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MONITORING CIVILIAN FIREARMS IN BORDERLANDS

A Framework for Trend Analysis and Estimation

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A pastoralist herder carries a firearm in Samburu county, northern Kenya, 2023.
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Overview

In East Africa, civilian firearms circulation[1] often follows observable routes tied to how people live, trade, and protect themselves. In borderland and peripheral areas, however, perception surveys and other proxy-based methods struggle to capture these broader, shifting dynamics.

This Briefing Paper presents a practical approach to tracking civilian-held firearms in complex settings by monitoring changes within defined localized 'zones'—grazing corridors, border areas, trading hubs, and insecure settlements—and using observable indicators of acquisition, retention, and loss.

Drawing on its application in Kenya, the paper demonstrates how this approach enables county-level security actors to generate plausible estimates and, more importantly, monitor longitudinal changes in civilian firearms circulation.[2] It aims to provide a basis for more adaptive security responses and to offer a framework applicable across similar African borderland contexts, designed primarily for county-level security actors responsible for monitoring and responding to local security dynamics.[3]

Key findings

- Civilian firearms circulation in northern Kenya is not evenly distributed, but instead structured by distinct localized zones shaped by livelihoods, mobility, and security conditions. Analysis that treats counties as uniform risks misrepresenting both the drivers and scale of civilian holdings.
- A zone- and mechanism-based framework shows that civilian firearm trends can be inferred from observable changes in circulation dynamics, rather than relying on static proxy indicators or one-off estimates.
- Application of the method demonstrates that local stakeholders can converge on a shared analytical framework for assessing civilian firearms circulation, even in the absence of reliable baseline data, indicating that a structured and comparable assessment is possible in low-data environments.
- Monitoring trends in acquisition, retention, and loss provides more policy-relevant insights than attempting to produce precise firearms totals, enabling a shift from static estimation to tracking directional change over time.

Introduction

Civilian firearms circulation in borderland and peripheral areas of East Africa is notoriously difficult to track and quantify. In these areas, firearms circulate through informal markets, cross-border systems of mobility and trade, and local kinship networks that exist outside of formal regulatory systems. Recognizing this, rather than attempting to provide precise figures, this Briefing Paper proposes a practical approach to monitoring changes in the scale of civilian firearms possession to derive a plausible estimate of the number of firearms in circulation in informal environments.

The primary purpose of this approach is to enable county-level security actors to monitor changes in civilian firearms circulation over time, allowing for earlier identification of emerging risks and more targeted security responses. The approach therefore serves two linked purposes: to monitor how civilian holdings change over time, and to produce a bounded estimate of civilian-held firearms.[4] Bounded estimates are used only as reference points to support consistent tracking and interpretation of these changes, rather than to produce precise totals.

Firearms move alongside people, livestock, and goods, and are a routine part of how communities manage protection, mobility, and trade in many areas. These dynamics are often observed in areas with irregular or limited state security, resulting in higher concentrations of civilian possession relative to areas with consistent state security presence. Yet the question of how many firearms are in civilian hands in remote areas remains difficult to answer directly; civilian firearms are often concealed, and their movement across borders and into communities is incremental and rarely tracked through formal data collection and reporting mechanisms (Florquin, Lipott, and Wairagu, 2019).

Official data sources, such as seizure reports, collection programmes, or police incident reports, provide only a partial view of firearms holdings and patterns of possession (Karp, 2018). As a result, estimation approaches may turn to other indirect methods to supplement official data in an attempt to achieve accurate numbers. In borderland and peripheral areas, however, these approaches can also fall short.

In addition to the logistical challenge of gathering empirical data in these locations, there is also a structural challenge to overcome. Civilian firearms circulation is shaped by local governance and community protection arrangements

that function largely independently of, but in interaction with, the state. This dynamic makes the direct counting of civilian firearms extremely difficult to achieve with any accuracy.

The reasons for this are straightforward: in local governance systems, firearms are often viewed as essential for protecting livestock and property, as well as securing access to resources such as seasonal pasture and water. As such, these long-standing governance systems—comprising councils of elders and chiefs, peace committees, and cross-border mediation networks—play a central role in managing civilian protection, local security, resource access, livelihoods, and mobility.[5] Within this context, patterns of firearms possession and use are often shaped more by local security practices than by formal security frameworks (Interpeace, 2024; Mkutu and Wandera, 2013; RECSA, 2016).

This dynamic is reinforced where state security provision is limited, and national or county authorities depend on local community structures, elders, and other local actors to support conflict management and borderland security (Kenya, 2024). In these situations, civilian firearms are often retained as a practical means of protecting livestock and property, while formal security responses typically do not distinguish between defensive possession and criminal use (ICG, 2024). Under these conditions, civilian firearms holdings are likely to be under-reported through formal record-keeping systems. Where firearms possession is locally understood as legitimate and necessary for survival, it exists in direct tension with formal systems that classify them as illegal. In high insecurity areas, this creates a disincentive to report or surrender firearms to authorities.

