

Increased demand for rhino horn in Yemen threatens eastern Africa's rhinos

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Abstract

Conservation organizations have neglected Yemen's role in the rhino horn trade since early 2003, with no attention given to the problem, although most horns from eastern Africa's poached rhinos are known to go there. Therefore, in early 2007 we collated data on rhino poaching in eastern Africa, and the first two authors carried out a survey in Yemen to update information on rhino horn smuggling. We learned that demand has risen substantially with the price of rhino horn up by 40% in four years, despite an increase in quantity of horns entering the country. We had meetings with decisionmakers to try to curtail the trade and improve public awareness to reduce demand for rhino horn.

Résumé

Les organisations de conservation ont négligé le rôle que le Yémen tient dans le commerce de corne de rhino depuis le début de 2003 et elles n'accordent pas d'attention à ce problème alors qu'on sait que la plupart des cornes des rhinos braconnés en Afrique de l'Est vont là-bas. C'est pourquoi, début 2007, nous avons rassemblé toutes les données sur le braconnage de rhinos en Afrique de l'Est, et les deux premiers auteurs ont mené une enquête au Yémen pour actualiser les informations sur la contrebande de cornes de rhinos. Nous avons appris que la demande s'était considérablement accrue et que le prix de la corne avait augmenté de 40 % en quatre ans, malgré une augmentation de la quantité de cornes arrivant dans le pays. Nous avons rencontré des décideurs pour tenter de réduire le commerce et de sensibiliser le public afin de diminuer la demande de corne de rhino.

Rhino poaching in eastern Africa, 2003–2006

For centuries rhinos have been killed in eastern Africa to meet the demand for rhino horn in Yemen. The horns are cut up and made into handles for curved daggers called jambiyas, still worn daily by most Yemeni men. Most jambiyas with rhino horn handles are old, but new ones are still being made.

Democratic Republic of Congo

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By early 2003 there were 30 of the rare northern white rhino subspecies in Garamba National Park (Hillman Smith and Ndey 2005), the only viable population left. In 2003 and 2004 there was an upsurge in poaching with the ceasefire in southern Sudan. Northern Arab horsemen as well as southern Sudanese poachers

penetrated the Intensive Protection Zone in the southern sector of the park, wiping out nearly all the rhinos and over 3000 elephants. Nine rhino carcasses were found from January 2004 to February 2005, all poached (Hillman Smith 2006), but between two and three times that number are missing. In a survey in November 2004 only four were seen in the park (Hillman Smith and Ndey 2005). An intensive aerial count in March 2006 saw two and with further groundwork two more were accounted for, maintaining the current minimum of four (Emslie 2006).

Kenya

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The official black rhino population in late 2005 was 540 (Emslie 2006). Poachers killed at least 11 black rhinos in Kenya from 2003 to 2006, mostly in Tsavo East National Park (5) and Solio Game Reserve in

Laikipia (3), according to the Kenya Wildlife Service (KWS) (table 1). In Tsavo East, most of the poachers were Somalis who succeeded in taking all the horns. In May 2006, however, KWS staff followed a gang of five Somali poachers responsible for killing the last two rhinos killed in this period. They reached Lamu District and shot dead three of the poachers, recovering all four horns (KWS Rhino Programme, pers. comm. 2006). On Solio, three black rhinos were snared in 2004.

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The official white rhino population in late 2005 was 235 (Emslie 2006). Kenya's white rhinos originate from southern Africa. Nine were poached, all on Solio, from 2003 to 2006 according to KWS. One was snared in 2003, and seven snared and one shot in 2004. The horns were left on the last shot rhino, as the poachers were scared away. No rhinos were poached or snared in 2005 and 2006.

Besides these 20 poached black and white rhinos that KWS recorded, others were known to have been poached in Kenya over this four-year period. In the huge expanse of Tsavo East, KWS estimates a black rhino population of 56, but not all these have been seen so the actual figure could be lower. In Aberdare National Park, KWS estimated 22 black rhinos in 2004, but in 2006 reduced this estimate to 10 pending an intensive rhino survey in a wider region of the park (KWS Rhino Programme unpublished data). So it is probable that most of these Aberdare rhinos were poached, although the official figure is only two

poached from 2003 to 2006. On Solio, the security forces agree that at least another four or five black and white rhinos were poached within this time that KWS has not yet recorded.

