



From Mine to Mobile Phone

The Conflict Minerals Supply Chain

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Increasing pressure on electronics companies to ensure that their products do not contain illicit minerals from the killing fields in eastern Congo is beginning to have a significant impact. With bills on conflict minerals moving through Congress, the electronics industry has spent about \$2 million per month lobbying Senate offices to relax the legislation, which would increase transparency in the supply chains for tin, tantalum, and tungsten, or the 3Ts.¹ These mineral ores, as well as gold, are key elements of electronics products including cell phones and personal computers, and also are the principal source of revenue for armed groups and military units that prey on civilians in eastern Congo. Congo’s mineral wealth did not spark the conflict in eastern Congo, but war profiteering has become the fuel that keeps the region aflame and lies beneath the surface of major regional tensions.²

Secretary of State Hillary Clinton highlighted the link between armed conflict, sexual violence, and minerals when she visited eastern Congo in August 2009, arguing that the world needs to do more “to prevent the mineral wealth from the DRC ending up in the hands of those who fund the violence.”³ The most effective way to achieve this goal is to ensure transparency in the consumer electronics supply chain to certify products as conflict-free. But many electronics companies maintain that their supply chains are too complex for this, because of the sheer number of actors involved in moving minerals from mines in Congo all the way to the gadgets in our pockets.

We traveled to eastern Congo shortly before the Secretary’s trip to better understand how the 3Ts and gold make their way from conflict-ravaged areas in North and South Kivu all the way to cell phones, laptops, MP3 players, and video game systems. From this ground level view, the conflict minerals supply chain is far less intimidating than the industry would have consumers believe. In fact, the journey from mine to mobile phone can be broken down into six major steps that make the supply chain relatively easy to understand.

The supply chain in six steps

1 The mines

A gold rush with guns

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looking the other way

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Step 1: The mines: A gold rush with guns

“This region [eastern Congo] has so much of this coltan, you just dig on any hill and you find it.”
- Denis, miner, Bukavu, South Kivu

“When the FDLR come to a mine, the first thing they do is get the girls and abuse them. Then they force many people to work and kill those who don’t want to work.”
- Jacques, former militia commander, Nyangezi, South Kivu

The journey of a conflict mineral begins at one of eastern Congo's many mines.⁴ A recent mapping exercise by the International Peace Information Service, or IPIS, identified 13 major mines and approximately 200 total mines in the region.⁵ Many geologists and companies believe that there may be a much greater abundance of minerals below the surface in eastern Congo, but decades of war have precluded large-scale geological exploration.

Of the 13 major mines identified by IPIS in eastern Congo, 12 are currently controlled by armed groups. Some of the mines are controlled the Democratic Forces for the Liberation of Rwanda, or FDLR—a Rwandan militia led by organizers of the 1994 genocide in Rwanda. Other mines are managed by the Congolese army as a means of personal enrichment—a flagrant violation of Congo's mining laws, which prohibit the presence of the army in the mines. The soldiers, many of whom were militia fighters who only just recently integrated into the army, illegally “tax” miners, abuse the population—particularly the women and girls—and pay workers very poor wages. Both the United Nations and IPIS estimate that armed groups and military units control over 50 percent of the 200 total mines in eastern Congo.

Armed groups control the mines in different ways. For example, at some mines the FDLR forces people to work, while at others their relationship to the local population is more strictly commercial.⁶ Working conditions at the mines are abysmal. As a leading minerals expert from the region described, “In the FDLR mines in Burinyi, the local population is there, but they are like slaves.”⁷ There are no health and safety standards for miners in the area from which the 3Ts and gold originate. The average wage for a miner is between \$1 and \$5 a day, and as the World Bank has documented, the mines are also filled with child laborers between the ages of 10 and 16, now missing out on precious years of school. Ben, 15, told us that he had worked in a mine since he was 10 and narrowly avoided a mine shaft collapse last year, a common occurrence. The conditions are slightly better in some of the mines, but as Robert, a local youth leader and civil society activist told us, “Overall, mine workers get very little from mining; in the armed areas it is only worse.” Meanwhile, the armed groups rack up the profits at the mines, earning up to 90 percent of the profits in some areas.⁸ Every dollar captured by the armed groups is a dollar that does not go into improving Congolese lives through better schools, health care, or jobs.



Kaniola gold mine, South Kivu.

