pastoral/fishing production activities. They reside in settlements ranging from single household villages to large complexes with hundreds of households.** Most household heads describe having moved from an upland region in stages: for example, from near the Ilemi or around Lowarengak near the Kenya-Ethiopia border, southward to as far as Kalokol and Ferguson’s Gulf (Fig. 1.3).

<sup>7</sup>Some local officials *privately* acknowledge this major crisis brewing, but political conditions prohibit them from making any public statements that are even potentially critical of the government. In fact, key SONT researchers were warned by these officials that their investigative work as well as dialogue with villagers about the matter were dangerous and could bring repercussion. Partly for this reason, the identity of respondents and their villages are protected by SONT.

<sup>8</sup>This rapidly spreading and nearly intractable mesquite shrub consumes major soil water resources, prevents native rangeland species’ establishment and is unpalatable for livestock (Manduab et al. 2011).



**Fig. 9.2** Northern Turkana livestock herds watering at the lake. *Top* Goats at lakeside for watering and browse (plants are mostly unpalatable invader species, *Prosopis juliflora*). *Center* Major death of baby goats (several hundred) from lack of water and browse on long trek to the lake). *Bottom left* Young camels with female, in *Prosopis* thicket at lake. *Bottom right* Dead wild ass (donkey) during drought period near the lake

- Most Northern Turkana communities from the upland areas now settled along the lake depend on fishing or mixed fishing/pastoral production for their survival. For the most part, these Turkana have lost the majority of their livestock or retain only a small number of animals (particularly small stock). Except for milk animals with very young offspring, even these livestock are often sent to camps well removed from the lake.
- Those households newly residing at the lake usually learn fishing from others already settled there. Many different social types of social arrangements are made for fisheries and related economic activities—arrangements for catch and village based post-catch tasks, including preparation of pallets for merchant pickup. Some villagers engage in highly specialized activities, such as boat preparation and repair or sail manufacture and repair (Fig. 9.3).  
In addition to being involved in cleaning and drying fish catch, women and children frequently do secondary production activities such as poultry raising, charcoal production and other small-scale manufacture. Although fishing communities have made major shifts in production relations since their pastoral existence, some dimensions of pastoral life have remained strong. Graduallyk these too have been impacted by commercial relations in the region.
- **Tens of thousands of pastoral/fishing Turkana reside in lands slightly removed from the lake but are also dependent on the lake resources and activities for their survival.** Many engage in work there—sometimes fishing boat owners, but often in one of many forms of wage labor or bartering and market activities that generally involve livestock products (live animals, skins and milk). The typically small numbers of village-based livestock are taken to the lake for watering, as well as grazing (when it is available.) With the assistance of local elders, SONT researchers identified the village complexes of both fishing and pastoral/fishing villages between Kalokol and the Kenya/Ethiopia border (Fig. 9.4).

- **Technology among Turkana fishers is relatively simple and mostly suited to fishing in nearshore areas—particularly Ferguson’s Gulf, the Omo delta, Alia Bay (Fig. 9.4) and smaller bays and inlets.** Wooden boats—universally the most desired item by fishers—are constructed, largely by boat-makers from the Kisumu-Lake Victoria region. Boats are pointed at both ends, constructed from timber planks with a v-shaped bottom, and are propelled by paddles and /or sails (Figs. 9.3 and 9.5). Sails are typically fashioned from plastic food aid bags and the Turkana are highly adept at repairing them. Boats are easily adapted for motors, but few Turkana can afford them. Lack of funds for boat purchase and engines is a universal complaint among the fishers along the lake’s western shoreline, as pressure on nearshore resources continues to grows with the influx of households needing to take up this new form of livelihood (Fig. 9.6). A few Turkana have developed expertise in boat-making, though the substantial capital required has favored the Luo builders from the Kisumu region who craft them—at Ferguson’s Gulf, especially. Meanwhile, traditional rafts constructed of doum palm trunks lashed together (Fig. 9.5) are used locally along portions of the lake’s shoreline where waters are sufficiently quiet. Rafts are extremely common in Ferguson’s Gulf, for example.
- **Fishing in wide areas of the lake is commonplace for both northern and central Turkana. Fishers with sailboats, for example, form seasonal, or temporary camps along the eastern shoreline** (Figs. 9.3 and 9.4) and ventures into the Omo delta are also taken on during multiple months of the year. Expeditions to the eastern shoreline can last up to a month or more and can be extremely risky, depending on security and weather conditions—like Turkana ventures into waters near the Omo delta. Specific direction, distance and duration of trips are determined by numerous factors, including size and condition of boats, lake currents and prevailing winds, Omo River inflow force (including its annual pulse with freshwater and nutrients), fish stock availability (involving reproduction and feeding rhythm, etc.), relations with other fishers and labor concerns.

Fishers commonly sail to eastern parts of the lake when winds subside and currents in the northern portion of the lake are strong: for example, during the Omo River’s annual ‘pulse’ of inflow to the lake. Seasons of the year are often described differently by residents along the lake—even among individuals in one locale, as reports to SONT members revealed. Moreover, seasonal changes of most concern to pastoralists are clearly different from those of fishers—a reality bringing even more complexity to the reckoning of participants in this relatively new type of livelihood among the Turkana. (Strong differences of interpretation emerged in group discussions of the matter in several shoreline villages, for example, and certainly in inland ones). Table 9.1 presents *only one* such description of seasonality.





**Fig. 9.3** Turkana fishing villagers along northwestern shores of Lake Turkana. *Top left* preparing nets before sailing expedition party leaves. *Top right* Pallet of dried fish await merchant pickup at roadside. *Center* Turkana wooden boats inshore with villagers bathing and water-getting. *Bottom left* Fishing expedition of sailing boats leaves for eastern Lake Turkana waters. *Bottom right* villagers repairing sails made of plastic international food aid bags



**Fig. 9.4** Fishing and mixed fishing/pastoral Turkana village areas at Lake Turkana. Major village complexes are indicated, along with temporary (seasonal) fishing villages along the eastern shore of the lake (another forms at North Island) and key fish reproductive habitats—primarily along shorelines in shallow waters (including near the Omo River inflow, in Ferguson’s Gulf and Alia Bay (see Fig. 5.2 for a bathymetric representation of lake level drop)



**Fig. 9.5** Turkana fishing village activities at Kalokol and northward along the lake. *Top left* Turkana man with fishing nets and raft of doum palm trunks lashed together—at Ferguson’s Gulf. *Top right* Sail boat (with sail constructed of food aid bags). *Bottom left* Clothes washing and interior of non-motorized boat—near Kenya-Ethiopia border. *Bottom right* Local market where households market their prepared charcoal to locals and to travelers



**Fig. 9.6** Northern Turkana Fishing Villagers. *Top left* Boys getting water at Ferguson's Gulf. *Top right* Girl with fish caught from doum palm raft in Ferguson's Gulf. *Bottom photos* Family members of fishing village complex near Ethiopia-Kenya border

**Table 9.1** Annual seasons described by northern Turkana fishers***ANNUAL SEASONS RECOGNIZED BY LAKE TURKANA FISHERS*****AUGUST to NOVEMBER: ANAMAPOLO**

Omo River: Major inflow to Lake Turkana

Currents: Extremely strong southward current from Omo River inflow, facilitating movement of west shore Turkana fishers to eastern waters.

Winds: From the north, relatively mild to moderate.