Tanzania

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The official black rhino population in late 2005 was 101 (Emslie 2006). Tanzania has an estimated minimum population of 101 black rhinos (Emslie 2006). There are no white rhinos. From 2003 to early 2006 the Tanzanian authorities reported not a single rhino-poaching incident. Two horns were seized in Dar es Salaam in 2003, however, which may or may not have originated from Tanzania (Tanzania officials, pers. comm. 2006). The massive Selous Game Reserve, an area of 45,000 km², is home to several scattered groups of rhinos and some could easily have been poached without the authorities being able to find out. Most of the other rhinos are in the protected areas of Serengeti, Ngorongoro Crater and Mkomazi, which field staff are able to monitor well.

Uganda

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Although poachers killed all of Uganda's indigenous northern white rhinos and its black rhinos over two decades ago, partly to meet the Yemeni demand for horns, the country now has four white rhinos (from Solio in Kenya). Two came to the Uganda Wildlife

Table 1. Official number of poached black rhinos in Kenya, 2003–2006

Date poached	Location	Age	How killed	Horns
5 August 03	Tsavo East National Park	adult	gun	removed
16 April 04	Solio Game Reserve	?	snare	removed
May 04	Tsavo East National Park	adult	gun	removed
May 04	Tsavo East National Park	?	gun	removed
June 04	Solio Game Reserve	?	snare	removed
June 04	Solio Game Reserve	?	snare	removed
27 October 04	Oi Pejeta Game Reserve	adult	snare	removed
21 November 04	Aberdare National Park	1 yr 6 mo	snare	present
1 December 04	Aberdare National Park	adult	snare	present
20 May 06	Tsavo East National Park	?(male)	gun	removed*
20 May 06	Tsavo East National Park	?	gun	removed*

Source: KWS Rhino Programme, Benson Okita-Ouma, unpublished

Total number of black rhinos poached – 11

* recovered in Lamu District by Kenya Wildlife Service

Foundation Centre in 2001 and two more to the Ziwa Rhino Sanctuary in July 2005 (Yvonne Verkaik, manager of the Ziwa Rhino Sanctuary, pers. comm. 2006).

Trade routes and prices for rhino horn, 2003–2006

The best way to collect information on trade routes and prices for rhino horns is at the time they are intercepted, usually by officials, and sometimes with the help of informers as well. It is important for African governments to put a lot of effort into confiscating the illegal horns and arresting the illegal traders. It is also important to obtain updated information on smuggling routes, allowing officials to know where greater vigilance is necessary. Accurate prices in turn help us understand trends in demand.

Smuggling through eastern Africa

In Kenya an important middleman based in the town of Nyeri, near Solio Game Reserve, was paying

poachers in 2006 KES 20,000 (USD 285) for a small horn weighing 1 kg and KES 30,000 (USD 428) for a large one of about 3 kg. Such horns are transported by road to Nairobi. These Nairobi traders may export directly or via someone else. The exporter pays USD 550–600/kg for the horns. From Tsavo East, horns probably go mostly overland to Mombasa or Somalia for export. Some of the evidence for the importance of Mombasa as an entrepot is that from 2000 to 2006 officials there made 13 seizures totalling 27 rhino horns. Kenya officials have also intercepted rhino horns in Marsabit and Lamu in northern Kenya, suggesting these horns were on their way to Somalia (KWS Rhino Programme, unpublished data). Prices for these horns were not obtained.

No prices for rhino horn from the Democratic Republic of Congo (DRC) have been recorded, either. Trade routes from Garamba have been affected by civil conflicts, particularly in neighbouring Sudan. In 1999 North and South Sudan forces essentially split with the SPLM (Sudan People's Liberation Movement), allying itself with Uganda. Uganda troops in turn occupied north-eastern DRC from 1999. Thus trade routes turned



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This entrance to the old town of Sanaa leads to the Jambiya souk.

east through Uganda with several reports of horns being offered for sale in the Uganda–DRC border town of Aru and in Kampala (Hillman Smith, pers. comm. 2007). Three horns, at least one from a white rhino, were confiscated by Kenya officials in Busia on the Uganda–Kenya border in 2000 (KWS Rhino Programme, unpublished data). Furthermore, around the time of the southern Sudan peace talks in 2003, when Garamba was being flooded by poachers, the northern Arab horsemen took their horns to Omdurman and Khartoum reinforcing this old trade route.