Source: Grassroots Reconciliation Group / Sasha Lezhnev



Child miner Patrice, 15, started working at the mine when he was eight years old.

Source: Grassroots Reconciliation Group / Sasha Lezhnev

Step 2: Trading houses: Looking the other way

Minerals dealer: “Look, this cassiterite [tin ore] is from one mine, and this on the right is from another mine.”

Government inspector: “Yes, and this one is from Shabunda, in the area where the FDLR is.”
- Dialogue at a minerals trading house, Bukavu

From the mines, the minerals get transported to trading towns and then on to the two major cities in the region, Bukavu and Goma. For the gold trade, Butembo and Uvira are also key trading hubs.

The 3Ts are brought by individuals—called *negociants* in French, or buyer-transporters—on their backs, by large trucks, and/or by planes in sacks the size of small garbage bags. The minerals are then sorted by trading houses called “*maisons d’achat*,” or trading houses, which process the minerals. The majority of these traders are paid in advance by the exporters to whom they sell the minerals (see Step 3).

Gold is much more valuable by weight compared with the 3Ts. Illustratively, the going price of processed tin is just under \$7 per pound, whereas gold is currently valued at more than \$15,000 per pound. So while the 3Ts are hauled around in heavy sacks, gold can easily be concealed in a backpack or pocket. As a result, it is very easy to smuggle gold.

In the case of the 3Ts, because they trade in much larger volumes and have to be transported out of Congo by trucks or planes, the 3Ts are harder to conceal, making them potentially easier to register, document, and regulate. But on the whole, the majority of the transporters and trading houses currently operate in violation of Congo’s mining laws without proper licenses and registration. Part of the problem is that the government charges \$500 for licenses, which the association of traders told us was a prohibitively high price to pay. We were informed that only one in ten transporters in Bukavu were officially registered with the government, meaning that 90 percent operate illegally. However, people who know the business, such as government inspectors, told us that such dealerships and transporters are widely known: there are approximately 100 trading houses each in Bukavu and Goma.

Contrary to what some companies allege, we found that it is fairly straightforward to tell from where the minerals originate, as both dealers at the buying houses and government mining inspectors demonstrated to us. Each sack of minerals had different coloration and texture, depending on which mine it came from.



Mineral trading house in Bukavu, South Kivu.
Source: Grassroots Reconciliation Group / Sasha Lezhnev



A minerals dealer compares tin ore from a rebel-held mine and a government-controlled mine.
Source: Grassroots Reconciliation Group / Sasha Lezhnev

But it is a dangerous business to provide transparency to this trade. One leading merchant told us that he would be killed if he went on camera to talk about how the trade works.

Armed groups control much of the transport from the mine to the buying house. They either take a large percentage of the profit from transporters—up to \$40 per sack—or they transport the minerals themselves. According to our estimates, the armed groups generated approximately \$75 million from mineral transport last year, out of the total of \$180 million earned by armed groups from the mineral trade.

Step 3: Exporters: Minerals enter international markets

“The comptoirs [exporters] ask us if we buy minerals from the FDLR, but it’s easy to lie and get around that. They don’t check” - Thomas, trader, Bukavu

Export companies then buy minerals from the trading houses and transporters, process the minerals using machinery, and then sell them to foreign buyers. These companies, known locally as *comptoirs*, are required to register with the government, and there are currently 17 exporters based in Bukavu and 24 based in Goma. Just as the exporters provide financing to their suppliers, the majority of them are paid in advance for their minerals by international traders from Belgium, Malaysia, and other foreign countries.

In 2008, the U.N.-appointed experts tasked with monitoring the links between natural resources and conflict in eastern Congo identified several major exporters as actively purchasing minerals from mines controlled by the FDLR and other armed groups. Although the associations of exporters in both North and South Kivu have denied these accusations and insist that they only purchase minerals through legal channels, there are many loopholes that still allow conflict minerals to enter into the supply chain at this state.

At present, the only system that the exporters use to avoid buying conflict minerals is verbal assurance: they simply ask, “Did you get this from a conflict area?” If the seller says no, without providing any proof of where the minerals came from, then the exporter goes ahead with the purchase. According to our interviews, there has not been a single case where an exporter refused a batch of minerals because they believed it originated in a conflict mine. Also, the laws prohibiting exporters from buying minerals from unregistered traders are weakly enforced, making it all too easy for minerals of dubious origin to enter the market. So smugglers, even armed fighters themselves, can easily walk into an exporting company and sell the minerals without difficulty.

