

Blowback

Kenya's Illicit Ammunition Problem in Turkana North District

By James Bevan



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Small Arms Survey

Graduate Institute of International and Development Studies
47 Avenue Blanc, 1202 Geneva, Switzerland

Phone: +41 22 908 5777

Fax: +41 22 732 2738

Email: sas@smallarmssurvey.org

Web site: www.smallarmssurvey.org

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Abbreviations and acronyms

CEWARN	Conflict Early Warning and Response Mechanism
IGAD	Intergovernmental Authority on Development
KES	Kenyan shilling
KOF	Kenya Ordnance Factories
KPR	Kenya Police Reserves
LDU	Local Defence Unit
MEC	Military Economic Corporation
OCPD	officer commanding the police division
OCS	officer commanding station
S&B	Sellier and Bellot
SPLA	Sudan People's Liberation Army
SPLM	Sudan People's Liberation Movement
UPDF	Uganda People's Defence Forces
USD	US dollar
UWA	Uganda Wildlife Authority

About the author

James Bevan is a researcher for the Small Arms Survey. His research into arms and ammunition in East Africa has resulted in him travelling widely among the Ugandan Dodoth and Jie, the Kenyan Turkana, and the Sudanese Toposa. He has most recently authored *Crisis in Karamoja: Armed Violence and the Failure of Disarmament in Uganda's Most Deprived Region*, has published numerous book chapters and papers on armed violence in the pastoralist regions of East Africa, and has advised international aid agencies on conflict dynamics in the region. In addition to researching all aspects of armed violence and security, he specializes in technical aspects of conventional weapons and their production, deployment, and use. He developed the Small Arms Survey's *Ammunition Tracing Kit* and associated Tracing Protocols, and also provides technical advice on arms and ammunition to a number of organizations, including UN sanctions inspectors. He is currently special advisor to the chair for the 2008 UN Group of Governmental Experts on Conventional Ammunition in Surplus, and is the editor of *Conventional Ammunition in Surplus: A Reference Guide*. He has also published widely on issues ranging from the structure and organization of armed groups to studies on small arms and light weapons production and trade.

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I. Introduction

Kenya has an ammunition problem. The Government of Kenya is fully aware of the symptoms, but it is not aware that it plays a large role in nurturing them. Turkana North District is afflicted by some of the most intense armed violence in the region. The wars that rage between the pastoralist communities in the district and neighbouring regions of Sudan and Uganda are fuelled by a steady supply of small arms ammunition.

The research presented in this paper provides strong evidence of a systematic unofficial initiative to supply the Turkana pastoralist groups with Kenyan government ammunition. It finds that the Kenya Police supplies almost 50 per cent of the ammunition that circulates illegally in Turkana North, ostensibly to provide the Turkana with some defence against rival groups in Sudan and Uganda.

The evidence presented here is fourfold. First, Kenyan local authorities recognize (and even welcome) additional firepower flowing to the Turkana, because the state is unable to provide effective security to pastoralist populations. Second, these ammunition transfers are observable in the same types of ammunition used by the police and Turkana (but not by neighbouring groups). Third, the distribution of ammunition among the Turkana and police-supplied Kenyan state security forces is strongly correlated. Fourth, and crucially, eyewitnesses (including the author) confirm that the practice is commonplace.

This practice has notably ill effects. The cartridges leave government control and become available for use in a variety of crimes, ranging from roadside banditry to targeted assassination.

The killing of Lokichoggio's World Food Programme head is the most internationally visible example of this 'blowback' effect. The same type of ammunition that is supplied to the Turkana by the Kenya Police was recovered from the scene of the crime. It probably came to the attackers indirectly; but

the extensive proliferation of this type of ammunition in the region makes it statistically probable that government-supplied ammunition is frequently used in many acts of violence each year, including this one.

Such questionably legal ammunition transfers from the police to the Turkana have for long remained discreet, due to the relative ‘anonymity’ of small arms cartridges, but Kenya can no longer claim that they are the result of isolated ammunition theft by members of the Kenya Police and Kenya Police Reserves (KPR).

The evidence presented in this paper has been compiled over a period of two years and includes more than 3,000 samples of ammunition recorded throughout Turkana North and in neighbouring regions of Sudan and Uganda. The study triangulates statistical analyses of ammunition with field research to develop a picture of the broad dynamics of illicit ammunition trade in the region. The paper finds, in particular, the following:

- Ammunition from at least 25 countries, and 51 different factories, circulates in the region, drawn to the area by the many conflicts that have raged there over the past decades.
- There are greater similarities between ammunition circulating within countries than there are between the countries, suggesting that, once in the region, the transfer of ammunition is relatively localized.
- Kenyan state forces’ ammunition stocks are strongly correlated (in types and numbers) with those of Turkana pastoralists in Kenya, which indicates ammunition transfer between the two groups.
- Ugandan state forces’ stocks are, likewise, correlated with those of Dodoth and Jie pastoralist groups based in Uganda.
- Strong correlations among the ammunition stocks used by different groups in the region closely match the major ammunition trade and transfer patterns revealed by field research in the region; the two methods are therefore mutually supportive.
- Interviews, eyewitness reports, and personal observations made by the author confirm that state security forces in Kenya, Uganda, and Sudan are a major source of ammunition for warring pastoralist communities in each country.

- The problems associated with the proliferation of government-supplied ammunition are not confined to the countries in question. At least 15 per cent of ammunition enters Turkana North District via Sudan and Uganda.

The paper concludes that with or without the supply of government ammunition, the parties to the conflict will retain access to numerous sources of ammunition because the region is already awash with armaments.

Turkana North's ammunition problem cannot be solved by restricting the supply of ammunition alone. This supply is an escalatory factor in the region's armed conflicts, not a causal one. Instituting effective controls on the management of arms and ammunition by Kenyan security forces could have a positive impact on curtailing the supply of ammunition to illicit users, but this would not address the underlying demand for ammunition in Turkana North.

Addressing this problem requires providing security to communities that, at present, have to protect themselves. It is clear that unless Kenya radically revises the strategies of its security forces in Turkana North and the resources placed at their disposal, the violence and insecurity that afflict the region will continue unabated. ■

II. Fuelling the fire: the role of ammunition in Turkana North's conflicts

Armed violence is endemic in Turkana North and adjoining regions, and has many faces. In the bush, it rages unchecked among armed pastoralist communities. On the roads, it accompanies roadside ambush and banditry. In the region's sparsely administered towns, it characterizes crime and commercial vendettas.

A typology of violence is well beyond the scope of this enquiry.¹ Here the focus is directed primarily on the pastoralist conflicts that are fought outside the region's urban centres. However, where need dictates, the scope of the investigation also covers the towns, because the flow of ammunition obeys few boundaries and much of the violence it feeds cannot be treated in isolation from the region's broader pastoralist conflicts.

The structure of conflict in the region and parties to it

There are essentially three major parties to the conflict in Turkana North District. Although this is a slight oversimplification, it is a useful one for understanding the backdrop to armed violence in the region and the ammunition trade that fuels it.

The Kenyan Turkana are situated at the centre of the conflict and are the focus of the present investigation. They are a pastoralist people and depend, for the most part, on raising cattle and goats, which they graze on the rangeland or 'bush' in the north-west of Kenya and in the extreme border regions of eastern Uganda and southern Sudan. Although the Turkana population extends southwards beyond Turkana North District, this study focuses only on the northernmost section of Turkana society (see Map 2.1).

The Ugandan Dodoth comprise the western party to the conflict. They are a sub-clan of the Ugandan Karimojong,² who inhabit the north-easternmost



reaches of Uganda. Like the Turkana, the Dodoth are a pastoralist group. They also cross the Uganda–Kenya border, primarily to graze their herds in Kenya, at the foot of the escarpment that divides the two countries.

The Sudanese Toposa are the third and northernmost party to the conflict. They too are a pastoralist group, whose range extends along the Kenyan border with Sudan; but also along the Ugandan border for a distance of some 25–50 km south-east of the intersection between Kenya, Sudan, and Uganda.

The Toposa frequently graze their cattle on the Kenyan side of the border, particularly in the areas to the immediate east of the Ugandan border and along either side of the Mogila range of hills (see Map 2.1).

The Dodoth, Toposa, and Turkana share the same ethnic and linguistic roots. They share the same Ateker language (albeit with some variance of dialect) and have many of the same practices and traditions. They are, however, nearly constantly at war, and the Turkana are at the centre of the conflict.

The Turkana: between the hammer and the anvil

The Turkana of Turkana North District are in the unenviable position of residing between, on the one hand, largely uninhabitable terrain to the east and south and, on the other, hostile neighbours to the north and west. The population is squeezed into a relatively small (in pastoralist terms) area, in which it needs to maximize the available pasture at its disposal. Unlike the Ugandan Dodoth, who have some leeway to the west, or the Toposa, who have some latitude for northerly movement, the Turkana have very little strategic depth.³

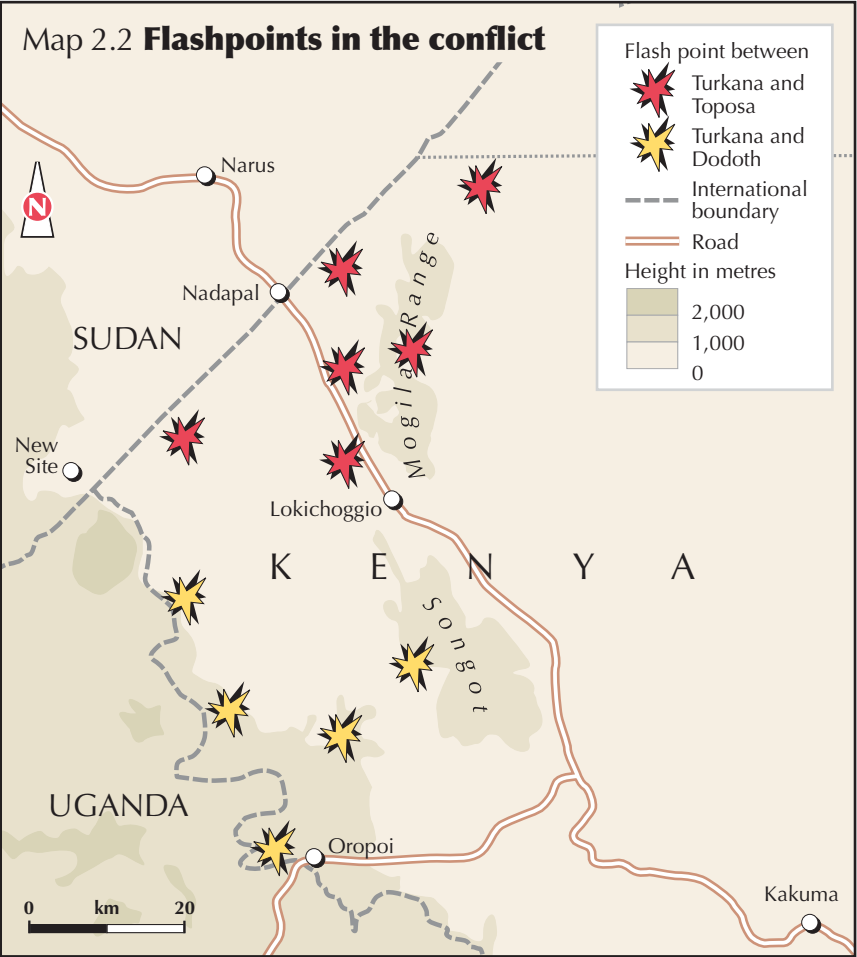
While much of Turkana North District is extremely arid, particularly in the dry seasons,⁴ the vegetation along the borders with Sudan and Uganda is in places notably greener than in the interior of the district. The relatively better grazing pasture grows here because of the water runoff from the surrounding hills, in particular the Uganda–Kenya escarpment; the foot of the uplands to the south of Natinga and New Site; and, to a certain extent, the base of the Mogila range (see Map 2.1). These pastures, however, lie along the fault lines of the Dodoth-, Turkana-, and Toposa-controlled areas. Each group benefits from exploiting the pasture, but grazing cattle in these areas also brings the groups into contact with one another, which creates hostilities. Paradoxically, the pasture also remains fresher in these areas precisely because of the conflict. On aggregate, the pasture in the interior of Turkana North is far more heavily grazed, but security concerns make grazing on the periphery of the district less frequent. The resulting fresher pasture on the periphery is a constant pull towards grazing there.

The peripheral regions of Turkana North therefore draw all parties to the conflict into a series of narrow pasture belts. It is among these pastures that

the flashpoints in the conflict are most visible (see Map 2.2). The conflicts arise because of a number of linked features of the pastoralist communities of the region, the most prominent of which is raiding.

Livestock raiding among communities

Raiding is the forceful seizure of cattle or goats. In the past in this region, it was orchestrated primarily by kraal leaders and elders. Its function was, and is, to augment the livestock upon which pastoralist communities depend.



Over time, the practice has become more injurious, primarily due to the availability of assault rifles, but also because increases in firepower have made it easier for relatively small groups of young men, or 'warriors', to successfully mount raids alone and without the consent of their communities. Although at times warriors have probably always acted alone, interviews among the region's communities point strongly to increasing problems associated with warriors acting outside the framework of community-sanctioned raids.

The warrior paradox

Warriors are responsible for a community's defence, but they also prompt hostilities, drawing communities into conflict with neighbouring groups and sustaining cycles of raid and retaliation.

Within each kraal or village, pastoralist communities share many resources, but the ownership of cattle and goats, upon which they depend, is divided among the men of each community. The ownership of livestock (in particular cattle) is indicative of wealth. Male social advancement is contingent on possessing livestock, notably with respect to paying a bride price, which allows young men to start a family.⁵ A young man with few or no cattle has little status in society, cannot start a family, and has difficulty acquiring weapons and ammunition.

Ownership of a weapon can provide a head start to any young man intent on acquiring or augmenting livestock. For this reason, many fathers in Turkana North purchase weapons for their male descendants, both for the purposes of defending the family's livestock and also to ensure that the warriors have the means to raid and augment livestock, should they need to in the future. Although the number of armed warriors fielded by a community increases its strength in relation to hostile neighbours, the warriors are also a risk factor in prompting hostilities.

Raiding for personal gain is the most notable part of this paradox. Small groups of young warriors are often tempted to launch raids, and increasingly they do this irrespective of the broader wishes of the community. The main incentive is to acquire livestock, and the resulting increase in social and material prosperity this brings, but raiding itself is often interpreted as proof of a

young man's claims to manhood. To compound matters, life as a pastoralist is not particularly varied or exciting, and raiding provides a welcome break for young men who would otherwise spend their days tending cattle or goats.

The results of warrior-instigated raids impact on entire communities. Raids often prompt counter-raids, which may not always be directed towards the attacking party. The complex network of communities, whose migratory paths are rarely stable, means it is often difficult for the victims of raids to ascertain from which communities raiders operate. Warriors are cognizant of this fact and often launch a raid through an area controlled by one group in order to deflect any possible retaliation onto the community in question.⁶

Armed warriors also have a comparative advantage in turning their attention to the region's road traffic, where ambush can be more profitable (and less dangerous) than launching raids against well-armed pastoralist neighbours. The region's towns⁷ are a market place for looted commodities, which otherwise might possess little retail value among the pastoralist communities who reside in the bush. The towns also provide a further pull to warriors, not least because they offer merchandise, such as clothing and blankets, as well as alcohol. Although conflict is largely confined to the bush away from the region's small towns, warriors' firepower is used to settle scores and commercial disputes between urban inhabitants.

The regional dynamics of armed violence and the demand for ammunition

There are two principal fronts in Turkana North's conflicts. The first is between the Ugandan Dodoth and the most westerly of the Turkana population, and lies close to the Kenya–Uganda border. The second roughly follows the Kenya–Sudan border and involves fighting between the Toposa and Turkana around the town of Lokichoggio and the Mogila hills to the east (see Map 2.1). Each of these fronts, and the protagonists involved, are worth exploring in some detail, because they have serious implications for the transfer and distribution of ammunition.

The Dodoth and the Turkana

The primary area of contention between the Dodoth and Turkana is on and around the escarpment that divides Turkana North and the Ugandan plateau.⁸ The Dodoth occupy the plateau, which receives more rainfall than the arid valley that comprises much of Turkana North to the east. Traditionally, the Turkana have climbed the escarpment to graze their livestock on the Ugandan side of the border. This has prompted raids by both parties, and the Turkana have recently been targeted by the Ugandan military in an effort to dissuade them from crossing the border (see Box 2.1).⁹

As a result of the hostilities described in Box 2.1, the Turkana are currently (2008) reluctant to scale the escarpment, but exploit the pasture and water points at its base. Even at the foot of the escarpment, however, the Turkana also come into conflict with the Dodoth, who descend in search of water and the better vegetation resulting from the runoff from the hills. The Dodoth raid deep into Turkana North, penetrating a stretch of Kenyan territory from the hills around Oropoi to the western side of the Songot mountain range (see Map 2.1).

Kenyan local authorities are very much aware of the risks posed by the Turkana–Dodoth conflict and station KPR among the Turkana, particularly in and around the towns of Oropoi and Natira. These towns have, in the past, suffered grievous raids.

The Dodoth are armed primarily with Warsaw Pact-standard weaponry and, for the most part, Kalashnikov-pattern assault rifles. One notable difference on the Ugandan side of the border is the far more frequent use of SKS rifles, which are relatively uncommon in Turkana North. Each of these weapons is used by the Ugandan security forces, and both are chambered for the 7.62 x 39 mm ‘Kalashnikov’ cartridge (see Table 3.1).

The use of NATO-calibre weapons, such as G3 and SLR/FN rifles, is virtually non-existent throughout Karamoja, Uganda, and the demand for 7.62 x 51 mm NATO cartridges is consequently minimal. These calibre differences impose a natural barrier to the trade in NATO ammunition, which might otherwise originate in Turkana North, where NATO-standard weapons and ammunition are relatively common (addressed below).

Box 2.1 Ugandan military attacks against the Turkana

In October 2006 Kenyan pastoralists grazing in the Loteere area of Uganda (about 40 km west of Lokiriamia, Kenya) were reportedly attacked by a Uganda People's Defence Forces (UPDF) helicopter gunship. Local NGOs in Kenya subsequently compiled the names of 35 Turkana pastoralists reported killed in the incident,¹⁰ and the aggrieved parties claimed the loss of some 2,000 head of cattle.

At least three Kenyan parliamentarians from the Turkana region spoke out against the attacks. The UPDF acknowledged that one of its aircraft was involved, but claimed that the attack took place after the helicopter had been shot at by Turkana warriors.¹¹ Reports in the Kenyan press also suggested that Ugandan aircraft may have subsequently attacked Turkana villages just inside the Kenyan border.¹²

The attack against the Turkana was the first recorded use of military force against neighbouring pastoralist groups on Ugandan soil. The weapons used included Soviet-made 80 mm S-8 rockets and 23 x 115 mm cannon ammunition, produced in Novosibirsk, Soviet Union in 1985.¹³ Each armament is consistent with the weapons of the Russian-made Hind helicopter gunships flown by the UPDF.¹⁴

Hostilities directed against the Turkana continue. In early 2008 rocket or mortar fire¹⁵ was directed from the plateau down the escarpment in what was interpreted by the Turkana as a warning to desist from grazing livestock in the area.

Remains of S-8 rockets and 23 x 115 mm cannon ammunition, November 2006, undisclosed location, Kenya.

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The Turkana and the Toposa

Hostilities between the Turkana and Toposa occur primarily along the Sudan–Kenya border, in a triangle between New Site to the west and the towns of Napadal and Lokichoggio to the east. Frequent clashes also occur in the hanging valley that bisects the Mogila range and in the rangeland to the immediate north-east of Mogila (see Map 2.2).

These clashes occur either because the Toposa move south into Kenya, or the Turkana approach (or, in rare cases, cross) the border into Sudan. The distribution of clashes along the border is uneven, and there are several corridors that raiders from both parties to the conflict appear to favour. The first is a stretch of territory running south-east from New Site. The second corridor crosses the border at Nadapal and runs southward (loosely following the road) towards Lokichoggio, and the third runs along either side of the northern part of the Mogila range. These corridors afford raiders relatively unmolested and direct routes along which to escape with stolen cattle.