Lake level: Generally at a maximum level in central/ northern portions of the lake, Ferguson's Gulf and bays with highest waters and often high fish catch.

Strong currents around Omo delta are dangerous and avoided. Fish stocks in shoreline areas and nearshore are relatively plentiful.

High level of movement to east shore waters from west shore villagers: up to 1 month trips.

Quiet backwaters, tiny bays ('*Ahaar*') forming in modern delta with abundant fishing by Dasanech.

**DECEMBER to MAY: AKIBONG ANAM**

Omo River quiet, much reduced.

Currents: Not strong, slowed considerably.

Winds: Extremely strong, from southeast, in early phase; then quieted. Travel on lake possible as winds subside.

Lake level: Swelling gradually dwindling back toward minimum.

Fishing: Most lake travel suspended because of high winds in early phase.

After winds subside, major travel possible: fishing expeditions to lake's eastern shoreline, northern shoreline, etc.

**JUNE - JULY: ALELES NGAITIA**

Omo River: Relatively quiet, low inflow to lake. Currents relatively slow to moderate.

Winds: Moderate, allowing traditional boats throughout the lake.

Lake level: Northern waters only slightly swollen relative to rest of the lake.

Ferguson's Gulf -- waters reduced, low level.

Fishing: Expeditions throughout eastern lake as well as northern shoreline and modern delta (day expeditions, due to Dasanech opposition).

Ferguson's Gulf – catch levels reduced.

Destinations dependent on boat type, gear, labor issues.

Note: Many refer to "the time of many birds breeding" for this period.

Fishing seasons contrast with pastoral ones, with fundamentally different factors for livelihood. Monthly periods indicated are approximate and fluctuate with environmental conditions. Much variation in villagers' use of these terms also exists in the northern and central regions

Fishing conditions in the lake would be drastically altered by even short-term cessation of Omo River inflow, which would eliminate the river's annual pulse of freshwater, sediment and nutrients. Major destruction of fish habitat and plummeting fish catch would result—decimating the livelihood of Turkana fishing communities.



**Fig. 9.7** Turkana girl and villagers with dried fish pallets set at roadside for transport to market. These pallets here have remained for two weeks, awaiting merchant pickup

As according to fishing elders from villages along the western shoreline, Turkana fishers forming camps along the eastern shore of the lake frequently mingle with El Molo fishers in their targeting of tilapia, Nile perch, and other species. They are at considerable risk of attack, however, by Dasanech from the east shore and by Gabbra herders (Fig. 1.3).

Conflicts between Turkana and Dasanech fishers (described in Chap. 7) are frequent and often involve gear thefts and killings—particularly in the northern lake waters and around the Omo delta where the two groups compete for limited fish stocks during many months of the year. According to all fishers, these stocks are greatly stressed by the large commercial fishing boats based in Ethiopia. Turkana sailboats and gear are generally far superior to the technology available to the Dasanech—another contributing factor to conflict. In a survey of Turkana fishing households in several different village complexes along the northwestern shoreline of the lake, this writer and other SONT researchers recorded numerous accounts of gear theft and killings between Dasanech and Turkana fishers.

*As the survival systems of both the northern Turkana and the Dasanech continue to decline and the influx of pastoralists 'refugees' to the lake economy increases, the conditions for violent conflict intensify.*

- **Fishing for markets is a precarious enterprise for the northern Turkana villagers.** As early as the 1960s, some fishers have sent fish—primarily tilapia and Nile perch—to Kitale, Lake Victoria and other Kenyan markets. Preparation of catch for market has not changed substantially over the years. There are no post-catch facilities for cleaning fish, so fish are commonly cleaned on the sandy shores of the (therefore, deemed of reduced quality in markets), then salted and sun-dried on netting racks strung well above the ground (Figs. 1.3 and 9.9). Dried fish for marketing are stacked and bound onto large pallets and left at the roadside (Figs. 9.3 and 9.7). Pallets are picked up at irregular times by merchant truckers and moved to markets in Kalokol and Lodwar within Turkana, as well as to Kisumu by Lake Victoria and elsewhere in Kenya. The price paid to villagers is entirely set by the merchants and fluctuates widely. These are matters of real distress to northern Turkana fishers, since the number of days between pallet preparation and merchant pickup can be so extended that their financial return for their efforts is miniscule.

While household commodity production—including the common activities of charcoal preparation and chicken/geese raising—is easily incorporated into customary Turkana social relations, commercial relations have generally brought new pressures to the Turkana (Fig. 9.5). Instead of participating in community-based fishing and marketing, for example, a few villagers have now become fish merchants themselves. Local community members view them with some scorn and such privatization style change suggests the potential future impacts of commercial systems on traditional cooperative relationships—should fishing even survive as a means of livelihood in the region.

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## Fishing Shoreline Communities: Household Practices and Resources

SONT researchers conducted a survey of the practices and outcomes of fishing by households in three distinct settlement areas along the lake, between Ferguson's Gulf and Todenyang (Fig. 9.4). Randomly selected household heads were questioned about their livelihood activities and status. Data for 35 households from the different settlement areas are summarized in Table 9.2.

### Major patterns emerging from this survey include the following

- Considerable uniformity exists within and among fishing communities in terms of fishing location and patterns of consumption versus marketing of catch. There is also little variation in types of household commodity production.
- More than half of all households had been settled along the lake for fewer than ten years, 25 % for twenty to forty years and only 2.8 % for more than forty years. In general discussion, many household heads indicated that they remained at the lake following the failure of aid development projects they had been part of, since they had insufficient resources to return to pastoral life.
- Villagers from the northern area (Todenyang, Lowarengak) were from upland pastoral areas such as Lokitaung (Fig. 9.4) and relatively closer to Ilemi pastures. Many from the Kalokol region have arrived from Eliye Springs or lands toward Lodwar and northward while others arrived from villages in the extreme northwestern shoreline area (Fig. 9.8). All households settled along the lake for last resort survival activities after the loss of all or nearly all of their livestock from starvation and disease during drought times or from raids by adjacent ethnic groups.
- All households took up fishing almost immediately after settling by the lake (mostly on others' boats). Of the 35 fishing household heads surveyed, 12 owned (or co-owned) wooden boats. A number of fishers in the Kalokol/Ferguson's Gulf area used doum palm rafts, most of them stating that they could not afford a boat. Nariokotome and Nachukwi (north of Kalokol) were the only village areas surveyed where a substantial number of fishers owned their boats. Very few had been able to purchase an engine—a matter of real frustration among these fishers.
- Food for household consumption consisted primarily of fish, with occasional meat (from purchase with proceeds from fish marketing or from barter with nearby pastoral households). International food aid, primarily in the form of maize meal or powdered milk, has provided occasional temporary relief for households in some locales; others have received no aid at all.
- A minority of fishing households surveyed (approximately 17 %) undertook some type of household-based commodity production, such as preparation and marketing of charcoal, grass mat weaving and chicken raising, in order to purchase additional food (Figs. 9.5 and 9.9).

As described earlier for the region as a whole, most fishing households engage in regular exchange (both barter and sale/purchase) with nearby pastoral or mixed pastoral/fishing villagers. Most needed to market a relatively high proportion of their fish catch, however, and worked cooperatively with surrounding households. The prices paid by merchants for sun-dried and salted fish picked up at the roadside were inconsistent among lakeside villages. Villagers complain that they are powerless in this regard since they have to accept whatever the fish merchant will pay. At the time of the SONT survey, a large pallet of sun-dried mixed species fish brought the low price of about 30 Kenyan shillings/kg in villages near Lowarengak, for example. Nile perch clearly commanded the highest return—about 150 Kenya shillings/kg, except for fish 'maws' (entrails).<sup>9</sup>

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<sup>9</sup>At the time of survey, USD 1 was equivalent to about 80 Kenyan shillings.