The proposed framework responds to this challenge by providing a structured way to analyse how firearms circulate within these local systems. Rather than attempting to count weapons directly, it focuses on identifying patterns of acquisition, retention, and loss within defined local environments. By doing so, it offers a practical basis for monitoring change over time and generating more plausible estimates of civilian holdings in data-constrained areas and complex environments.

Basis of this approach: A borderland lens

This methodological framework is grounded in the understanding that borderland areas are socially and economically interconnected spaces shaped by movement, exchange, and livelihoods. These overlapping systems are fluid and constantly evolving (Kochore, 2025). Tracking firearms in these areas therefore requires an approach capable of accounting for that fluidity.

This approach builds on two decades of research generated by the Small Arms Survey, particularly its Human Security Baseline Assessment (HSBA) for Sudan and South Sudan project. Analysis of armed violence and firearms circulation in the East and Horn of Africa shows that civilian firearms stocks and circulation are closely linked to local insecurity, armed actors, and governance systems.[6] While much of this work has been developed in the context of active armed conflict, the underlying dynamics of firearms circulation also extend into non-conflict environments.

The broader body of work produced by the Survey has consistently highlighted three recurring dynamics shaping armed mobilization and civilian firearms circulation in borderland environments:

1. security provision outside of the state: firearms are used to protect livelihoods and property where state security is absent or limited;
2. political and economic incentives: violence and arms flows do not merely reflect the breakdown of social and political orders, but are often organized, incentivized, and tied to systems of power and accumulation; and
3. mobility networks and cross-border systems: circulation follows existing mobility and trade patterns and is often managed through local security arrangements, including chiefs and elders, formal kinship networks, armed community groups, and, in some cases, local political elites with their own vested interests.

This methodological framework therefore focuses on the county level and, in particular, on differentiated 'zones' within counties, such as grazing corridors, border areas, trading hubs, or other contextually relevant environments where civilian firearms circulation and possession are shaped in distinct ways.

It is within these zones that it becomes possible to observe variations in weapons circulation dynamics—not to produce precise estimations, but to more easily identify directional changes, namely increases, decreases, or relative stability in civilian firearms numbers.

Limitations of existing methods

Existing firearm estimation methods face several constraints, including cost, technical requirements, and challenges in producing comparable data over time. While these limitations are not unique to borderland and peripheral areas, they are particularly acute in such environments where high mobility, cross-border flows, and informal security arrangements can complicate efforts to define stable populations.

Furthermore, survey-based estimates rely on self-reported data, which may be affected by under-reporting or response bias, particularly in contexts where firearms possession is politically sensitive or illicit. These challenges also extend beyond borderland and peripheral environments, but are often more pronounced where trust in state authorities is low and firearms are critical to the functioning of informal security arrangements.

While survey-based approaches can produce useful data for nationwide policy, planning, and response, these approaches are difficult to implement consistently in borderland and peripheral areas because of frequently shifting political and security dynamics.[7] Large national surveys are also resource intensive, and countries with fewer national resources may depend on external funding, limiting the survey's repeatability. Without replication, survey results—while useful—provide only snapshots of firearms possession at a single point in time.

A one-off survey will also fail to capture how civilian firearms possession evolves. While national data may capture patterns of perceived insecurity relative to county- or state-level firearms distribution, approximating the number of weapons in circulation alone is insufficient for understanding armed violence and crime trends over time (Faltas, 2018).

Other commonly used approaches rely on proxy assumptions or fixed ratios, such as applying a constant firearms-per-capita estimate across areas with similar economic or demographic characteristics (Karp, 2018). These approaches assume stable relationships between population size and firearms possession, regardless of changes in security conditions, livelihoods, or other local dynamics. In practice, however, civilian firearms possession can change rapidly in response to shocks such as drought, trade disruption, or sudden insecurity spikes, making static approaches unreliable in such areas.[8]

When used in isolation, proxy indicators derived from law enforcement data offer only limited insights. Seizure data, for example, provides a reference point but reflects levels of law enforcement activity more than the scale of ongoing weapons circulation (UNODC, 2020). Disarmament or voluntary surrender data can function in a similar way. While it may indicate reductions, it does not capture what remains in, or is entering, civilian possession. In some cases, collected weapons from one group have been redistributed to another, exacerbating local tensions (Duke and Rouw, 2013).

These limitations show that existing approaches struggle to provide a reliable and repeatable way to assess how civilian firearms holdings in borderland and peripheral areas change over time. In these areas, circulation is fluid and shaped by shifting patterns of mobility and insecurity.