There are also massive concerns with the gold trade. According to Congolese government sources, in 2008 Congo legally exported only 270 pounds of gold, compared with an estimated 11 thousand pounds of production.⁹ This means that the lion’s share of the profits for the gold trade accrues to the armed groups, further fueling the cycle of violence in Congo.



An exporter cited by UN experts as purchasing minerals from the FDLR.

Source: Grassroots Reconciliation Group / Sasha Lezhnev

Step 4: Transit countries: Origins obscured

“The border patrols don’t check when you come across from Congo. Then you sell at one of two houses here [in Uganda]. They never ask for papers about where the gold comes from. Then they sell to Dubai. This business is very big, millions of dollars.” — Frank, former minerals smuggler, Kampala, Uganda

From the exporter the minerals are sent mainly by road, boat, or plane to the neighboring countries of Rwanda, Uganda, and Burundi.¹⁰ Some minerals are legally exported, with taxes paid to the Congolese government, while others are smuggled across Congo’s porous borders. Either way, conflict minerals form a major portion of the trade.

Vast inconsistencies in the statistics recorded by neighboring countries attest to the scale of the smuggling, as minerals from Congo are labeled as having originated in Uganda, Rwanda, or Burundi. For example, Uganda officially produced less than \$600 worth of gold in 2007, yet exported over \$74 million worth of gold.¹¹ Similarly, Rwanda produced \$8 million worth of tin ore but officially exported at least \$30 million of tin.¹²

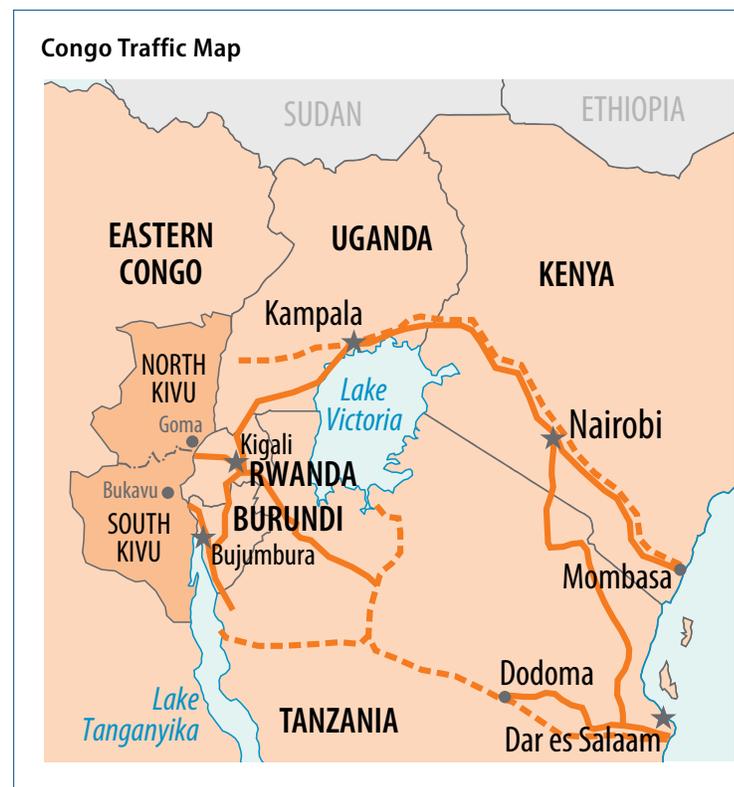
Congolese sellers either working independently or sent by the exporting companies work with buying houses and companies in Rwanda, Uganda, and Burundi. In Uganda and Burundi, these shops are unmarked houses. In Rwanda, buying companies mix Congolese minerals with those produced by Rwandan mines. In all three countries, the companies’ proprietors rarely ask questions about where the minerals come from.

In Uganda and Burundi, buying shops also work closely with officers in the security services—the army and police of the country—so that their investments are “protected.” Military officers receive cuts from this trade, and use their security connections to keep business flowing smoothly. This climate of repression and the real threat of violence is enough to dissuade most whistleblowers. Some of these traders have been put on United Nations sanctions lists for trading in conflict minerals, so they maintain underground profiles to avoid the spotlight and further sanctions.



