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## MONITORING ILLICIT ARMS FLOWS

### National Forensic Institutions in the Sahel

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## Front cover photo

An expert from the Niamey Police Forensic Science Laboratory performs a ballistics assessment using a comparison microscope, Niger, June 2015.

Source: André Desmarais

## About the author

**André Desmarais** spent 30 years working for various forensic services operated by the French Ministry of Interior, before finishing his law enforcement career as head of the Ballistics Unit of the Marseille Police Forensic Science Laboratory. He spent four years helping to set up the Kabul Police Laboratory in Afghanistan, and also worked on various projects in Algeria, Bulgaria, and Niger. He currently works as a consultant for the Small Arms Survey.

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## Overview

The issue of illicit arms flows in the Sahel region has become significant due to the armed conflicts that have been ongoing in Libya and Mali since 2011. In response to these arms flows, various entities in the region—including military units, groups of UN experts in charge of monitoring the UN Sanctions Regime, peacekeeping missions, and research institutes—have collected specific data used to identify types and models of illicit arms in circulation as well as various arms trafficking networks.

Most of this data, however, was obtained by foreign or international institutions that are tasked with carrying out their research within a specific geographic area, over a limited time period. One might therefore consider the role played by national forensic institutions in the detection and monitoring of illicit arms flows in the Sahel region. With this objective in mind, this Briefing Paper analyses the capacities and practices of forensic institutions in three French-speaking Sahel states—Mauritania, Niger, and Chad—whose staff include highly skilled local firearms and ammunition experts.

This Briefing Paper feeds into the framework of the Sustainable Development Goals, particularly Goal 16.4, which calls for a significant and measurable reduction of arms flows.<sup>1</sup> Drafted in cooperation with INTERPOL, this study is based on visits and interviews conducted in Mauritania and Chad in December 2017, and on interviews and remote exchanges with officials in Niger.

## Key findings

- There is a significant imbalance in the capacities of forensic institutions in the states studied. Whereas institutions in Niger operate almost completely in line with good practices, those in Mauritania and Chad have neither the technical expertise nor the equipment that ballistic laboratories need to operate effectively.
- Forensic institutions are often confronted with situations where the procedures for protecting a crime scene have not been respected, and where seized weapons are prematurely reallocated to state-run institutions. Moreover, arms seizures are frequently considered as an end goal rather than as grounds on which to carry out new technical and judicial investigations. For example, the judicial authorities in Mauritania and Chad are not sufficiently aware of the scientific value of ballistic evidence.
- Forensic institutions generally hold relevant information that is potentially useful for monitoring illicit arms flows. For example, data from all three countries confirms that there has been a sharp increase in the number of alarm pistols that have been modified in order to be able to fire solid projectiles.
- Practices must now evolve to enable forensic institutions to fulfil their role as monitors of arms flows. It is especially important to ensure that seized illicit arms and ammunition are systematically handed over to police forensics services.
- The results achieved by forensic institutions in Niger confirm the positive impact that appropriate technical and financial support can have on abilities to monitor illicit firearms, make ballistics comparisons, and conduct firearms identification through efficient procedures.

## Introduction

This Briefing Paper analyses the capacities of the national forensic institutions in three French-speaking Sahel states: Mauritania, Niger, and Chad. These institutions, which collect and analyse evidence to assist with criminal investigations, are responsible for examining ballistics evidence found at crime scenes, such as spent cartridge cases, fragments of bullets, and weapons.<sup>2</sup> The specialists who carry out this work are some of the most experienced experts on firearms and ammunition in the region.

Very little information is available, however, both on the capacities of forensic institutions in Sahelian countries and on their contribution—current and potential—to the monitoring of illicit arms flows in the region. This paper attempts to fill this gap by providing answers to the following questions for the three countries studied:

- What are the capacities of these forensic institutions in terms of ballistic analysis?
- Are the arms and ammunition seized during criminal investigations systematically examined by these institutions? If not, what are the obstacles to doing so—particularly in terms of capacities and procedures?
- To what extent can these institutions retain and analyse detailed information on ballistics to help monitor illicit arms flows in the long term?
- What steps could be taken to support these institutions?

The research is based on visits to, and interviews with, members of the forensic institutions in Mauritania and Chad in December 2017, as well as meetings with representatives of the police forces, gendarmerie, forensic medicine services, police forensics services, customs, and judicial institutions. The armed forces of these countries have not been included in this analysis and could therefore be the subject of another study. It is important to note, however, that the forensic institutions studied do generally not work for the army, at least not in capacities

related to analysing arms and ammunition. These visits were organized with the support of the INTERPOL Firearms Programme, INTERPOL's regional bureaus in Abidjan and Yaoundé, as well as INTERPOL's national central bureaus in Mauritania and Chad. Data and information concerning Niger were collected between November 2017 and the beginning of 2018 through email exchanges and telephone conversations with various sources. The interview guide used for this purpose was prepared by the Small Arms Survey and approved by INTERPOL in October 2017.

The first section of the paper provides a brief contextual overview of the three countries in which the forensic institutions in focus operate, including information on the firearms legislation in place and the extent of the illicit arms issue. The second section analyses these institutions' capacities in terms of forensics, forensic medicine, and ballistics. The third section describes how these capacities are used to combat criminality and monitor small arms trafficking. Finally, the conclusion presents various observations and suggestions for decision makers and international cooperation stakeholders.

## Background

This section provides background information on the size of the illicit small arms market in the three countries studied and, more generally, on civilian arms holdings.