Unlike on the Ugandan side, there are no Kenyan towns situated next to the Kenya–Sudan border. As a result, conflicts between the Turkana and Toposa are mostly fought quite far from Lokichoggio town, although this does not preclude some raids on the town's peripheral inhabitants. Kenyan military forces,¹⁶ the Kenya Police, and the KPR are stationed in Lokichoggio town. These forces play only a peripheral role in moderating the conflict around Lokichoggio and usually intervene only to prevent or investigate raids when they are launched against targets close to town—notably when raids affect the outskirts of town or the Lokichoggio–Nadapal road.

In the range of weapons at their disposal, the Toposa are far more heavily armed than the Turkana (although their overall supply of ammunition may not be that much greater). This disparity in armaments arguably results from the many heavy weapons left over from the Sudanese war. In particular, Toposa communities frequently deploy at least one PK machine gun among their warriors.¹⁷ The PK is a general purpose machine gun, designed to provide heavy suppressing fire. It fires the 7.62 x 54R¹⁸ cartridge, which is common also to the Mosin-Nagant rifle (see Table 3.1).

Some Toposa groups also retain RPD light machine guns (7.62 x 39 mm) and RPG-7 grenade launchers, although the latter are rarely deployed. In

terms of individual weapons, the Toposa use NATO-standard G3 and SLR rifles (to a greater extent than the Turkana), in addition to many Kalashnikov-pattern assault rifles. Given this broad array of weapons and, by extension, calibres, the ammunition market in southern Sudan is more diverse than in either Kenya or Uganda.

Other parties to the conflict

Besides conflict between the Turkana and neighbouring Dodoth and Toposa, other parties enter the hostilities from time to time. Foremost among these are the Nyangatom of south-eastern Sudan, who reside between the Toposa and the Ethiopian border. The Nyangatom raid as far into Kenya as Lokichoggio and have transited through Toposa-controlled territory in order to seize cattle from the Turkana.

It is also worth mentioning the role of both the Sudanese Didinga and the Ugandan Jie. Neither party is in direct conflict with the Turkana, nor plays a significant role in Turkana North District, but their hostility towards the Sudanese Toposa and Ugandan Dodoth, respectively, helps to shape the market for arms and ammunition in the region.

The Sudanese Didinga reside, primarily, in the Didinga Hills, to the north and west of the Sudanese towns of New Site and Natinga. They are long-standing enemies of the Toposa, but have been a consistent source of weaponry to the Ugandan Dodoth (and, by extension, to Ugandan groups further to the south).¹⁹ Given the hostilities between the Turkana and the hostile Toposa, the Didinga have also been strategically placed to trade arms from Sudan to the Turkana (a route that might otherwise have been denied to the Turkana by the Toposa). Although these transfers were reported to be commonplace in the late 1990s, the Toposa have intervened to prevent them in recent years. This move on the part of the Toposa recognizes that the trade, which provides the Turkana with weapons and ammunition, is a strategic threat to Toposa interests.

The Uganda Jie inhabit an area that broadly encompasses Kotido District, Uganda. They are, of all the pastoralist groups in the region, historically and culturally closest to the Turkana. The Turkana themselves attribute their ori-

gins to the Jie, and the two groups are traditionally allied. When the Turkana were able to move relatively freely across the Kenya–Uganda border, trade with the Jie provided each party with a source of weapons and ammunition. Now that cross-border movement is extremely hazardous due to Ugandan military operations (see Box 2.1), this trade is reported to have stopped. The Jie are in sporadic conflict with the Dodoth. Periods of intense hostility (generally in the areas around the administrative boundaries between the Ugandan districts of Kaabong and Kotido) are punctuated by periods of peace. These peaceful periods permit the Dodoth and Jie to trade arms and ammunition, as part of a loose network that begins with the Sudanese Didinga and extends to the far south of Karamoja, Uganda.²⁰

Common assumptions regarding ammunition proliferation in the region

Turkana North's illicit arms and ammunition problem is primarily the result of porous borders and the resulting unchecked influx of weaponry from neighbouring states. This is the common explanation of the problem proffered by Kenyan government officials, district authorities, local non-governmental authorities, and even some academics; but is this explanation an accurate one?

The answer is no. As the following sections note, the illicit trade in arms may well be the legacy of the wars that have severely affected Kenya's immediate and proximate neighbours, notably Sudan, Ethiopia, Somalia, and, to a certain extent, Uganda. But that is not the case for the ammunition in Turkana North, where a good percentage of it originates within Kenya.

The following analysis uses a triangulated set of methodologies to assess the distribution of ammunition in Turkana North and patterns in that distribution, which may suggest avenues of illicit transfer. The first part of the study is quantitative and focuses on the ammunition and its spatial distribution in the region. The results of this part of the study are then assessed against findings from field interviews. This qualitative approach focuses on determining specific parties to the illicit trade in ammunition and generating back-

ground information about ammunition demand in the region. Combined, these methods provide a fairly robust basis for understanding the broad trends in ammunition trade and transfer in the region.

The quantitative and qualitative research methods used in this study are explained, in full, in Annexes 1 and 2 to this paper, respectively. ▀

III. Silent witnesses: a statistical analysis of ammunition distribution

There is a broad range of ammunition circulating in Turkana North and neighbouring regions: 7.62 x 39 mm ammunition, used in the Kalashnikov-pattern assault rifle, is the most common variety in Turkana North and also in neighbouring parts of Sudan and Uganda. Of 3,382 cartridges recorded from both state and non-state actors between May 2006 and January 2008, 7.62 x 39 mm ammunition comprised over 75 per cent of the sample (see Table 3.1), which equates roughly to the proportion of Kalashnikov-type weapons in the region.

The sample illustrates some broad features of global ammunition supply into the region. Chinese and Eastern European manufacturers feature strongly. In general, the Eastern European ammunition (and that of the former Soviet Union) dates from the periods prior to and during the collapse of the Soviet system and the economic crisis of the 1990s that followed. This is to be expected, and the trend accords with the large numbers of surplus (and, in some cases, newly manufactured) ammunition transferred out of the region in that period.²³ Chinese ammunition in the sample dates back to the 1970s, but ammunition manufactured in China is most commonly date-marked with the year 2000 or more recently. Again, this is to be expected, given China's recently expanding interests in East Africa and its military support for a number of states in the region, including Uganda (discussed below).

The types of ammunition circulating in the region are clear evidence of the global transfer networks that feed ammunition into states in conflict. The war in Sudan, the conflict in Uganda, and the acquisition networks used by state and non-state parties in the region have introduced ammunition manufactured in virtually every region of the world, ranging from the Americas to Europe, the Middle East, South and Central Asia, East Asia, and Africa itself. In total, the sample includes ammunition manufactured in 25 countries,²¹ and by 51 factories²² within those countries.

Table 3.1

Types and numbers of cartridges in the sample

Calibre	Weapons using these calibres in the region (in order of prevalence)	Number in the sample
7.62 x 39 mm	Kalashnikov-pattern assault rifle RPD light machine gun SKS-pattern rifle	2,588
7.62 x 51 mm	G3 rifle SLR/FN rifle Lee-Enfield rifle (late models)	540
7.62 x 54(R) mm	Mosin Nagant rifle PK machine gun	232
.303 inch	Lee-Enfield rifle (early models)	15
5.56 x 45 mm	AR-18 assault rifle (very rare)*	7
	Total number of cartridges	3,382

* This weapon is undoubtedly an outlier in the sample. The AR-18 rifle and the 7 examples of 5.56 x 45 mm ammunition were recorded by the author several kilometres north of the Kenyan town of Todenyang. This is the only 5.56 mm weapon ever encountered by the author during three years of research in the region. It is unclear how the weapon (and ammunition) entered the region. The owner of the weapon had acquired it after having killed its previous owner on the Ethiopian border (which is a common means of acquisition). It is included in the table purely because the ammunition was in the sample. The weapon and ammunition should not, however, be interpreted in any way as being characteristic of munitions circulating in the region.

There are, however, some features of the sample that might appear surprising to some readers. Africa's arms and ammunition problem is often framed in terms of an influx of foreign weaponry into the continent. The sample, however, includes ammunition that is manufactured on the African continent, including by factories in Kenya, Sudan, Uganda, and (in miniscule numbers) Zimbabwe. Together, these states account for a small percentage of the ammunition (just over 6 per cent) in the sample, but a significant one nonetheless.

Far more significant is the prevalence of ammunition marked 7.62 x 39_03 (see Table 3.2), which cannot be attributed to any particular manufacturer. The ammunition is unusual in two respects. First, it proliferates in great numbers (comprising over 25 per cent of the entire sample). Second, despite its

prevalence, it does not appear in the most comprehensive ammunition databases. Experts consulted during this study were unable to attribute it, conclusively, to a particular manufacturer or country of origin. These factors suggest that ammunition marked in this way is uncommon elsewhere in the world (otherwise it would appear in existing records), and may be specific to the region (possibly because the parties acquiring it have specifically requested that it be marked in this way). Although the ammunition cannot be traced to a particular manufacturer, it arrives in the region via Kenyan security forces, as the following sections of the paper devote attention to explaining.

The prominent types of ammunition in the region

Table 3.2 **The 15 most prevalent types of ammunition in the sample**

7.62 x 39_03	# sampled: 873	% of sample: 25.8
Calibre: 7.62 x 39 mm Manufacturer: unknown	Country of origin: unknown	Factory location: unknown
	This ammunition is of unknown manufacture, but it is the most common type in the sample. Several ammunition experts have attributed the cartridge to one of two factories, located either in a Central Asian or South Asian country.²⁴ Neither country can be reported here because the results are inconclusive. It is issued to the Kenya Police and is also in service with the KPR. It is the most prolific type of ammunition on the illicit market in Turkana North District. The numerals ‘7.62 x 39’ indicate the calibre and case length. The ‘03’ probably indicates the year of ‘first’ manufacture.²⁵ Three cartridges of this type in the sample are date-marked ‘01’, and 24 are marked ‘02’. Some of the cartridges in the sample feature an asterisk-shaped dot to the left or right of the date mark. The ammunition is packed in green nylon bags, each of which contains 200 cartridges (see Annexe 6 for a discussion of packaging marks).	

61_04	# sampled: 220	% of sample: 6.5
Calibre: 7.62 x 39 mm Manufacturer: Factory 61	Country of origin: China	Factory location: unknown
SEE ENTRY FOR 61_00	This ammunition is manufactured in China. Although it proliferates among the Sudanese Toposa, and to a lesser extent the Kenyan Turkana, it is most common among the Jie and Dodoth of Uganda, and is issued to Ugandan state forces (indicated by a significantly larger proportion of this ammunition sampled from Ugandan state forces). ²⁶ It is the second most prolific type of ammunition in the sample. The numerals '04' indicate the Chinese manufacturer code. '04' four denotes the year of first manufacture. Cartridges of this type, but date-marked for various years between 1972 and 2004, also appear in the sample, totalling 476 cartridges (see Annexe 4 for a date mark history of Chinese cartridges in the region).	
S&B_7.62 x 39	# sampled: 145	% of sample: 4.3
Calibre: 7.62 x 39 mm Manufacturer: Sellier and Bellot (S&B)	Country of origin: Czech Republic/ Czechoslovakia	Factory location: Prague
	This ammunition was manufactured in the Czech Republic. Production of the steel-cased variety (pictured here, and the only type in the sample) ceased in 2004. ²⁷ The ammunition is possibly issued to the Kenya Police in small numbers, ²⁸ and it is common on the illicit market in Turkana North and, to a certain extent, among the Sudanese Toposa. The headstamp features the manufacturer marks 'S&B', with associated circular symbols of the Sellier and Bellot brand. The ammunition is not date-marked and features only a calibre designation: '7.62 x 39'.	
61_00	# sampled: 114	% of sample: 3.4
Calibre: 7.62 x 39 mm Manufacturer: Factory 61	Country of origin: China	Factory location: unknown
	See entry for 61_04, above.	

10_95	# sampled: 108	% of sample: 3.2
Calibre: 7.62 x 39 mm Manufacturer: Durjava Voenna Fabrika	Country of origin: Bulgaria	Factory location: Kazanlak
	This ammunition was manufactured in Bulgaria, and circulates among the Turkana and Toposa. Only three cartridges of this type were sampled from the primarily government-supplied KPR, which probably indicates that these members of the KPR purchased them on the illicit market, rather than acquiring them through government channels. Ammunition marked 10_95 in the sample was found in two varieties: a copper-washed version (illustrated here) and a plain (unwashed) steel-cased type (in far smaller numbers). The ammunition is date-marked '95', but there are other examples from this factory in the sample that are date-marked for various years between 1980 and 1999 (totalling 124 cartridges).	
7.62 x 51_97	# sampled: 103	% of sample: 3.0
Calibre: 7.62 x 51 mm Manufacturer: unknown	Country of origin: unknown	Factory location: unknown
	The manufacturer of this ammunition is unknown, but forensic experts suggest that it may originate either from a Middle Eastern country or from a country in South Asia. The head-stamp is also similar to that of a southern European manufacturer.²⁹ None of the countries can be reported here because the results are inconclusive. The ammunition is most prevalent in the hands of Kenyan government-supplied location and sub-location chiefs³⁰ and the KPR (89 per cent), which almost certainly means it is supplied through Kenyan state channels rather than acquired on the illicit market. It is sufficiently similar to the government-supplied 7.62 x 39_03 cartridge to suspect that the marking scheme on each cartridge has been requested by the Kenyan authorities. The headstamp of each cartridge differs, however, with the 7.62 x 39_03 being forged rather than stamped. The cartridge is marked with the calibre '7.62 x 51' and date stamp '97'. Similar cartridges of this type in the sample are marked with the date stamp '01' and '89', but these are few (12) in number.	

3_73	# sampled: 84	% of sample: 2.5
Calibre: 7.62 x 51 mm Manufacturer: Ulyanovsk Machinery Plant State Production Association	Country of origin: Russian Federation/USSR	Factory location: Ulyanovsk
NO IMAGE	This ammunition is marked with a '3' at the 12 o'clock position, which denotes the Ulyanovsk Machinery Plant. The numerals '73' at the 6 o'clock position comprise the date stamp. Cartridges of this type in the sample are also date-marked for various years between 1970 and 1977, comprising 92 cartridges. These cartridges are most commonly found among the Turkana, less so among the Toposa, and even less frequently in the hands of Ugandan non-state groups. They are held in insignificant numbers by Kenyan state security forces in the sample (less than 0.4 per cent), which suggests illicit acquisition rather than government supply.	
LI_02	# sampled: 83	% of sample: 2.5
Calibre: 7.62 x 39 mm Manufacturer: Luwero Industries	Country of origin: Uganda	Factory location: Nakasongola
	This ammunition is manufactured by Luwero Industries, Uganda. It is constructed from Chinese-manufactured components (cartridge cases, propellant, primer caps, and bullets). ³¹ The markings consist of the letters 'LI', which designate the factory, and a date mark '02'. Ammunition with date marks '91' and '04' also features in the sample (four and eight cartridges, respectively). Interestingly, the samples marked 'LI_04' are stamped in reverse, which indicates that the stamping die was wrongly cut (potentially in China). ³² The ammunition is issued to Ugandan security forces and proliferates among the Karimojong as a result of illicit diversion. ³³	
Unmarked	# sampled: 82	% of sample: 2.4
Calibre: 7.62 x 39 mm Manufacturer: unknown	Country of origin: unknown	Factory location: unknown
	This ammunition is most prevalent in the hands of the Toposa. It is unclear which factory or state manufactures the cartridges, but they are sufficiently similar in composition, construction, and distribution to believe that they may be poorly marked Sudanese- (Khartoum-) manufactured ammunition of the SU_1_39_01 type listed immediately below (see Annexe 5).	

SU_1_39_01	# sampled: 77	% of sample: 2.3
Calibre: 7.62 x 39 mm Manufacturer: unknown	Country of origin: Sudan	Factory location: Khartoum
	This ammunition is manufactured in Khartoum (see Annexe 3 for a thorough investigation of Sudanese ammunition types in the sample). It is common among the Sudanese Toposa, less common in Kenya, and relatively rare in Uganda. The letters 'SU' indicate Sudan, '01' is probably the date mark, and '39' indicates the calibre. ³⁴ It is unclear what the '1' or 'l' mark designates.	
324_94	# sampled: 68	% of sample: 2.0
Calibre: 7.62 x 39 mm Manufacturer: Factory 324	Country of origin: Romania	Factory location: unknown
NO IMAGE	This ammunition features the factory code '324' at the 12 o'clock position and the date mark '94' at the 6 o'clock position. It is more prevalent among the Kenyan Turkana (82 per cent) than among either the Toposa (16 per cent) or the Ugandan non-state groups (less than 2 per cent). Three cartridges of this type also appear in the sample, which are date-marked for the years 1974 and 1991. The cartridge was not found in the hands of state forces in the region.	
KOF_7.62_04	# sampled: 57	% of sample: 1.7
Calibre: 7.62 x 51 mm Manufacturer: Kenya Ordnance Factories	Country of origin: Kenya	Factory location: Eldoret
	This ammunition is manufactured in Kenya and issued to the Kenyan armed forces and, to a lesser extent, the Kenya Police. It is also in service with the KPR. The letters 'KOF' indicate Kenya Ordnance Factories, '7.62' indicates the calibre (7.62 x 51 mm), ³⁵ and '04' probably indicates the date of first manufacture. Nineteen cartridges of this type in the sample are date-marked '00', 25 are marked '02', and 9 are marked '03'. These cartridges are packed in wooden crates, each of which contains 1,200 cartridges (see Annexe 6 for a discussion of packaging marks).	

SUD_39_98	# sampled: 50	% of sample: 1.5
Calibre: 7.62 x 39 mm Manufacturer: unknown	Country of origin: Sudan	Factory location: Khartoum
	This ammunition was manufactured in Khartoum. 'SUD' indicates Sudan, '39' designates the calibre (7.62 x 39 mm), and '98' is probably the date mark. Seven examples in the sample are also marked with a '97' date mark (see Annexe 3).	
Saad_Seen_70	# sampled: 50	% of sample: 1.5
Calibre: 7.62 x 51 mm Manufacturer: Defence Industries Organization (Sazeman Sanaye Difa)	Country of origin: Iran	Factory location: Tehran
	This ammunition has been identified as Iranian. ³⁶ It is marked in Arabic script, from left to right, with the characters <i>seen</i> and <i>saad</i> , denoting the factory. The cartridge is date-marked with the Arabic numerals '70'. There are also cartridges of this type in the sample that are date-marked for the years 1966, 1969, and 1971. These are almost exclusively (99 per cent) in circulation among the Sudanese Toposa, which suggests that they were transferred by one of the parties to the Sudanese war.	
61_01	# sampled: 49	% of sample: 1.4
Calibre: 7.62 x 39 mm Manufacturer: Factory 61	Country of origin: China	Factory location: unknown
See entry for 61_00	See entry for 61_00, above.	

Mapping and statistical analysis of ammunition distribution

The distribution of ammunition in a region can suggest a great deal about the local dynamics of ammunition acquisition and transfer. High concentrations of particular types of ammunition in the hands of some parties may suggest that these factions share similar acquisition sources. Low concentrations, or very different types of ammunition in use, may suggest that groups acquire their ammunition from diverse parties.

Mapping the distribution of ammunition in this way cannot prove trade or transfer patterns beyond reasonable doubt, but it can suggest 'where to look' for evidence to support or disprove any assumptions made regarding illicit trade. The sections below explore a subset of the sample of 3,382 cartridges, focusing only on the most common calibre: 2,588³⁷ 7.62 x 39 mm 'Kalashnikov' cartridges. The sections examine a number of questions, as follows:

1. Do groups that reside within the same countries have very similar types of ammunition, and, by extension, do groups that reside in different countries have divergent ammunition types?
2. Do state and non-state groups have similar types of ammunition? If so, which groups are similar (correlated) and which are uncorrelated? Are any observable trends indicative of diversion (loss or illegal transfer) from state groups to non-state actors?
3. What can the proportions of ammunition types in circulation tell us about the nature of illicit ammunition transfers in the region? Do large proportions of some types of ammunition indicate large-scale, organized trade, and, if so, where is this trade likely to originate?