Smuggling from Africa to Yemen

In early 2003 most of the rhino horn from eastern Africa went to Djibouti (Martin and Vigne 2003). Yemeni smugglers would arrive in Djibouti by dhow or small motorboat to sell heavily subsidized petrol, stolen Yemeni antiquities, and subsidized foods. With the money obtained they bought illicit drugs, alcohol, medicines, firearms, cigarettes, and sometimes rhino horn. Rhino horn in 2003 sold in Djibouti for USD 750/kg. The smugglers took their purchases back with them to the Yemen coast around Aden, Mocha, al-Khokha and Dhubab. These items were then moved clandestinely to different parts of Yemen, especially to Sanaa, and some, including a little rhino horn, went even as far as Saudi Arabia.

There was also considerable illegal movement of goods across the Red Sea from Somalia, Ethiopia and Eritrea to Yemen, and also people, livestock, and occasionally rhino horn, to Yemen. This trade continues, according to Yemeni officials and informers. Many illegal immigrants pass through Yemen on their way to the Gulf States and Europe, sometimes selling rhino horn to help pay their expenses. Customs agents are often bribed to get items through. According to a study carried out by the United States Agency for International Development, ‘Yemen Customs remains one of the most corrupt government agencies’ (Robinson et al. 2006). The Economist Intelligence Unit (2006) concurs, ‘Smuggling forms a large and unrecorded part of trade, and collusion by officials occurs at all levels. Alcohol and firearms land on the Red Sea coast....’ In fact, the Yemen government’s official figures estimate that the country’s losses through Customs evasion are USD 150 million annually (Economist Intelligence Unit 2007).

From 2003 to 2006 the Red Sea trade routes have become less popular for rhino horn due to the greater



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A Sanaa craftsman prepares a water buffalo horn handle for a jambiya.

presence of foreign military forces, which regularly patrol to intercept pirates, smugglers and terrorists (Vigne and Martin 2006). Yemen’s officials have also been putting more effort and equipment into fighting this smuggling route. Yemeni authorities have established a Coast Guard Authority, and in 2004 the Italian government signed an agreement with the Yemenis to finance the first phase of a coastline surveillance (World Bank 2006). European governments have provided technical, financial and material assistance to improve Yemen’s security on its coastline (Economist Intelligence Unit 2007). Americans have also helped obtain 15 boats, 7 metres long, called RIBs (rigid-hull inflatable boats). These run on 200 horsepower engines, strong enough to catch any dhow attempting to trade in illicit merchandise, including rhino horn. As a result of this assistance, in February 2007 the Yemen authorities seized a dhow carrying illicit cigarettes and alcohol from Djibouti to Yemen (Col. Ali al-Sufi, deputy head of Yemeni Coast Guard, pers. comm. March 2007).

As a result of increased sea patrols, perhaps only 10 kg a year are now coming across the Red Sea to Mocha or other coastal areas, according to informers. Horns are sometimes taken by air from Djibouti airport to Hodeidah, Taiz and Sanaa. Other air routes are now preferred for smuggling rhino horn as well, such as from Khartoum and perhaps other Sudan airports to Sanaa. Or they go on to Ethiopia to leave by air from Addis Ababa to Yemen, according to Sanaa traders.

More rhino horn is imported into Yemen in the summer when Sudanese students and teachers go back and forth for their holidays. Prices are lower for horn at that time. Diplomats, other officials, sheikhs and businessmen travelling to and from Africa carry it in their luggage or send it by air cargo, sometimes as full horns, but more usually cut into pieces to make it harder to identify. It is often hidden in food items such as recently in 20-litre cans of peanut butter. Traders in Sanaa verified the origin of some of their horn, saying they obtained it from South Sudan, DRC and a little from Tanzania.

Results of surveys and investigations in Yemen

We had informers collect information on the amounts and prices of rhino horn coming into Yemen. We also carried out investigations in Sanaa's old souk regarding both jambiya production and retail sales to compare with past surveys and trends.