Case study: Approaches in Kenyan and county-level estimations

In Kenya, national-level estimates have included a 2012 baseline survey developed through collaboration between the Kenya National Focal Point on Small Arms (KNFP) and the Small Arms Survey (Wepundi et al., 2012). This survey has provided key data for the national arms control policy (KNFP, 2020); however, it has not been updated since and therefore offers limited insight into changes in patterns of civilian firearms possession.

A standardized methodology for estimating or monitoring civilian firearms stocks does not exist at the county level in Kenya. Currently, each county employs its own methods, which may include livestock-to-firearms ratios, per-capita prevalence rates, or estimates based on local people's own perceptions.[9] Because these methods are applied unevenly and typically lack a consistent empirical basis, their results are not easily comparable across counties and can be unreliable for assessing changes over time.

This shortcoming is illustrated by one of Kenya's northern counties, where a rigid 10% ratio is applied to official household census data to determine sub-county firearms estimates; an aggregated county-wide total is then derived from sub-county totals. This approach is limited for several reasons. First, because the data does not draw on field observations or a pool of relevant proxy indicators, it becomes trapped in a methodological loop—firearms estimates are updated only in direct proportion to new census data. Second, the rigidity of the approach excludes critical factors, including ethnic differences, livelihood variations, and local security dynamics. As a result, the method will always conclude that the highest concentration of firearms is in the most densely populated areas of the county; however, the highest security risks—and therefore probably the highest demand for firearms—often occur in grazing corridors and border zones, rather than in more densely populated trading centres and towns.[10]

Understanding domestic firearms circulation is essential for interpreting broader trafficking dynamics (UNODC, 2020), yet national and local authorities often lack the tools to capture it in local contexts. As Kenya has long played an exemplary role in regional arms control—serving as a pillar for the implementation of the Nairobi Protocol and hosting the Regional Centre on Small Arms in the Great Lakes Region, the Horn of Africa and Bordering States (RECSA) Secretariat—it serves as a relevant pilot case for applying and testing a zone- and mechanism-based methodology. The measurement challenges addressed here are common across borderland and peripheral environments, positioning Kenya as a suitable pilot for applying this approach more broadly.

For authorities such as national focal points and commissions on small arms control, this approach provides a more consistent and defensible basis for interpreting subnational civilian firearms circulation dynamics—thereby supporting the development of evidence-based responses. At the county level, it provides a structured way to generate local evidence on firearms dynamics to inform resource allocation and security planning, including at the national coordination level. As such, the value of this approach is in providing a tool that strengthens local and national decision-making through evidence and response alignment derived from local knowledge and experience.

Engagements with county-level stakeholders during the development process highlighted several practical advantages. Participants emphasized the value of analysing firearms circulation beyond administrative boundaries, allowing a change of perspective to focus on areas defined by shared livelihood and security dynamics rather than fixed administrative lines.[11] It offers comparability across counties or similar zones with closely related dynamics.

These discussions also underscored the role of local political dynamics in shaping firearms distribution, particularly where the expansion of settlements and administrative units is linked to resources and political representation. In such contexts, local political actors were identified as influential in shaping patterns of movement and the concentration of firearms. Similar dynamics have been observed in other northern Kenyan contexts, including parts of the North Rift where local stakeholders highlighted how insecurity can be instrumentalized to sustain personal access to resources and political advantage.[12]

Analytical approach to estimating civilian firearms stocks

This section outlines the analytical foundation of the zone- and mechanism-based framework and explains how it is used to estimate and monitor civilian-held firearms at the county level. The framework structures available information and provides an approach for interpreting how firearms circulate within local settings, drawing on law enforcement data, operational knowledge, and local observation.

This approach is designed to be applied at the county level or its administrative equivalent, where security actors operate and local monitoring can be conducted effectively. A county boundary serves as a fixed reference point for applying the framework. Within this boundary, the analytical units used to track firearms circulation and estimate civilian holdings are referred to as zones.

The framework was developed in collaboration with the KNFP, RECSA, and county-level security sector heads and civil society stakeholders in three northern Kenya counties—Garissa, Mandera, and Wajir. It was revised through workshops in Wajir and a validation workshop in Nairobi. These activities helped refine the approach and strengthen its applicability across different contexts.

Zones: The unit of analysis

Civilian firearms circulation is not uniform throughout a county but varies across local contexts. To capture these variations, the framework divides a county into distinct analytical units, referred to as 'zones'.

A zone is defined by its unique patterns of movement, livelihoods, trade, and security conditions. A single county will typically have multiple zones. For

instance, zones may include a border area, grazing corridor, market and trading centres, and insecure settlements, along with other relevant classifications identified through collaborative mapping by county security actors. Each zone captures the conditions under which firearms are acquired, retained, or lost in that particular zone, enabling more detailed analysis of variations in firearms circulation within a county.