None of these questions can be answered by the ammunition data alone. As the following sections note, however, analysing the data provides some powerful indicators of the likely avenues of illicit trade. These observations are subsequently gauged against the results of extensive field interviews and background research in the latter sections of this paper. Statistical methods are presented in Annexe 1.

Evidence of within-country trade

There are very significant differences between the types and concentrations of ammunition in Turkana North and neighbouring regions of Sudan and Uganda. The following results are from an analysis to determine the similarities and differences between the state and non-state groups in the sample.

They indicate that the distribution of ammunition types differs considerably when some groups are compared to others. In some cases, however, the

distribution patterns are very similar (correlated), which may suggest that the groups in question have similar sources of ammunition.

In particular, there are strong correlations (≥ 0.65 , $P \leq 0.01$)³⁸ between ammunition in the hands of the pairs of groups listed in Table 3.3. As the table clearly illustrates, these strong correlations occur between state and non-state groups within the same countries. There are no strong correlations between any two groups that reside in different countries.

Table 3.3
Strong correlations of ammunition type distributions among groups (paired comparisons, by host country)

Strongly correlated groups (paired)		Host country (of each pair)
Dodoth	LDUs*	Uganda
Jie	UWA**	Uganda
Jie	LDUs	Uganda
LDUs	UWA	Uganda
KPR	Turkana	Kenya
KPR	Chiefs (loc. & sub-loc.)***	Kenya
Turkana	Chiefs (loc. & sub-loc.)	Kenya

* Ugandan Local Defence Units

** UWA: Uganda Wildlife Authority

*** For an explanation of these titles, see endnote 30.

Note: The distribution of ammunition belonging to the Toposa of Sudan, in particular, is not highly correlated with any other group in the sample, although it is correlated (moderately) with Ugandan state and non-state groups.

These results provide reasonable grounds for assuming that there is some kind of relationship between groups that are situated within the same countries. One obvious hypothesis is that groups who reside in the same countries acquire ammunition from the same sources as one another, while groups that reside in different countries have differing sources. The hypothesis is plausible from the perspective of group proximity. However, the analysis also reveals correlations between state security forces and non-state, illicit ammunition users in the same countries. These two groups should, theoretically, not be correlated, as the following section illustrates.

Indications of transfer between state and non-state parties

State armed forces and non-state, illicit ammunition users in the region procure their ammunition through different sources. Logically, each group should therefore stock different types and quantities of ammunition. As the following analysis notes, however, this is not the case. Ugandan and Kenyan state forces' ammunition correlates with that of illicit users in the two countries, which suggests trade or transfer between government-supplied agencies and non-state groups.

Kenyan state and non-state stocks are highly correlated ($r = 0.97$, $P \leq 10^{-6}$). This means that these parties (the government-supplied KPR and location chiefs on the one hand, and the non-state Turkana on the other) possess very similar types of ammunition. Moreover, these types are present in similar proportions. Given the fact that the types and proportions of ammunition circulating in Sudan and Uganda differ quite considerably from those in Kenya, these findings suggest that Kenyan state-supplied and non-state groups each have a lot of ammunition in their possession that is not common to neighbouring countries. These findings point towards a common source of ammunition within Kenya.

The situation is similar in Uganda. The types and proportions of ammunition in the hands of Ugandan state groups (LDUs and UWA) correlate with those used by Ugandan non-state groups (Dodoth and Jie). The correlation is weaker than it is for the Kenyan groups ($r = 0.77$, $P \leq 10^{-5}$), but the data likewise suggests that Ugandan state and non-state groups have similar sources of ammunition. Again, as in the Kenyan case, these findings point towards a common source of ammunition within Uganda.

One way to assess whether there may be a relationship between state and non-state groups is to ask some questions about what one might expect to find in terms of the types and numbers of ammunition circulating among each party. State and non-state forces differ in the resources available to them, particularly in their reliance on formal and informal arms markets, respectively. These different circumstances should be apparent in the quality and quantity of ammunition in the hands of each party.

Firstly, it is logical to expect that state forces in the region have more centralized and coherent arms acquisition systems than the (relatively impoverished) non-state parties in the region. This can be explained as follows:

1. States acquire ammunition in bulk because they require large volumes (millions of cartridges) and because mass purchases yield economies of scale.
2. Bulk purchases are likely to originate from a small number of suppliers due to the need for states to maximize economies of scale within each transaction.
3. Suppliers are likely to provide states with relatively few types (in global³⁹ terms) of ammunition, because these have been manufactured in large production runs.⁴⁰
4. State forces are therefore likely to stock relatively few types of ammunition, but in large quantities—i.e. their stocks are likely to tend towards homogeneity.⁴¹

The non-state pastoralist groups, by contrast, can be expected to acquire their ammunition through a variety of channels. They should therefore possess many different types of ammunition (and relatively few examples of each type), for the following reasons:

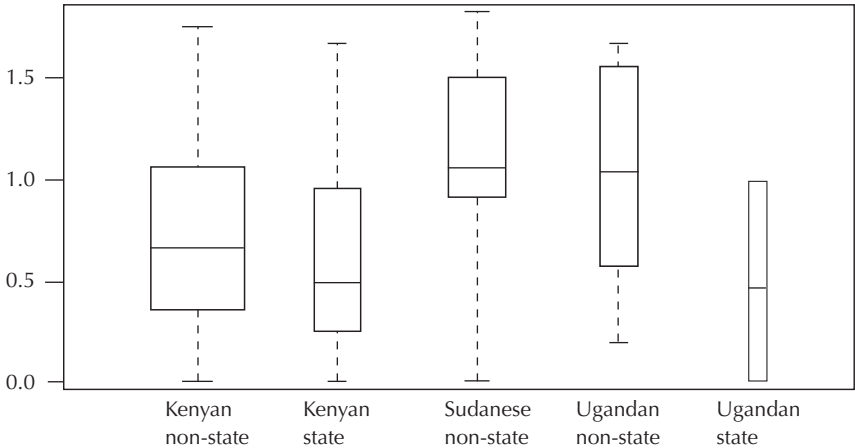
1. The groups have neither the demand, the international contacts, nor the purchasing power to purchase ammunition legally and in bulk.
2. Demand is therefore met relatively locally and with whatever ammunition can be most easily acquired by the parties in question.
3. Given that there are many sources of ammunition in the region (including neighbouring groups, legacy arsenals from wars, and state parties), the types of ammunition acquired by non-state groups should be diverse.
4. Non-state actor ammunition should therefore tend towards heterogeneity, particularly given the fact that there are 220 differently marked types of ammunition from over 51 different factories in the sample.

Given these observations, homogeneity of ammunition may be a possible indicator of organized ammunition trade in the region. In particular, it may signify transfers between states and non-state actors. It might suggest that, rather than acquiring ammunition piecemeal, non-state actors have acquisition channels that ‘tap into’ organized (state) markets.

These hypotheses are broadly confirmed by analyses of the types of ammunition circulating in the region. Ammunition stocks are more heterogeneous in the hands of non-state actors than they are in the hands of state forces in both Kenya and Uganda.⁴² Conversely, state stocks are more homogeneous

than non-state actor stocks. The significant variations between state and non-state groups are illustrated by the differing entropy⁴³ values plotted in Figure 3.1, in which lower values indicate greater homogeneity.

Figure 3.1
Box plot of entropy values for state and non-state actors in the sample (n = 123)



Notes: The box plot displays results of entropy calculations for 123 individuals, whose ammunition stocks contained 5 or more of the most common 15 ammunition types in the sample. The widths of boxes are proportional to the square root of the sample size for the box. Wider boxes therefore correspond to larger sample sizes.

The Sudanese Toposa have the most heterogeneous or ‘diverse’ distribution (different types and small quantities of these types) of ammunition in the sample. These findings are to be expected. The average Toposa warrior has few resources from which to purchase large stocks of ammunition. Additionally, the Toposa reside in a post-conflict environment, which features many types of ammunition still in circulation from the war in Sudan. Similarly, the non-state Ugandan and Kenyan pastoralist groups have diverse (heterogeneous) ammunition distributions, although each of these groups has more homogeneous ammunition stocks than the Toposa (Jie, Turkana, and Dodoth, in ascending order of homogeneity).

In distinct contrast, all of the state forces in the sample have more homogeneous stocks. They have relatively few types of ammunition in their posses-

sion and relatively large numbers of each type. These forces include the UWA and LDUs (each supplied by the Ugandan military), and the Kenyan location and sub-location chiefs and KPR (each supplied by the Kenya Police). These findings confirm the hypothesis that the more organized ammunition supply by states to their own security forces leads to these forces having relatively homogeneous ammunition stocks. ■

IV. Weighing the evidence: statistical analysis vs. field interviews

If state forces have relatively homogeneous ammunition stocks, and non-state, illicit users do not, homogeneity should be a powerful indicator of any transfers from state forces to non-state actors. As the following sections note, homogeneity is one such indicator, and the results of statistical analyses broadly accord with results from field interviews in the region. Combined, these methods reveal strong evidence to suggest that Kenyan security forces supply ammunition to illicit users in Kenya, and Ugandan security forces do the same on the other side of the border.

The supply of ammunition to Kenyan groups

Of the non-state groups, the Kenyan Turkana feature significantly more homogeneous stocks than the Sudanese and Ugandan groups in the sample (see Figure 3.1). The results of these entropy calculations suggest that the Turkana have access to one or more sources that supply them, consistently, with the same types of ammunition. The entropy values are plotted on Map 4.1, and provide a striking illustration of how homogeneous stocks (the taller bars) are most dense among the Turkana, in comparison to other groups in the region.

These findings strongly suggest the diversion or redistribution of ammunition from Kenyan security forces. Given these findings, which types of ammunition might be subject to these types of state to non-state transfer?

In order to narrow down the range of options, the 123 individuals whose ammunition was used to calculate the entropy values (see Figure 3.1) can be divided into three groups: a low entropy (homogeneous) group; a middle entropy group; and a high entropy (heterogeneous) group. These sub-divisions make it easier to compare the types of ammunition in use by each group.

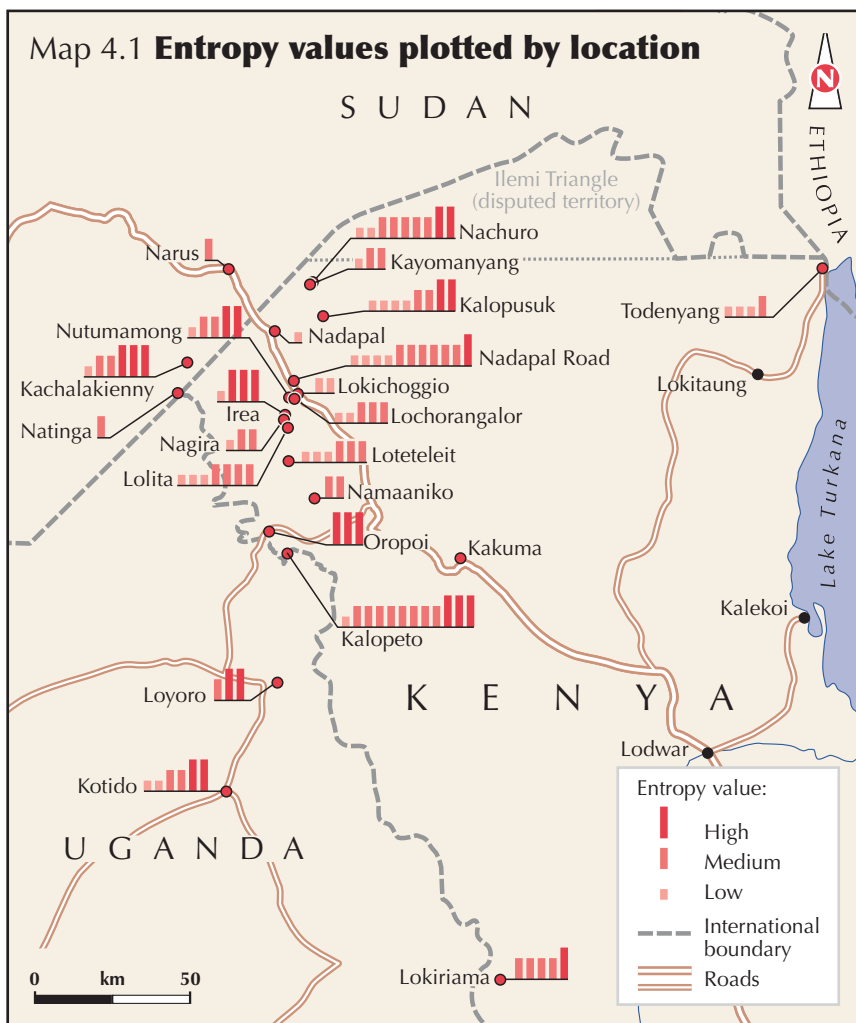


Table 4.1

Entropy groups by ammunition type

Ammunition type	Low entropy group	Medium entropy group	High entropy group
7.62 x 39_03	0.787	0.293	0.137
61_04	0.099	0.085	0.154
SU_1_39_01	0.025	0.049	0.031
S&B_7.62 x 39	0.022	0.126	0.040
SUD_39_98	0.017	0.032	0.017
324_94	0.015	0.024	0.063
3_77	0.009	0.042	0.008
61_01	0.009	0.027	0.038
3_73	0.006	0.076	0.037
10_95	0.004	0.049	0.117
61_00	0.003	0.059	0.119
Unmarked	0.003	0.053	0.050
539_72	0.001	0.031	0.042
LI_02	0.001	0.035	0.104
71_99	0.000	0.021	0.042

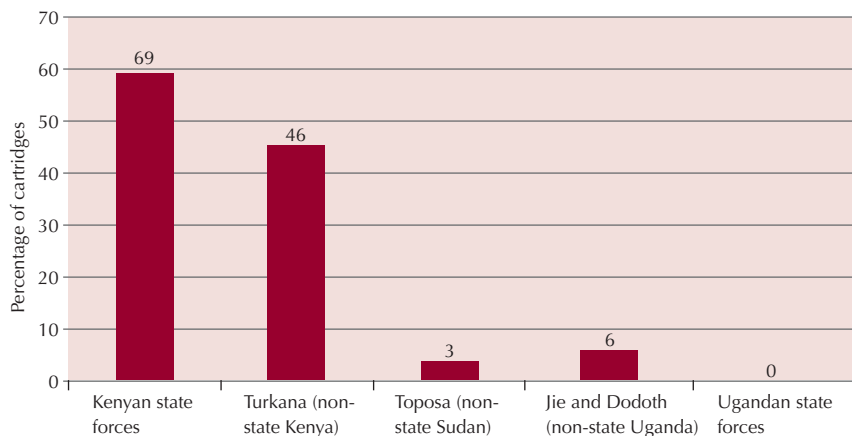
Note: Cartridges that appeared most frequently in each of the entropy groups appear at the top of the table. The table indicates declining frequency from top to bottom.

The results are displayed in Table 4.1, and clearly demonstrate that the low entropy (homogeneous) group has a preponderance (a very significant one) of ammunition marked 7.62 x 39_03 (given in red in the table). The high entropy group, by contrast, has a fairly uniform distribution of all 15 ammunition types in this analysis. These findings suggest that if the Turkana have an organized source of ammunition, then that source supplies them with ammunition marked 7.62 x 39_03.

That source is most likely to be Kenyan security forces for two reasons. Firstly, the KPR and location and sub-location chiefs have, by far, the highest concentrations of ammunition that is marked 7.62 x 39_03 with respect to all the ammunition of that type in the sample (see Figure 4.1). It is logical to conclude that,

Figure 4.1

Proportions of ammunition marked 7.62 x 39_03 (all groups; n = 873)



Note: Proportions are calculated as a percentage of all 7.62 x 39 mm ammunition (2,588 cartridges) distributed among the groups, not the full sample of various calibres, totalling 3,382 cartridges.

given that these groups are supplied primarily⁴⁴ by the Kenya Police, 7.62 x 39_03 is the type of ammunition that is issued to them by the police. It would be unusual for either the KPR or the chiefs to be in possession of such large proportions of a single type of ammunition had it not been supplied through Kenyan state channels.

Secondly, ammunition marked 7.62 x 39_03 is significantly less frequent in the samples taken from either Ugandan (state and non-state) groups or the Sudanese Toposa than it is among the Turkana. The most logical explanation for this concentration among the Turkana is that they purchase or otherwise receive ammunition either from the KPR and the chiefs; or from the Kenya Police, which supplies these former actors with ammunition; or potentially from all three parties. As Map 4.2 clearly illustrates, the spatial distribution of ammunition marked 7.62 x 39_03 is most concentrated among the Turkana (see Figure 4.1).

Field interviews, personal observations by the author, and eyewitness testimony confirm the results of the statistical analysis. Ammunition marked 7.62 x 39_03 is standard issue to the Kenya Police. It is, moreover, one of several types that have been distributed to Turkana warriors on at least two occasions in 2007

Table 4.2

Types of ammunition identified as having been transferred by the Kenya Police to the Turkana

Calibre	Manufacturer	Dates of manufacture
7.62 x 51 mm	Kenya Ordnance Factories, Kenya (see Table 3.2)	Post-1999
	Unknown, marked 7.62 x 51_97* (see Table 3.2)	Post-1997
	Fábrica Nacional de Munições, Portugal	Late 1970s–early 1980s
	Industrie Valcartier Incorporée	Late 1970s
7.62 x 39 mm	Unknown, marked 7.62 x 39_03** (see Table 3.2)	Post-2003

* The ammunition in question also features date marks other than ‘97’ (see Table 3.2), although ‘97’ is by far the dominant mark in the sample.

** The ammunition in question also features date marks other than ‘03’ (see Table 3.2), although ‘03’ is by far the dominant mark in the sample.

Sources: Ammunition recorded by the author from KPR and chiefs immediately following distribution by the Kenya Police, 2008; observations made by a third party during ammunition distribution by the police in 2007; author interviews with recipients of ammunition supplied by the Kenya Police. Confirmation that ammunition marked 7.62 x 39_03 is the type in service with the Kenya Police was provided during an interview conducted by a third party with the officer commanding station (OCS) of Lokichoggio branch of the Kenya Police.

and 2008. As Table 4.2 illustrates, the ammunition distributed by the police to the Turkana includes Kenyan-manufactured 7.62 x 51 mm ammunition, in addition to some older varieties manufactured by NATO countries; but 7.62 x 39_03 is by far the most common of these cartridges, due to the prevalence of 7.62 x 39 mm calibre weapons.

It is worth briefly restating the findings presented in the previous sections. Firstly, ammunition marked 7.62 x 39_03 comprises over 30 per cent of the entire sample of 7.62 x 39 mm ammunition recorded on the illicit market in Turkana North. It is significantly less frequent in Sudan (3 per cent) and Uganda (5 per cent), which suggests that neither of these countries is where illicit transfers of these cartridges originate. Secondly, the types and distribution of Kenyan state and non-state ammunition are correlated—primarily due to the prevalence of ammunition marked 7.62 x 39_03. Thirdly, the lower entropy (high homogeneity) values of the Turkana, in comparison to other non-state groups in the region, are primarily the result of ammunition marked 7.62 x 39_03 (see Table 4.2). Finally, interviews with illicit ammunition users,

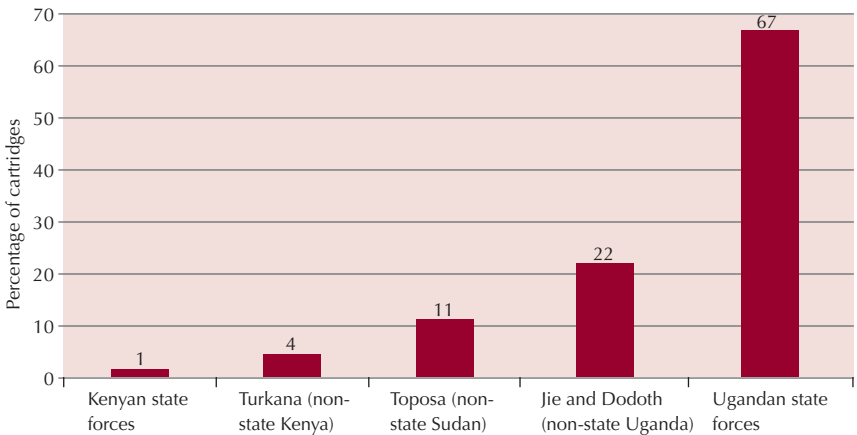
[illegible]Bevan **Blowback** 51

The supply of ammunition to Ugandan groups

Ugandan state and non-state actors’ ammunition stocks are correlated, as noted previously, but are they indicative of ammunition transfers between the two groups? The answer is yes, but with the qualifier ‘probably’.