Amounts of rhino horn smuggled into Yemen, 2003–2006

As this trade is illegal, Yemeni rhino horn traders will not divulge any information on the amount of rhino horn coming into the country. Nevertheless, through an intelligence-gathering network sporadically operating in recent years, we estimate perhaps 60–70 kg of rhino horn entered Yemen each year in 2004, 2005 and 2006.

There have been no successful confiscations recently. In late 2006 a small box of horn pieces came into Sanaa airport via Oman that Customs suspected



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Buyers in the Sanaa souk examine a selection of old jambiyas with rhino horn handles.

was rhino horn. Officials called in a prominent jambiya trader for his expertise, who said it was from ox (buffalo). This is unlikely, as water buffalo horns from the domestic animal are imported very cheaply in large consignments direct from India. The horn pieces were returned to the Yemeni importer.

Our informers have seen full new horns, old horns and small pieces from 2003 to 2006 in various houses in Sanaa. For example, in early 2006, a Sudanese man had a bucket full of pieces of various sizes, which he stored on the roof of his house in Hadda, a prosperous suburb of Sanaa. Two months later he sold it to a Yemeni trader 'from the north', but he said that he could obtain more horns in 2–3 weeks if needed. Also in early 2006 an old Yemeni man offered for sale to our informer 10–12 handles of old rhino horn. He said he had new horns in his house for sale, but he would not display them until he was shown the large amount of money he required in payment.

There are two ways to estimate the quantity of rhino horn imported into Yemen each year. One is by collecting information from those involved in the trade in Yemen: importers, wholesalers, jambiya makers and officials. As already mentioned, this figure was perhaps 60–70 kg a year from 2003 to 2006. The other is by calculating the potential amount of horn reaching Yemen from rhinos poached in eastern Africa, found or not by the authorities. This calculation excludes the few rhinos that die of natural causes in the thick bush and are never seen by either officials or poachers. Poachers have taken horns from nearly all the recorded carcasses in eastern Africa, and probably from the poached rhino carcasses that officials do not recover. There is no evidence from either official or private sources of any old rhino horns having been stolen and put on the market during this four-year period. We have to assume also that, excluding those horns officially seized from traders, nearly all the horns went to Yemen and not elsewhere — as has been the case over the last 20 years.

From official figures, DRC between 2003 and 2006 lost through poaching at least 26 northern white rhinos. In Kenya during this time, KWS can confirm that a minimum of 11 black rhinos and 9 whites were poached, plus our estimate of 17 poached black rhinos in the Aberdares and Tsavo East, and about 4–5, mostly whites, that were poached in Solio. (In Uganda no rhinos were poached and in Tanzania officials say none were poached during this time either.) This totals at least 29 black rhinos and 38 white rhinos illegally



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Yemeni women shop at a jambiya stall.

killed in eastern Africa. If the average black rhino carries 2.88 kg of horn (Martin 1983) and the average white rhino carries 5.5 kg (Anon. 1986), this gives a minimum total of 292.5 kg of horn over this period minus 22 kg that were seized. Therefore, a maximum of 270 kg of horn from eastern Africa's poached rhinos could have reached Yemen, or 67.5 kg on average per year from 2003 to 2006. This is coincidentally close to the estimate our informers gave us earlier in Sanaa. There is still no evidence of horns from eastern Africa going directly to eastern Asia; horns from southern African rhinos go to the Far East and almost never to Yemen.

Jambiya-making in Sanaa

We carried out a survey in late February 2007 on the number of workshops and craftsmen making jambiyas in the souk al-Janabi, which is within the walled city of old Sanaa. This is where nearly all the jambiyas are made in Yemen. We counted only the open workshops

with craftsmen making and repairing dagger handles. There were also craftsmen making blades, scabbards and belts in the souk, but we did not include them in our survey, concentrating on handles, as in the past. We conducted our counts, as before, in the afternoon as workers chew qat (a stimulant), making this the most active working time. We counted 124 craftsmen working in 74 workshops; 66 of these workshops were making new handles and 8 repairing old handles. These are all record numbers (table 2); the numbers have been increasing steadily from 1983 when there were 41 workshops and 61 craftsmen.