## Mauritania

In Mauritania, civilian ownership of firearms is governed by Section II ('Arms') of Decree No. 60-072 of 20 April 1960. Provided they hold an arms licence, civilians may own and carry any of the following three categories of firearms: 'sophisticated rifled-barrel weapons', 'sophisticated smooth-bore weapons', and 'trade guns' (Pézard and Glatz, 2010, p. 43).<sup>3</sup> Gun licence applications must, however,

contain the exact references to the gun to which the application relates. The Ministry of Interior's regulatory service keeps a record of guns owned by civilians, and INTERPOL's national central bureau in Nouakchott keeps a file containing information on guns allocated to the police force.<sup>4</sup> Imported guns must be marked upon receipt, and guns owned by state institutions or guns that will be used for target shooting are also marked.<sup>5</sup> In December 2017, discussions were held with a view to submitting a bill to parliament to establish new firearms regulations.<sup>6</sup> It was not possible to obtain accurate statistics on the number of guns legally owned in Mauritania. According to various sources, the 2008 estimate—70,000 firearms owned by civilians—still applies, although this figure is likely to have increased since then (Pézard and Glatz, 2010, p. 25; GRIP and Small Arms Survey, 2016, p. 31).<sup>7</sup> In 2013, a former Mauritanian army officer said that '90% of Mauritanian families [owned] a gun, either a "gun of glory" or any other kind of gun' (Kane, 2013). In fact, the majority of legally owned firearms are 'prestige guns'<sup>8</sup> (generally old guns that are passed down from one generation to the next), defence

guns, and guns used for target shooting. Target shooting is a popular sport in Mauritania: there are several hundred licenses in the country, and it is regulated by the government (Tariouveté, 2016).<sup>9</sup> Interviewees were unable to provide accurate information on the extent of the seizures carried out by the authorities or on the guns seized. A study by the Small Arms Survey published in 2010, however, listed the short and long gun models available on the illicit markets in Mauritania. At the time, supplies of illicit arms originated primarily from Western Sahara, Mali, and several southern countries such as Guinea, but also included arms that had been deliberately leaked from army stockpiles (Pézard and Glatz, 2010, pp. 44, 54, and 82). Recently, several groups of cannabis traffickers carrying AK-type assault rifles were intercepted while crossing from northern Mauritania into Algeria on a road bypassing the south of Morocco.<sup>10</sup> Furthermore, sources mentioned the recent emergence in Mauritania of modified or original alarm pistols.<sup>11</sup> An Ekol Tuna alarm pistol modified in order to be used to fire steel balls can apparently be purchased for between MRO 70,000 and 80,000<sup>12</sup> (between USD 197 and 225).



Post-test firing of a converted Ekol Tuna alarm pistol: cartridge case, steel ball, plastic wadding. Nouakchott Police Forensic Science Service, December 2017. Source: Mauritania National Police Forensic Science Service

It has been alleged that these guns are illegally brought into Mauritania via the border with Senegal.<sup>13</sup> It has also been established that guilds of blacksmiths produce firearms in Mauritania.<sup>14</sup>

## Niger

In Niger, civilians require a licence in order to own a gun. It would appear, however, that after 1991, gun licences have been granted ‘somewhat uncontrollably’ (CNCCAI, 2010, p. 28). Since 2011, the Nigerien authorities are purported to have issued fewer than 500 gun licences per year, most of which have been issued for 9 mm semi-automatic Parabellum pistols.<sup>15</sup> In 2017, however, only 2,000 authorized gun licensees were registered with Niger’s Commission for the Collection and Control of Illicit Arms (CNCCAI) (de Tessières, 2018, p. 42). A new act is soon to be drafted in Niger that will be based on the recommendations of the United Nations Office on Drugs and Crime (UNODC), the Convention of the Economic Community of West African States (ECOWAS) on small arms and light weapons, and the Arms Trade Treaty.<sup>16</sup> In 2007, it was estimated that 93,000 firearms—licit and illicit—were present in Niger (Karp, 2007). In view of the situation in Libya, it is likely that there are a significantly higher number of firearms in Niger today (GRIP and Small Arms Survey, 2016, p. 33).<sup>17</sup>

Against a background of armed conflict in Libya and Mali and the confrontations with Boko Haram on the Nigerian border, Niger is significantly affected by cross-border arms trafficking. These illicit arms—small arms and light weapons, as well as portable surface-to-air missiles, mortar shells, and machine guns—pass through Niger before reaching their recipients in neighbouring countries, although some are also supplied to Malian and Nigerian armed groups that operate in Niger (de Tessières, 2018, p. 10). The

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statistics prepared by the gendarmerie on gun seizures are incomplete, but nevertheless provide an initial idea of the illicit arms in circulation. Between January 2014 and October 2016, 462 guns were seized; 56 per cent (258) were assault rifles (of which 95 per cent were AK-type rifles and 5 per cent were FAL and G3 rifles); 26.5 per cent (123) were handguns (the majority of which were converted alarm pistols); 5.5 per cent (26) were traditional guns and hunting rifles; and lastly, 12 per cent (55) were other types of guns (including MAS 36 rifles, RPGs, and machine guns) (de Tessières, 2018, p. 43).