Table 9.2 Household Survey in Lake Turkana Fishing Communities: A Summary

Household number*	1	2	3	4	5	6	7	8	9
Village	Todenyang	Lowarengak	Lowarengak	Lowarengak	Nakitoe-konon	Nakitoe-konon	Nadoupua	Nadoupua	Loreskawotolem
Number years lived at lake	20	10	4	13	3	12	10	20	8
Prior village areas	Lowarengak	Pringan, Naki-toekonon	Lochwa Arengan Kachoda	Todenyang Lokitaung	Lomekwi Kalokol	Lowarengak Kakuma	Lowarengak Kakuma	Todenyang Kakuma	Lokitaung Kateng
Reason moved to lake	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss
Major household food **	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish
Own boat	Yes	No	Yes	No	Yes	No	No	Yes	No
Boat type	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood
<b>Fishing: Jan to Apr 2011</b>									
Area fished	Kanamukuny	Ileret	Ileret	Kanamukuny	Ileret Kambi	Lowarengak Ileret	Deep water	Deep water	Deep water
Catch/month: Kg (dried) fish	30	120	200	20	520	40	300	130	230
Fish consumed per month (kg)	30	30	80-100	14	20	60	180	30	50
Number of fish marketed per month (approximate)	70	190	2600	23	300	300	100	80	180
Other areas fished	None	Selicho	Selicho Delta	Ileret, Delta	Ileret	Ileret	Lowarengak	Kanamukuny	Ileret Kanamukuny
Main target fish	Labelo, Tilapia	Labelo, Tilapia, Nile perch	Nile perch	Nile perch	Labelo N. perch	Labelo	Labelo	Tilapia	Tilapia
Fish prep. for market	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)
Market destination	Kalokol Kisumu	Kalokol Kisumu	Kalokol Kisumu	Kalokol Kisumu	Kalokol Kisumu	Kalokol	Lowarengak	Lowarengak	Lowarengak

(continued)



Table 9.2 (continued)

Household water source	Lake	Lake	Well	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake
<b>Own livestock</b>	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cattle	0	3	8	5	0	0	0	0	0	0	0	0
Small stock	0	10	5	3	27	5	14	33	5	33	5	5
Camels	0	2	4	0	0	0	0	0	0	0	0	0
Other food sources	No	No	No	No	No	No	No	No	No	No	No	No
Household commodity sale	No	No	No	No	No	No	No	No	No	No	No	Charcoal
Relief aid	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom
<b>Household number*</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>17</b>	<b>18</b>	<b>18</b>
Village	Nadoupua	Nadoupua	Nadoupua	Nadoupua	Nadoupua	Nadoupua	Nariokotome	Nariokotome	Nariokotome	Nariokotome	Nariokotome	Nariokotome
Number years lived at lake	30	40	5	3	22	8	13	23	9	23	9	9
Prior village areas	Lowarengak Kakuma	Born	Lowarengak Todenyang	Lowarengak Todenyang	Lowarengak Turkwel	Lowarengak Kakuma	Todenyang	Lowarengak Kakuma	Lowarengak Todenyang	Lowarengak Kakuma	Lowarengak Todenyang	Lowarengak Todenyang
Reason moved to lake	Livestock loss	N/a	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss
Major household food **	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish
Own boat	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boat type	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood	Wood
<b>Fishing: Jan to Apr 2011</b>												
Area fished	Deep water	Deep water	Deep water	Deep water	Ileret	Choro	Deep water	Ileret Choro	Ileret Choro	Ileret Choro	Ileret Choro	Ileret Choro

(continued)

Table 9.2 (continued)

Catch/month: Kg (dried) fish	210	300	25	170	300	100	27	305	160
Fish consumed/ month (kg).	50	140	15	90	140	47	52	30	80
Number fish marketed/ month.	160	220	50	210	430	203	50	490	190
Other areas fished	Ileret	Ileret	Ileret	Kanamukuny	Kanamukuny	Choro	Ileret	Choro, Ileret	Choro, Ileret
Main target fish	Tilapia, Labeo	Nile perch Tilapia, Labeo	Nile perch Tilapia, Labeo	Nile perch Tilapia, Labeo	Nile perch Tilapia, Labeo	Nile perch	Labeo	Nile perch Distichodus	Nile perch Labeo
Fish prep. for market	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)
Market destination	Lowarengak	Lowarengak	Lowarengak	Lowarengak	Lowarengak	Kakuma	-	-	-
Household water source	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake
<b>Own livestock</b>	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Cattle	0	0	0	0	2	0	0	0	0
Small stock	38	8	3	0	43	5	12	26	8
Camels	0	0	0	0	2	0	0	2	0
Other food sources	No	No	No	No	No	Work in mission	Work in mission	Work in mission	No
Household commodity sale	No	No	No	No	No	No	No	No	No
Relief aid	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom
<b>Household number*</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>
Village	Nariokotome	Nariokotome	Nachukwi	Nachukwi	Nachukwi	Nachukwi	Nachukwi	Nachukwi	Kalochoho
Number years lived at lake	5	30	18	10	9	18	10	24	8
Prior village areas	Lowarengak	Lowarengak	Lowarengak	Lowarengak	Lowarengak	Kakuma	Kataboi	Kalokol	Kalokol

(continued)

Table 9.2 (continued)

	Kalokol	Ngomeris	Todenyang	Todenyang	Todenyang	Livestock loss	Kalokol	Lobolo	Lodwar
Reason moved to lake	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss
Major household food**	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish
Own boat	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Boat type	Wood	Wood	Wood	-	Wood	Wood	Wood	Wood	Wood
<b>Fishing: Jan to Apr 2011</b>									
Area fished	Nariokotome	Nariokotome	Choro	Ileret	Ileret	Choro	Ileret	Ileret	Deep water, Kalochoro
Catch/month: Kg (dried) fish	250	430	30	202	-	68	30	42	145
Fish consumed/ month (kg).	60	80	20	30	-	30	60	220	90
Number fish marketed/ month.	370	620	84	120	-	90	310	400	300
Other areas fished	Choro, Ileret	Choro, Ileret	Choro, Ileret	Choro, Ileret	-	Choro	Choro	-	Kerio
Main target fish	Nile perch Labeo	Nile perch	Nile perch Labeo	Nile perch Labeo	-	Nile perch Labeo	Nile perch Labeo	Tilapia, Labeo	Distichodus, Labeo
Fish prep. for market	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	-	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)
Market destination	-	-	Kalokol Kakuma	Kalokol Kakuma	-	Kalokol Kakuma	Kalokol Kakuma	Kalokol Kakuma	Kalokol
Drinking/cooking water	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake
<b>Own livestock</b>	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cattle	0	0	0	0	0	0	0	0	0
Small stock	8	8	8	10	8	8	3	9	10
Camels	0	0	3	9	3	3	2	6	0
Other food sources	No	No	No	Work in mission	No	No	No	No	No
Household commodity sale	No	No	No	No	No	No	No	No	Sell mats baskets
Relief aid	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom

(continued)

Table 9.2 (continued)

Household number*	28	29	30	31	32	33	34	35
<b>Village</b>	Kalochoro	Kalochoro	Kura	Kura	Kura	Kura	Namadak	Namadak
Number years lived at lake	13	6	4	7	12	8	20	13
Prior village areas	Kataboi Kalokol	Namadak Kalokol	Lodwar	Lodwar Kataboi	Todenyang	Todenyang	Eliye Springs Kerio	Lobolo, Eliye Springs
Reason moved to lake	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss	Livestock loss
Major household food **	Fish	Fish	Fish	Fish	Fish	Fish	Fish	Fish
Own boat	No	No	No	No	Yes	No	No	No
Boat type	Wood	Wood	Raft	Raft	Wood	Wood	Raft	Raft
<b>Fishing: Jan to Apr 2011</b>								
Area fished	Deep water, Kalochoro	Deep water, Kalochoro	Kura, Karipun Longech	Kura Longech	Kura Longech	Kura Longech	Namadak Namukuse	Namadak Namukuse
Catch/month: Kg (dried) fish	240	170	400	370	3,000	4,000	2,000	1,500
Fish consumed/ month (kg).	50	78	50	70	40	400	200	50
Number fish marketed/ month.	120	320	2,000 fingerlings	2,400 fingerlings	2,100 fingerlings	16,000 fingerlings	9,000 fingerlings	7,000 fingerlings
Other areas fished	Nariokotome	Kalochoro Nariokotome	Ekwar Adisi (Ferguson's Gulf)	Ekwar Adisi (Ferguson's Gulf)	Ekwar Adisi (Ferguson's Gulf)	Ekwar Adisi (Ferguson's Gulf)	Namukuse Ferguson's Gulf	Lokoro Ferguson's Gulf
Main target fish	Distichodus Labco	Distichodus Labco	Tilapia Clarias	Tilapia Clarias	Tilapia Clarias	Tilapia Clarias	Tilapia	Tilapia
Fish prep. for market	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)	Sundry (salt)

(continued)

**Table 9.2** (continued)

Market destination	Katokol	Katokol	Katokol	Katokol	Katokol	Katokol	Katokol	Katokol	Katokol	Katokol
Household water source	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake
<b>Own livestock</b>	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
Cattle	0	0	0	0	0	0	0	0	0	0
Small stock	8	12	0	0	0	10	13	7	7	7
Camels	0	0	0	0	0	5	0	0	0	0
Other food sources	No	No	No	No	No	No	No	No	No	No
Household commodity sale	Sell mats baskets	Sell mats baskets	No	No	No	No	No	No	No	No
Relief aid	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom	Seldom

<sup>a</sup>Household head interviewed; <sup>b</sup>Occasional maize meal from food aid organizations



**Fig. 9.8** Turkana life at Ferguson's Gulf and northward along shoreline. *Top left* Children on beach, near Kenya-Ethiopia border. *Top right* beach at Ferguson's Gulf. *Bottom left* Goats watering at Ferguson's Gulf. *Bottom right*, Lower right Girl washing clothes from doum palm raft



**Fig. 9.9** Turkana woman drying fish for marketing with secondary geese/chicken—raising

### Fish Species and Critical Habitats

*Fishing villages all along the west shore depend almost entirely on fishing for their survival, with the number growing all the time. A viable alternative way of survival is rare among them.*

[GOK fisheries officer in Kalokol]

➤ **Local accounts of important fish and their favored habitats, recorded by SONT researchers summarized in Table 9.3, point to the devastating impacts that the Gibe III dam and dam linked irrigated commercial agricultural development would have shoreline retreat would have on critical fish environments and indigenous fishing.**

- Habitats for breeding and early life cycle stages for some of the most important fish species for northern Turkana fishing communities are concentrated along the northern shoreline of the lake and the Omo delta, where the annual flood pulse of the Omo River provides major freshwater and nutrient contributions to the lake—as well as in Ferguson’s Gulf, Alia Bay and several other key fishing habitats along the lake’s shallow locales.
- **The two most important catch species for the Turkana—Nile perch and Nile tilapia—depend on these habitats.** Tilapia lay their eggs and hatch in grassy or reed areas along the shoreline in Ferguson’s Gulf and in other bay waters. Tilapia fingerlings mature along the lake’s muddy shores. Nile perch, on the other hand, lay eggs and hatch in deep water, but juveniles feed on tilapia and other species’ fingerling populations in the delta and along the shoreline. Their presence in the northern shoreline and delta area corresponds with the Omo’s annual flood and annual pulse of lake inflow between early August and December. Nile perch also migrate upstream in the Omo River, where they provide subsistence to the

poorest Dasanech and Nyangatom communities. Three different species of tilapia: *Orochromis niloticus*, *Sarotherodon galilaeus* and *Tilapia zillii*, are caught in the river, dried and sold to the export-oriented fishing enterprises operating from Ethiopia.

- Turkana fishers report a larger number of migrating species than are described in the scientific literature. Of the more than 50 fish species recorded for Lake Turkana, at least 12 are of major significance to the Turkana fishing communities. Hopson (1982) describes four different fish communities in the lake: a littoral assemblage, an inshore assemblage, an offshore demersal assemblage, and a pelagic assemblage. Eleven fish species are endemic to the lake—nearly all of them living in the offshore pelagic or demersal zone (Lowe-McConnell 1987). During the river's annual flood, some of these migrate up the Omo River and breed for various periods (Hopson 1982; Beadle 1981; Lévêque 1997). These species include *Alestes baremoze*, *Hydrocynus forekalii*, *Citharinus citharus*, *Distichodus niloticus* and *Barbus bynni*.
- During the early months of the year, currents come from the north, with relatively light Omo River inflow, so Turkana communities from the western shoreline can access both the Omo delta/northern shoreline areas and the eastern portion of the lake, along with all available areas along the western shoreline. These conditions often have facilitated a relatively high fish catch. Local fishermen report catch levels range from 30 to 4000 kg (kilograms per month) during the comparatively favorable February to April period. This wide range of catch values reflects a multiplicity of factors, similar to those identified earlier for seasonal movements (e.g., access to boats and gear, available labor, number and duration of fishing expeditions, current and wind conditions, and shifts in target fish locales.) Catch values of 1000–4000 kg were recorded only for fishers at Ferguson's Gulf area—primarily those fishers possessing sailboats with engines.

Table 9.3 lists those fish deemed most important by local fishers, along with identification of critical fish reproductive and life cycle habitats, as well as their estimated sensitivities to lake level change. Localities and seasonality of fishing basically conform to the seasonal movements and fish reproductive habitat locations indicated in Fig. 9.4. A view of progressive lake level drop—predictable from Gibe III and commercial scale irrigated agricultural developments—is presented in Fig. 9.10. A closer view of progressive lake level drop—including changes to be expected in the earliest phase of these developments, is shown for the Omo delta and Ferguson's Gulf in Fig. 9.11.