Mechanisms of stock change: Acquisition, retention, and loss

Within these zones, changes in civilian firearms stocks occur through one of three mechanisms: acquisition, retention, or loss. These mechanisms reflect the processes through which firearms enter, remain within, or exit civilian possession.

The dominant mechanism will vary by zone, shaped by local conditions such as cross-border trade and community security arrangements. As a result, firearms circulation does not change uniformly across a county but follows activity unique to each zone. Mechanisms therefore provide a structured way to analyse change through regular observation of how acquisition, retention, or loss evolves across each zone.

Indicators for trend monitoring

Indicators provide the empirical basis for tracking how civilian firearms circulation evolves over time. They guide county officials in translating observable changes in civilian firearms dynamics into measurable signals that capture acquisition, retention, and loss. For borderland areas, indicators will include changes in weapons prices; shifts in the types and volume of firearms; patterns of armed incidents; seizure activity; changes in local security arrangements; and other context-relevant indicators.

A core set of five to seven indicators is established to enable longitudinal consistency and comparability across borderland counties with similar socio-economic and political dynamics. In most cases, these indicators are grounded in what county security actors are already monitoring and are further complemented by observations from community leaders and civil society.

The approach ensures comparability across counties that share similar socio-economic, livelihood, and security characteristics. In predominantly pastoralist regions, for example, a common set of core indicators can be applied across counties such as Garissa, Mandera, and Wajir to enable meaningful comparison. In contrast, applying the framework in different contexts—such as large urban centres—would require a distinct set of contextual indicators tailored to those environments. As such, the framework is not intended as a tool for direct national-level comparison across all county types, but rather as a means to generate consistent and comparable analysis within similar contexts.

By linking indicators to the dominant mechanisms within each zone, the framework provides a structured way to track changes in civilian firearms circulation. The analytical framework section below shows how to operationalize this through the selection and application of indicators across zones.

Overall approach: The combined framework elements

This approach does not aim to provide county security actors with an absolute number of civilian firearms. Instead, it prioritizes verifiable trend analysis and the determination of a defendable bounded estimation. This approach uses collected data to establish both low and high ranges of civilian firearms within each zone and, when aggregated, to produce a county-level estimate range. Applied consistently over time, the approach tracks directional change in civilian firearms stocks within each zone, and throughout the county.

Analytical framework: Zones, mechanisms, and indicators

This section outlines how the zone- and mechanism-based framework is applied in practice to estimate and monitor civilian firearms at the county level (see Box 1).

The method is implemented by county-level security actors, including relevant government authorities, law enforcement, civil society, and community leaders and officials responsible for security coordination and reporting. These actors apply the framework using available administrative data, operational knowledge, and analytical judgement. As a unit, these actors are referred to in this section as the 'county assessment team'.

The framework is supported by a methodological 'toolkit'—a set of standardized worksheets and recording templates to assist county assessment teams in structuring and preserving data collection, and with documentation efforts across zones. These tools are referenced in the relevant steps below. The process produces a set of structured outputs that can be repeated over time to track changes in civilian firearms.

Box 1 Framework components

The framework is made up of the following components:

- **Zones:** areas within a county where firearms circulation follows consistent patterns linked to movement, trade, and security conditions.
- **Mechanisms:** the process through which firearms stocks change through acquisition, retention, or loss.
- **Indicators:** observable measures used to track these mechanisms and assess directional change over time.