In the 1970s, when many thousands of jambiyas were made out of rhino horn, craftsmen spent much more time on each handle (1–2 days), producing higher profits on the finished product. By the mid-1980s when the amount of rhino horn imported dropped to less than 500 kg a year, the same number of craftsmen were using cheap alternatives and having to produce many more handles to make a reasonable profit. In 2006 only about 200 jambiyas were made with rhino horn handles,

according to estimates on rhino horn imports from informers. From 1 kg of horn, usually about 3 handles can be made of about 130 g each; the rest—about 60% (Martin et al. 1997)—is waste, which used to be sent in huge quantities to China. Over 300,000 handles were

Table 2. Number of jambiya workshops and craftsmen in the souk al-Janabi, 1971–2007

Year	Workshops (no.)	Craftsmen (no.)
1971	47	?
1983	41	61
1986	51	84
1989	57	87
1993	56	91
1994	65	92
1999	59	100
2001	69	101
2003	70	102
2007	74	124

Source: surveys taken by Lucy Vigne and Esmond Martin, except for 1971 (Dostal 1983)



Lucy Vigne

Tourist shops selling jambiyas with water buffalo horn handles have become increasingly popular in Sanaa souk with the growth in tourism.

made of water buffalo horn in 2006, according to the biggest jambiya maker and trader. An average craftsman thus produces a far greater number of jambiyas nowadays than in the 1980s because they take a shorter time to make using buffalo horn. While there has been a doubling of craftsmen there has also been an even greater increase in jambiya production.

Over 90% of Yemen's total production of jambiyas is made from water buffalo horn. A cut piece is bought for 100–150 rials (USD 0.5–0.75) to produce a handle, and a craftsman may produce 10 a day, with another craftsman fitting the handle to the blade. Blades are all made in Yemen, almost entirely in Sanaa and Dhamar, costing 200 to 10,000 rials (USD 1 to 50). Only occasionally are handles made of other materials nowadays as they are less popular. Such materials include camel nails (obtained free from the butcheries), wood, bone and plastic. Rhino horn accounts for well under 1%. We saw no new horn being made into jambiya handles despite several visits into the souk al-Janabi, whereas in the past we would have seen it on at least one occasion. This could just mean that craftsmen were more careful and were working at home. But there again, they are very infrequently made.

The rent for a small workshop in early 2007 was about 7000 rials (USD 35) a month; for the larger ones 20,000 rials (USD 100). Many of the craftsmen receive a salary according to their skill, from 30,000 rials (USD 150) to 70,000 rials (USD 350) per month. Many are paid daily.

Jambiya retail sales

Within the workshop area is the main jambiya-making and trading family's relatively big shop, which is a workshop and retail shop combined. Here, men will

come from all over the country for advice on buying a top-quality rhino horn jambiya. A selection of such jambiyas is displayed in two glass cabinets. Nearby is the retail souk with more old and expensive rhino horn jambiyas for sale. Here, stalls display tiers of jambiyas, with old rhino horn ones usually at the top and others (old and new) beneath. Only one of these stalls had several jambiyas with new-looking rhino horn handles, which are also recognizable, being paler than the older ones. Unlike the other sellers, the owner refused to let us photograph them. Individuals will also bring their own rhino horn jambiyas to this area of the market to sell, holding them out to passersby. (See table 3 for prices.)

Some older jambiyas with amber handles were for sale in the jewellery section of the souk. Those with medium-size handles were 40,000–60,000 rials (USD 200–300). Some jambiyas with amber handles and old silver sheaths cost 120,000–170,000 rials (USD 600–850).

New jambiyas, by far the majority, are made with cheap materials. These jambiyas sell for different prices depending on the size of the handle (table 4). They are sold in some of the workshops, in the area selling scabbards and belts, and in tourist sections of the souk. Many are sold in an area opposite the main entrance to the old city. Other jambiya shops are sprinkled elsewhere in Sanaa.

Effects of the population, economy and culture in Yemen on rhino horn demand

The amount of rhino horn reaching Yemen per year in the 2003–2006 period has doubled since the 1995–2002 period (table 5). The import price in Sanaa

Table 3. Retail prices for jambiyas with rhino horn handles in Sanaa, March 2007

Age	Size	Price range in Yemeni rials	Price range in USD	Av. price in USD
New	small	50,000 – 150,000	250 – 750	450
New	medium	150,000 – 200,000	750 – 1000	875
New	large	250,000 – 400,000	1250 – 2000	1670
50 years	small	70,000	350	350
50 years	medium	150,000 – 450,000	750 – 2250	1500
50 years	large	600,000 – 700,000	3000 – 3500	3250
Antique	medium	400,000 – 40,000,000	2000 – 200,000	—

Source: survey taken by Lucy Vigne and Esmond Martin
These are prices that Yemenis would pay, not tourists.