The homogeneity analysis (see Table 4.1) reveals that Chinese-manufactured ammunition, which is marked 61_01, is the second-most common type of ammunition in the low entropy (homogeneous) group. As Figure 4.2 demonstrates, this type of ammunition is most densely (highest relative proportions) distributed among Ugandan state forces (LDUs and UWA).

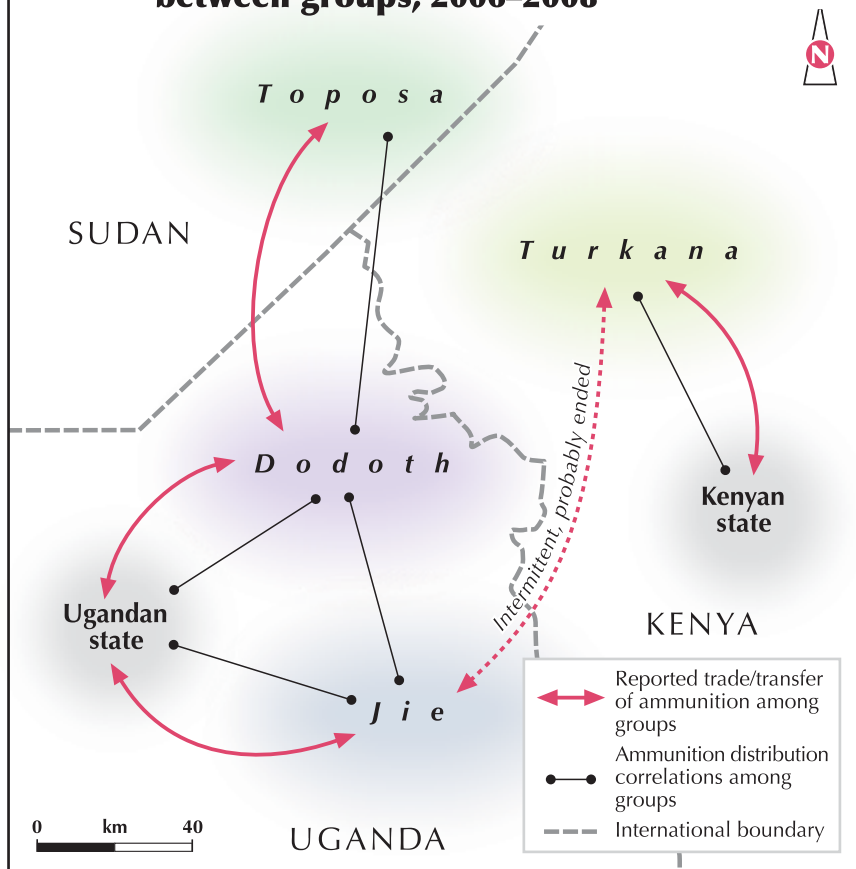
Figure 4.2
Proportions of ammunition marked 61_01 (all groups; n = 220)



Note: Proportions are calculated as a percentage of all 7.62 x 39 mm ammunition (2,588) distributed among the groups, not the full sample of various calibres, totalling 3,382 cartridges.

Interviews with UWA and LDU personnel (sampled in this study) confirm that ammunition marked 61_04 is issued by the UPDF to the UWA and, to a lesser extent, the LDUs.⁴⁵ Figure 4.2 illustrates that this ammunition proliferates in greater numbers with the Ugandan Dodoth and Jie pastoralists than it does with either of the neighbouring Kenyan or Sudanese groups. Like the Kenyan data, these findings suggest potential within-country trade or transfer between members of Uganda’s security forces and non-state Ugandan groups.

Map 4.3 **Reported trade routes and correlations between groups, 2006–2008**



Evidence for this trade has already been the focus of analysis. In 2007, the Small Arms Survey concluded, from ammunition samples and field interviews, that there was a strong case to be made for illicit diversion from members of the Ugandan security forces to Dodoth and Jie. The study, conducted by Bevan and Dreyfus (2007, pp. 290–301), indicated that the greatest commonalities between state and non-state stocks occurred because of the high prevalence of Chinese ‘61’-marked ammunition and Luwero Industries

(Uganda) ammunition. It concluded that elements within the Ugandan security forces have sold poor quality Ugandan ammunition, in particular, to the Dodoth and Jie. The findings presented here add to those of the previous study by suggesting that Chinese ammunition may also feature strongly in illicit diversion.

One other notable feature of the sample displayed in Figure 4.2 is the moderate proportion of ammunition marked 61_04 in the hands of the Sudanese Toposa. Some caution is required here, because it is unclear whether the Sudan People's Liberation Army (SPLA)⁴⁶ also uses ammunition of this type, but the trend may indicate trade between the Ugandan pastoralist groups and the neighbouring Toposa.

Ugandan state and non-state groups are each correlated (not strongly, but significantly) with the Toposa to around 0.55 ($P = 0.009$) in both cases. Importantly, there are no such significant cross-border correlations between either Kenyan and Ugandan groups, or Kenyan and Sudanese groups (see Map 4.3).

Although the Ugandan security forces' ammunition is correlated with that of the Toposa, there is no reason to suggest any direct relationship between Ugandan state security forces and the Sudanese group. The transfer relationship, in this case, is probably indirect. A great number of the Toposa warriors interviewed between May 2006 and January 2008 claimed to have acquired their ammunition from the Agoro⁴⁷ cattle market in Kitgum District, Uganda, in addition to trade with the Dodoth (the most northerly of the Ugandan Karimojong). Given that ammunition in the hands of the Ugandan state forces and the Karimojong in the sample is correlated due to the diversion of ammunition from the former to the latter, it is unsurprising, therefore, to find correlations between these state forces and the Sudanese Toposa.

V. Spotlight on Kenya's ammunition problem

The evidence presented in previous sections of the paper suggests, beyond reasonable doubt, that Kenyan security forces supply ammunition to the Turkana. The next sections of the paper are devoted to understanding why this happens, to what order of magnitude, and to what effect. These sections focus, firstly, on the historical patterns of arms and ammunition transfers into Turkana North District and how these transfers have shaped contemporary demand for ammunition in the region. Secondly, they present Kenya's rationale for supplying the Turkana with ammunition and the structure through which government-supplied ammunition reaches these illicit users. Finally, this part of the paper concludes with an assessment of the relative scale of each of the Turkana's ammunition sources and, by extension, the relative impact these sources have on armed violence in Turkana North District.

The recent history of arms transfers in Turkana North

The war in Sudan had the most pronounced impact on the supply and distribution of arms and ammunition in Turkana North District. By virtue of its location, the district was arguably to become the most heavily armed part of Kenya. Lokichoggio Division⁴⁸ is the focus of this study. The division has long been an epicentre of the district's trade in arms, but the following brief history illustrates how supply and demand dynamics in Lokichoggio have interacted (sometimes counter-intuitively, when taken at face value) with other parts of Turkana North.

Supply, demand, and weapons prices in Lokichoggio Division

The first and most significant impact of the war in Sudan was an influx of refugees into northern Kenya. Lokichoggio Division abuts the Sudanese border

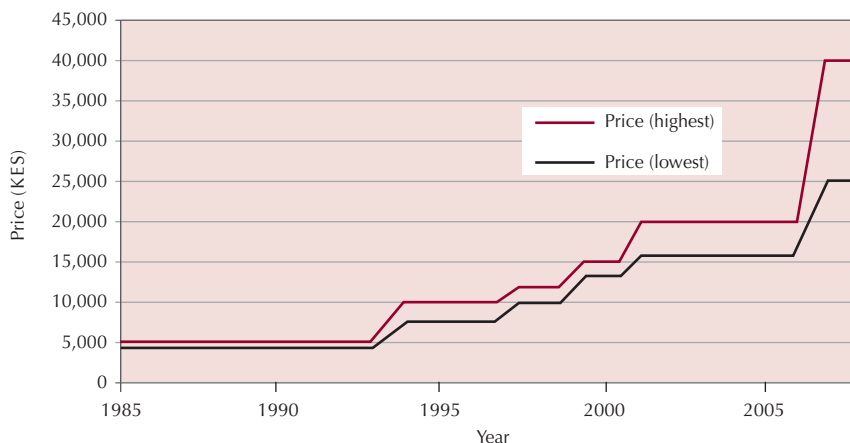
and was therefore the first Kenyan-administered territory encountered by refugees fleeing from Sudan. Many of these refugees were armed and, seeking sanctuary in Kenya (many in the Kakuma refugee camp 75 km to the south-east of Lokichoggio), were therefore anxious to be rid of their arms and ammunition. The refugees were keen to sell their weapons quickly and consequently offered them at values well below the existing market rate in Lokichoggio. The Turkana of Lokichoggio Division capitalized on their windfall of weapons, arming their communities and trading excess supply for goats, cattle, and hard currency with the Turkana populations to the south. Sustained supply of Sudanese weapons persisted into the late 1990s, as refugees continued to cross the border and, more importantly for the future development of the arms trade in Lokichoggio, the SPLA established itself (discreetly, but firmly) within Kenyan territory.

In the early 1980s a personal agreement between the then president of Kenya, Daniel Arap Moi, and the SPLA leader, John Garang, allowed for the creation of a relatively small SPLA base in Kenya. The station, named Key Base,⁴⁹ was situated approximately 3 km to the north of Lokichoggio, just to the east of the Lokichoggio–Nadapal road. It offered the SPLA a rearward base of operations and a convenient resupply location for military materiel shipped overland from Mombasa and Nairobi, or by air to the airstrip at Lokichoggio. The base was to become the nexus of Lokichoggio's arms trade (although not necessarily commerce in ammunition, as will be discussed below) over the ensuing two decades. Most local accounts suggest that weapons were diverted from the SPLA–Khartoum government front lines and transported to Key Base by members of the SPLA or by Sudanese parties operating in collusion with the soldiers. It is very plausible that Key Base (situated in the 'no man's land'⁵⁰ between Kenya and Sudan) was also a convenient location for Sudanese refugees to offload their weapons before entering territory policed by the Kenyan security forces (policing, which effectively began then, and still does now, at the Lokichoggio roadblock).

The price of Kalashnikov-pattern assault rifles in the mid-1980s was, relative to today's values, low; ranging between KES 4,000 and 5,000 (USD 60 and 75), according to the quality of the weapon.⁵¹ Most weapons were reasonably new and in comparatively good condition, having been recently issued to the

Figure 5.1

Upper and lower price estimates of Kalashnikov-pattern assault rifles in Lokichoggio Division, 1985–2008



SPLA. The market in Lokichoggio Division was not saturated, but sufficiently liquid to feed an onward trade to the Turkana populations clustered around the Kenyan towns of Kakuma and Lodwar to the south. The price of Kalashnikov-pattern weapons rose through the 1990s, not because of any notable reduction in supply (Key Base was still believed to supply around 90 per cent of Lokichoggio's illicit weaponry), but as a result of increasing demand (see Figure 5.1).

This phenomenon of (fairly rapidly) increasing demand was not due to any measurable escalation of hostilities between the Turkana and their neighbours, but rather the result of some subtle social and qualitative shifts in demand that encouraged increased acquisition. Lucrative commerce continued with the Turkana populations to the south. To this more or less constant demand curve, however, can be added two factors. Firstly, relatively low prices encouraged the Turkana to begin arming their young men more heavily (youths who might otherwise have spent several years personally acquiring the means to purchase a rifle). This trend increased the overall demand base among the Turkana of Lokichoggio Division. Secondly, with a decade to 15 years having passed since the beginning of the Sudanese arms influx, the Turkana's weapons were showing signs of age and many warriors were keen to acquire newer ones.

Contrary to most logical expectations, which might have predicted diminishing demand in Sudan as the conflict subsided and hence an 'exflux' of weaponry into Kenya, this does not appear to have happened in Lokichoggio Division. One key factor may have been that a reduction in Sudanese hostilities detracted from the role of Key Base as a supply nexus. The declining role of Key Base has been strongly suggested in field interviews and was probably due to organizational factors rather than purely supply-side factors (perhaps reduced opportunities for members of the SPLA to acquire or transport arms to the Kenyan-located base). With the hostile Toposa placed between the Turkana and the war-recovering southern Sudanese populations, and unwilling to trade with the Turkana for strategic reasons, Key Base's declining role could conceivably have damaged Lokichoggio's illicit arms trade considerably (despite regional market predictions that might have suggested otherwise). The price of Kalashnikov-pattern weapons continued to rise in the late 1990s, with weapons commanding a value of between KES 16,000 and 20,000 (USD 240 and 300) (see Figure 5.1).

Key Base closed in late 2006. While it had continued to supply weapons to Lokichoggio Division until that time, its closure arguably led to a fairly rapid reduction in Lokichoggio's supply of illicit weapons. Kalashnikov-pattern weapons rose greatly in price after 2007, reaching a high-end value of around KES 40,000 (USD 600). Demand was constant in the period, but restricted supply made it more difficult to acquire a high quality weapon in Lokichoggio. The growing breadth of price range (see Figure 5.1) may illustrate that, although commerce in older Kalashnikov-pattern weapons is still relatively strong (the lower price estimate) in Lokichoggio Division, acquiring newer weapons necessitates acquisition from southern Sudan. Lokichoggio remains a transport staging post into southern Sudan, and goods pass regularly between the town and Sudanese commercial centres, such as Kapoeta and Torit. These centres are now the reported sources of many of Lokichoggio's newer weaponry (see Box 5.1), but the distances and risks involved in transport add considerable costs to the trade (producing the higher price estimate in Figure 5.1).

Box 5.1

By road from Kapoeta

Kapoeta, southern Sudan is a major hub for the regional trade in ammunition. Interviews conducted among the Turkana suggest that traders linked to Kapoeta provide ammunition to the Turkana.

The siege of Kapoeta by the SPLA in 1988 was one of the defining moments of the SPLA's action against Sudanese government forces. This siege resulted in the SPLA's capture of the town; but such was their haste to pursue the government forces that the front pushed rapidly northwards, leaving the town's armouries open to local people. The armouries were heavily looted, which resulted in the Toposa acquiring a broad array of weapons and ammunition, ranging from small arms and ammunition to heavy machine guns, RPG-7 grenade launchers, and mortars. It is unlikely, however, according to many of the Turkana of northern Kenya, that the Toposa themselves are the source of anything but a small percentage of the illicit ammunition in Turkana North. Most of the interviewed Turkana warriors confirm that Kapoeta⁵² is a hub for small arms and ammunition trade, but that the trade is conducted in the town and not among the peripheral pastoralist communities, either around Kapoeta or closer to the Kenyan border.⁵³

The trade is therefore conducted by Lokichoggio-based Kenyan traders, who travel by road to Kapoeta and purchase ammunition in the town, either from individuals within the SPLA or from traders in the town who are unconnected with the military. Either avenue is plausible. Kapoeta is a major SPLA base and therefore far better provisioned with arms and ammunition than any other SPLA post close to the Kenyan border, with the exception of New Site.⁵⁴ New Site is, by contrast, an isolated military base and does not offer the commercial 'cover' for illicit deals offered by Kapoeta, with its large market for non-military commodities.⁵⁵ It is also very likely that ammunition looted during the siege of Kapoeta was stockpiled by some of the town's inhabitants and is now being sold on the illicit market.

Once purchased, the ammunition is carried in vehicles as far as Narus, which is the last Sudanese town before the SPLA-controlled border crossing at Napadal.⁵⁶ Owing to the heavy (and increasingly watchful) SPLA presence in Napadal, the ammunition is then transported from Narus, on foot or donkey, through the bush to Lokichoggio. The journey is a potentially hazardous one, because Kenyan traders have to pass through tracts of Toposa-controlled territory, but the rewards are considerable. In 2007–08, 150 cartridges of 7.62 x 39 mm ammunition (Kapoeta is also a source of 7.62 x 51 mm ammunition) commanded a price of one bull in Lokichoggio (KES 12,000–14,000 or USD 180–210). Given that Lokichoggio town centre is an unsuitable venue for illicit ammunition sales, traders either sell the ammunition at water points,⁵⁷ which are a natural meeting point for warriors and their herds, or, in some cases, take the ammunition directly to the kraals.⁵⁸

Box 5.2

The dangers of interpreting price information: lessons learned from Turkana North (2008 prices and preferences)

The low price of ammunition can be the result of a surfeit of supply, but it can also be the outcome of a drop in demand. There is often a tendency for researchers to assume the former; but a drop in demand appears to be the reason for the low price of 7.62 x 51 mm ammunition in Turkana North. This should not, however, be interpreted as evidence of an aggregate drop in demand for all types of ammunition.

In Turkana North, there is steady supply of two calibres: 7.62 x 39 mm (Kalashnikov) and 7.62 x 51 mm (NATO). Such is the prevalence of Kalashnikov weapons that the demand for the former type of ammunition is much greater than the latter. Regardless of the numbers of each type of cartridge in circulation, by virtue of the relative scarcity of NATO-calibre weapons, there is a surfeit in the supply of 7.62 x 51 mm ammunition.

Table 5.1

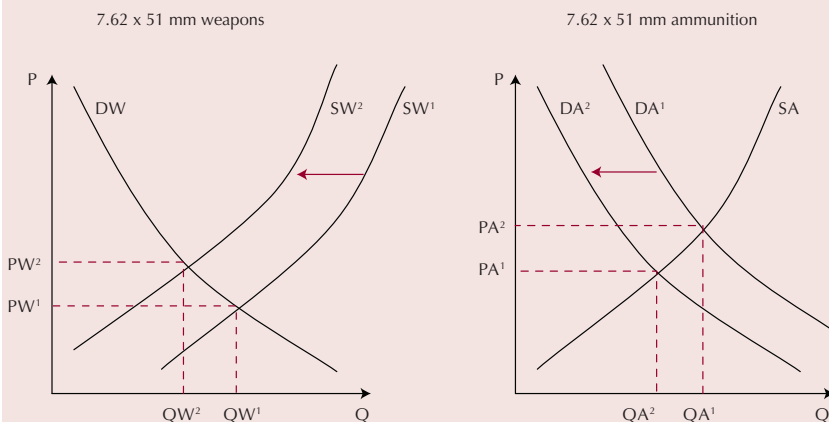
Preferences for and prices of weapons and ammunition in Turkana North

Weapon	Weapon preference among Turkana	Weapon availability	Weapon price (KES/USD)	Ammunition	Ammunition availability	Ammunition price (KES/USD)
FN/SLR	1	Low	40,000+ /600+	7.62 x 51 mm	Moderate	50/0.75
Kalashnikov	2	High	25,000–40,000/ 375–600	7.62 x 39 mm	Moderate	100/1.50
G3	3	Low	25,000- /375-	7.62 x 51 mm	Moderate	50/0.75

As Figure 5.2 illustrates, a reduction in the supply of NATO-calibre weapons (described previously in the text) from SW^1 to SW^2 leads to a price increase for those weapons, which are still in high demand in Turkana North (see Table 5.1). However, the diminishing number of these weapons in the region (QW^1 to QW^2) decreases the demand for NATO 7.62 x 51 mm ammunition from DA^1 to DA^2 . Because this type of ammunition is in relatively plentiful supply, the price of 7.62 x 51 mm cartridges falls from PA^1 to PA^2 .