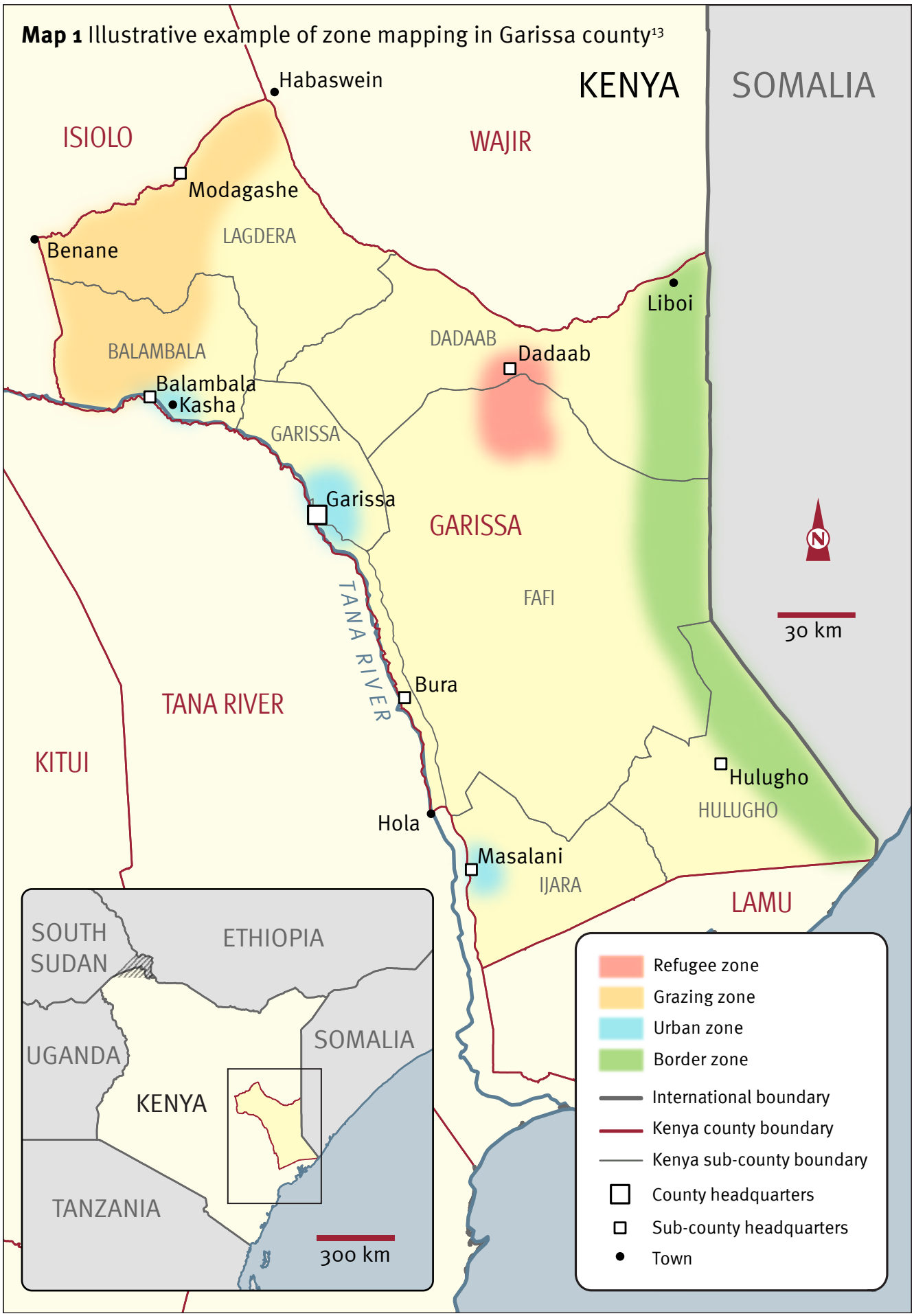
Defining zones

The first step is to divide the county into a limited number of analytically distinct zones where firearms circulation follows identifiable patterns.

Zones should be defined according to functional characteristics—such as patterns of mobility, economic activity, insecurity, and population settlement—rather than administrative boundaries. In practice, this may include grazing corridors, border areas, market centres, or settlement clusters. Other zones can be established beyond this list, as necessary depending on the context of each county.

The county assessment team should:

- identify areas where firearms are consistently present or stored over time (such as households, grazing areas, settlement clusters, or market locations where armed presence is routinely observed);
- group together areas that are not physically connected but where firearms follow the same pattern of use, movement, or supply (such as multiple livestock markets linked to


Map 1 Illustrative example of zone mapping in Garissa county[13]
KENYA
SOMALIA
Habaswein
ISIOLO
WAJIR
Modagashe
LAGDERA
Benane
Liboi
DADAAB
Dadaab
BALAMBALA
Balambala
Kasha
GARISSA
Garissa
GARISSA
FAFI
TANA RIVER
30 km
Bura
TANA RIVER
KITUI
Hulugho
HULUGHO
Hola
Masalani
IJARA
LAMU
SOUTH SUDAN
ETHIOPIA
UGANDA
SOMALIA
KENYA
TANZANIA
300 km
Refugee zone
Grazing zone
Urban zone
Border zone
International boundary
Kenya county boundary
Kenya sub-county boundary
County headquarters
Sub-county headquarters
Town

the same trading networks, or populated settlement areas where firearms movement behaves the same way; see Map 1); and

- exclude areas where firearms are only passing through and not typically kept locally (such as continuous transit routes that enter and exit county boundaries).

Each zone should be documented with a clear written description, including key landmarks, physical land features (such as rivers, mountains, or grazing areas), relevant administrative boundaries or borders, and major towns and settlements. This information is recorded using a standardized zone definition sheet to ensure consistency and enable reliable application in follow-up assessments and estimation cycles.

Output: A defined and mapped set of zones representing the firearm ecosystem within the county.

Identifying mechanisms of stock change

For each zone, the county assessment team identifies the dominant processes leading to changes in firearms stocks in each zone. The three mechanism categories are:

- acquisition (inflow into civilian hands);
- retention (continued possession over time); and
- loss or removal (through seizure, surrender, or confiscation).