## Chad

Aside from the government bill expected in early 2018, the Chadian authorities have promulgated and revised no fewer than 13 acts to regulate civilian ownership of firearms since 1961.<sup>18</sup> Civilians in Chad are permitted to own a maximum of two firearms per person but restrictions apply based on the type of weapons— one is allowed to own one hunting rifle and one handgun, but one is not permitted to hold two handguns. Licences are granted for an unlimited term and licensees are required to pay an annual fee of CFA 10,000 (USD 19) for a handgun, CFA 7,500 (USD 14) for a .22 long rifle carbine, and CFA 4,500 (USD 9) for a 12 gauge shotgun. These licences are

also valid for ammunition. Licensees are permitted to own up to 15 cartridges for a handgun and 25 cartridges for a shoulder weapon. They are required to apply to the authorities for a permit to purchase new ammunition. As all arms and ammunition retailers were closed down in Chad in 2014, civilians must find their own means for obtaining supplies.<sup>19</sup>

As a result of the 20 January 2014 moratorium, no civilian was granted an arms licence until January 2017, when the moratorium was lifted. Guns owned by civilians are now registered when a licence is issued, with 210 guns having been registered in 2017.<sup>20</sup> A sample of 47 licences issued in 2017 was examined for this study: the licences had been issued for semi-automatic pistols (more than two-thirds) and hunting rifles.<sup>21</sup> Three-quarters of the pistols were 9 mm PAK guns manufactured in Turkey and modified to shoot metal projectiles. Only six per cent of them were 9 mm Parabellum pistols—that is, two MAC 50 manufactured in France.

Estimates of the number of guns—licit and illicit—owned by civilians in Chad vary significantly.<sup>22</sup> In 2002, Napoléon Abdoulay estimated that Chadian non-state actors owned between 500,000 and one million firearms (Issa, 2010, p. 190). In 2007, the Small Arms Survey estimated that Chad civilians owned 109,000 firearms (Karp, 2007). In 2015, the coordinator of the

Monitoring Committee for Peace and Reconciliation estimated that more than one million illegal weapons were in circulation. According to a study published the same year, ‘approximately 5 to 6 out of 10 households [owned] a weapon (legal and illegal)’.<sup>23</sup> Many observers believe that turmoil in Libya is primarily to blame for this rapid increase, referring in particular to the return of 60,000 Chadian civilians—some of whom were armed—to Chad in 2011 (Musila, 2012), and to the fact that, between 2011 and 2013, some weapons from Libya that were passing through the north of Chad remained in the country and were used to supply the local market (Tubiana and Gramizzi, 2017, p. 13). These observers also confirm that guns are produced on a small scale in Chad, although production is in decline.<sup>24</sup>

## The capacities of national forensic institutions

This section assesses the national capacities of the three countries in the light of good practice in forensic sciences, forensic medicine, and ballistic analysis.<sup>25</sup>

## Forensic capacity

At crime scenes, searching for digital traces and taking photographs are activities managed primarily by departments of the Ministry of Interior:<sup>26</sup> the Nouakchott Police Forensic Science Laboratory (Laboratoire du service national de la police technique et scientifique) in Mauritania, the Niamey Police Forensic Science Laboratory (Laboratoire de police technique et scientifique) in Niger, and the Police Forensic and Civilian Identification Department (Direction de la police technique, scientifique et de l’identification civile) in Chad. Each of these departments retains criminals’ fingerprints and keeps an up-to-date electronic fingerprint database.

In all three countries, biological samples taken during sensitive cases—assaults on foreign nationals, for example—are systematically analysed in another country. In Chad, the national gendarmerie takes biological samples in terrorism cases—particularly from guns and casings—and records the genetic profile of terrorist actors, enabling it to compare biological evidence gathered from crime scenes with the data in the electronic records.<sup>27</sup>

All three departments conduct expert examinations of administrative and handwritten documents at different levels. For drug analyses, the Nigerien laboratory carries out the entire process; the service in Mauritania uses drug testing kits; but neither of these options is available to the laboratory in Chad. Furthermore, none of the three departments are able to carry out a full analysis—from sampling to analysis—in the event of a fire or an explosion.<sup>28</sup> In addition, the Niamey Police Forensic Science Laboratory provides analysis upon request regardless of whether that request comes from a judge, a police officer, or a gendarme.<sup>29</sup>

Unlike its counterparts in Chad and Mauritania, the Niamey Police Forensic Science Laboratory has Internet access, although none of the services studied have an IT network. The Niamey forensics laboratory has undertaken to obtain ISO/IEC 17025:2017 accreditation.<sup>30</sup> In Mauritania, plans are underway to set up a joint police and gendarmerie laboratory.<sup>31</sup>

The German international cooperation agency (Gesellschaft für Internationale Zusammenarbeit – GIZ) is present in the three countries. While it has not provided



Galil ACE 21 assault rifle allocated to the Chad police force, with police marking. December 2017. Source: André Desmarais

any training on topics directly related to firearms, it is very active regarding the management of crime scenes.

## Forensic medicine and ballistics

In the Sahel countries, forensic medicine suffers from a lack of human and material resources. The main hospitals in Mauritania, Niger, and Chad—and Mali—have a morgue, but no specific institution for forensic medicine.<sup>32</sup> Each of the countries studied has only one forensic pathologist in post,<sup>33</sup> although three forensic pathologists will soon have completed their training in Chad.<sup>34</sup> Generally, forensic pathologists carry out very few autopsies.

Between 2015 and 2017, the forensic pathologist in Chad carried out 26 autopsies,<sup>35</sup> although 143 deaths linked to traumas caused by firearms or explosions were recorded at the national general hospital (Hôpital Général de Référence Nationale) in 2015 alone—particularly due to the terrorist explosion in the N'Djamena central market.<sup>36</sup> According to a study of penetrating traumas treated under general surgery at the N'Djamena general hospital in 2013 and 2014, 22.7 per cent of the 569 emergency surgical admissions involved penetrating wounds, of which 60 per cent involved young men (aged between 21 and 30) and 13 per cent had been caused by firearms (Choua et al., 2016, pp. 181, 185).<sup>37</sup>

In Mauritania, the forensic pathologist carried out only 11 autopsies in three years (between 2015 and 2017).<sup>38</sup> Of the 73 suspicious deaths dealt with during this period, only seven per cent had been caused by a firearm. In 2010, 55 and 186 people were killed by a firearm in Mauritania and Chad respectively (GRIP and Small Arms Survey, 2016, p. 16), although it is clear that an autopsy was not performed in all of these cases.