Table 4. Retail prices for new jambiyas with various cheaper handles in Sanaa, March 2007

Handle material	Size	Price range (Yemeni rials)	Price range (USD)	Av. price (USD)
Water buffalo horn	small	2000 – 4500	10 – 22.50	15
	medium	3000 – 15000	15 – 75	25
	large	8000 – 12000	40 – 60	50
Camel nail	medium	4500 – 7000	22.50 – 35	29
	large	7000 – 8500	35 – 42.50	39
Plastic	small	500 – 800	2.50 – 4	3.25
	medium	1500 – 5000	7.50 – 25	17.75
	large	2500 – 3500	12.50 – 17.50	15
Bone	small	500	2.50	2.50
	medium	800 – 1500	4 – 7.50	5.75
	large	3000 – 3500	15 – 17.50	6.25
Wood	small	200 – 300	1 – 1.50	1.25
	medium	800 – 1200	4 – 6	5
	large	1500 – 3000	7.50 – 15	11.50

Source: survey taken by Lucy Vigne and Esmond Martin
These are prices that Yemenis would pay, not tourists.

Table 5. Minimum imports of rhino horn into Yemen, 1990–2006

Year	Amount (kg)	Origin of horn
1990	333	Kenya, Sudan, Tanzania
1992	150	East Africa
1993	80	?
1995	30	?
1998	< 30	DRC, Kenya
2000	< 20	Kenya
2002	30	Eastern Africa
2003	60–70	Eastern Africa
2004	60–70	Eastern Africa
2005	60–70	DRC, Kenya
2006	60–70	DRC, Kenya

Estimates calculated by Lucy Vigne and Esmond Martin
Eastern Africa includes Kenya, Tanzania, Uganda and DRC – Democratic Republic of Congo

Table 6. Import price for raw rhino horn in Sanaa, 1980–2007

Year	Av. price per kg (Yemeni rials)	Av. price per kg (USD)
1980	3,500	766
1984	4,300	782
1988	12,400	1035
1991	30,000	1220
1995	135,000	1200
1999	182,000	1400
2001	214,500	1300
2002	218,400	1200
2003 early	218,400	1200
2005	263,300	1375
2006	285,940	1450
2007 early	340,000	1700

Source: surveys taken by Lucy Vigne and Esmond Martin

for raw rhino horn has also gone up from USD 1200/kg in early 2003 to 1700 in early 2007 (table 6). The wholesale price in Sanaa is today USD 2000–3000/kg depending on quality—this is, as expected, higher than the import price.

Jambiyas with new rhino horn handles have also risen in retail price from 2003 to early 2007: a small one from USD 255 to USD 450 and a large one from USD 824 to USD 1670 (see table 4), despite a devaluation of the Yemeni rial. The production of all jambiyas has grown markedly over this time.

As both the quantity and the price of rhino horn have risen in Yemen since 2003, demand is up. This rising demand has been mostly the result of a large population growth. The population has increased from 9.7 million in 1983 for North and South Yemen to 21 million in 2007 for Yemen (with North and South having reunited in 1990). The number of people and the number of craftsmen have doubled in the last 24 years (see table 2). With the population increasing at 3% annually, the demand for jambiyas will probably continue to rise.



A retailer offers for sale a jambiya with sheath and belt.

The increased demand for rhino horn has not been due to a rising per capita income. Yemen is still a poor country with a per capita income of only USD 649 in 2004 (Yemen 2006) and there has been little per capita income growth from 2003 to 2006 (Economist Intelligence Unit 2007). The Economist Intelligence Unit (2006) even goes further by stating that since the late 1960s real living standards have continued to deteriorate. If there is a reversal and the per capita income rose briskly, as has occurred in most of the Gulf, it could be disastrous for rhinos.