**Given the density of northern fishing communities, the shoreline fish habitats on which they depend, their already precarious nutritional status and the borderline potability of lake water, Turkana fishing communities are clearly vulnerable to catastrophic level destruction from lake retreat caused by the planned Omo basin developments.**

## Counting the Discounted: Northern Turkana Population at the Lake

- **The question remains as to just how many Turkana are vulnerable to such livelihood destruction in terms of possible destruction of the lake fishery loss of the lake resources for livestock raising and access to potable water for basic household needs.**

**It is apparent from the Kenyan government, development bank and other international agency documents and particularly the 2009 national census by the Kenyan government, that the lakeside population remains vastly underestimated in official records.** This fact is basic to the government and banks' failure to account for its vulnerability to demise from the planned developments in impact assessments and other reports. The SONT research project had insufficient resources to be able to accurately assess the numbers of Turkana facing these threats, let alone the population of other vulnerable ethnic groups around the lake—a calculation that must include Dasanech, Gabbra, and El Molo communities (Fig. 1.3). Targeted information gathering from local records (when available), meetings with council of elders members were the only realistic means available for establishing a rough estimate. Moreover, village populations along the lake, as well as pastoral/fishing ones slight removed from the lake, shift rapidly with changing social and environmental conditions both in the lake zone and the upland plains. (Fig. 9.4).<sup>10</sup>

<sup>10</sup>Fishing and pastoral/fishing village complexes shown in Fig. 9.4, for example, are mapped in relational terms, since GPS was not available to SONT researchers at the time of survey.