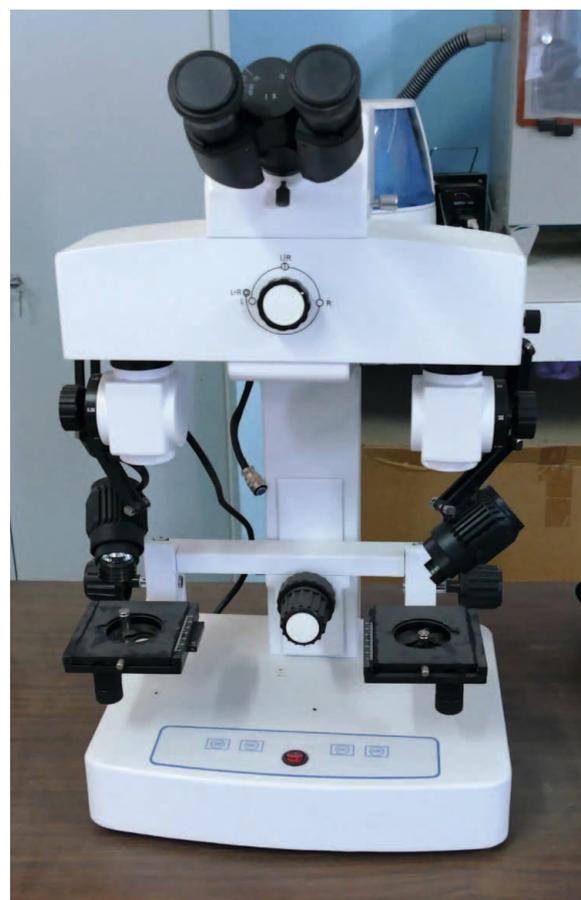
Although it is not possible to carry out a ballistic analysis in Chad<sup>39</sup> or Maurita-

nia,<sup>40</sup> the projectiles discovered during autopsies are systematically handed over to the authorities in order to be placed under seal.<sup>41</sup>

## Ballistic analysis

Niger differs from Chad and Mauritania due to the quality of its ballistic analysis procedures, which are carried out almost in accordance with international standards (the requirements identified appear in Box 1). The Niamey Police Forensic Science Laboratory integrates standard ballistic analysis procedures into many of its everyday activities. The team is made up of five specialists who have appropriate scientific qualifications<sup>42</sup> and have been working as forensic scientists for an average of six years. Notably, the team received a donation of forensic equipment in 2014 (Laouali, 2014). In addition to a top-of-the-range comparison microscope, the specialists have at their disposal equipment that can be used to weigh and measure projectiles as well as a laser trajectory reconstruction kit. In June 2015, ballistics comparison training was provided by the author of this paper. They have appropriate technical documentation at their disposal to examine guns and ammunition. They also received a serial number restoration gel at the end of 2015 which they used for experimental purposes by grinding off the serial numbers on obsolete MAS 36 rifles and subsequently restoring them. As this stock is now depleted, the 2018 plan of action includes a proposal to develop this activity, with reagents prepared on site.<sup>43</sup>

The Niamey Police Forensic Science Laboratory does not yet have a collection of reference guns and ammunition. Since 2016, however, the laboratory has been compiling a collection of cartridge cases and bullets from pending investigations. These pieces of evidence taken from crime scenes are sent to the laboratory for analysis and subsequently placed in



Comparison microscope used by the Nouakchott Police Forensic Science Service, Mauritania, December 2017. Source: André Desmarais

its custody by the judge in charge of the investigation.

In Chad, specialists from the Police Forensic Science Service are not systematically asked to attend crime scenes to carry out a ballistic analysis.<sup>44</sup> When they do attend a crime scene, only in exceptional cases is the gun still present. Occasionally spent cartridge cases remain at the crime scene and are photographed by the officials. Officials from the Chad Police Forensic Science Service do not have at their disposal any trajectory analysis equipment; they do, however, study crime scenes using their judgement rather than specific techniques. In one specific case, for example, they successfully determined a firing distance based on their observation of the scene and the description of the injury provided by the forensic pathologist; the gun had been

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fired at a distance of only several metres, although the perpetrator claimed to have fired the gun from a location around 100 metres from the victim. This assessment was confirmed by the investigation.<sup>45</sup>

In terms of training, the experts in Chad undertook two training sessions on the topic of combating arms trafficking in the second half of 2016—one session intended for judges and investigators and a seminar that focused particularly on the training of trainers (UNODC, 2016; UNREC, 2016). At the end of 2017, two officials from the Police Forensic Science Service

spent a week in Marseille, France, where they received information on ballistics activities.<sup>46</sup>

In Mauritania, the technical ballistics skills of officials from the Police Forensic Science Service are comparable to those of their counterparts in Chad. The service has a basic ballistics comparison microscope but the device has never been used as no training was provided when it was delivered. In 2014, for example, the team failed to identify the number of guns used in a particular case; around 50 7.62 x 39 mm cartridge cases from a crime

scene were handed over to them, but the team observed ballistics traces using a magnifying glass rather than the comparison microscope.<sup>50</sup>

Forensic services in the three countries have no stock of cartridges for the calibres used most frequently for test firings. The laboratory in Niger must systematically submit requests for ammunition to the Department of Logistics and Infrastructure, which then provides a firing monitor and ammunition.<sup>51</sup> Test firings are currently carried out using a barrel filled with water. The service received a bullet recovery tank filled with cotton wadding at the beginning of 2018, but this had yet to be installed at the time of writing.<sup>52</sup> In Chad, firing practice sessions are held using only the 7.62 x 39 mm cartridges held in stock and an ordinary wooden case lined with cotton.<sup>53</sup> In Mauritania, test firings can be carried out at the police school's shooting range, with cartridges of different calibres usually used by the police force; only cartridge cases are recovered. Occasionally, it is possible to fire a cartridge discovered in a seized gun, but it is usually impossible to recover the projectile.