Figure 5.2

Supply and demand models for 7.62 x 51 mm weapons and ammunition



The supply and demand dynamics for the more prevalent 7.62 x 39 mm ‘Kalashnikov’ ammunition are precisely the reverse of the models presented in Figure 5.2. The numerical predominance of Kalashnikov-pattern weapons creates strong demand for 7.62 x 39 mm calibre ammunition. Although the aggregate supply of this type of ammunition is plentiful, relative to the number of Kalashnikov users in the region it is comparatively scarce. This leads to the higher price of 7.62 x 39 mm ammunition, indicated in Table 5.1.

Weapons and ammunition are complementary goods. Assessing either the price of ammunition or the price of a weapon independently from the other variable can generate a false picture of demand and supply dynamics. For example, the decreasing price of 7.62 x 51 mm ammunition might suggest that it is entering the region in greater quantities (which it is not) or that there is decreasing demand for weapons in general in the region (which there is not). Conversely, a study that records higher prices of FN rifles in the region might conclude that demand is escalating or some unknown factor is restricting the supply of weapons. If the study failed to note that this was true only of 7.62 x 51 mm weapons (and not the Kalashnikov-pattern weapons that predominate), then its findings could be drastically misinformed.

The low price of 7.62 x 51 mm ammunition is arguably a market distortion in Turkana North. Although the supply of 7.62 x 51 mm weapons, such as G3 and FN rifles, to the illicit market has declined in recent years, the availability of 7.62 x 51 mm ammunition has been sustained by supply from the Kenyan security forces (recall, for instance, the various 7.62 x 51 mm police-supplied cartridges listed in Table 4.2).

The weapons of Turkana North and the demand for ammunition

Since the early 1980s there have been significant changes in the types of weapons circulating among the Turkana. NATO-calibre weapons, such as SLR and G3 rifles, have gradually declined in number, and have been replaced, although not entirely, by Kalashnikov-pattern assault rifles. These changes have had a significant impact on the demand for ammunition.

The shift in weaponry responds to two factors: the growing availability of Kalashnikov-pattern weapons and the (linked) ascendance of the Warsaw Pact ('Kalashnikov') 7.62 x 39 mm calibre in the region. Prior to the early 1980s the dominant weapons in use by the Turkana were ageing British .303 inch and 7.62 x 51 mm Lee-Enfield rifles and more recently manufactured FN rifles (including the British SLR variant) and G3 rifles. These latter types use the 7.62 x 51 mm NATO cartridge and were, in the early 1980s, common to the Kenyan security forces, whose military weapons generally followed British colonial preferences for small arms.

The influx of weapons from the Sudan war, however, resulted in a major shift in the types and calibres of weapons circulating in the region. Some of these weapons were already relatively common in Turkana North. G3 rifles, for instance, found their way south (albeit in relatively small numbers) from the conflict.⁵⁹ It was Kalashnikov-pattern weapons, however, that were to enter the region in the greatest numbers during the course of the war, and their entry was to fundamentally change the demand for ammunition in Turkana North.

The sample in this study illustrates the diminishing role of 7.62 x 51 mm calibre weapons in the region. While once the primary armament in the region, 7.62 x 51 mm ammunition now comprises around 15 per cent of all ammunition recorded in the region. Of this, over 50 per cent is in the hands of Kenyan government-supplied chiefs and KPR personnel, who frequently use older G3 and Lee-Enfield (late model) rifles previously issued to the Kenya Police. The decline in prevalence of the 7.62 x 51 mm cartridge in the region is reflected in the price it commands.

While NATO-standard 7.62 x 51 mm ammunition once commanded the highest prices, it now sells for half the price (KES 50, or USD 0.75) of 7.62 x 39 mm ammunition. This depressed price is not in response to inferior quality or

firepower. The Turkana recognize that the G3 is a more powerful and accurate rifle than the Kalashnikov, although it is more cumbersome to carry. The FN/SLR rifles are still rated above the Kalashnikov (and well above the G3), but each of these NATO weapons is in short supply. Decreased demand, resulting from the fact that so few of these weapons proliferate, deflates the price of NATO-calibre ammunition (see Box 5.2).⁶⁰

The Kenyan state's role in ammunition transfers to the Turkana

The Kenya Police is at the centre of a number of legal, quasi-legal, and illicit ammunition supply dynamics within Turkana North. Transfers take several forms, ranging from unquestionably illicit, ad hoc sales by individuals within the police and by members of the KPR, to the distribution of ammunition on a large scale that appears to be part of a broad local authorities-sanctioned strategy to arm the Turkana in defence against hostile neighbours. This latter activity not only runs contrary to Kenya's stated position, which is in opposition to the illicit proliferation of small arms and light weapons, but is also open to abuse, as the following sections note.

Ad hoc sales: from the KPR to the Turkana

Police officers, acting in a private profit-making capacity, undoubtedly sell ammunition to local Turkana warriors, either directly or through intermediaries. But it is members of the KPR that have the greatest motive, and critically the most opportunity, to sell or distribute ammunition to the Turkana. Of the lower levels of the security forces, it is among the KPR that institutional controls, which could restrict the supply of ammunition, are at their weakest.

The Kenya Police supplies the KPR with ammunition. Authority for these transfers nominally rests with the officer commanding the police division (OCPD) of Turkana North District.⁶¹ The KPR's intended role is to defend local communities against aggression (within Turkana North) by the Sudanese Toposa and Ugandan Karimojong groups.⁶² It can best be described as a civilian militia force, which operates largely outside centralized control. To the external

observer, members of the KPR are often indistinguishable in their appearance and equipment from Turkana warriors. They do not perform regular military duties⁶³ and live among their fellow Turkana. Police transfer of ammunition to the KPR is irregular, and decisions to resupply ammunition appear to be made on a relatively ad hoc basis, in response either to major ammunition shortages or to increased hostilities between the Turkana and their neighbours.

Members of the KPR, like many Turkana, are both suppliers and recipients of illicitly traded ammunition. Owing to the irregular supply of ammunition from the police, many KPR personnel have to acquire ammunition from traders and fellow Turkana. In the latter case, the transfers are best characterized as friend-, family-, and clan-based, comprising a bi-directional flow of ammunition (sometimes traded, often gifted) in response to the respective needs of Turkana warriors and the KPR who reside alongside them. It is for these reasons that the KPR stocks of ammunition in the sample often feature quite diverse types of ammunition, such as Khartoum-manufactured cartridges,⁶⁴ which almost certainly have not been supplied by the Kenyan state authorities.

Retransfer: from the chiefs to the Turkana

The government-appointed location and sub-location chiefs receive ammunition from the police. The ammunition is officially destined for personal use. However, the chiefs have the opportunity to distribute ammunition to overcome a frequent lack of legitimacy that they experience in their relations with local communities. This problem arises because chiefs are assigned to particular communities, not by the communities themselves, but by local state authorities.⁶⁵ To compound matters, many of the chiefs live in the towns, often far from the communities that they are supposed to represent, and day-to-day responsibility for the communities (and hence allegiance) often rests with the kraal leaders.⁶⁶ When the chiefs receive ammunition from the police, distributing it to the Turkana warriors becomes a useful way to garner favour among factions in the communities to which they are assigned.

Systematic distribution: from the Kenya Police to the Turkana

At the beginning of February 2008 a Kenyan government minister, travelling with members of the Turkana North Police Division, visited the town of Oropoi

just before nightfall. The minister's visit lasted approximately one hour and, in that time, he addressed a circular, seated audience of Turkana warriors and KPR. The address concluded with the distribution of ammunition to both parties. The minister's address and the distribution of ammunition are linked, but some caution should be observed as to how to interpret this event.

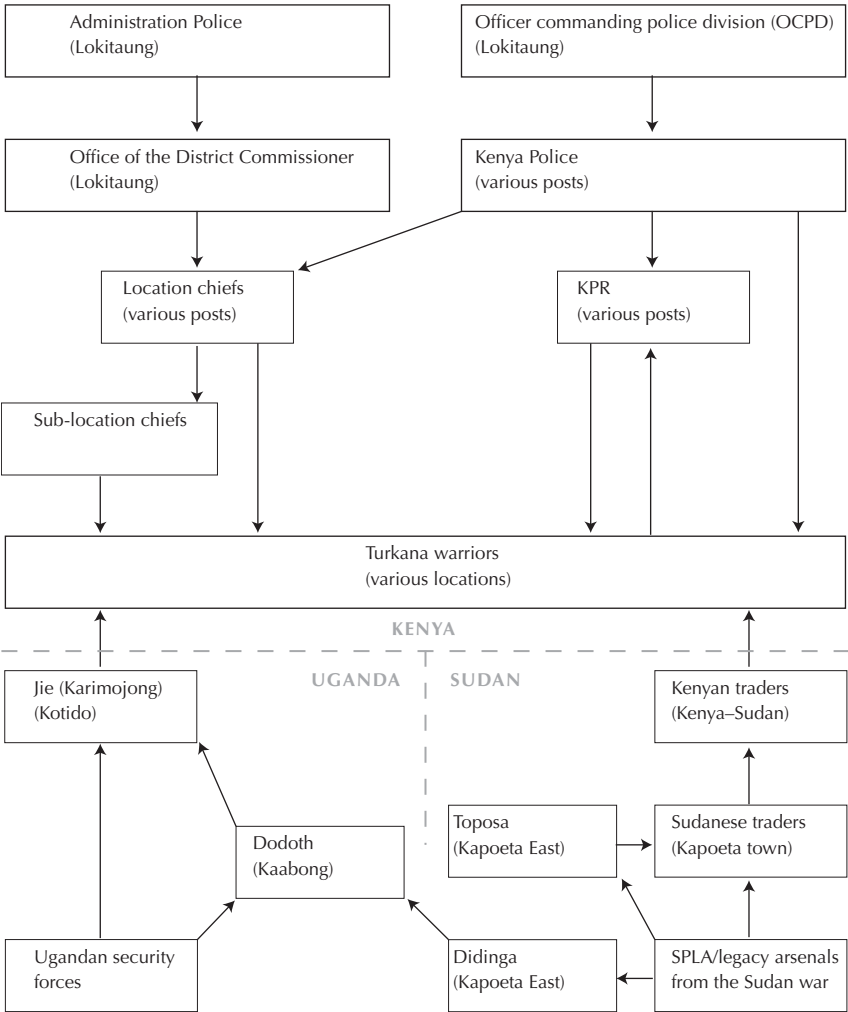
Firstly, although the ammunition arrived with the minister,⁶⁷ this in itself is not unusual. Turkana North Police Division has such a shortage of petrol and vehicles that the minister's visit may well have provided an opportunity for members of the Kenya Police to visit Oropoi and distribute ammunition (ostensibly to the KPR, but to the Turkana also, as discussed below).⁶⁸

Secondly, as later sections of this paper note, the distribution of ammunition by the Kenya Police to the Turkana has become normalized. Local authorities and local government generally perceive such transfers as legitimate, given their inability to provide security to the Turkana. The fact that the minister was present could be interpreted as fulfilling his mandated role as a member of parliament by providing for his constituents—whatever the wisdom of the practice.

Political motivations might well be attributed to this event, but it is also clear that political motives can be attributed to any 'benevolent' action taken by a politician. This event occurred after the December 2007 elections, not before. It is arguably more indicative of the local administration's inability to police Turkana North's conflicts than it is of some form of 'bullets for votes' policy.

That said, ammunition is a precious strategic resource for Turkana communities, and its distribution at the meeting may well have been the main attraction for the meeting's attendees.⁶⁹ The event puts the minister in a very difficult position. On the one hand, he is aware of and broadly agrees with the fact that the police consistently supply ammunition to the Turkana. The event was not an isolated incident, and government-appointed officials attended the distribution of ammunition by the Kenya Police at several different locations in Turkana North in 2007 and 2008, including a near-identical⁷⁰ incident recorded in March 2007 about 30 kilometres to the east of Lokichoggio.⁷¹ On the other hand, the minister's later interview with the author suggests that he is deeply concerned for the welfare of the Turkana, but also constrained in the resources he can place at the disposal of Kenyan security forces, which might otherwise be able to provide better security to the region (discussed below).⁷²

Figure 5.3
The flow of ammunition to the Turkana



One thing is clear: the event and others like it indicate that the Kenya Police operates a systematic policy of supplying the Turkana with ammunition, one that has the support of local authorities in Turkana North.

The questionable legality and wisdom of ammunition transfers

The distribution of ammunition by the police is doubtfully legal, from the perspective of both the recipients and the suppliers. First, the vast majority of Turkana (many of whom do not even hold mandatory Kenyan national identity cards) certainly do not possess firearms certificates. Kenyan law stipulates that 'no person shall purchase, acquire or have in his possession any firearm or ammunition unless he holds a firearm certificate in force at the time' (Kenya, 1954, part II, sec. 4, art. 1). Second, the legality of members of the Kenya Police supplying ammunition to the Turkana is also doubtful, regardless of whether they may be following orders from higher authorities. Article 26A (para. 1) of the Firearms Act asserts: 'Any public officer who ... disposes of any Government firearm or ammunition to any person who is not under his immediate command without lawful authority ... shall be guilty of an offence' (Kenya, 1954). Moreover, the law is clear that '[i]t shall not be a defence to a charge under this section that the act constituting the offence alleged was carried out by the accused person upon the orders of any other public officer' (Kenya, 1954, para. 3). It is unclear whether any local administrative or legislative arrangements provide for exceptions to the Firearms Act.

Irrespective of its legal status, and perhaps more importantly, the practice is also in direct opposition to Kenya's stated position against the illicit proliferation of small arms, as Kenya's statement to the UN Security Council makes explicitly clear:

Since the United Nations Conference on Small Arms and Light Weapons in All Its Aspects held in July 2001, Kenya as a country most ravaged by the effects of illicit small arms, has been in the forefront in the war against the proliferation of illicit weapons The problem of illicit circulation of small arms is multifaceted. To address it effectively, we need to find out how, by whom and for whom, are these weapons manufactured, traded and used. (Kenya, 2002)

The problem is clear. The questions raised by the statement are, in part, answered by this study. By issuing ammunition to the Turkana, agents of the Kenyan state lose control over how it is used. Regardless of the legality of its

transfer, the ammunition becomes another element in the illicit trade that 'ravages' Kenya.

The state's predicament

Why does the practice of supplying the Turkana exist and why does it continue? It is very unlikely that supply of ammunition by the Kenyan police is a government policy. It is far more likely, as the following discussion notes, to be an ad hoc response by local authorities to the difficulties of policing Turkana North's peoples and conflicts.

Governing and providing law and order to an area like Turkana North is no easy task, and any analysis of conflict, state responses to it, and, ultimately, the distribution of ammunition has to keep this observation firmly in mind. Four broad challenges face the Kenyan state: the peripheral economic and political status of the region; the mobility of the population within it; the conflicts among the groups that inhabit or encroach into the region; and the geography and land cover of Turkana North District. These challenges are not independent of one another, as the following discussion illustrates, but they arguably constrain the actions of state security and local administrators to such an extent as to leave questions of security to the Turkana communities themselves. The distribution of ammunition, whatever its legal status, must be viewed within these parameters.

Turkana North, like many of the world's pastoralist regions, is situated at the periphery of the state. The majority of the Turkana population⁷³ have few ties with the formal Kenyan economy, and the way of life for most of the region's inhabitants has changed very little over the past centuries. There have consequently been few incentives for the state to comprehensively administer much of Turkana North, simply because there are very few conurbations to administer. The exceptions are the small, former colonial outposts of Lokitaung, Todenyang, and Oropoi (Lokichoggio barely existed before it was adopted as the air and land bridgehead for Operation Lifeline Sudan in the 1980s). As a result, relatively few security forces are stationed in the region and the primary role of these forces is, arguably, to secure Kenya's borders against foreign aggression and provide security in the towns, rather than to police most of the territory.

Much of the Turkana population is highly mobile. Its migratory routes are dictated, not by any state imposed administrative boundaries or infrastructure, but by the search for fresh pasture. As a result, most of the population resides far from Turkana North's towns, away from the region's few roads,⁷⁴ and often many hours travel (by 4x4 vehicle) from the local state administration or security forces.

The conflicts among the Dodoth, Turkana, and Toposa (and to some extent the Nyangatom) discourage development or investment in the region. The border regions of Turkana North (to the north and west) are generally considered a 'no man's land'. Roads pass through some of these regions, but the near-constant insecurity arguably deters the growth of villages or other trading hubs along these commercial arteries. The economy in the region is therefore stagnant. What little trade passes through it (and humanitarian services can be added to this) tends to transit the region and does not, therefore, spur development. With little development, the Kenyan state has few incentives to provide security beyond the towns and roads—simply because there is no tangible commercial activity or infrastructure to protect.

Topography and land cover present the final challenge to the Kenyan state and its ability to exert control over Turkana North. Turkana (North, Central, and South Districts) covers an area of approximately 68,000 square kilometres.⁷⁵ To provide some idea of scale, Turkana is 30 per cent larger than the combined areas of Rwanda and Burundi.⁷⁶ Turkana North, in particular, features only one paved road, running north–south from Kakuma to the Lokichoggio roadblock on the Nadapal road. The remainder of the district's roads are either constructed of sporadically graded murram (earth) or are ungraded bush tracks (primarily kept open by the regular passage of livestock). The rest of the district is composed of scrub or open (albeit rocky) rangeland. The activities of the Kenyan police and military are generally constricted to the roads for the practical reason that much of the bush is impenetrable to vehicular access.

These four factors—the district's peripheral status, a mobile population, the impact of conflict on development, and topography/land cover—restrict Kenyan police and military activities to the towns and some of the roads, which leaves many communities outside the orbit of state-provided security.

The provision of state security to the Turkana is therefore scant. Neither the police nor the military have the capacity to respond to security incidents rapidly. This slowness of response is often due to the fact that reports of hostilities travel slowly among the Turkana, who, for the most part, reside far from the district's small administrative centres, such as Lokichoggio and Oropoi. Reports of violent events often arrive too late for effective intervention by the security forces. These forces are consequently unable to offer protection to Turkana communities in the event of a raid or other acts of hostility. None of these obstacles is insurmountable in the long term; nor do they fully justify the lack of investment by the Kenyan state in the district's administration.

At the national level, this lack of investment manifests itself in the minimal resources placed at the disposal of the security forces for maintaining law and order. The Kenya Police and Administration Police of Lokichoggio do not have the resources (petrol, number of vehicles, etc.) to adequately police the northern parts of the district. The police station in Oropoi, for instance, is staffed by too few officers (only six in January 2008) to permit them to respond to any hostilities outside of the town (primarily because they have to leave a certain number of officers to guard the station and the armoury). There is very little police presence elsewhere in the district, with few officers stationed at the small outposts of Todenyang and relatively few in Lokitaung. No officers are stationed outside of the region's towns.

At the local level there is a prevalent *laissez-faire* attitude among district officials. This comes across strongly in interviews and appears to be based on the rationale that the conflicts cannot effectively be policed, so the only option is to bolster the Turkana's defences against hostile forces. As a result, there is a tacit (although far from unspoken) agreement between the local Kenyan authorities and Turkana warriors according to which the Turkana receive ammunition directly from the police for their own defence. The Turkana part of the bargain is a widely understood rule that the state-supplied ammunition is to be used only in the bush, and that weapons are neither carried in the region's towns nor used to molest the region's road traffic.

This 'pact' has clearly not been obeyed, and, inevitably, the ammunition does not remain in the bush among the pastoralist communities. There is

strong demand for ammunition in Turkana North's towns. Warriors interact with urban economies, with the result that ammunition becomes a form of currency in the region and flows from the kraals to fuel violence in the towns.