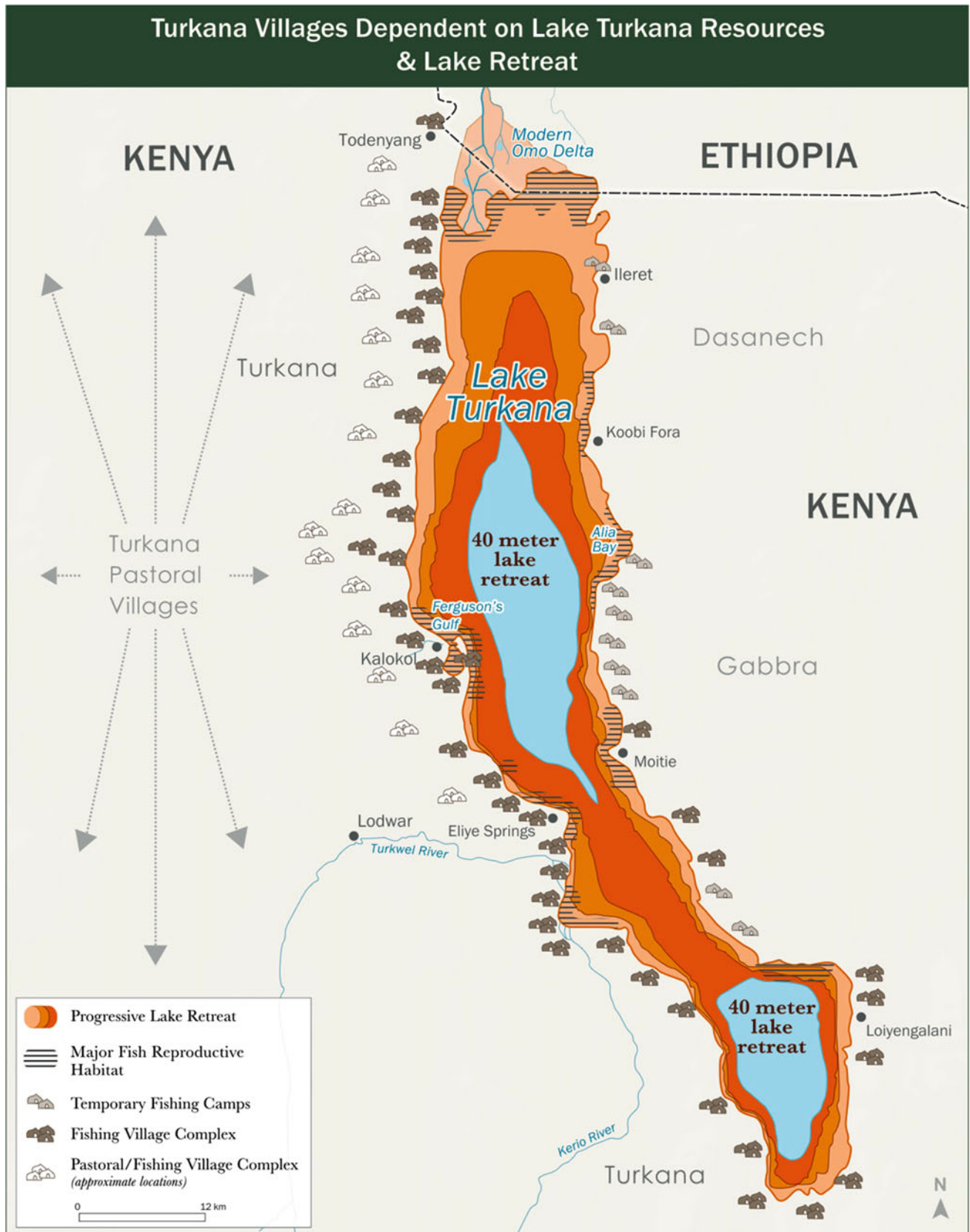


**Table 9.3** Lake Turkana fish species and habitats of importance to Turkana fishing communities

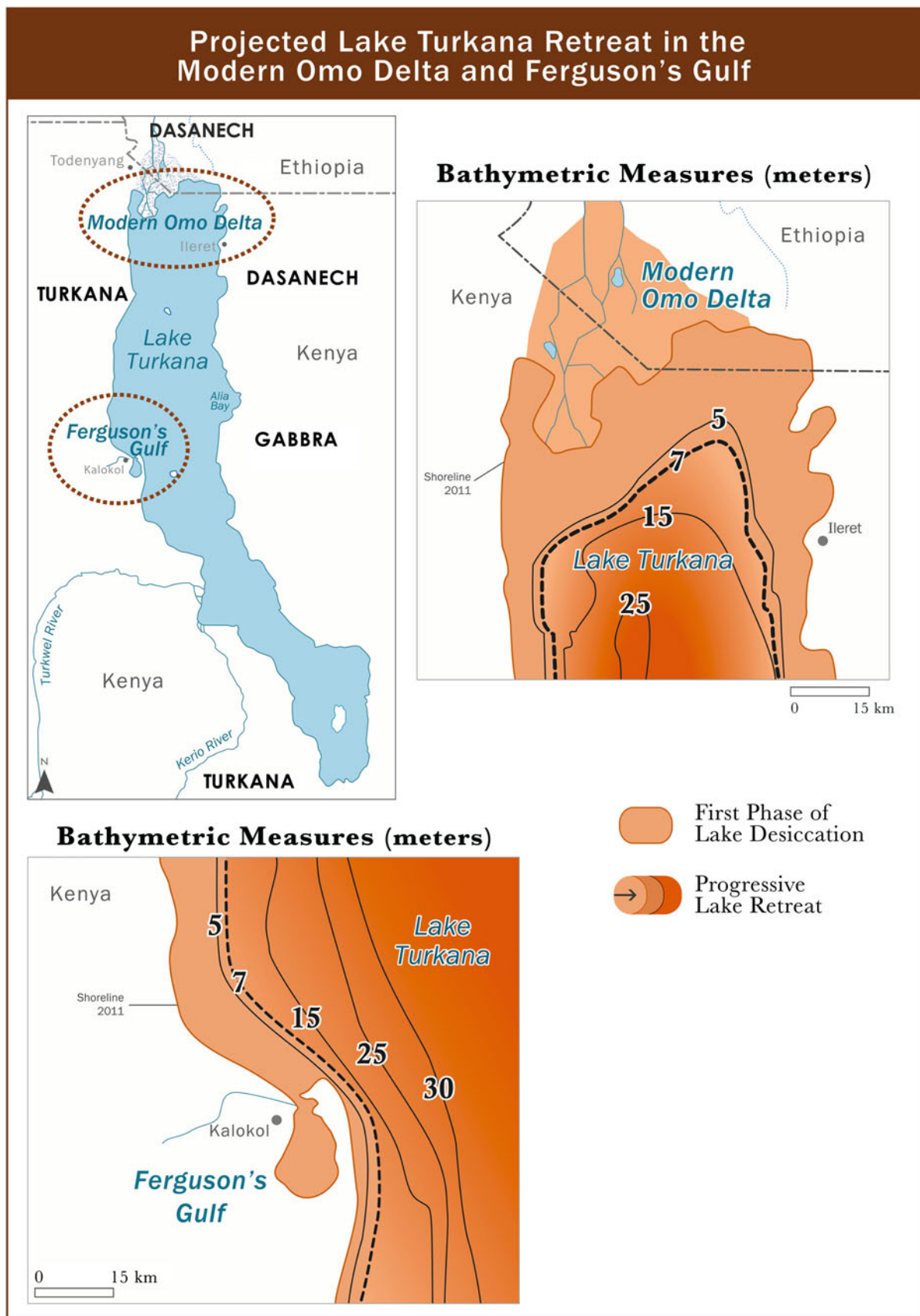
Scientific/Common Names	Turkana Name	Area most fished by Turkana and Spawning Habitat	Importance to Turkana Survival System	Sensitivity to Lake Retreat
Tilapia spp, including: <i>T. nilotica</i> <i>T. galilaea</i> <i>T. zillii</i> <i>Oreochromis niloticus</i>	Kokine	Delta, near shore, Ferguson's Gulf, bays <i>Spawn:</i> Delta, Ferguson's Gulf, shorelines	◆◆◆ Critical Consumption, Marketing	<b>3 Extreme</b> Loss of spawning habitat; desiccation of delta, shoreline, Ferguson's Gulf and bays.
<i>Lates niloticus</i> Nile Perch	Iji	Delta, north shore, North and Central Islands <i>Spawn:</i> Pelagic, but juveniles feeding in delta	◆◆◆ Critical Consumption, Marketing	<b>3 Extreme</b> Feeding habitat and catch habitat destruction
Labeo Horrie	Chubule	Delta, nearshore, some throughout lake <i>Spawn:</i> Grassy shore areas	◆◆◆ Critical Consumption Marketing	<b>3 Extreme</b> <b>Loss of spawning habitat and catch habitat destruction</b>
<i>Distichodus niloticus</i>	Golo	Delta, north shore, shorelines <i>Spawn:</i> Delta-Omo R. (grassy shoreline)	◆◆◆ Critical Consumption, Marketing	<b>3 Extreme</b> Spawning and catch habitat destruction
<i>Clarias lazera</i> Catfish	Kopito	Delta, north shore, near shore <i>Spawn:</i> Muddy shallow water, grassy reeds	◆◆◆ Critical Consumption, Marketing	<b>3 Extreme</b> Spawning habitat destruction
<i>Synoclonotis</i> sp.	Tir	Shoreline <i>Spawn:</i> Shoreline	◆◆◆ Critical	<b>3 Extreme</b> Spawning/ juvenile habitat loss
Alestes - including: <i>A. dentex</i> <i>A. baremose</i> <i>A. nurse</i>	Juuze	Delta, north shore, Ferguson's Gulf, bays, offshore, flood shallow <i>Spawn:</i> Delta, bays, North Island	◆◆◆ Critical Consumption, Marketing	<b>3 Extreme</b> Spawning/ juvenile habitat Destruction (except North Island)
<i>Citharinus citharus</i>	Gesh	Delta, north shore, near shore, general lake <i>Spawn:</i> Delta	◆ Significant Consumption (limited)	<b>3 Extreme</b> Spawning and feeding habitat destruction
<i>Hydrocynus forkalii</i> Tigerfish	Lokel	Delta, shoreline, offshore <i>Spawn:</i> Delta	◆◆ Major Consumption	<b>3 Extreme</b> Spawning habitat destruction
<i>Barbus turkanae</i> <i>B. bynni</i>	Momwara	Delta, near shore, offshore (schools) <i>Spawn:</i> Delta	◆◆ Major Consumption (limited) Marketing	<b>3 Extreme</b> Spawning habitat
<i>Bagrus</i> spp. Balck Nile Catfish	Loruk	Offshore/ demersal. <i>Spawn:</i> General lake	◆◆◆ Critical Consumption, Marketing	<b>1/2 Moderate/high</b>
<i>Schilbe uranoscopus</i>	Naili	Delta, north shore <i>Spawn:</i> Delta	◆◆ Major Consumption (northern region )	<b>3 Extreme</b> Spawning habitat destruction
<u>Cichlidae</u>	Loroto	Deltas, shallow water	◆ Significant Consumption Marketing	<b>3 Extreme</b>
<u>Bagridae-</u> (giraffe catfish)	bulubuluch	Delta only	◆ Significant Consumption	<b>3 Extreme</b>

**Key:**  
-- Importance to Turkana Survival System: ◆ = significant. ◆◆ = major, ◆◆◆ = critical  
-- Sensitivity to Lake Retreat: 1 = moderate, 2 = high, 3 = extreme

Identification of taxa and assessment of habitat sensitivity described by local fishermen from villages along Lake Turkana's northwestern shoreline



**Fig. 9.10** Bathymetric representation of Lake Turkana retreat from Gibe III Dam and linked irrigation agriculture. *Source* ARWG; bathymetric base map from Hopson (1982)



**Fig. 9.11** Desiccation of Ferguson's Gulf and the modern Omo delta: projected from Gibe III dam and irrigated enterprises along the Omo River. Source ARWG; bathymetric values from Hopson (1982)

Some of the figures obtained were markedly below certain non-governmental organization estimates—even radically so, as in the case of Kalokol town, which was recorded by several nonprofit groups as 55,000 whereas the SONT estimate (from consultations with local elders and aid agency figures) was closer to 30,000. Since the population of Kalokol fluctuates greatly with economic and environmental conditions, this is not surprising. Other estimates, such as those by Oxfam for a number of village/town locales along the lake—recorded in 2007 (*prior to the 2007–2010 drought*), were lower. *The highest population figures, however, provide the best indication of the central and northern Turkana's vulnerability to the decline or disappearance of Lake Turkana's waters and living resources.*

Local Turkana administrators and council of elders members consistently described to SONT researchers that the GOK's 2009 census takers:

- Recorded populations only in major centers, avoiding the more populous outskirts.
- Avoided rural areas near the lake where most Turkana live (all local administrators questioned by SONT attest to the fact that there are often more people living between main village complexes than within them). The GOK Census states that census takers recorded very large areas (often hundreds of square kilometers around towns). Local officials questioned gave contrary accounts—namely, that GOK census takers did not record the large and diffuse populations in lands surrounding those towns visited.
- Did not request the direct cooperation of locally chosen administrators—individuals who are trusted by local residents and far more knowledgeable about their communities and population sizes.
- Recorded information from children and others unlikely to report accurately, rather than from heads of household.

Population estimates from SONT efforts with community members were taken primarily during the dry season. As noted earlier, the populations of these complexes can fluctuate widely with changing environmental and social conditions.