The forensic departments in Chad and Mauritania have other aspects in common: they are unaware of the numerous specific characteristics of small arms, they do not have a collection of open ballistics cases, and they lack ballistics specialists. Furthermore, neither country restores serial numbers—whereas the laboratory in Niger is committed to acquiring this skill. Lastly, none of the three departments are able to analyse gunshot residue.

## Current practice

This section looks at the use of forensic capacities by the judicial authorities in the three countries, and the capacity of their forensic institutions to monitor illicit arms flows. It also highlights several areas for improvement in these two fields.

### Box 1 Ballistics expertise requirements

This research has highlighted areas where technical improvements could easily be made by police forensic specialists, should they receive the appropriate training and equipment to:

1. identify firearms and ammunition;<sup>47</sup>
2. store information on firearms and ammunition in order to facilitate exchanges of information;
3. restore serial numbers using chemical solutions prepared on site;<sup>48</sup>
4. create designated shooting areas;<sup>49</sup>
5. systematically enter information in the INTERPOL Ballistic Information Network (IBIN) database, on the basis of ballistics samples that fulfil the requirements imposed under the INTERPOL Firearms Programme;
6. obtain good quality ballistics comparison microscopes (and receive relevant training);
7. create a national directory of guns and ammunition—owned by state security and defence forces as well as civilians—in the form of a database accessible to both investigators and forensic services, providing that access to the database is monitored and recorded.

## Justice and combating firearms crime

Under the criminal laws applicable in the three countries, a judicial police officer must seize any item that might be of interest in an investigation, including firearms. These items are placed under seal and then sent to the appropriate public prosecutor. The judicial police officers and judges interviewed for this study all insisted on the importance of this principle, particularly in criminal cases, and pointed out that anyone who violates the legislation on firearms is severely punished.

As the importance of forensic activities is not recognized, however, investigators do not systematically call on the police forensic science services,<sup>54</sup> and occasionally alter crime scenes before the specialists arrive at the scene. Furthermore, as seized guns and ammunition are generally reallocated prematurely, the legal system is unable to obtain evidence that might provide new leads. For example, during anti-terrorism operations carried out jointly with allied forces, the guns seized from terrorists are sometimes immediately destroyed—meaning that they cannot be analysed.<sup>55</sup>

In Mauritania, when customs intercept military firearms,<sup>56</sup> the prosecutor is informed accordingly and must decide either to hand the firearms over to the local court registry or to immediately hand them over to the army.<sup>57</sup> In Nouakchott, in December 2017, a trader who was awoken by an individual armed with a knife and a truncheon assaulted his attacker with his hunting rifle; by the time officials from the Police Forensic Science Service arrived, the arms had already been handed over to the local police station (see photo p. 11).<sup>58</sup>

In Niger's main towns, crime scenes generally remain untouched;<sup>59</sup> however, some security agencies responsible for storing seized arms keep the arms for themselves, in breach of applicable conventions.<sup>60</sup> Certain judges in Niger prefer to entrust arms placed under seal to the



Ekol P29 alarm pistol converted to fire solid projectiles and allocated to an official in Chad. December 2017. Source: André Desmarais

national gendarmerie, as their own courts are often insecure.<sup>61</sup> It also appears that the arms examined by the Niamey Police Forensic Science Laboratory are not a representative sample of the illicit arms in circulation in Niger, when compared with the sample made available for this research by the gendarmerie (see the section on the situation in Niger). Of the 71 arms analysed by the Police Forensic Science Laboratory in 2017, 18 per cent (13) were AK rifles and 66 per cent (47) were alarm pistols.<sup>62</sup>

In Chad, formal confessions made by traffickers of military firearms and ammunition may be filmed and used as evidence in court. Once traffickers have been questioned, the arms and ammunition are immediately sent to the Directorate-General for Strategic Reserves (DGRS). In cases involving the illicit ownership of a handgun, however—including numerous 9 mm PAK semi-automatic pistols

modified for shooting bullets—arms and ammunition are confiscated and may be allocated to officials who wish to carry a side arm with them while undertaking their daily duties.<sup>63</sup> Members of the security forces often keep seized arms for themselves, particularly guns manufactured more recently than those they are using; this is understood as the collection of 'war trophies'. At every level of the hierarchy, it is customary to offer a quality arm to one's superior. At best, these arms are registered.<sup>64</sup>

As judges in Mauritania and Chad cannot use the services of a ballistics analysis laboratory, they consider an arms seizure as the end of a process rather than the beginning of an investigation. In criminal proceedings, a firearm is a representation of the cause of the victim's death. In Mauritania, reports drafted by judicial police officers are authoritative since a ballistics expert assessment

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is not obtainable.<sup>65</sup> The same goes for Chad, and those interviewed acknowledged a lack of skilled technical staff.<sup>66</sup>

In Niger, however, the ballistics team is regularly asked to carry out analyses.<sup>67</sup> The Nigerien judge interviewed for this study was pleased with the quality of the work produced by the Niamey Police Forensic Science Laboratory. In this country, seized arms are considered pieces of evidence and used for further scientific research.

Box 1 contains a list of the improvements that should be made to the manner in which crime scenes and ballistic activities are managed in criminal cases. Essentially, improved integration of ballistics and scientific evidence in the criminal process is required, and all illicit arms and ammunition should systematically be placed under seal before being handed over to the appropriate court registry.