Blowback

On 7 May 2008 gunmen armed with Kalashnikov-pattern assault rifles ambushed the head of the World Food Programme's sub-office in Lokichoggio, Turkana North District. Silence Chirara was killed as he drove his vehicle through the gates to the UN compound, in an attack that bears all the hallmarks of a premeditated assassination. The vehicle was struck by seven bullets, and police subsequently recovered seven 7.62 x 39 mm cartridge cases from the scene. To the dismay of the Lokichoggio police,⁷⁷ of those cartridges, three were of the type issued by the police to the Turkana. How these

A blood-stained and bullet-holed World Food Programme Landcruiser at the scene of the killing, UN compound, Lokichoggio, Kenya, 14 May 2008. © James Bevan



Table 5.2

Cartridges recovered by the Kenya Police from the UN compound in Lokichoggio and the numbers of the same types of cartridges in the sample

#	Cartridges recovered from the scene of the shooting at the UN compound	Number and percentage of these cartridges in the overall sample (2,588) of 7.62 x 39 mm cartridges used in this study
1	7.62 x 39_03	873 (33.7%)
2	7.62 x 39_03	
3	7.62 x 39_03	
4	3_73	84 (3.2%)
5	270_68	1 (0.0%)
6	270_68	
7	Unmarked/marks faded (see Annexe 5)	84 (3.2%)

cartridges came into the possession of the attackers is unclear, but given the prevalence (over 30 per cent) of this government-supplied ammunition in Turkana North (and its near-absence elsewhere in the region), the laws of probability suggest that its use in the shooting is to be expected.

The heterogeneity of these cartridges suggests that they are simply a reflection of the diverse types of ammunition circulating on the illicit market—one, however, that includes a great many government-supplied cartridges.

Unfortunately, it takes a high-profile incident such as the UN shooting to raise the visibility of Turkana North's ammunition problem to the international level. It is a highly potent reminder that the violent use of ammunition provided to the Turkana by the Kenya Police is not confined to pastoralist conflicts. Its distribution has a 'blowback' effect.⁷⁸ Because of its sheer prevalence in the region, the ammunition has the potential to be used in the full spectrum of armed violence in Turkana North.

Armed robberies, ambushes, and shootings occur frequently in Turkana North District. In 2006 the Intergovernmental Authority on Development's (IGAD) Conflict Early Warning and Response Mechanism (CEWARN)⁷⁹ reported 11 clashes in Kenya. Thirty-one people died in a three-month period alone, and just over 25 per cent of these were cross-border incidents between the Turkana and neighbouring

groups. Most of the deaths were almost certainly inflicted with rifles.

The 31 deaths reported by CEWARN are a gross underestimate of Turkana North's conflict burden. In neighbouring Uganda, some estimates put the death toll from the conflict, which is similar in almost all respects, at over 550 each year.⁸⁰ CEWARN reports are updated only sporadically and the reporting mechanism for Turkana North is not effective in the northern parts of the district.⁸¹ Conflict deaths can be expected to be orders of magnitude higher than these figures suggest and undoubtedly run into several hundred each year.

Armed violence impacts on livelihoods, on the economies of local communities, and ultimately on the development prospects of Northern Kenya. Mku-tu's (2008, pp. 90–99) work on the pastoralist conflicts to the south of Turkana paints a grim picture of these impacts, including the high costs of providing treatment to gunshot victims in a healthcare system that is already overwhelmed and under-resourced; the price borne by communities that have lost livestock to raids; and the extreme burden of death and injury to the region's young male population.

Seven 7.62 x 39 mm cartridge cases recovered from the shooting outside the UN compound, Lokichoggio, Kenya, 20 May 2008. © World Food Programme



The supply of ammunition to the Turkana arguably plays a critical role in sustaining the region's injurious levels of armed crime and armed violence, but to what extent is this problem domestically driven and what role does 'foreign' ammunition play in the violence? These are important questions because they have strong implications for the ways in which many of the region's governments interpret the flow of illicit small arms and ammunition and, by extension, formulate responses to it.

In proportion: Kenya's domestic ammunition problem

What proportion of illicit ammunition proliferation is a Kenyan-generated phenomenon? Although the findings presented below are rough, they give some relative scale to the sources of ammunition in Turkana North.

Figure 5.4 displays ammunition that is believed to have entered the illicit market in Turkana North through three broad sources: via the Kenya Police, through various routes originating in Sudan; and, indirectly, via diversion from the Ugandan armed forces. It includes only cartridges that were recorded from the Turkana in Turkana North District. It does not include ammunition in service with either the KPR or chiefs of location and sub-location.

From the Kenya Police to the Turkana

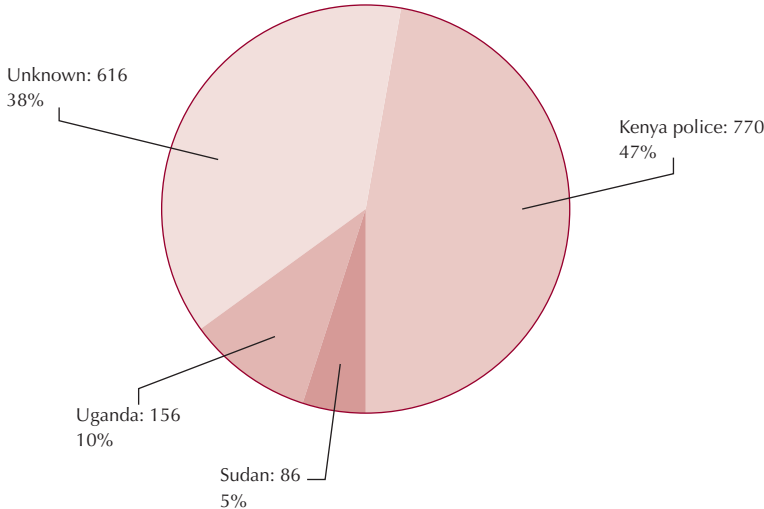
All (726) of the cartridges marked 7.62 x 39_03 are included in this category (together with cartridges of this type that are date-marked 97, 01, and 03). This category also includes 7.62 x 51 mm cartridges issued by the Kenya Police (Table 4.2) and marked 7.62 x 51_97 (and other dates); Kenya Ordnance Factory-marked cartridges; and Portuguese ammunition (Table 4.2). Together, these 7.62 x 51 mm cartridges are 44 in number.

From Sudan to the Turkana

For the purposes of this exercise, Sudanese-marked ammunition can be assumed, for the most part, to have arrived in Turkana North through the trade routes detailed in previous sections of this paper: primarily by road from Kapoeta and, to limited extent, via the Didinga of southern Sudan and possibly

the Ugandan Jie. These cartridges include 59 Sudanese-marked 7.62 x 39 mm cartridges (of the 77 given in Table 3.2). In addition, as discussed in Annexe 5, the unmarked ammunition in the sample is probably manufactured in Sudan. Twenty-seven of these cartridges appear in the sub-sample, and these are included under the heading ‘Sudan’ in Figure 5.4.

Figure 5.4
Origins of 7.62 x 39 mm and 7.62 x 51 mm ammunition on the illicit market in Turkana North (n = 1,628)



From Uganda to the Turkana

This category includes 35 cartridges manufactured by Luwero Industries, Uganda, in addition to 121 Chinese cartridges marked 61_04 (including date marks ‘00’ and ‘01’), which predominate in the stocks of Uganda security forces. These cartridges proliferate among the Ugandan Jie and hence are most likely to enter Kenya via this route, given the hostilities between the Turkana and the Ugandan Dodoth and Sudanese Toposa, which discourage trade.

Despite the potential for error, Figure 5.4 clearly illustrates the magnitude of Kenyan ammunition supply to the Turkana. Far fewer cartridges can be di-

rectly attributed to either Uganda or Sudan, although the unknown proportion of the sample certainly includes numerous types of ammunition that have passed through the two countries.

The findings are clear. Statistically speaking, any person killed with illicit ammunition in Turkana North, whether a party to a crime or to a pastoralist conflict, has a near 50 per cent chance of losing his/her life to a Kenyan-supplied bullet. This statement is not intended to hype the results of the data, but to provide a clear indication that Kenya's policy of arming the Turkana has a potentially very significant role to play in armed violence in the region. ■

VI. Conclusion: prospects for Turkana North

Ammunition supply is a misunderstood aspect of small arms proliferation in the region. In 2004, the Kenyan Minister for Foreign Affairs reported that 60,000 small arms had found their way into Kenya since the collapse of the Somali state.⁸² Similarly, Kenya's report to the 2006 Small Arms Review Conference framed the issue in the following terms:

Kenya has suffered the effect of SALW [small arms and light weapons] proliferation as a result of long porous borders with unstable neighboring states, large refugee population, relative stability in an unpredictable region, geographically vast and isolated arid and semi arid areas that can not be policed adequately among many others. These arms have continued to fuel urban crime, abet cattle rustling and fuel ethnic conflicts. The net effect has been high cost of providing security, underdevelopment of arid areas inhabited by armed pastoral communities and instability arising from cross border manifestation of these pastoral conflicts. (Kenya, 2006, p. 3)

Governments, the news media, researchers, and even some illicit users continue to frame the problem as one that results from the free transit of 'conflict weapons' across the region's porous international borders. Mkutu's (2008) *Guns and Governance in the Rift Valley* is a rich exploration of arms and armed violence in the region. It contains comprehensive charts of arms flows in the region and some valuable price information on ammunition, but it does not even touch on the supply of government ammunition to the Turkana. Despite the great value in the book, it (and others like it) arguably perpetuates the 'old myth' that small arms are an uncontrollable feature of the region. The preoccupation with 'foreign weaponry' entering via 'porous borders' from 'bad neighbours' is to a certain extent accurate, but it is only half the picture.

Ammunition matters, because it is half the small arms equation. It is half of the problem, and precisely one half of that problem is currently being ignored. Whether or not the Kenyan government is fully aware of the scale of

government-supplied ammunition proliferation in Turkana North is unclear, but an initiative to supply the Turkana with ammunition has been under way in Turkana North for a number of years, and this initiative is little disguised.

The intent behind the initiative is logical, up to a point. Kenya's security force infrastructure in Turkana North cannot address the conflicts between the Turkana and neighbouring groups. Supplying the Turkana with ammunition is a gesture on the part of local authorities to the effect that, despite the relative powerlessness of state security forces, the Turkana's security is a matter of state concern.

This practice, however, cannot improve the Turkana's security in the long term; nor is it beneficial to the development trajectory of the region. Cycles of raid and retaliation among the region's pastoralist groups continue unabated, fuelled by the supply of ammunition. It is worth noting that the Turkana are not merely passive defenders in the conflict, but also active aggressors who use government-supplied ammunition to raid neighbouring communities.

Moreover, there is now increasingly clear evidence that Kenyan government-supplied ammunition is being used in the crime and general lawlessness that afflicts much of Turkana North. Ammunition issued to the Turkana enters the towns and is used in acts of armed violence, the most recent of which involved the death of a UN employee. The implications of supplying Kenyan government ammunition to the Turkana are, therefore, not merely local or regional, but demonstrably international.

Much could be accomplished to control the supply of ammunition to the Turkana if Kenya instituted effective arms management practices—notably comprehensive accounting and record keeping—which could deter loss, theft, and the illegal distribution of ammunition. Looking to the long term, even if the quasi-policy of distributing arms to the Turkana were to be halted, future efforts to curtail armed violence would still need to prevent the uncontrolled sale of ammunition for personal gain by individuals in the Kenya Police, the KPR, and local chiefs.

Turkana North's ammunition problem, however, cannot be solved by restricting the supply of ammunition alone. Ammunition supply by the Kenya Police is an escalatory factor in the region's armed conflicts, not a causal one. It is clear that unless Kenya radically revises both the strategies of its security

forces in Turkana North and the resources placed at their disposal, the violence and insecurity that afflicts the region will continue unabated. With or without the supply of government ammunition, the parties to the conflict will retain access to numerous sources of ammunition, because the region is already awash with armaments.

The Kenyan police supply ammunition to the Turkana for a reason—the inability of the Kenyan state to provide security to its pastoralist populations in the north of the country. Ammunition supply is therefore a remedy (however misjudged) that has been instituted in the hope of addressing the Turkana's insecurity. Arguably, the solution to the insecurity in Turkana North lies in the rationale behind this misguided policy.

The long-term solution to the problem rests, not with the Turkana, but with the Kenyan state and its capacity to provide adequate law and order in the north. To use a counterfactual example, if the Kenyan state moves to severely restrict ammunition supply to the Turkana, then if the latter are still faced with the same threat from the Dodoth and Toposa, demand for ammunition will remain unaffected. It is not difficult to conceive of 'foreign' ammunition sustaining armed violence (over 50 per cent of the Turkana's ammunition can be attributed to external sources), or the activation of new supply channels to meet increased demand. The region provides a latent pool of ammunition that arguably has yet to be fully exploited by northern Kenyan groups, simply because demand is currently met by government-supplied ammunition.

These factors point to demand reduction as the only viable long-term strategy for reducing armed violence in the region. Providing security is a prerequisite to peace for the Turkana and, by extension, to economic improvements, development, and a reduction in ammunition demand. Arguably, these long-term objectives call for a more active approach to law and order, one that is not premised on the existing arrangements that promote static 'defence' of the region's towns against the lawlessness that prevails in the bush.

Turkana's pastoralist conflicts require mediation and, at times, forceful intervention if they are to be brought under control. Developing security forces that can respond to attacks, bring perpetrators to justice, and return cattle are a necessity. The region's conflicts demonstrate that local security arrange-

ments, when left to the armed warriors, play as great a role in prompting hostilities as they do in defending against aggression.

At present there are few indications that the state security forces in Turkana North have the structural capacity or resources to respond to the conflicts among pastoralist communities. The need for flexible response is arguably the greatest requirement for Kenyan security forces. Cycles of raid and retaliation can only be broken when security forces have the communications structures in place to alert them to impending attacks or those in progress. Once notified, they need to be able to intervene to either prevent groups of warriors from attacking one another, forcibly intercede in hostilities, or conduct follow-up actions to isolate perpetrators (notably small groups of warriors) and return stolen livestock.

The supply of ammunition into Turkana North is much more than an unwise policy that has deleterious impacts on the district's security. It is an increasingly visible symbol of the Kenyan state's neglect of its pastoralist populations and its need to invest adequately in their protection. ■

Annexe 1: Collection and analysis of ammunition

The author recorded the ammunition referred to in this paper while it was in the possession of various state and non-state agents in Kenya, Sudan, and Uganda. This process entailed requesting that each person unloaded their weapons, recording the markings on every cartridge, and then returning the ammunition to the user. This person-by-person method ensured that every one of the 3,382 cartridges in the sample could be attributed⁸³ to the person using it. The study did not record any ammunition that had either been found on the ground or stockpiled, either of which might have led to a lack of clarity concerning who its users were.

The study sampled ammunition in this way from 207 individuals in Kenya, Sudan, and Uganda, of whom 17 per cent were state forces and 83 per cent were non-state pastoralist warriors. Seventy-eight per cent of the people sampled in Kenya and Uganda could be described as illegal users. In the case of Sudan, the legal/illegal distinction is less clear, given the ongoing consolidation of SPLA/SPLM control over the populations of South Sudan.⁸⁴

The average number of cartridges sampled from each person in Kenya was 14; in Sudan it was 16; and in Uganda it was significantly greater, with an average of 29 cartridges per person. The regional average was 16 (around half a full Kalashnikov magazine).

Collecting the ammunition data

Individuals and groups in Turkana North and neighbouring regions of Sudan and Uganda are, without exception, reticent in revealing their ammunition stocks to an outside observer. During the collection of ammunition data for this study, some refused to have their ammunition recorded. Their refusal was understandable, given that ammunition is a strategic resource and any

information divulged about its sources and quantities is a potential threat to acquisition. Most state forces view ammunition as a national security issue and therefore 'out of bounds' to anyone but the security forces. Given these sampling limitations, a purely random sampling method could not be employed in the study. The sample is therefore an opportunistic one. When individuals and groups were willing, the Small Arms Survey recorded every item of ammunition that could be made available at the time.

In additions to problems of access to ammunition, the sample is also geographically limited. The semi-nomadic, pastoralist mode of production in the region means that groups are highly mobile. The location of groups at any one time depends on a variety of factors, including the seasonal availability of pasture, and the intensity and dynamics of inter-group conflicts at the time. Orchestrating a sampling strategy according to location or demography is therefore problematic. Locations are intermittently populated and unpopulated, such that a sampling strategy organized by geography or sedentary demography is generally unprofitable.

The unit of social organization in pastoralist regions, and arguably the preferred unit of analysis, is the adakar or kraal. Peopled primarily by pastoralist warriors (and sometimes a broader spectrum of society), kraals are temporary cattle camps, which are often situated on the front lines of the region's inter-clan conflicts. The kraal is usually the repository of the largest part of a community's arms and ammunition, because it is here that communities have the greatest share of their livestock and hence the greatest need to protect their wealth. The kraal is a worthy unit of analysis because it is the focus of strategic decision making in the community, whether related to planning cattle raids and retaliatory actions, defining the location and reach of the season's pasture, or granting an outside researcher access to arms and ammunition.

Once granted, access to ammunition is generally unrestricted, to the extent that a sample taken from one kraal is almost certainly representative of that community's ammunition stocks as a whole. Although ammunition is a privately owned commodity and possessed, like the community's livestock, by individual warriors, its management, like that of livestock, is an issue for the community as a whole. Individuals of the same kraal affiliation share the

Table A1.1
Examples of the type of information collected when sampling cartridges

Location*	Country	GPS**	Group	Affiliation	Calibre	Headstamp
Lokichoggio	Kenya	----,----	KPR	State	7.62 x 51 mm	KOF_02_7.62
Natinga	Sudan	----,----	Toposa	Non-state	7.62 x 39 mm	bxn_60

* ‘Location’ refers to physical location and not to the Kenyan administrative unit, the ‘location’, from which the ranks of location and sub-location chiefs originate.

** GPS references are not provided here for reasons of confidentiality, but were recorded for each cartridge in the sample.

same clan allegiances (whether Turkana, Toposa, or Dodoth), fight together, and resupply with ammunition from the same sources, whether government-supplied or illicitly acquired. This means, for instance, that samples taken from Toposa kraals are broadly representative of Toposa ammunition stocks and their sources more generally.⁸⁵ Likewise, samples taken from Jie kraals are representative of Jie ammunition stocks.

The sample of kraals was not universal. In total, the study recorded ammunition from over 28 different kraals located across a swath of some 90,000 square kilometres of Kenya, Sudan, and Uganda, but undoubtedly omitted many more. The sampled kraals were nevertheless representative of each of the broader warring clan factions in the area of study, including the Turkana of Kenya, the Toposa of Sudan, and the Dodoth and Jie of Uganda, and the sampling method was sufficient to identify and analyse broad trends in ammunition supply to and among the region’s conflicting parties.

Once compiled, the data comprised a 3,382 line spreadsheet, in which each row corresponded to a single cartridge, i.e. the primary observational unit of analysis for the study (see Table A1.1).

Analysing the ammunition data

The analysis focused on the 2,588 7.62 x 39 mm cartridges in the sample. The overall aim of the analysis was to understand the relationship of each cartridge to other cartridges of the same type according to various factors, such

as group, location, and affiliation, and to assess the strength of these relationships with statistical measures such as P-values. The study was also designed to identify any interesting patterns in the distribution of ammunition types across the factors of interest.

Analysis methods

The first analysis considered whether ammunition types ('Headstamp' in Table A1.1) varied according to the groups using them. In order to reduce the number of headstamps, the study focused on the 15 most common types in the sample. These ranged in frequency from 873 (7.62 x 39_03) to 46 (3_77): a total of 2,070 cartridges out of the full sample of 2,588.

The study considered the observed proportion of each of the 15 types of ammunition (headstamps) for each of the groups. This can be thought of as a sample from the true multinomial distribution (a distribution with 15 categories in this case and associated probabilities) for each group. This true distribution is what would have resulted had every cartridge that the group had in its possession been sampled. The basic question was to determine whether multinomial distributions varied according to group and, if they did, then to what extent. In order to do this, the study collapsed the data to provide an observed multinomial (the vector of observed proportions⁸⁶) for each group.