Gold powder is tested and weighed within dealerships.

Source: Grassroots Reconciliation Group / Sasha Lezhnev



There is nothing inherently wrong with neighboring countries importing and exporting Congolese minerals, but given the history of regional governments direct involvement in the illicit minerals trade, linkages between these governments and business and military elites who dominate the trade, and the continuing lack of transparency and due diligence on the part of these governments, much greater scrutiny of this step in the trade is necessary. These countries should insist that verifiable documentation accompanies the minerals, documenting the chain of custody to ensure that they are conflict free, and that they have been legally taxed by the Congolese authorities. Moreover, they need to start holding smugglers to account. The government of Rwanda has recently started a program to certify the origin of much of Rwanda's domestic mineral production. This is a step in the right direction and full implementation of this policy by all minerals companies in the country, as well as in Uganda and Burundi, should be encouraged.

Step 5: Refiners: Minerals to metals

“Minerals used to create the metals in electronics products are often mixed from various sources and exchanged in ways that prevent tracing.”

– Electronic Industry Citizenship Coalition statement on minerals used in electronics products.

In order for the minerals to be sold on the world market, they have to be refined into metals by metal processing companies.¹³ These companies, based mainly in East Asia, take the Congolese minerals and smelt or chemically process them together with metals from other countries in large furnaces.¹⁴

For tin, the most lucrative conflict mineral in eastern Congo last year, 10 main smelting companies process over 80 percent of the world's tin, almost all of which are based in East Asia.¹⁵ For tantalum, four companies make up the overwhelming majority of the chemical processing market, based in Germany, the U.S., China, and Kazakhstan. For tungsten, there are several processing companies in China, Austria, and Russia. The main destination for Congolese gold is Dubai in the Middle East, though recent records indicate that Switzerland, Italy, and Belgium may also be processing gold from eastern Congo.

When it comes to tracing supply chains back to their sources, refiners are the critical link. After the mineral ore is refined into metal, it becomes impossible to distinguish tin or tantalum that originated in Congo from other sources, and supplies from all over the globe are mixed together at this step in the chain. This is why it is essential that these companies take pains to document where they are sourcing from and make their records subject to independent audits.

The International Tin Research Institute, or ITRI, a membership association consisting of major tin smelters, has developed an initiative to improve due diligence for tin from eastern Congo. Together with certain metal traders and Congolese exporters, they have developed a three-step approach to developing a more traceable supply chain. So far, the measures taken remain insufficient, but with a more robust system of independent audits that would ensure that companies are not responsible for policing themselves, this initiative could positively impact the trade.¹⁶



Inside a tin smelter.

Source: AP Photo / Dado Galdieri

The U.S. Congress, led by Senators Sam Brownback, Russ Feingold, and Dick Durbin, has also proposed legislation that would require companies to trace the 3T minerals sourced from Central Africa back to their original mines. The House of Representatives, led by Rep. Jim McDermott, is working on a similar bill, which would put in place audits of refining facilities to help ensure they are conflict free. These are all welcome steps in the right direction, although their success will depend on the results they deliver on the ground.

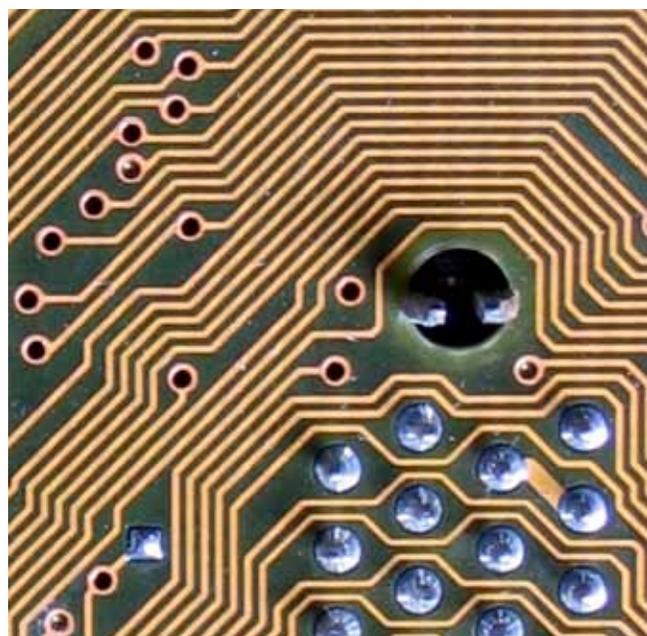
Step 6: Electronics companies: Conflict minerals in your phone

“I hear these minerals are used in mobile phones, but I don’t know how. Why don’t the big companies make sure they are not buying from the FDLR? They have that power and money, surely.”