## Monitoring illicit arms flows and combating trafficking

The arms seized by the national security forces in the three countries are not systematically placed under seal and are occasionally reallocated. As a result, forensic services can only examine some of the pieces of evidence seized, which thus limits their capacity to monitor arms trafficking networks.

Not all of the forensic institutions studied are able to use the seized materiel placed at their disposal. Only the forensic police services in Niger can read and interpret ammunition markings. The institutions in Chad and Mauritania cannot analyse ammunition markings or study seized firearms. As a result, seized arms are never handed over to them by investigators but are, in the best case scenario, handed over to the appropriate court registry without first being expertly analysed.

Investigators can access various databases to attempt to identify illicit arms and ammunition. They can consult the database of the defence and security forces in Niger<sup>68</sup> and the DGRS database in Chad.<sup>69</sup> Under the Chad gendarmerie's research protocol on illicit arms, searches must be carried out on the DGRS database to determine whether it contains information on markings or serial numbers on arms allocated to the government.<sup>70</sup>

The interviews held in Chad and Mauritania did not bring to light any information about a specific monitoring strategy to identify new illegal import channels. If seized arms are not registered in the national register, investigators in these two countries do not have any documentation at their disposal that would enable them to carry out more in-depth

searches—in order to identify a logo, for example—and trace the illicit materiel. The Niamey Police Forensic Science Laboratory has, however, created a database of arms and ammunition seized in the context of cross-border trafficking.

At the international level, INTERPOL has created the iARMS system for its member states, which can be used to trace illicit arms (INTERPOL, 2018). Investigators who use it can immediately establish whether arms have been reported as lost, smuggled, or stolen. At the beginning of 2018, security agencies in Sahelian countries received training on the system, which resulted in a significant increase in usage of the iARMS database. By the beginning of March 2018, the five Sahel states (Burkina Faso, Chad, Mali, Mauritania, and Niger) had already reported the loss, theft, smuggling, or trafficking of around 300 arms. As a result, any investigator who subsequently seizes one of these arms will be able to immediately determine its origin using the iARMS database. The numerous reports filed are likely to be the result of the training and international police operations organized in the region since the beginning of 2018.<sup>71</sup>

No Sahelian state, however, is a member of the INTERPOL Ballistic Information Network,<sup>72</sup> but these states occasionally cooperate with partner states on ballistics matters. Consequently, France has added various spent cartridge cases from Niger to its national ballistic information database (FNIB).<sup>73</sup>

At the regional level, Mauritania, Niger, and Chad were among the eight West African and Sahel states that took part in Operation Africa Trigger III carried out jointly by INTERPOL, the World Customs Organization, and the UNODC in November 2017.<sup>74</sup> During this operation, ten firearms were intercepted in Mauritania. Two of these firearms were intercepted at the Gogui border post, between Mauritania and Mali: one unmodified Ekol Tuna pistol and one HK G3 assault rifle whose serial



The arms used to assault a trader, photographed by the Nouakchott Police Forensic Science Service at the local police station. Mauritania, December 2017. Source: Mauritanian National Police Forensic Science Service

number had been ground off.<sup>75</sup> A more wide-scale seizure was carried out in Chad, involving the seizure of 35 arms and 238 cartridges. These arms included three alarm pistols, an AK-47 assault rifle, and several trade guns.<sup>76</sup> It is understood that these arms were traced via the iARMS database at the end of January 2018.

Forensic services are neither organized nor set up to monitor arms trafficking networks, and only have limited access to seized arms. They occupy a unique position that enables them to identify certain important trends, however. For example, in the three states studied, forensic services observed the widespread presence of Turkish alarm pistols modified in order to be used to fire solid projectiles. Although this increase is already well-documented in neighbouring Libya and

Niger,<sup>77</sup> this study highlighted that the phenomenon can also be observed in Mauritania and Chad. Forensic institutions can therefore notify policy-makers should any new trend of this kind emerge. Generally, it would be advisable to increase the capacity of these services to monitor fire-arms trafficking by systematically seizing illicit arms and ammunition during investigations, regularly using the iARMS database, and setting up dedicated national services to combat arms trafficking—or by providing more support to existing services.

## Conclusion

This study contains information on forensic analysis of arms in Mauritania, Niger, and Chad. Niger has gained a good under-

standing of forensic analysis, as the country is increasingly complying with international standards and the judicial authorities are keen to generate weapons-related expertise. Mauritania and Chad do not have, however, proper forensic laboratories, and in the judicial system, arms seizures are seen as an end goal rather than as grounds on which to carry out an investigation. In all three countries, investigators are able, to a certain extent, to consult national databases containing information on the arms owned by state services and civilians.

In Mauritania, Niger, and Chad, not all recovered illicit arms are placed under seal. Some of them are simply added to national arsenals or even handed over to state officials, in which case they are not subject to expert assessment by a forensic



Some of the arms seized during Operation Africa Trigger III, N'Djamena, Chad, November 2017. Source: Confidential

institution. This significantly restricts the capacity of forensic services to identify the arms and to investigate their origins.

To enable these countries to implement ballistic analysis standards, they should be provided with assistance to improve their practices in terms of both security and the right of defence. This study highlights various areas for improvement, one of which serves as a prerequisite for other interventions: the systematic sealing of all seized or recovered illicit arms and ammunition. This would enable investigators to input information into, and regularly consult, INTERPOL's iARMS database. Furthermore, it would be advisable to set up a service responsible for dealing exclusively with arms matters, which could coordinate the fight against the trafficking of small arms and light weapons and their ammunition.