Until the economy grows, international NGOs should support the government in building first class museums to improve the education of its people to make them culturally aware that in today's world it is no longer morally acceptable to support trade in a product from a rare and endangered animal. Yemenis have remained in a time warp compared with the rest of the Gulf and desperately need better education. Since 1970 when thousands of Yemenis were able to afford rhino horn jambiyas, they did so to emulate the elite in the country. Most of all, they follow the example of their leaders, like the president, in culture and

dress. Yemeni elite have a responsibility to discourage such use of new rhino horn and to make these handles unfashionable. It would be a good idea if the president were photographed for posters wearing western dress (as is often the case) or with a jambiya made with a handle alternative to rhino horn, such as silver, gold or even water buffalo horn decorated with gems.

Efforts to curtail the trade in rhino horn in Yemen

Our three weeks in Yemen were spent with jambiya traders and influential people to bring their attention to the continuing rhino horn problem. We also worked at the two government zoos to increase public awareness on the plight of the rhino, and with the media to cover the problem for a wider audience.

The main jambiya dealers

We held discussions with the family that employs the largest number of craftsmen working on jambiyas in the country to find a suitable high-quality substitute.

The senior member said that he was continually looking for such a material but has not yet found one: 'I am not asleep on this issue,' he said. For example, he has experimented with adding gold to a buffalo horn handle of a jambiya but lamented that nobody bought it at 50,000–70,000 rials (USD 250–350). He has been hoping that scientists abroad would make an acceptable expensive alternative to rhino horn, which he would eagerly buy. He claims that his business is not as profitable as in the past when he could legally use rhino horn. When asked his present-day demand for raw rhino horn, he replied that he would like to receive a one-off legal sale of 1000 kg or preferably 300 kg a year indefinitely. He was evasive about the price he would pay. He said he had about 1750 kg of rhino horn shavings and 250 kg of large chips. Since 1987 the government has not allowed its export. He still regrets not having received any compensation from the United Nations for this, which he claims is legal old stock.

Meetings with senior government officials and ambassadors

The American ambassador, Thomas Krajeski, helped us to meet some of the most influential people in Yemen regarding rhino horn and agreed to be alert to the problem himself. The British ambassador, Mike Gifford, and the Dutch ambassador, Johan Blankenberg, and his colleagues also greatly assisted us in this regard.

We met the chairman of the Environment Protection Authority (EPA) under the Ministry of Water and Environment, Mahmoud Shidiwah. He said that he would check the 775.5 kg of rhino horn stocks that the jambiya traders had recorded with the government in 1993 and find out which traders were still in the jambiya business. Regarding penalties, Mr Shidiwah told us that the judges in Yemen are responsible for setting fines when people break any environmental law (in-



Esmond Martin

A jambiya trader sits in his retail shop beneath pictures of the president of Yemen in both western and traditional dress.

cluding rhino horn matters—although this has never happened). We were told that the Yemen government is aware that their judges need training to improve their knowledge on environmental law. Mr Shidiwah also supported the need for a workshop funded by the United Nations Environment Programme (UNEP) regarding the implementation of CITES in Yemen, including training on rhino horn recognition. Mohammed al-Haddad from the Department of Animal Health (Ministry of Agriculture and Irrigation) is in charge of CITES on checking confiscated rhino horn for authenticity. He was extremely keen to have further training to recognize rhino horn. It is important that the government also introduces a better system to prevent bribing, such as offering rewards, changing job positions more often, and having officials of different tribal backgrounds working together on confiscation so they do not collude. A workshop on these matters would help improve CITES implementation and law enforcement in Yemen, which are crucial to cut back on smuggling. We helped the EPA and UNEP negotiate for such a workshop to take place.

We also saw the minister of Water and Environment, Abdul Rahman Fadl al-Iryani, who also thought it would be worthwhile to have a workshop on CITES and to encourage greater commitment to law enforcement. He was highly aware and concerned about conservation issues in Yemen.

At a several-day security meeting in Sanaa we met senior members of Yemen's Border Forces, Customs Authority and Navy as well as advisers from Britain on smuggling. We asked these Yemeni officials to be vigilant about rhino horn to prevent it from coming into the country. The officers said they were presently increasing all security measures on their borders, ports and airports.