Comparison between groups

The first step was to determine whether the observed proportions of the headstamps differed significantly among groups. Because some of the groups had an observed headstamp proportion value of zero, it was difficult to use a multinomial logistic regression. The study therefore employed a test statistic to measure the differences in the observed proportions among the groups. This involved computing the sum of the 15 absolute differences of the observed proportions for each pair and then taking the maximum value of these paired differences. A permutation test (closely related to the bootstrap) was then used to produce an overall P-value, which could subsequently be used to establish whether the multinomials corresponding to the groups were the

same or not. The permutation test was based on 10,000 permutations of the data, so that the smallest P-value produced was $P = 10^{-4}$. If the analysis found strong evidence that the multinomials were not all the same (i.e. a small P-value), then a similar permutation test was conducted on each pair of groups to determine which of the groups differed significantly from one another.

Homogeneity of ammunition stocks

A second analysis entailed calculating the degree of ammunition type homogeneity or heterogeneity for particular groups. Entropy is a measure that is maximized if all 15 categories have the same frequency and is minimized if all the cartridges for a group fall into one category. In a sense, it is a measure of whether the distribution of a group's ammunition is concentrated into a few types of ammunition or includes many types. For the homogeneity/heterogeneity analysis, the actor (i.e. the individual from whom the cartridges were recorded) was the observational unit. Each actor had an observed proportion of the 15 headstamps. The analysis used a summary measure of this observed multivariate, which reflected whether the distribution of ammunition in the hands of each actor was homogeneous or heterogeneous. As described above, entropy provides such a univariate measure. In order to determine the relationship between ammunition type (headstamp) and the measure of homogeneity/heterogeneity, the actors were divided into clusters, based on their scores. The observed multinomials were then compared across clusters.

Note

Small P-values give strong evidence that observed differences are very unlikely to have arisen by chance due to sampling. Conventional cut-offs for P-values are 0.05 (mild evidence of difference), 0.01 (strong evidence of difference), and 0.001 (very strong evidence of difference). The permutation test used in this study generated a minimum P-value of 0.0001.

Annexe 2: Interviews conducted for the study

This study relied on numerous interviews, conducted in Kenya, Sudan, and Uganda. Some of these were conducted individually; others took the form of group discussions (particularly those in the various kraals). For security reasons, including the risk of reprisal, it is not been possible to cite the names of many of the persons interviewed in this study, nor the dates on and places in which those interviews took place. To partially redress the lack of a comprehensive list of interviewees, Table A2.1 indicates the broad categories of persons interviewed during the course of the study and the subjects of these interviews. indicates the broad categories of persons interviewed during the course of the study and the subjects of these interviews.

Table A2.1

Interviews conducted for the study (persons interviewed and subjects covered)

Civilian administration	Subjects covered
• Commissioner of Kapoeta East County, Sudan • District officers of Turkana North District, Kenya • Chief administrative officer, Kotido District, Uganda • Various other lower levels of the civilian administration hierarchy	• Personal views on the sources of arms and ammunition proliferation • State responses to armed violence in the region • The efficacy of existing initiatives to control the supply of weapons or reduce the impact of armed violence
State security forces	
• Intelligence services in Kenya and Uganda • Police commanders in Kenya and Uganda • Serving military and police personnel • Low-level auxiliary forces, such as the KPR and LDU	• Resources available to security forces to conduct their operations • Specific responses to violent incidents • Weapons and ammunition seizures • Personal opinions on the efficacy of existing initiatives/capacity
Illicit ammunition users	
• Kraal leaders, elders, and warriors of the Turkana in Kenya; the Dodoth and Jie in Uganda; and the Toposa in Sudan • Ammunition sellers based in and around Lokichoggio, Kenya • Car and truck drivers who have transported arms and ammunition across the region's borders	• The social organization of the region and parties to the conflicts • The primary sources of ammunition in the region • Transfer avenues between different locations and groups • The specific types of ammunition subject to illicit trade (including packaging) • Variations in demand for, and supply and price of, arms and ammunition
Ammunition experts	
• Ammunition manufacturers and forensic laboratories	• Specific technical characteristics of ammunition (particularly markings) • Production runs and international transfers of the ammunition in the sample
Other	
• Local NGOs, including mediation groups • International organizations and aid agencies	• The impact of armed violence on development in the region • The social structure of parties to the region's violence

Annexe 3: Sudanese ammunition production

The record of ammunition in the sample provides some potentially important clues regarding the structure of ammunition production in Sudan. The information is arguably useful because very little publicly available information on ammunition production in the country exists.

Evidence from the sample?

Table A3.1 illustrates four types of headstamp: two Arabic versions and a further two versions that use Western characters. In the latter two cases, notably, the two different forms of stamping (three and four entries, respectively) apply to both 7.62 x 39 mm and 7.62 x 51 mm cartridges.

Table A3.1

Headstamp variations on Sudanese-manufactured cartridges (n = 206)

Type	Date range	Headstamp example	Date	Batch/lot	Country mark	Calibre
7.62 x 51 mm	1964	س ٤٤ ٨	٤٤	٨	س	
7.62 x 51 mm	1980–84	س ٧٠٤ ١٩٨٠	١٩٨٠	٤	س	٥١x٧.٦٢
7.62 x 51 mm	1996–98	SUD_51_96	96		SUD	51
7.62 x 39 mm	1997–98	SUD_39_97	97		SUD	39
7.62 x 39 mm	1999–2001	SU_1_39_01	01	1	SU	39
7.62 x 51 mm	2003	SU_1_51_03	03	1	SU	51

Notes:

1. Owing to the fact that some production runs continue into subsequent years, date marks are not always a positive identification of the year of manufacture. This phenomenon does not affect the present analysis.⁸⁷
2. The number (206) includes the last entry (7.62 x 51 mm, dated 2003), which was recovered from the Darfur region of Sudan in 2008 (confidential source).
3. Batch/lot numbers are questionable. It is unclear what these mean precisely.



Ammunition box for Sudanese-manufactured 7.62 x 39 mm cartridges, photographed in Chad, November 2007.
© Sonia Rolley/AFP Photo/Getty Images

Note: The munitions on top of the box are not those referred to in the information stencilled on the side of the box.

Although the sample is small (206 cartridges) it appears to indicate periods of dormancy in Sudanese ammunition production. Owing to consumption, pre-1980s cartridges are probably very rare, but there is a distinct absence of cartridges manufactured during the period 1984–96. This disjuncture coincides with a change in marking practices (from Arabic to Western), which may indicate the acquisition of new machinery or new production facilities. What little evidence exists of Sudanese ammunition manufacturing appears to corroborate these observations.

1960s to the mid-1980s

The earliest round in the sample (1964) was probably manufactured in a factory in Khartoum (exact location unclear), which was reportedly established via the transfer of manufacturing equipment by the British firm Kynoch (Jorinan and Regenstreif, 1995, p. 59) in the 1950s and 1960s (precise date unclear).⁸⁸

Statements by President Bashir appear to confirm that an ammunition factory was constructed during this period, but had been closed later (see below).

The factory appears to have operated until at least 1985, and the samples of ammunition in Figure A3.1 indicate that at least one Sudanese factory was producing 7.62 x 51 mm ammunition until that date. A 1985 World Bank country study that year, for example, listed only one ammunition factory under the control of the Military Economic Corporation (MEC).⁸⁹ The MEC was reported to have disbanded in the same year.

It is unclear whether the factory ceased production when the MEC was disbanded, although ammunition in the sample disappears after this manufacturing date. Some evidence suggests that the factory may have been dormant. A 1996 report noted an 'old and disused' ammunition factory in 'Shajara', outside Khartoum (*Sudan Democratic Gazette*, 1996), and in 2000 President Bashir noted that an ammunition factory established under President Abud (who was deposed in 1965) had been closed, but did not specify when (BBC, 2000).

1996–97 onwards

In 2000 Bashir also commented that a new facility within the Yarmuk Industrial Complex had commenced production of small arms ammunition (BBC, 2000).⁹⁰ The facility probably operates under the name of the Sudan Technical Centre (see the photograph of the ammunition box marked in this way). Several reports (see below) suggest that the facility was either rebuilt or refurbished in 1996–97, possibly with the attempted or actual involvement of Ukrainian and Bulgarian firms, acting through Cypriot intermediaries. This period of building or refurbishment coincides with the 'reappearance' of Sudanese ammunition in the sample (see Figure A3.1), and notably, the presence of Western-marked headstamps.

In February 1996 the Ukrainian firm Tasko allegedly 'signed a contract with the Cypriot firm Landerton Enterprises for the construction of an enterprise in Sudan to manufacture powder and ammunition worth [USD] 20 million' (*Jane's Intelligence Review*, 1999). In 1997 opposition radio in Sudan reported that a Bulgarian-supplied ammunition factory was being built in Khartoum (BBC, 1997). In May 2002 the executive director of the Bulgarian

machine-building enterprise Cherven Bryag (Beta-Chervyan Bryag), who later faced trial over illegal arms trade with Sudan (BBC, 2005), declared that

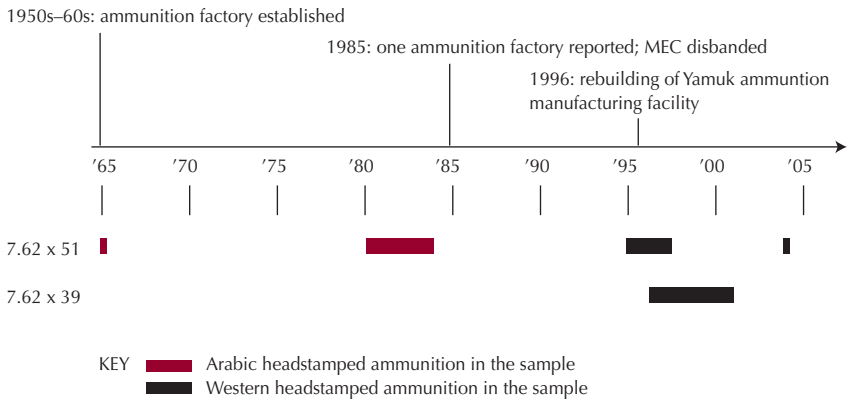
the only current transaction involving a country under an embargo was the construction of a defence products factory in Sudan. The project, which was started under a seven year-old contract, was almost complete. The company still has to receive hundreds of thousands of dollars under this contract.

(Dzhonkova and Sholeva, 2002)

If this is to be believed, work on the factory would have started in 1996–97.

In May 2002 the German Ministry of Finance and customs police said that an international brokering and trafficking network involving a German broker had used Bulgaria and an address in Cyprus to supply arms to embargoed destinations. One of the brokering companies named in Bulgaria, KAS Engineering, was accused of involvement in the construction of an engineering plant in Yarmuk (cited in Amnesty International, 2004, footnote 64).

Figure A3.1
Timeline of Sudanese-manufactured ammunition in the sample and historical events related to Sudanese ammunition production, 1965–2005 (n = 20)



Annexe 4: A partial history of Chinese ammunition production, established through ammunition factory and date marks

Figure A4.1 has been compiled from 737 Chinese-manufactured cartridges recorded in Kenya, Uganda, and Sudan. A qualifier should be noted first: this sample is not a complete record of Chinese production and reflects only those cartridges that have found their way into the hands of the groups in the region (and have not been used). However, there are some clear patterns in the data, and the chart is given in this Annexe because so little publicly available information exists on Chinese ammunition manufacturing. The information contained in Figure A4.1 may either be of use to some researchers or raise important research questions for others. The most notable features of the sample are as follows:

If the factory designations have remained the same over the period, there appear to have been many (19) Chinese ammunition manufacturers; more so, perhaps, than the combined military ammunition manufacturers of any other country over a similar period.

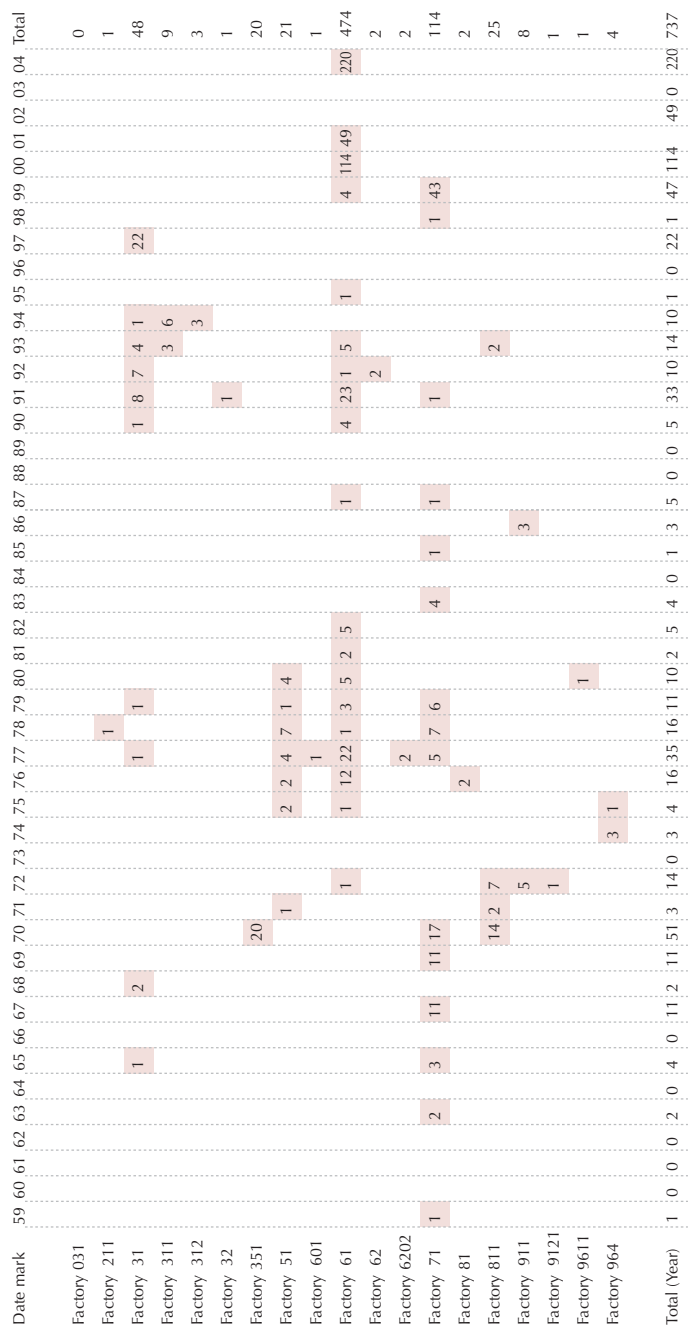
The few factories in the sample from the 1950s and 1960s coincide with China's probable development of domestic ammunition manufacturing capacity (with Soviet assistance) in this period (all Soviet support programmes were severed in 1959–60).⁹¹

There appears to have been a rapid increase (from 2 to 12) in the number of Chinese ammunition factories in the 1970s. This increase accords with the rapid development of numerous small defence factories in the period as part of the 'Third Front' policy.⁹²

The most prolific manufacturers in the sample are Factories 61 and 71, which appear to have commenced production in the 1950s and 1970s, respectively.

Since the 1990s there appears to have been a reduction in the number of factories in the sample, despite the fact that the overall number of cartridges recorded from this period is very much larger than for cartridges manufactured in previous periods. This increase may be indicative of consolidation in the Chinese ammunition manufacturing industry, beginning in the 1980s.

Figure A4.1 Date marks found on ammunition manufactured by various Chinese manufacturers, 1959–2004 (n = 737)



Note: The overall number of Chinese cartridges was actually 738, i.e. one more than listed in Figure A4.1. The reason for this discrepancy is that one cartridge, manufactured by Factory 031, is undated (see the empty first row of the table).

Annexe 5: Some insights into ‘unmarked’ ammunition in the region

The 2,588 7.62 x 39 mm cartridges in the sample contained 79 (3.1 per cent) unmarked cartridges. All of these cartridges feature a brass-coloured case, and many are notable because they feature a circular ridge running around the headstamp. One plausible hypothesis is that, rather than being unmarked, the marks on many of these cartridges have faded due to the softness of the case material and shallow stamping.

The photograph in this Annexe, for example, illustrates three Sudanese-manufactured cartridges that show the effects of wear on the clarity of the headstamp. The cartridge in the left of the frame is typical of Sudanese cartridges of this type—the head of the cartridge is uneven, and the stampings are shallow and vary in depth because of the uneven head surface. The round in the centre of the frame shows the circular ridge clearly and also illustrates the effects of wear, particularly around the outer edges of the head. Because the marks on this type of ammunition tend to be shallow and aligned towards the outer edge of the head, the headstamp appears to be particularly susceptible to wear. For instance, the ‘SU’ Sudan mark on the cartridge in the right of the frame is barely visible.



Given that Sudanese-manufactured ammunition of this type is relatively prominent in the sample, it is plausible that many of the 'unmarked' cartridges are, in fact, ammunition of this type, for several reasons:

1. Sudanese markings are demonstrably subject to wear.
2. The ammunition is relatively unique in colour and production quality.
3. These cartridges are 77 in number (3.0 per cent) of the sample—almost exactly the proportion of 'unmarked' ammunition.

The hypothesis cannot be proved without further analysis (notably metallurgical analysis).

Annexe 6: Packaging marks

The following two examples are illustrative of the packaging marks for two varieties of ammunition used by the Kenya Police and distributed to the Turkana. The first is Kenya Ordnance Factories 7.62 x 51 mm ammunition, while the second variety is the 7.62 x 39 mm cartridge marked '7.62 x 39_03', which is of unknown manufacture. Photographs of each type of ammunition are presented in Table 3.2 of this paper.

KOF_7.62_04

These cartridges are boxed in wooden crates. The crates contain 1,200 cartridges and feature a lot number ('03' in the example below), the abbreviation of Kenya Ordnance Factories Corporation ('KOF'), and what appears to be a date code ('07'). The letters 'GK' probably stand for 'gross kilograms'.⁹³ The crate's packaging marks are as follows:

1200 Cartridges
7.62 x 51 mm
Ball SS 77/1
Lot 03 KOF 07
GK 35kgs

Each of these wooden crates contains 24 cardboard boxes, which each contain 50 cartridges. These boxes are also marked with a lot number, manufacturer's code, and date code. The following example of packaging marks is from a box that was not contained within the crate noted above (hence the differing lot numbers):

50 Cartridges
Ball SS 77/1

7.62 x 51mm
Lot 05 KOFC 01

7.62 x 39_03

This ammunition is packed in olive green, rectangular nylon bags, which have to be cut to gain access to the ammunition. Each bag contains 10 white cardboard boxes, each containing 20 cartridges. The boxes are marked with a lot number ('01' in the example below) and the date of manufacture ('01/02/03'). The date of manufacturer ('2003') on the boxes suggests that the '03' marking on the majority of 7.62 x 39_03 cartridge cases is a date stamp rather than a lot number (see the photograph of the cartridge in Table 3.2). The box is not marked with a manufacturer's code or abbreviation, which may confirm that this ammunition was not manufactured by Kenya Ordnance Factories and has been imported by Kenya. The box marks are as follows:

20 cartridges
7.62 x 39mm
Lot 01 of 01/02/03

Endnotes

- 1 Readers can gain a fairly comprehensive overview of the dynamics of armed violence in the Kenyan, Sudanese, and Ugandan pastoralist conflicts by reading Bevan (2008a), Mkutu (2003; 2007a; 2007b), and Small Arms Survey (2007).
- 2 The affiliation 'Karimojong' is used here as it is commonly employed to denote the four largest Ateker-speaking sub-clans of eastern Uganda, including (from north to south): the Dodoth, the Jie, the Matheniko, and the Bokora. The Karimojong usually affiliate themselves with their sub-clan and reserve the label Karimojong for the Matheniko alone.
- 3 Although they have a little more space at their disposal, the freedom of movement of either the Dodoth or Toposa should not be overemphasized. Each group is, similar to the Turkana, constrained by geography and surrounded by often-hostile neighbouring groups.
- 4 There are effectively two dry seasons in the region, punctuated by two rainy seasons; one long and one short. The short rains usually occur in October–November and the long rains in April–June–July. For a detailed description of Turkana North's contemporary rainfall and climatological dynamics, see Arid Lands (2007).
- 5 Bride price is the value, measured in goats and cattle, paid by a man to the father of a prospective spouse. It is not a simple transaction, and other factors enter the equation, including alliance building within and among communities. Bride price does not equate to payment in lieu of a 'marriage' conceived in Western European terms. There are several broad thresholds in the system, including an initial payment received by the father of the 'bride' upon her cohabiting with a warrior and subsequent payments when she is with child, with the various stages reflecting the degree of relationship between the warrior and his spouse.
- 6 To compound matters, attacking warriors often collude with the communities whose territory they must pass through to launch the raid and, more importantly, escape with any captured livestock. The prospect of a 'transit tax' of a small number of livestock is often sufficient for communities to 'turn a blind eye' to warriors passing through their territory. This profiteering is, however, dangerous because collusion is a well-recognized phenomenon and the community in question can become the target of retaliation by the aggrieved party.
- 7 The 'urban factor' changing the nature of armed violence in pastoralist regions is addressed more fully in Bevan (2008a, pp. 28–30) in a discussion of the similar violent dynamics of pastoralist regions observed in Karamoja, Uganda.
- 8 The escarpment forms the easternmost edge of the Western Rift Valley (often called the Albertine Rift). The escarpment is a natural topographic boundary between Kenya and Uganda.
- 9 See Bevan (2008a) for an overview of Uganda People's Defence Forces operations in Karamoja.