The police forensic science services are essential for the various investigations carried out in each of these states. It is therefore equally essential that these forensic teams are systematically involved in the management of crime scenes where

an act of violence has been committed using a firearm and in mass seizures of arms and ammunition. Lastly, analysis laboratories should be able to study all arms, ammunition, and elements of ammunition, establish technical links between cases, and guarantee improved traceability of seized arms. In order to achieve this, they should be provided with the necessary equipment; their staff should be trained on identifying arms and ammunition, macroscopic observation, and restoring serial numbers; and they should receive relevant technical documentation.

In order to allocate the required financial and human resources to forensic services, however, it is essential that judges clearly stipulate the importance of forensic evidence in the judicial process and acknowledge that this type of analysis is essential in procedural practices. ●

## Notes

- 1 On 25 September 2015, the United Nations General Assembly adopted Resolution 70/1 setting a 2030 Agenda for Sustainable Development. Goal 16 (Peace, justice and effective institutions) notably includes Target 16.4, the aim of which is to 'significantly reduce [...] arms flows [...] and combat all forms of organized crime' (UNGA, 2015).
- 2 See CrimeSceneInvestigatorEDU.org (n.d.).
- 3 During the colonial period, trade guns included average quality guns intended to facilitate trade with indigenous populations. These trade guns use old firing systems (silex, percussion of a primer) and are still manufactured in some African states. See Williams (2009, p. 43).
- 4 In-person interview with confidential source SC8, December 2017.
- 5 Email exchange with confidential source SC29, September 2015.
- 6 In-person interviews with confidential sources SC12 and SC26, December 2017. During these interviews, an undated text on combating terrorism and organized crime—drafted in French and Arabic—co-published by UNDP, the French Embassy in Mauritania, and the US Department of Justice was provided to the author.

- 7 The interviewees refrained from commenting on the estimate prepared by the Mauritanian Department of National Security.
- 8 According to a senior Mauritanian police officer: 'Mauritians believe that owning a gun is a matter of prestige.' In-person interview with confidential sources SC2 and SC4, December 2017.
- 9 In 2016, Mauritania had 77 target shooting teams (Agence Tawary, 2016). One year later, the country had only 40 teams, due to internal dissent and a shortage of ammunition. On an organizational level, a team can include more than ten licensees, although numbers are limited to ten shooters per team in competitions. Only three guns are permitted in this sport: FAL and HK G3 rifles, and Mauser 98 carbines, all of which have a calibre of 7.62 x 51 mm. Assault rifles are not modified in any way to neutralize automatic firing. Shooters are not permitted to own more than one gun, and guns are provided by the army. Any shooter who relinquishes their gun must inform the authorities, as guns are duly registered. The army sells ammunition at a reasonable price to shooting club members (MRO 200, or USD 0.56) (El Mesned, 2016). New ammunition cannot be purchased without bringing back cartridge cases, although it seems that this requirement is not systematically fulfilled (Bechir, 2015). Telephone conversation with confidential source SC5, December 2017, and emails exchanged with confidential source SC29, September 2015.
- 10 In-person interview with confidential source SC1, December 2017.
- 11 A suicide case involved a person who killed himself using a cartridge modified with a steel ball. The gun was a modified Ekol Tuna alarm pistol manufactured in Turkey. In-person interview with confidential source SC18, December 2017.
- 12 The Mauritanian prices mentioned in this document are stated in ouguiya (MRO), the official currency of Mauritania from 28 June 1973 to 31 December 2017. The country introduced a new currency with the same name (MRU) on 1 January 2018, with MRU 1 being equivalent to MRO 10.
- 13 In-person interview with confidential source SC8, December 2017. In Senegal, alarm pistols are classified as category 4 arms, with reference to Decree No. 66-889 of 17 November 1966 laying down the terms of application of Act No. 66-03 of 18 January 1966 on the general rules applicable to arms and ammunition. Permission must be obtained in order to purchase this type of firearm (see Article 13 of Decree No. 66-03) (Republic of Senegal, 1966a; 1966b). Emails exchanged with confidential source SC28, February 2018.
- 14 In-person interview with confidential source SC8, December 2017.
- 15 Telephone conversation with confidential source SC3, January 2018.
- 16 Telephone conversation with confidential source SC3, January 2018.
- 17 Telephone conversation with confidential source SC3, January 2018.
- 18 In-person interview with confidential source SC7, December 2017.
- 19 Safariland is subject to an exemption, which allows it to own hunting arms and ammunition. Foreign hunters who travel to Chad with arms and ammunition are granted a temporary licence valid for three months, which may be renewed once. Sales of military and paramilitary uniforms are regulated. In-person interview with confidential source SC6, December 2017.
- 20 A document was provided containing a summary of information concerning 47 guns for which a licence had been issued. Various pieces of information are repeated in the document; for example, the same registration number appears twice for several guns of the same brand, model, and calibre.
- 21 An exemption was granted for one gun from this sample in 2015.
- 22 In-person interview with confidential source SC7, December 2017.
- 23 Emails exchanged with confidential source SC30, October 2015.
- 24 Emails exchanged with confidential source SC30, October 2015.
- 25 In particular, good practice as described in reference publications by FBI (2013), Gallusser (2014), and Heard (2008).
- 26 In Chad, a unit of the national gendarmerie also has various prerogatives in relation to the management of crime scenes.
- 27 Emails exchanged with confidential source SC13, December 2017.
- 28 Interviews with confidential sources SC3, SC13, SC17, SC18, and SC19, December 2017 and January 2018.
- 29 It was not possible to obtain information on those who request analyses in Chad and Mauritania.
- 30 ISO/IEC 17025:2017 follows on from the previous version from 2005. It is a series of requirements concerning the competence of laboratories, notably police forensic science laboratories. The standard 'specifies the general requirements for the competence, impartiality and consistent operation of laboratories' and is used 'by customers, regulatory authorities, organizations and schemes using peer-assessment, accreditation bodies, and others ... in confirming or recognizing the competence of laboratories' (ISO, 2017).
- 31 Interview with confidential source SC2, December 2017.
- 32 Emails exchanged with confidential source SC14, September 2017, and telephone conversation, January 2018. Observations made in 2013 in Mali and in 2017 in Niger.
- 33 For Niger, it was not possible to collect any information about its forensic medicine and ballistics capacities other than the fact that the country has only one forensic pathologist.
- 34 Emails exchanged with confidential source SC15, December 2017.
- 35 Emails exchanged with confidential source SC15, December 2017.
- 36 In-person interview with confidential source SC24, December 2017.
- 37 Far less than the dozen ballistic traumas reported each day in N'Djamena in 2005 (Alusala, 2007, p. 63).
- 38 In-person interview with confidential source SC16, December 2017, and emails.
- 39 Emails exchanged with confidential source SC15, December 2017.
- 40 In-person interview with confidential source SC16, December 2017.
- 41 In-person interview and emails exchanged with confidential sources SC15, SC16, and SC17, December 2017.
- 42 Telephone conversations and emails exchanged with confidential source SC3, January 2018.
- 43 Telephone conversations and emails exchanged with confidential source SC3, November 2017 and January 2018. While experimenting on the restoration of serial numbers, the laboratory team achieved an acceptable success rate of 20 per cent; it would be difficult to obtain a success rate of more than 30 or 40 per cent.
- 44 In 2015, following the assassination perpetrated with a firearm of an accountant at her home, the police forensic science branch was not invited to attend the crime