The focus is on identifying the dominant driver of change, instead of listing individual incidents. The county assessment teams should consider the overall trend. A structured mechanism identification table is used to record this designation consistently across zones. If mechanisms change—for example, from acquisition to loss—a written justification is recorded and filed using the identification table for that assessment cycle.

Output: A mechanism profile for each zone, identifying the primary driver of stock change. Indicators are chosen based on this mechanism.

Selecting indicators

To apply this framework, indicators are used to provide observable signals through which to track and identify dominant mechanisms—acquisition, retention, and loss—within each zone. Rather than prescribing a fixed set of indicators, the approach defines a core group to ensure consistency and comparability, while allowing additional indicators to capture local variations.

For each zone, at least three indicators—one primary and two secondary—should be selected.[14] Indicators are intended to remain consistent across assessment cycles to support comparability over time but may be adjusted if changes in local conditions affect how the mechanism is observed. When a mechanism is revised due to observable evidence of directional change, the indicators for that mechanism should reflect this change, while still drawing from the initially selected five to seven core indicators.

Indicators are selected based on the following criteria:

- direct relevance to firearm stock changes;
- observability and verifiability;
- repeatability over time; and
- applicability within at least one identified zone.

Examples of indicators include changes in firearm prices, seizure activity, the types and volume of firearms in circulation, and local security arrangements, such as shifts in patrol patterns or in the presence of informal armed security actors (see Table 1). When tracked over time, these indicators reveal broader patterns in firearms availability and use. At the national level, the KNFP, or a comparable national body, can play a role in aligning the selection of indicators across counties to ensure comparability over time and across regions.

In a cross-border corridor zone where the dominant mechanism is identified as acquisition, the primary indicator may be reports of new firearm types or calibres entering circulation. This signal is interpreted in relation to supporting indicators, such as seizure data compared to patrol activity and the expansion of firearms possession into new areas (see Table 2). Together, these indicators help determine whether changes reflect an increase in inflow, rather than isolated or unrelated events.

In contexts where firearms possession is embedded within local livelihood and security systems, administrative data alone may not fully capture local dynamics. In these cases, indicator assessment may draw more heavily on engagement with community actors, such as local leaders, peace committees, civil society organizations (CSOs), or other knowledgeable interlocutors. These inputs are treated as one source among several and interpreted through triangulation.

Output: A structured interpretation of firearms dynamics and directional change linked to zones and mechanisms.

Table 1 Indicators and data sourcing

Indicator	Typical sources	Considerations
Firearm prices	Local markets, traders, community sources	Data is sensitive and requires triangulation across sources.
New firearm types or calibres	Seizures, field observations, security reports	Data serves as strong signal when consistently observed.
Seizure trends (relative to patrol activity)	Police/security records	Data reflects enforcement activity as well as circulation.
Armed incident patterns	Police incident reporting, community reporting	Data must be interpreted alongside broader conflict dynamics.
Visible armed protection	Local observation, elders, CSOs	Data could under-represent concealed firearms.
Voluntary surrender or confiscation	Official records	Data indicates removal, stock not remaining in circulation.
Changes in local security arrangements	County actors, community leaders	Data is context specific and best used with other indicators.

Establishing a baseline range

Using the defined zones, mechanisms, and indicators, a baseline estimate of civilian-held firearms is established.

Table 2 Illustrative application of indicators within a zone in Garissa county

Zone	Zone description	Dominant mechanism	Primary indicator	Supporting indicators	Interpretation
Grazing zone	Grazing areas in Lagdera and Balambala sub-counties, to Tana River county border area	Acquisition	Reports of new firearm types (or ammunition calibres) entering circulation	1. Increased seizures/ recovery of firearms by law enforcement 2. Increased firearms possession among herders	Indicates likely acquisition and increased civilian-held firearms through cross-border routes

These estimates serve primarily as a reference point for tracking directional changes over time, rather than as precise measures of total firearms holdings.

Estimation is first conducted at the zone, rather than the county, level. For each zone, the county assessment team establishes:

- a low estimate—minimum plausible number;
- a high estimate—maximum plausible number; and
- an anchor estimate—most likely value between the low–high range.

The objective is not to achieve precision, but to establish a reasonable and defensible range that excludes implausible values. Estimates are documented with a brief justification explaining the reasoning behind the selected range. Estimation relies on multiple sources of information and incorporates both formal data and local knowledge of firearm presence, use, and circulation patterns. Where such inputs are used, they are triangulated with other indicators and assessed for consistency to ensure that estimates remain structured and comparable across zones. The low–high range should be interpreted as a whole, with the anchor value serving as a reference point for tracking change over time.

In sum, these estimates are derived from:

- the mechanism identified;
- evidence collected for selected indicators;
- observed firearm presence and use; and
- the size and characteristics of the zone.