- 10 The Kenyan press had previously alleged greater numbers killed in the incident.
11 See, for example, Olita (2006).
12 Reported in Ekitela (2006).
13 Some of the Turkana who had been the target of the attack recovered the munitions fired from the helicopter gunship. The author was able to photograph these armaments as the Turkana crossed back into Kenya from Uganda.
14 Specifically, the cannon ammunition is believed to have been fired from a Gsh-23 twin-barrelled cannon, which is fitted to several models of the Hind gunship. The S-8 rockets are also part of the Hind's standard armaments. In this case, the severe damage to the rockets probably occurred due to high-order detonation, wherein the rockets detonated at very short range and the unexpended fuel from the rocket motor added to the explosive effect (confidential correspondence with two experts in the field of conventional arms and ammunition).
15 The angle of fire indicates that the weapon(s) in question were probably RPG-7 grenade launchers, although this cannot be confirmed (author's personal observations made on the escarpment, 1–2 February 2008).
16 Kenyan military forces are primarily stationed outside Lokichoggio and include a large detachment of the Kenyan Army (stationed around 2 km outside town on the road to Kakuma) and an air defence detachment stationed next to Lokichoggio airstrip. These forces reportedly have little contact with the local population. Interviewees suggest that the forces may be restricted to their barracks for much of the time to prevent them becoming involved in Lokichoggio's numerous criminal enterprises.
17 The Sudan People's Liberation Movement (SPLM) administration of Kapoeta East County, southern Sudan has called for all Toposa groups to be armed with at least one PK machine gun, for reasons of defence against the Turkana. It is unclear to what extent these statements are reflected in the prevalence of PKs among the Toposa (interviews with members of the SPLM administration in Narus, Kapoeta East County, Eastern Equatoria, Sudan, 2007).
18 The letter 'R' denotes that the 7.62 x 54R cartridge is rimmed rather than featuring an inset rim, which is a feature of 7.62 x 39 mm and 7.62 x 51 mm cartridges (and, indeed, most assault rifle ammunition).
19 See Bevan (2008a, pp. 48–49) for an analysis of the Karimojong trade with the Sudanese groups to the north, with a focus on price information.
20 See Bevan (2008a, pp. 48–49).
21 The 25 manufacturing countries exclude two varieties of ammunition that cannot be attributed to a manufacturer or country of first origin.
22 The 51 manufacturing factories do not include at least three facilities that could not be identified.
23 See Kiss (2004) for a detailed analysis of the economic factors driving this phenomenon of the 1990s.
24 For assessment purposes, photographs were provided to Bill Woodin of Woodin Laboratories, Tucson, United States, and samples were sent to Khaldoun Kabbani of LGC Forensics, Leeds, United Kingdom.

- 25 'Year of first manufacture' is used here instead of 'year of manufacture', because some manufacturers have a tendency to date mark ammunition for the year of manufacture, but to retain this date mark subsequently (usually for a period of months, rather than years). The primary reason for this practice appears to be cost saving: it is cheaper to retain a stamp than to have a new one manufactured. This practice is arguably not commonplace, but it is an important qualifier. Date marks, nonetheless, remain a very useful way of establishing when production commenced (see Annexes 3 and 4 of this paper).
- 26 See discussion later in the text and findings presented in Bevan and Dreyfus (2007), which present clear evidence of trade from the Uganda security forces to the Jie and Dodoth groups.
- 27 Author correspondence with Sellier and Bellot, Geneva/Prague, May 2008.
- 28 Interviews conducted with illicit users in Turkana North suggest that this ammunition may be used by the Kenya Police and later distributed to the Turkana (addressed later in the paper). The ammunition is distinctive in being the only plain (unwashed or unplated) steel cartridge found in the region. This distinctiveness means that people tend not to forget from whom they acquired it.
- 29 For assessment purposes, photographs were provided to Bill Woodin of Woodin Laboratories, Tucson, United States and to Cartwin Pro, Kaufering, Germany. Physical samples were provided to Khaldoun Kabbani of LGC Forensics, Leeds, United Kingdom.
- 30 Chiefs of location and sub-location are government-appointed positions. They were initially created during the British colonial period to provide a level of government administration among the rural pastoralist communities. Very few of the chiefs of location or sub-location, however, reside with the communities they represent (addressed below).
- 31 Interview with Jacqueline Suzan Mbabazi, general manager, Luwero Industries Ltd., 29 February 2008, Kampala. Interview conducted by Eric Berman, managing director of the Small Arms Survey.
- 32 A die is an engraved metal form used to stamp marks onto cartridge cases before the final assembly of the cartridge. The die is engraved in reverse (mirror image) so that the resulting stamps are read in the normal direction.
- 33 See Bevan and Dreyfus (2007).
- 34 The mark '39' almost certainly indicates the calibre of this 7.62 x 39 mm cartridge. A near identically marked cartridge of 7.62 x 51 mm (also marked 'SU', '01', and '1') was recorded in the Darfur region of Sudan in April 2008. This cartridge featured the numerals '51', suggesting the second part (case length) of the calibre.
- 35 In the case of KOF 7.62 x 51 mm ammunition, it arguably would be more logical to indicate the type using the second (case length) part of the calibre (i.e. 51), given the prevalence of two types of 7.62 calibre ammunition in Kenyan arsenals (7.62 x 51 mm and 7.62 x 39 mm). This trend in KOF-manufactured ammunition is probably a throw-back to the period in which the Kenyan armed forces used the 7.62 x 51 mm cartridge (not the 7.62 x 39 mm) and therefore only needed to distinguish between this cartridge and the similarly proportioned (although differently designed) .303 inch ammunition then in service.
- 36 This ammunition was identified by Khaldoun Kabbani of LGC Forensics, Leeds, United Kingdom.

- 37 Of these 2,588 cartridges, 1,857 were sampled from illicit users and 731 from state security forces in Kenya, Sudan, and Uganda.
- 38 The overall P-value for comparing over groups is $P = 10^{-4}$. The P-values for comparisons of pairs of groups are all less than 0.002, with the exception of the Doth and Jie, where the P-value is 0.0715.
- 39 'Global' in this sense refers to the entire spectrum of possible ammunition types that a party could possibly acquire in the region—in this case, the 220 differently marked types of cartridges that were recorded in the sample.
- 40 When retransferred, the transferring party is likely to have purchased the ammunition as part of a large consignment, so the same expectations regarding few types of ammunition should apply.
- 41 These conditions almost certainly do not apply in all cases, and nothing precludes states from acquiring ammunition of diverse types from a multitude of sources. In economic terms, however, it is illogical for states to do this unless the legal market for ammunition is impaired and the state in question is in dire need of munitions. The states in the region are generally not in this position.
- 42 As noted previously, the Sudan People's Liberation Army (SPLA) was not included in the sample and there is, consequently, no Sudan state category.
- 43 Entropy is a measure of 'randomness'.
- 44 The KPR are often short of ammunition and, at times, acquire it (in small quantities) from Turkana warriors.
- 45 UWA stocks are relatively homogeneous. LDU stocks are, in contrast to those of the UWA, much more heterogeneous and feature numerous Soviet- and Eastern European-manufactured cartridges, in addition to Chinese cartridges marked 61_04.
- 46 Uganda supplied the SPLA with arms and other military materiel during the Sudanese war, partially in response to the Khartoum government's support for the Lord's Resistance Army insurgency in Uganda. It is unclear whether Uganda still supports the SPLA, and, by extension, whether the SPLA might use the same types of ammunition as Uganda (or possibly procure these types autonomously).
- 47 Agoro is a well-known hub for small arms and ammunition trading in the region, situated only around 5 km from the Sudanese border with Uganda.
- 48 In Kenya, a division forms part of a district; thus Lokichoggio Division is in Turkana North District.
- 49 The local Ateker language rendering of the name Key Base translates, phonetically, as 'Kibis', which should not be confused with the town of Kibish on the Kenya–Ethiopia border.
- 50 An uninhabited (and largely unpoliced) stretch of land of approximately 26 km in breadth extends between the last Kenyan military post, just outside Lokichoggio, and the Sudanese border town of Nadapal. This area is frequently the scene of ambushes along the Lokichoggio–Nadapal road, and is a route used by both the Turkana and Toposa when raiding one another.
- 51 USD:KES rate as at 1 May 2008. All price estimates are from interviews with senior warriors and kraal elders, conducted between 2006 and 2008. These estimates are clearly

subject to error, notably errors that can be attributed to recollection. Given, however, that small arms are a central feature of life (and death) in the region, errors are arguably insignificant. Nobody in Western Europe, for instance, would forget the value of a major investment, such as a home purchased in the early 1980s.

- 52 Numerous interviews among the Turkana, and with drivers who regularly transport a variety of commodities across the border, confirm the Kapoeta–Turkana North ammunition trade. No evidence of this, however, appears in any correlations observable between the types and numbers of ammunition in the hands of the Turkana and Toposa. The Toposa-held ammunition is actually correlated with that of Ugandan groups rather than with the ammunition stocked by the Turkana. Why might this be the case?

There are two plausible explanations. The first is that the Toposa and the Turkana are hostile to one another. Field interviews suggest that neither side is willing to trade either arms or ammunition with the other on account of these hostilities. Strong evidence for this is provided by the data in which only 16 cartridges marked 7.62 x 39_03 were recorded from the Toposa, in comparison to 718 from the Turkana. With these observations in mind, the ammunition in possession of the two groups should not be correlated, because each has relatively independent, and unconnected, sources of ammunition. This explanation, however, only goes a certain way in explaining the discrepancy. As noted above, the ammunition circulating in and around Kapoeta is probably similar to the types and numbers used by the Toposa. This means that ammunition entering Turkana North from Kapoeta should broadly reflect the type and relative quantities used by the Toposa. The hypothesis cannot be proved either way without a sample of ammunition from Kapoeta.

A second explanation is that the types of ammunition circulating in southern Sudan are primarily the legacy of the protracted war. Because there are so many different varieties in circulation, the prospects of finding similar distribution patterns (correlations) among the Toposa and Turkana are relatively slight (see, for example, the low entropy/high heterogeneity value for the Toposa in Figure 3.1). This is because no one type of ammunition predominates, making it much more difficult to discern patterning in a relatively small sample of around 3,000 cartridges. Sudanese-manufactured ammunition, for instance, circulates in roughly equal proportions among the Toposa and Turkana, but at around 3 per cent of the stocks in each group, it comprises a very small percentage of the total ammunition in circulation. In short, this means that the statistical methods employed here are effective for determining major, homogeneous supplies of ammunition, but less effective at unpacking the dynamics of ‘disorganized’, heterogeneous trade. These observations reassert the importance of triangulating the statistical analysis of ammunition with in-depth field research on illicit trade. The Kapoeta–Lokichoggio route may be a potentially significant source of ammunition to the Turkana, but it is difficult to quantify how significant it is.

- 53 The Turkana and Toposa do not generally trade in weapons or ammunition, due to the long-standing conflict between the two communities.
- 54 New Site is located adjacent to the intersection of the Kenyan, Sudanese, and Ugandan borders.
- 55 New Site is isolated for a reason. It was established by John Garang, the late leader of the SPLA, to provide a safe haven during the war with the Khartoum government; one that

was sufficiently close to the Kenyan border to permit the unmolested supply of military materiel (via a still-active SPLA-controlled airstrip 3 km to the east of New Site and the road to the Kenyan border, which crosses at Nadapal some 30 km to the east). No village of any note was present before the base was established, and New Site is not situated on anything approaching a significant vehicular trade route.

- 56 The territorial status of Nadapal is disputed. Kenya has traditionally claimed that Nadapal lies within Kenyan territory, but a 'no man's land' of approximately 26 km extends from the last Kenyan military post, just outside Lokichoggio, to Nadapal. Nadapal itself is controlled (increasingly so) by SPLA/SPLM border guards, military police, and regular SPLA troops.
- 57 Some of these water points are very close to the town. One that is known locally as a trading place for ammunition lies only a few hundred metres north-west of the centre of Lokichoggio.
- 58 The author encountered several ammunition traders en route to the more distant kraals (out of bounds to most vehicles and close to the Mogilla mountain range, some 45 km north-east of Lokichoggio). Traders also reportedly use Lokichoggio-based taxis to visit the nearer kraals.
- 59 Most of the G3s probably entered Kenya with Sudanese refugees. Before the war, the Sudanese military had adopted the G3 as its service rifle, and government forces continued to use the weapon for many years, although its use was later superseded by the Kalashnikov-pattern assault rifle. The weapons number many German-manufactured models, but also Pakistan Ordnance Factories variants. These weapons are still favoured by the Sudanese Toposa, much more so than by the Kenyan Turkana. The Toposa probably acquired G3s from Sudanese government forces, which frequently supplied arms to the Toposa in an attempt to undermine the SPLA (the SPLA, interestingly, also armed the Toposa, whose allegiances in the war can best be described as opportunistic). Very few of the G3 rifles in Turkana North, however, are likely to have been supplied directly by the Toposa, due to their long-standing conflict with the Turkana.
- 60 The price decrease is, however, welcomed by the relatively few Turkana users of the G3 and FN/SLR.
- 61 Kenya Police divisions are assigned to the district level. The OCPD for Turkana North District commands a police division, which is stationed across a number of localities, including Kakuma, Lokichoggio, and Oropoi.
- 62 The Sudanese Nyangatom (situated close to the Ethiopian border) can also be listed among the parties to the conflict in Turkana North, although the Turkana are less frequently subject to raiding by the Nyangatom than they are to aggressive actions by the Toposa and Dodoth.
- 63 The Kenya Police and government-appointed location and sub-location chiefs (the latter being the smallest administrative unit in the region) mobilize the KPR, on an ad hoc basis, to respond to raids by hostile clans and, sometimes, to escort civilian convoys. For the most part, however, the KPR role can best be described as a deterrent rather than an operational force.
- 64 Sudanese-marked cartridges comprise around 8 per cent of the 7.62 x 39 mm ammunition sampled from the KPR.

- 65 In the final analysis, the decision to appoint location and sub-location chiefs is taken by the district officer in charge of the particular division of the district.
- 66 There is an important distinction to be made between chiefs and kraal leaders. Traditionally, chiefs were appointed to their position by their own communities, usually at the kraal level. However, in an attempt to bring communities under the control of the Kenyan state, national authorities began to appoint location and sub-location chiefs who had responsibility for the communities in relatively small geographic units. Given that the chiefs are often dislocated, by geography and a lack of communication, from the kraals, the day-to-day command of each kraal usually rests with the kraal leader, which is a community-appointed position.
- 67 The ammunition was not supplied or distributed by the local Oropoi police garrison.
- 68 The reliance of the police on any available means of transport is far from unusual. On numerous occasions during the course of his work in the region, the author has been asked to transport military and police personnel, who would otherwise be prevented from visiting a location due to a lack of transport.
- 69 This event was personally witnessed by the author when visiting Oropoi. Interviews during the hours after the event confirmed that a large volume of ammunition had been distributed in the concluding minutes of the address.
- 70 The standard approach to these 'resupply meetings' is for the police to request that Turkana warriors (with KPR among them) form two lines, one composed of people armed with G3 and SLR rifles (7.62 x 51 mm), and another composed of those armed with Kalashnikov-pattern assault rifles (7.62 x 39 mm). Dividing the intended recipients by calibre makes it easier to distribute ammunition, which is stored separately.
- 71 Confidential interviews with Turkana warriors (recipients of the ammunition) and 'outside' observers of the event.
- 72 Author interview with Hon. John Munyes Kiyong'a, minister, Ministry of Labour and member of parliament for Turkana North, Geneva, 7 June 2008.
- 73 The total population of Turkana (North, Central, and South Districts) was estimated at 450,860 in 1999 by the Kenya Bureau of Statistics (n.d.).
- 74 See Fastrak Logistics (2005) for a survey of the region's roads.
- 75 Turkana's area is listed by the Kenya Bureau of Statistics (n.d.) as 68,388 km², excluding Lake Turkana at 2,279 km².
- 76 Land area data for Burundi (27,830km²) and Rwanda (26,338 km²) is from CIA (n.d.).
- 77 Interview conducted by a third party with the OCS of Lokichoggio branch of the Kenya Police.
- 78 'Blowback' is a term used to describe unintended and negative consequences of a policy. It derives from US intelligence circles and is usually used when covert operations have deleterious consequences for the implementing party. The term is resonant in Turkana North.
- 79 IGAD's CEWARN is one attempt to provide early warning on cross-border pastoralist conflicts in Ethiopia, Kenya, and Uganda. However, coverage is incomplete and the compilation of reports is slow, with May–August 2006 being the last published reporting period at the time this paper went to press. See the CEWARN website at IGAD (2007).

- 80 See Bevan (2008a, pp. 41–42) for a detailed investigation of mortality data in Karamoja, northern Uganda.
- 81 The reporting for the northern part of Turkana District is currently (May 2008) conducted from Lodwar, which is around 200 km from Lokichoggio—usually by cell phone.
- 82 The Kenyan government has no ability to trace much of its own weaponry, let alone identify particular weapons that have arrived from Somalia (minister’s comments cited in Mkutu, 2008, p. 54).
- 83 See Bevan (2008b) for a discussion of the importance of ‘attributed sampling’.
- 84 South Sudan (formerly New Sudan) is the most recent name given to the southern part of the country under the nominal control of the Government of South Sudan.
- 85 For more information on sampling methods, see Bevan (2008a).
- 86 This can also be described as the ‘observed multinomial’, which is an estimate of the vector of probabilities of the true multinomial. 29 February 2008
- 87 Information supplied by Luwero Industries, Uganda during an interview with Eric Berman, managing director of the Small Arms Survey.
- 88 Kynoch was incorporated into British Imperial Chemical Industries (ICI) in the 1920s.
- 89 The report also lists a second factory, which it lists as ‘Spare Parts Factory (for ammunition plant)’ (World Bank, 1985, p. 165).
- 90 This complex, which is referred to in a 2003 report as the ‘Yarmuk Military Manufacturing Complex’ (Scheuer, 2003, p. 125), probably goes under the shorter name of the Military Manufacturing Complex. A 2001 Christian Aid report describes this as a ‘huge complex on the Khartoum-Medani [Madani] highway’, which ‘reportedly specialises in light weapons, machine guns and ammunition’ (Christian Aid, 2001).
- 91 Godwin (2003) describes how the Soviet Union provided manufacturing capacity during a very brief period. The withdrawal of Soviet cooperation left China with a fairly underdeveloped defence industry (compounded by Chairman Mao’s neglect of defence in several plans) until redevelopment in the late 1960s and early 1970s.
- 92 See Naughton (1988) for an overview of the ‘Third Front’ policy and Bachman (2001, pp. 280, 285) for specific commentary on the development of small Third Front ammunition-manufacturing enterprises in Guangdong.
- 93 The Kenya Ordnance Factories Web site confirms that the standard packing system used by the factory is 1,200 cartridges in a crate and 50 in a box (KOF, n.d.).

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