Even a conservative estimate of the population dependent on the lake's resources points to at least **300,000 Turkana who are** dependent on the lake's waters—for household members' daily consumption, for fishing and/or for livestock watering and grazing, and many exchange relations involving lake resources.

- **The Turkana population surrounding Ferguson's Gulf is particularly vulnerable to major hunger and disease conditions brought about by the retreat of Gulf waters, accompanied by fishery collapse.** Together with council of elders members, SONT conducted a preliminary survey of villages around the Gulf, and continued data collection at Kalokol and northward along the western shoreline. *This work consistently produced larger figures than those released by the 2009 GOK census.* Moreover, this population is overwhelmingly likely to swell as environmental and economic 'refugees' move southward along the lake and toward the lake from the upland plains. Ferguson's Gulf, along with the northern reaches of the lake, must be anticipated to suffer the most immediate effects of early lake level drop from the developments underway (see Fig. 9.11).
  - Lake retreat caused by the Gibe III dam's inevitable radical reduction of Omo River inflow, even during the presumed reservoir-fill, would desiccate Ferguson's Gulf as indicated in the bathymetric of Figs. 9.10 and 9.11.<sup>11</sup>
  - The extremely shallow waters and biochemical characteristics of Ferguson's Gulf support major reproductive habitats for fish species critical to the Turkana and intensive fishing activity during parts of the year. These critical fish habitats would be eliminated by even the first phase of lake retreat (Figs. 5.2 and 9.11).

As this book goes into print, there is substantial evidence of major river flow reduction from closure of the Gibe III dam and reservoir filling, and early reports from villagers in both the lowermost Omo at Lake Turkana suggest both that recession agriculture in the delta and riverside environments and the river's annual pulse of freshwater, sediment and nutrients into the lake are fully compromised. All communities contacted report fish catches reduced, although to date, no systematic

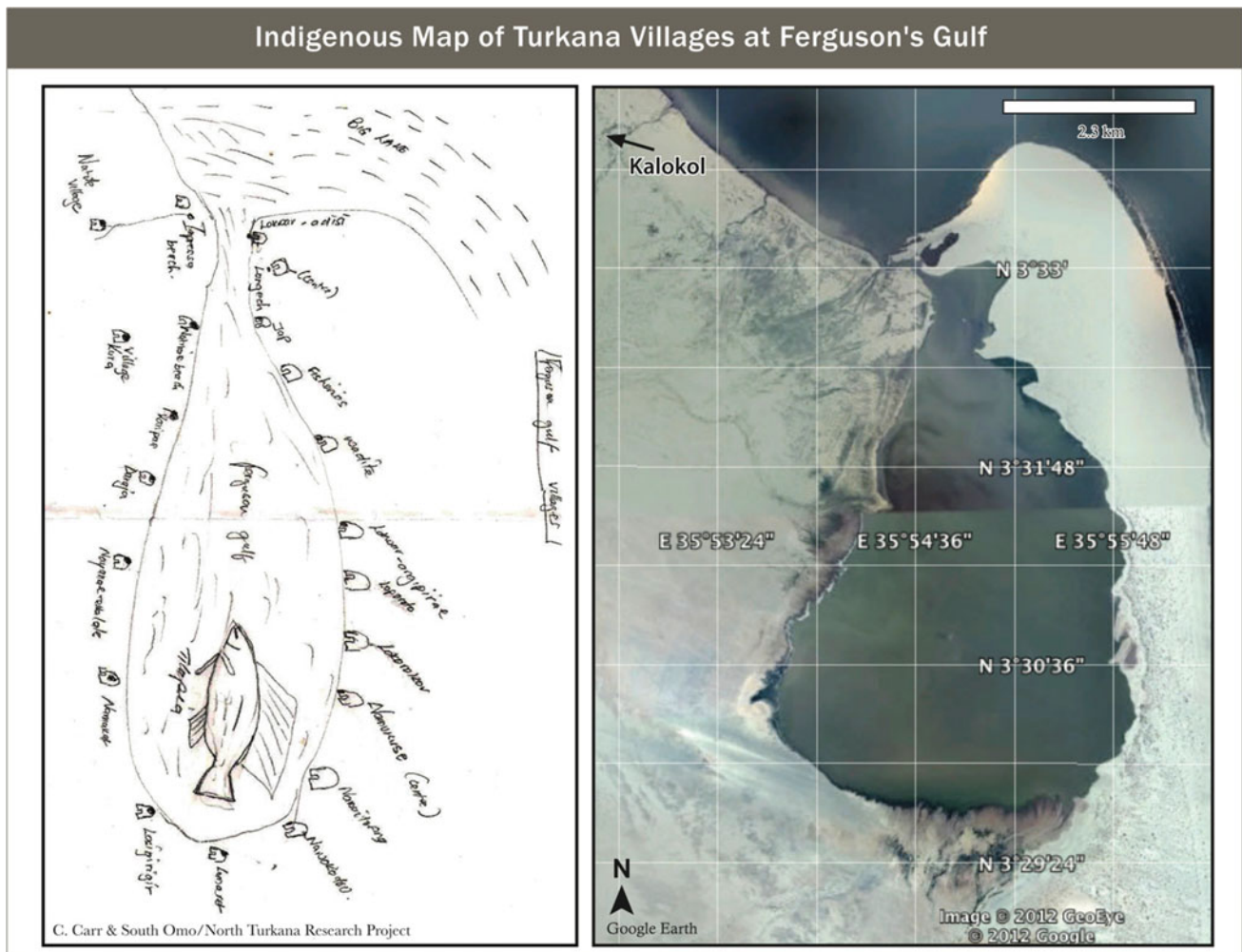
<sup>11</sup>Gulf locales measured 5–6 m in depth as recently as 2005 were only 2.5–3 m by 2013, according to local fishery officer reports to SONT researchers. The mouth of Ferguson's Gulf, once more than 1800 meters wide (according to figures quoted from the East African Common Services Organization in the early 1960s), has become so nearly closed and shallow that even small wooden vessels typically could not pass through the mouth and had to remain in the main lake waters (Fig. 9.11).

investigation has been possible. The possible role of climate change in worsening the lake level impact from Gibe III dam and irrigated agricultural development is unknown, but it is likely to be substantial in the longer term.

➤ **Turkana fishing villages extend around the (Longech) spit at the Ferguson’s Gulf opening to the lake, and continue into lands between the Gulf and the town of Kalokol, where nearly all villagers are engaged in fishing activities in one way or another.** Many of them bring livestock and are part of the pastoral/fishing complexes described earlier. To the extent possible, herd owners keep their small stock locally (Figs. 4.6 and 9.2) and groups of thousands of small stock can be seen trekking to the lake for watering any grazing that is available. Camels are typically sent inland and are only brought to the lake for watering when necessary.

Council of elders members at Ferguson’s Gulf drew a map of villages present at the time of SONT’s visits in late 2012, as shown in Fig. 9.12. The supplementary Google Earth image of Ferguson’s Gulf indicates the high level of accuracy with which these individuals (relationally) represented their villages, despite no previous experience with maps. Based on estimates earlier submitted to local officials, elders reported the population totals listed in Table 9.4. While figures for individual locales sometimes fluctuate greatly with shifting economic, environmental and other conditions, the overall totals are representative of the settlement presence and Turkana dependence on the Gulf’s resources.