– Robert, youth civil society activist, Bukavu,

Finally, the refiners sell Congo’s minerals onto the electronics companies. The electronics industry is the single largest consumer of the minerals from eastern Congo. The now-processed metals usually go through a few sub-stages here—first to circuit board and computer chip manufacturers, then to cell phone and other electronics manufacturers, and finally to the mainstream electronics companies such as Intel, Apple, Nokia, Hewlett Packard, Nintendo, etc. These companies then make the products that we all know and buy—cell phones, portable music players, video games, and laptop computers. Because companies do not currently have a system to trace, audit, and certify where their materials come from, all cell phones and laptops may contain conflict minerals from Congo.

The electronics industry is not the only one that uses the 3Ts and gold, but it is the largest. Other industries with a significant stake include tin can manufacturers, industrial tool and light bulb companies for tungsten, and aerospace and defense contractors, as well as the banking and jewelry industries in the case of gold.



Tin solder is used to affix components to circuit boards.

Source: flickr.com / quapan

Steps toward a solution

These six steps connect our cell phones and computers to the conflict in eastern Congo. This connection presents an opportunity for consumers to make a difference by demanding that companies sell us verifiably conflict-free products.

A recent Enough Project strategy paper provided an overview of a comprehensive policy to end the trade in conflict minerals, incorporating corporate responsibility, security measures, governance reforms, and livelihoods initiatives.¹⁷ Consumers and companies have a critical role to play, by demanding three steps to enable Congo’s minerals to benefit its people rather than the armed groups that prey upon them:

- **Trace:** Companies must determine the precise sources of their minerals. We should support efforts to develop rigorous means of ensuring that the origin and production volume of minerals are transparent.

- **Audit:** Companies should conduct detailed examinations of their mineral supply chains to ensure that taxes are legally and transparently paid to the Congolese government and guard against bribery and fraudulent payments. Credible third parties should conduct or verify these audits.
- **Certify:** For consumers to be able to purchase conflict-free electronics made with Congolese minerals, a certification scheme that builds upon the lessons of the Kimberley Process will be required. Donor governments and industry should provide financial and technical assistance to galvanize this process.

What you can do

Your cell phone doesn't have to fuel the deadliest war in the world. Use it to change the equation for Congo. It's your call to make.

Call, email, or meet with your Senators and urge them to both cosponsor *and* help strengthen the Congo Conflict Minerals Act of 2009 (S.891). Talking points can be found at www.raisehopeforcongo.org or you can dial the U.S. Capitol switchboard at (202) 224-3121.

Help us increase demand for conflict-free electronics. Visit www.raisehopeforcongo.org to email the biggest buyers of Congo's conflict minerals—major electronics companies—and let them know that you want to buy conflict-free products. The message is clear: “If you take conflict out of your cell phone, I will buy it.”

Stay in touch! Text the word “Congo” to 228488 (ACTIV8) to get updates and actions from RAISE Hope for Congo.