We established contact with the minister of Tourism, Nabil Hassan al-Fakih, who agreed to support us. He said he could help by printing posters on Yemen's wildlife and conservation, including the rhino horn problem. From 2003 to 2006 the number of foreign visitors to Yemen expanded from 154,667 to 382,332 (unpublished statistics from the Ministry of Tourism 2007). The minister said that tourists should be encouraged to support the crafting of water buffalo horn handles for jambiyas and of course be discouraged from buying rhino horn ones. When posters are produced, his ministry will distribute them to schools and also travel agents, he said. Because of shortage of funds and time on this visit, we had to put this work on hold.

We also met the minister of State, Yahia al-Shaibi, who is also the mayor of Sanaa, to inform him that rhino horn smuggling was continuing into Yemen. He agreed to spread awareness, which he said could be especially effective on radio and television. He said he could assist us, if we gave him the materials, by putting up a sign about rhinos in the old souk and by distributing leaflets in the old city. When we have more funds we hope to do this.

Minister al-Shaibi suggested we see the minister of Planning and International Cooperation, Abdul Karim Ismail al-Arhabi, which we were able to do. He was surprised to learn that rhino horn was still being imported and also agreed to spread awareness. He suggested we see the minister of Information for media involvement, especially a radio programme to cover the subject. Unfortunately, we ran out of time for this.

Public awareness

On this visit, we produced banners on the plight of the rhino, specifically for the zoos of Sanaa and Taiz. We also talked to professors and teachers for their support, and gave interviews to the two main English-speaking newspapers.

Banners and billboards

We designed and printed in Arabic 12 banners (1 x 2 m) in durable heavy-weight plastic so they could be displayed in the open air in the Sanaa and Taiz zoos for many people to see. We had three basic designs showing wild animals on the left and African rhinos on the right with pictures of jambiyas and the fatwa (religious edict) written at our request by the grand mufti (Yemen's religious leader) in 1992 stating that it was against the will of God to kill rhinos for their horns. The messages on the banners stated 'Rhinos are threatened with extinction', 'Take care of our animals in today's world' and 'Protect Yemen's animals, which are rare and threatened with extinction'. We kept the wording simple and to a minimum.

Although four years ago we had hoped to produce posters for an education centre at Sanaa zoo, such a centre still had not been built by early 2007. With the new management we were able to get permission to display the banners in prominent positions around the zoo, putting two up as billboards on metal posts, one at the zoo entry and one in the middle of the zoo. Before this, the zoo had no banners, only signs on



Banners and billboards were put up in Sanaa and Taiz zoos to promote rhino conservation and popularize the religious edict against killing rhinos for their horns.

some of the animal cages. From the day they were erected they attracted much attention. Similarly, we got permission to put the banners up at Taiz zoo, which until then had no pictures of animals at all. Both zoos are visited by thousands of people every month and are excellent places to increase wildlife conservation awareness.

Professors and teachers

With the help of Laurens Jacobs and Linda Olyhoeck from the Dutch Embassy, we met Dr Abdul Nasher, professor of Zoology at Sanaa University, who is a member of the IUCN Leopard Specialist Group. We gave him updated information on the rhino horn problem in Yemen, asking him to include more information in his lectures. We also met the biology teacher at the Sanaa International School and he also agreed to include this information in the curriculum. Many Yemeni children from wealthy families attend this school. It is important to target the young and prosperous males of Yemen, who are the ones who will next buy jambiyas.

The press

We gave interviews to the two English language newspapers in Yemen, which are read by the Yemeni elite. The *Yemen Observer* (Estrada 2007) ran a page-long story on rhinos and a poached rhino picture on the back page was entitled 'Shame of day'. The political adviser of the president and retired prime minister, Abdul Karim al-Iryani, told us that he liked the article, adding positively that it will be available everywhere on the Internet. The *Yemen Times* took a lot of information and illustrations for future stories and will carry out investigations in the souk. It is important to keep the rhino horn trade issue alive in the press to help keep up pressure on the government to reduce it.

Conclusion

The import price of rhino horn in Yemen since early 2003 has gone up by 40% from USD 1200 to USD 1700 a kilogram. This alarming statistic will stimulate poachers and traders to put more effort into killing

rhinos for their horns in eastern Africa. The governments and conservationists involved in eastern Africa will need to be aware of this increase in price. They will need to increase their anti-poaching efforts and in turn the Yemen government must implement a strategy to combat this illegal trade. Therefore, international conservation organizations urgently need to work more closely with the Yemen government to reduce demand for rhino horn and improve law enforcement.

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