- scene. In-person interview with confidential source SC17, December 2017. See also Tchadinfos.com (2015).
- 45 In-person interview with confidential source SC17, December 2017.
- 46 In-person interview with confidential source SC17, December 2017.
- 47 In order to identify ammunition, the ballistics team must have a set of accurate scales, a digital calliper, and a binocular magnifying glass.
- 48 For this purpose, the team should be able to obtain various chemicals, laboratory glassware, and personal protective equipment on the local market. It could also use ready-to-use gels or Magnaflux, subject to availability.
- 49 The team should have a stock of ammunition of common calibres, a bullet recovery system, and individual protective equipment, including bulletproof vests, hearing defenders, and protective glasses.
- 50 In-person interview with confidential source SC18, December 2017.
- 51 Emails exchanged with confidential source SC3, November 2017.
- 52 Telephone conversations and emails exchanged with confidential source SC3, January 2018.
- 53 In-person interview with confidential source SC17, December 2017.
- 54 See note 44 on the assassination of an accountant in N'Djamena (Tchadinfos.com, 2015).
- 55 Emails exchanged with confidential source SC20, March 2018.
- 56 Usually assault rifles.
- 57 In-person interview with confidential source SC9, December 2017.
- 58 In-person interview with confidential source SC18, December 2017.
- 59 Emails exchanged with confidential source SC3, January 2018.
- 60 This practice is in violation of Article 17 of the ECOWAS Convention on Small Arms and Light Weapons (ECOWAS, 2006), of which Niger is a signatory state (de Tessières, 2017, p. 7).
- 61 Telephone conversation with confidential source SC11, January 2018.
- 62 Telephone conversation with confidential source SC3, January 2018. This sample is not intended to be representative of the arms seized; it simply reflects the ballistics work of the Police Forensic Science Laboratory in 2017. All 9 mm PAK cartridges seized had a metal projectile.
- 63 In-person interview with confidential source SC10, December 2017.
- 64 Telephone conversation with confidential source SC21, January 2018.
- 65 In-person interview with confidential source SC12, December 2017.
- 66 In 2004, the International Federation of Human Rights Leagues already observed the absence of ballistics expertise in the Chad judicial system (FIDH, 2004).
- 67 Emails exchanged and telephone conversations with confidential source SC3, January 2018. Forty per cent of these analyses are carried out at the request of an investigating judge, and 60 per cent at the request of a judicial police officer.
- 68 Emails exchanged and telephone conversations with confidential source SC3, January 2018.
- 69 In-person interviews with confidential sources SC13 and SC19, December 2017.
- 70 In-person interview with confidential source SC13, December 2017.
- 71 Emails exchanged with confidential source SC20, March 2018.
- 72 Interview with INTERPOL representatives, September 2017.
- 73 Documents provided by confidential source SC27 in 2017, in the context of the SAFTE study coordinated by the Flemish Peace Institute (Duquet, 2018). The FNIB database operates via the Evofinder application.
- 74 This operation was designed to effectively combat the trafficking of firearms and terrorist mobility. More than 150 arms were seized. Around 50 people were arrested (emails exchanged with confidential source SC20, March 2018).
- 75 Interview with confidential source SC8, December 2017.
- 76 Interview with confidential source SC22 and communication of photographs showing the items seized, December 2017.
- 77 See de Tessières (2018, pp. 46–47); Jenzen-Jones and McCollum (2017, p. 40).

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# About the SANA project

The **Security Assessment in North Africa** is a project of the Small Arms Survey to support those engaged in building a more secure environment in North Africa and the Sahel-Sahara region. The project produces timely, evidence-based research and analysis on the availability and circulation of small arms, the dynamics of emerging armed groups, and related insecurity. The research stresses the effects of armed conflicts in the region on community safety.

The Security Assessment in North Africa receives ongoing funding from the Ministry of Foreign Affairs of the Netherlands. It has previously received grants from Global Affairs Canada, the Swiss Federal Department of Foreign Affairs, the Danish Ministry of Foreign Affairs, the German Federal Foreign Office, the Royal Norwegian Ministry of Foreign Affairs, and the US State Department.

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