The county assessment team derives these estimates through a structured, collective assessment process, combining indicator evidence, observed firearm presence, and the characteristics of each zone. The low estimate reflects a conservative minimum grounded in confirmed and observed presence, while the high estimate is bounded by the strongest available indicator evidence. The anchor estimate is then selected within this range as the most plausible level based on the relative strength and direction of indicator signals, rather than simply the midpoint between the low and high values (see Box 2).

Zone-level estimates are then aggregated to produce a county-level low–high range and anchor (baseline) estimate. While the framework is designed to support consistency over time, zones, mechanisms, and indicators may require periodic review to ensure they continue to reflect evolving local conditions and are not retained simply for convenience rather than analytical relevance.

Output: A zone-level and aggregated county-level baseline range for civilian-held firearms.

Establishing a monitoring protocol

To operationalize the framework, responsibilities for monitoring indicators must be defined.

For each indicator, the county assessment team specifies:

- the responsible officer or role (by title or role rather than the person's name);
- the information sources used (such as administrative data, intelligence reporting, or key informant consultations); and
- the frequency of the assessment (for example, annually).

This ensures that indicator tracking is institutionalized and repeatable over time. A county protocol table is used to document responsibilities, sources, and reporting frequency.

Output: A defined monitoring protocol linking indicators to responsible actors, data sources, and assessment frequency.

Tracking trends over time

Once the baseline is established, changes in indicator patterns provide a basis for identifying directional change in civilian firearms circulation. Interpreted in relation to defined zones and associated mechanisms, these changes enable the team to analyse whether civilian-held firearms are increasing, decreasing, or remaining stable across different contexts.

This approach draws on documented observations and inputs from county security actors, complemented by insights from community leaders and other local sources, to provide a structured basis for interpreting change. The focus is on assessing the direction and relative magnitude of change, not on producing precise estimates.

Where sufficient evidence emerges, baseline ranges may also be revised to reflect updated conditions. This allows the framework to remain responsive over

Box 2 Illustrative example of a baseline range estimation

In a grazing corridor, for example, where acquisition is identified as the dominant mechanism, the county assessment team draws on a selected set of context-relevant indicators, such as seizure trends, reports of new firearm types, and observed changes in armed herders and livestock protection. Confirmed and repeated observations of firearm presence among the main identified local categories and groups of potential firearm owners establish a conservative minimum that informs the low estimate. Where several indicators point to increased inflow and wider distribution, the high estimate represents the upper limit of a plausible range. The anchor estimate is then selected as the most plausible level within this range, based on the consistency and convergence of indicator signals and local knowledge. Finally, the range reflects a structured judgement based on triangulated evidence, rather than a single data point or assumption.

time while maintaining a consistent basis for assessing directional change in civilian stocks at both the zone and county levels.

Output: Periodically updated trend assessments and baseline ranges to support the interpretation of longitudinal changes in civilian firearms circulation.

Interpreting results for policy response and relevance

The outputs of this framework help in understanding how and why firearms stocks are changing, and go on to inform policy and security responses. Changes in indicator patterns and mechanisms provide insight into underlying dynamics. For example:

- increased acquisition indicators may signal heightened insecurity, increased visibility of arms in the community, or conflicts in formerly peaceful areas;
- sustained retention may indicate that the status quo is maintained;
- increased loss or removal may reflect improved security, reduced reliance on firearms, or weakened community defence capacities; and
- shifts in mechanisms within a zone may indicate changes in security dynamics (for example, firearms that previously moved through an area begin to be acquired and retained locally).

Interpretation should be based on indicator trends rather than any single data point and should be documented in the relevant record sheet.

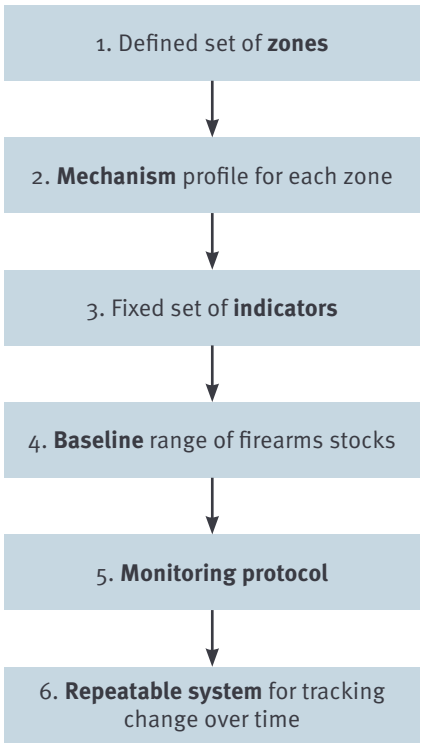
Complete process

As demonstrated in Figure 1, the sequential process is to establish:

1. a defined set of zones;
2. a mechanism profile for each zone;
3. a fixed set of indicators;
4. a baseline range of firearms stocks;
5. a monitoring protocol; and
6. a repeatable system for tracking change over time.