*Most of these villages were not even included in the GOK’s census; others were greatly underestimated.* For example, the population for Namukuse village area was under-represented by at least 40 % in the census. For an accurate estimation of the



**Fig. 9.12** Indigenous map of Turkana villages at Ferguson’s Gulf. Source Local Council of Elders from the Gulf region—meetings and field reconnaissance with SONT researchers. Satellite map added

**Table 9.4** Population estimates from Ferguson's Gulf region

Longech <sup>a</sup>	12,000
Lomaret	500
Jap	2000
Losigirigir	200
Village (South. of Jap) <sup>b</sup>	1800
Namakata	1000
Wadite	3000
Nayanae ekalale	500
Lokwar angipirea	1500
Daraja <sup>c</sup>	650
Loporoto	800
Karepun	700
Lokorokor	3000
Natirae	1500
Namukuse	10,000
Kura	3500
Village-near above	900
Impressa	5000
Nawoitrong	1000
Natole	4000
Nawokodu	500
Total population	54,050

*Source* Council of Elders (from prior accounts reports to aid officials) as reported to SONT researchers in field-based meetings

<sup>a</sup>Cholera outbreaks known

<sup>b</sup>Former GOK fisheries camp

<sup>c</sup>Former NORAD project locale

vulnerable Turkana population actually dependent on the Ferguson's Gulf region, the populations of Kalokol town, its immediate environs, and the area between Kalokol town and Ferguson's Gulf must be added. Estimates from local administrators (in private consultation) and council of elders members were:

Kalokol town 11,500 (GOK census figure; larger environs not recorded)

Kalokol (outlying)—4500 (incl. Nakiria—2300)

This estimate excluded additional population segments essential to include, but such a survey was beyond the logistical capabilities of the SONT team. These population components include:

- Thousands of pastoral/fishing Turkana in settlements slightly more removed from the lake but fundamentally dependent on its resources for their survival (Fig. 9.4).
- Villagers diffusely settled between Kalokol town and Ferguson's Gulf.

Based on above estimates for the immediate Ferguson's Gulf, area combined with Kalokol and its outlying communities, the affected resident population in the Gulf area was at least **70,050**.

In all probability this estimate is a conservative one, due to the continued migration to the lake since the time of this SONT survey.

The drying out of the Gulf would produce crisis level of hunger for both the population residing around the Gulf itself and for multiple thousands of Turkana living in locales slightly removed.

The Turkana population residing along the western shoreline is not only acutely vulnerable to economic collapse: it is also threatened with major disease epidemics, including cholera. According to U.N. data, cholera in the Turkana region is already one of the highest in Kenya, with recorded outbreaks along the western shoreline of Lake Turkana, especially around Kalokol (Africa Health 1998).

- **Population estimates for towns along the shores of Lake Turkana between Kalokol and the Ethiopia/Kenya border (Fig. 9.4) present a similar picture of major exclusion by the Kenya government's 2009 national census.** Along with nearby large village complexes, these areas were recorded by SONT members with assistance from local government administrators, council of elders members, and Beach Management Unit members (local residents who are government appointed). The results are summarized in Table 9.5; data excludes populations of villages scattered between population centers—areas that must be included for a minimally acceptable population estimate for the northern Turkana region. Local officials describe the density of people and livestock in these areas as considerably swollen following major stress conditions in upland plains to the west and northwest. *Both administrators and elders reported that most of these village areas were not visited by government census takers.*

**Table 9.5** Population estimates for towns and village complexes along Lake Turkana's western shore from Kalokol to the Kenya-Ethiopia border

Kangaki	2000
Lokalale	650
Lomekwi	3000
Ngingolekoyo	1200
Nachukwi	5000
Kangatukusio	320
Kataboi	9000
Kaitengiro	500
Katiko	8000
Toperenawi	3000
Nasechabuin	3000
Kalotumukol	1700
Nalukowoi	350
Nariokotome	5000
Kaitio	200
Kokiselei	950
Kalochoro	290
Narengewoi	1300
Nayanae engol	800
Namarotot	500
Nadoupua	800
Lokapetemoi	300
Namadak	4000
Todenyang/Arii	10,300
Lowarengak	7000
Lokitonyalla	2300

*Source* Local government officers, and Council of Elders (from prior accounts reports to aid officieals) as reported to SONT researchers in field-based meetings

Based on these locally derived estimates, the indigenous population in the shoreline area between Kalokol and Todenyang (Fig. 2) is at least **71,460**

Combining the above rough estimates, the indigenous population in the shoreline area of Ferguson's Gulf, extending northward Lake Turkana to the Kenya/Ethiopia border (near Todenyang) is at least: **141,000**

The true population of those Turkana who are vulnerable to destruction of their survival means from the effects of the Gibe III dam and irrigated agriculture on Lake Turkana is far greater, however. This population includes those fishing and mixed pastoral/fishing villagers who reside slightly more removed from Lake Turkana, but who nevertheless depend on it for their survival, through:

- Work as fishers—generally working for boat owners, or in post-catch fisheries related work
- Trading for fish, offering livestock products (meat, milk, skins, live animals)
- Livestock watering and lakeside grazing.

While there are no estimates for this pastoral/fishing population, which was apparently largely omitted from the census, many thousands of villagers clearly reside throughout this zone (villages are listed and relationally mapped in Fig. 9.3). A population estimate of at least **200,000** for those Turkana residing either along the lake or slightly removed from it is likely a conservative one.

The unreliability of the GOK's population census does not alter the reality that the total indigenous fishing and pastoral population depending on Lake Turkana for their survival is far greater, even excluding the tens of thousands of Dasanech residing (within Kenyan borders) in the modern Omo Delta (see Fig. 1.2) and around the lake's northeastern shoreline, as well as El Molo, Rendille, Gabbra and other peoples around the southern and eastern lake.

**In sum, the total regional population facing a survival crisis from their dependence on Lake Turkana should be presumed to be at least 300,000.**

The extreme vulnerability of this population is compounded by the continuing decline of Turkana the region's pastoral sector. Since at least a significant proportion of this population possibly remains uncouncted by the Kenyan government in its 2009 national census as well, the region's looming disaster scale impacts of the developments underway cannot be ignored in national and international policy institutions and civil society.<sup>12</sup>

**With comparable crises to that of Kenya's Turkana unfolding among the Dasanech and Nyangatom peoples as well, cross-border armed conflict among these groups and their neighbors (Fig. 5.3) can be expected to escalate—thus worsening the armed struggle underway in South Sudan.** (Numerous young men from the region—especially Nyangatom and Turkana—have already joined insurgent groups in South Sudan—some of them returning with new arms.)<sup>13</sup>

Active policy decisions by the Ethiopian government, the Kenyan government and international development organizations—particularly the World Bank and the African Development Bank—raise the specter of violation of internationally recognized human rights. These violations center around U.N. resolutions regarding the human rights to water, to livelihood and to freedom from political repression.

<sup>12</sup>The 2009 AFDB socioeconomic report cited a general lake-associated population of 300,000 (AFDB 2009), but embedded in the body of the report text, without notation of any significance within the context of the planned developments and without mention in the Summary and Conclusions sections. The EIB assessment of the Ethiopian segment includes some fragmentary and ambiguous population estimates for Ethiopia's lower Omo region.

<sup>13</sup>Detailed consideration of the decline of authority relations amongst the Turkana and the pastoral Suri is available in Abbink (2007) and Skoggard and Adem (2010).



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