Endnotes

- 1 There is also currently a House bill being drafted by Rep. McDermott, which would require audits of minerals refining facilities, and which some electronics companies have reportedly supported. Jonathan Broder, "In the Business of Change," Congressional Quarterly, September 14, 2009.
- 2 For a background on the crisis, see John Prendergast and Noel Atama, "Eastern Congo: An Action Plan to End the World's Deadliest War," (Washington: Enough Project, 2009).
- 3 Janine Zacharia, "Clinton Calls on Congo to Stop Mineral Wealth Funding Conflict," Bloomberg News, August 11, 2009.
- 4 The 3Ts are produced from mineral ores: tin from cassiterite, tungsten from wolframite, and tantalum from columbite-tantalite, known throughout Congo as coltan. To the untrained eye, these minerals look like ordinary rocks, and are often found together in the same ore. For gold, there are three types of mines – underground, in which miners carve out a section of a mountain and dig tunnels beneath the earth; pit, in which miners dig in open ditches; and alluvial, which is panning for gold in rivers, similar to the methods used during the California gold rush over a century ago. See also Dan Fahey, "Le Fleuve D'Or: The Production and Trade of Gold from Mongbwalu, DRC," (L'Afrique des Grands Lacs Annuaire 2007-2008).
- 5 This includes North and South Kivu, and the major mines are identified as Minembwe, Misisi, Mpofi, Bisie, Gakombe, Bwina, Benzia, Wamiti, Lugushwa, Kinyinya Millimani, Ihana group, Bibatama – Rive Gauche, and Mugerero, each of which have over 500 workers at the mine site. See, "Interactive map of militarised mining areas in the Kivus (August 2009)" available at <http://www.ipisresearch.be/maps/MiMiKi/Areas/web/index.html>.
- 6 At the mines that are not controlled by armed groups, civilians work together with local chiefs to exploit the minerals. In addition, there are sizeable mines located outside of the conflict zone in the neighboring provinces of Katanga and Maniema, whose trading routes pass through the Kivus. See also, Steven Spittaels and Filip Hilgert, "Accompanying note on the interactive map of militarised mines in the Kivus", available at http://www.ipisresearch.be/fck/file/20090810_mining_kivus.pdf.
- 7 Interview with civil society mining expert, Bukavu, June 10, 2009
- 8 Interviews with mining inspectors and civil society representatives, June 10, 2009
- 9 Cadet Abedi, "La RDC perd 70 millions \$US à cause de la fraude du métal jaune," AllAfrica.com, July 15, 2009, available at <http://fr.allafrica.com/stories/200907150336.html>
- 10 Sometimes this stage is skipped, and the minerals are flown directly to refiners in Step 5. In other cases, metals trading companies based mainly in Europe buy the minerals from Congo and Rwanda and sell them onto refiners.
- 11 "Uganda Ministry of Energy and Minerals, Annual Report for 2007".
- 12 The official price reported in Rwanda in 2007 was US\$7.09 per kg of tin ore, but the world price for tin in 2007 was US\$14.10. While allowing for lowered prices of tin ore before it is smelted, there is still potentially a price discrepancy here, meaning that the real value of exported tin ore from Rwanda could be higher. There is a vast discrepancy between what H.C. Starck paid for tin ore from Rwanda (an average of \$12,410 per ton in 2007) and what other companies paid (an average of \$7,603 per ton). The overwhelming majority of these minerals came from eastern Congo. See Nicholas Garrett and Harrison Mitchell, "Trading Conflict for Development: Utilising the Trade in Minerals from Eastern DR Congo for Development," (Resources Consulting Service LLC, 2009).
- 13 The refiners sometimes also have related companies which process the metals into alloys and solder, in order for them to be usable in electronics and related products.
- 14 Some of the minerals, such as tantalum, are chemically processed using a heated salt mixture rather than smelted into metals. There are currently no smelting or chemical processing facilities in Central Africa, although there is a tin smelting plant in Gisenyi, Rwanda that may soon reopen.
- 15 The top 10 companies produced 259,711 combined tons of tin in 2007, and the United States Geological Survey estimates that world tin production in 2007 equaled 320,000 tons. ITRI, "Review of Tin Use and Recycling for 2007"; United States Geological Survey, "Report for Tin," 2009.
- 16 ITRI Fact Sheet, "Tin Supply from the Democratic Republic of Congo," available at http://www.itri.co.uk/POOLED/ARTICLES/BF_PARTART/VIEW.ASP?Q=BF_PARTART_310250
- 17 The Enough Project with Grassroots Reconciliation Group, "A Comprehensive Approach to Congo's Conflict Minerals," (2009), available at <http://www.enoughproject.org/publications/comprehensive-approach-conflict-minerals-strategy-paper>

Enough is a project of the Center for American Progress to end genocide and crimes against humanity. Founded in 2007, Enough focuses on the crises in Sudan, Chad, eastern Congo, northern Uganda, Somalia, and Zimbabwe. Enough's strategy papers and briefings provide sharp field analysis and targeted policy recommendations based on a "3P" crisis response strategy: promoting durable peace, providing civilian protection, and punishing perpetrators of atrocities. Enough works with concerned citizens, advocates, and policy makers to prevent, mitigate, and resolve these crises. To learn more about Enough and what you can do to help, go to www.enoughproject.org.