As highlighted earlier, the strength of the framework lies not in establishing precise firearm counts, but in producing a repeatable low–high range and tracking directional change over time. When the framework is used consistently, trend patterns of stock change emerge, producing longitudinal data for analysis.

Figure 1 Complete process



Conclusion

Existing approaches to estimating civilian-held firearms circulation in data-constrained environments are limited by their reliance on static surveys, weak proxies, or assumptions that do not reflect how firearms actually circulate. This Briefing Paper presents an alternative: a structured approach to approximating civilian firearms stocks by analysing localized systems of circulation, grounded in observable indicators and informed judgement. While the method requires an initial concerted county-level commitment to map zones, identify mechanisms, and select indicators, once this structure is in place, it allows for cost-effective and repeatable monitoring of civilian firearms circulation.

Importantly, the framework extends beyond a purely technical exercise and acknowledges that informal governance systems can contribute to an evidence-based firearms approximation method facilitated by county security officials. Because the approach is designed to be implemented at the local level where security decisions are made, it provides a practical basis for more targeted and adaptive security interventions.

Initial application of the framework in northern Kenya demonstrates that it is both feasible and relevant for practitioners. While further refinement and testing across different contexts will strengthen the methodology, the approach offers a clear pathway to move beyond the limitations of existing estimation methods.

Abbreviations and acronyms

CSO Civil society organization

KNFP Kenya National Focal Point on Small Arms

RECSA Regional Centre on Small Arms in the Great Lakes Region, the Horn of Africa and Bordering States

Notes

1 In this Briefing Paper, 'circulation' refers to the movement and redistribution of civilian-held firearms across space and over time.

2 'County' is referred to throughout as a general term for subnational administrative units, including states and similar jurisdictions. The term reflects the Kenyan context but also applies to equivalent levels of administration elsewhere.

3 While developed for use by county-level security committees or their equivalent in different contexts, the framework can be adapted by international organizations, research institutions, and other practitioners working on arms monitoring, violence reduction, or security analysis in similar settings.

4 In this Briefing Paper, the term 'civilian-held firearms' refers to weapons in the possession of non-state actors with a focus on illicit, unregistered, or informally held firearms circulating outside of formal regulatory systems.

5 In Kenya, chiefs are formally appointed as state administrative officials under the National Government Administrative Officers structure (Kenya, 2013, s. 15), although in practice they are drawn from the communities they serve and operate at the intersection of state authority and community-based governance and security systems.

6 See, for example, Young (2007); Flint (2009); Lewis (2012); Gramizzi and Tubiana (2013); Craze (2019; 2022a; 2022b).

7 The Survey has conducted large perception surveys in Kenya (Wepundi et al., 2012), Somalia (Small Arms Survey and UNDP, 2016a), and South Sudan (Small Arms Survey and UNDP, 2016b). While these studies were methodologically rigorous and provided reliable baseline estimations of total civilian firearms

holdings at the national level—with data disaggregated to provide insights on subnational distribution—they remain predominantly one-off studies that have not been replicated. In the case of the Kenya and South Sudan estimates, the numbers produced have been cited many years later as though they represent current civilian firearms possession numbers. See Mutambo (2021) and Panchol (2023).

8 For instance, during the conflict in Tigray, Ethiopia, an upsurge in migrants carrying weapons across the border into Turkana and Marsabit counties in northern Kenya was observed. These firearms were sold in Kenya to help facilitate Ethiopians' passage further south. Interview with civil society organization (CSO), Turkana county, April 2023.

9 See Africa Centre for Security, Governance, and Research (2021).

10 See Africa Centre for Security, Governance, and Research (2021).

11 This view was expressed by county teams from Garissa, Mandera, and Wajir during a workshop held in Wajir town, 23–24 February 2026.

12 Author interview with county peace practitioners from West Pokot and Turkana, Orwa, West Pokot, 23 April 2026.

13 This map illustrates the zones established by the Garissa security team during the Survey workshop in Wajir, Kenya, February 2025. It identified four zones: grazing, settlement, refugee, and border areas. For each zone, the Garissa team drafted a written description—noting landmarks, rivers, and administrative boundaries—to establish a descriptive record of the defined zones. This is key to enable the methodology to be replicated for subsequent assessments in Garissa.

14 An indicator should be considered 'primary' if it directly reflects the dominant mechanism (acquisition, retention, or loss) and shows directional change over time (increase, decrease, or stability). It must also be consistently observable within a zone and be described as specifically as possible to avoid confusion in interpretation. Secondary indicators are chosen to provide supporting evidence for the primary indicator and firearms trend. Their function is to rule out alternative explanations and provide additional context regarding the scale of firearms, directional changes in arms flows (increase, decrease, or stability), or changes in the level of intensity of flows.

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