

## The conservation of the rhino has turned into a battlefield

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### Fishing with electricity

Fishing with a pulse trawl saves energy  
But is it also better for nature?

### Mixed cropping works better

Growing several different crops  
together leads to higher yields

### Science as collective action

Increasingly, members of the public  
are doing their bit for the sciences



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## THE BATTLE FOR THE RHINO

The conservation of the rhinoceros has turned into a battlefield. Researchers place their hopes for the long term in new technologies and attention to the needs of local communities. 'Weapons are too simplistic a solution to a complex problem.'

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## SCIENCE AS COLLECTIVE ACTION

Increasingly, members of the public are doing their bit for scientific research by sending in observations or carrying out small-scale studies. European policymakers see 'citizen science' as a way of making the sciences more open and democratic.



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## MIXED CROPPING WORKS BETTER

Growing a variety of crops in strips or rows leads to fewer diseases and pests and a more attractive landscape. 'When I first heard that farmers were getting higher yields with mixed cropping, I didn't believe a word of it.'



**COLOPHON** Wageningen World is the quarterly magazine for associates and alumni of Wageningen University & Research and members of KLV, the Wageningen Alumni Network. A PDF version of the magazine can be found at [www.wur.eu/wageningen-world](http://www.wur.eu/wageningen-world) **Publisher** Wageningen University & Research, Marc Lamers **Editorial Board** Yvonne Fernhout, Ben Geerlings, Bert Jansen, Jac Niessen, Irene Salverda, Antoinette Thijssen, Erik Toussaint, Delia de Vreeze **Editor-in-chief** Pauline Greuell (Corporate Communications Wageningen University & Research) and Edwin van Laar (Editor-in-chief Resource, Wageningen University & Research) **Magazine editor** Miranda Bettonville **Copy editor** Rik Nijland **Alumni news** Yvonne de Hilster **Translators** Clare McGregor, Clare Wilkinson **Art direction and design** Petra Siebelink (Communication Services, Wageningen University & Research) **Cover picture** Getty Images **Overall design** Hemels Publishers **Printer** Tuijtel Hardinxveld-Giessendam **ISSN** 2212-9928 **Address** Wageningen Campus, Droevendaalsesteeg 4, 6708 PB Wageningen, PO Box 409, 6700 HB, Wageningen, telephone +31 317 48 40 20, [wageningen.world@wur.nl](http://wageningen.world@wur.nl) **Change of address alumni** [alumni@wur.nl](mailto:alumni@wur.nl) **Change of address associates** [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl), mentioning code on address label **Change of career details** [alumni@wur.nl](mailto:alumni@wur.nl)

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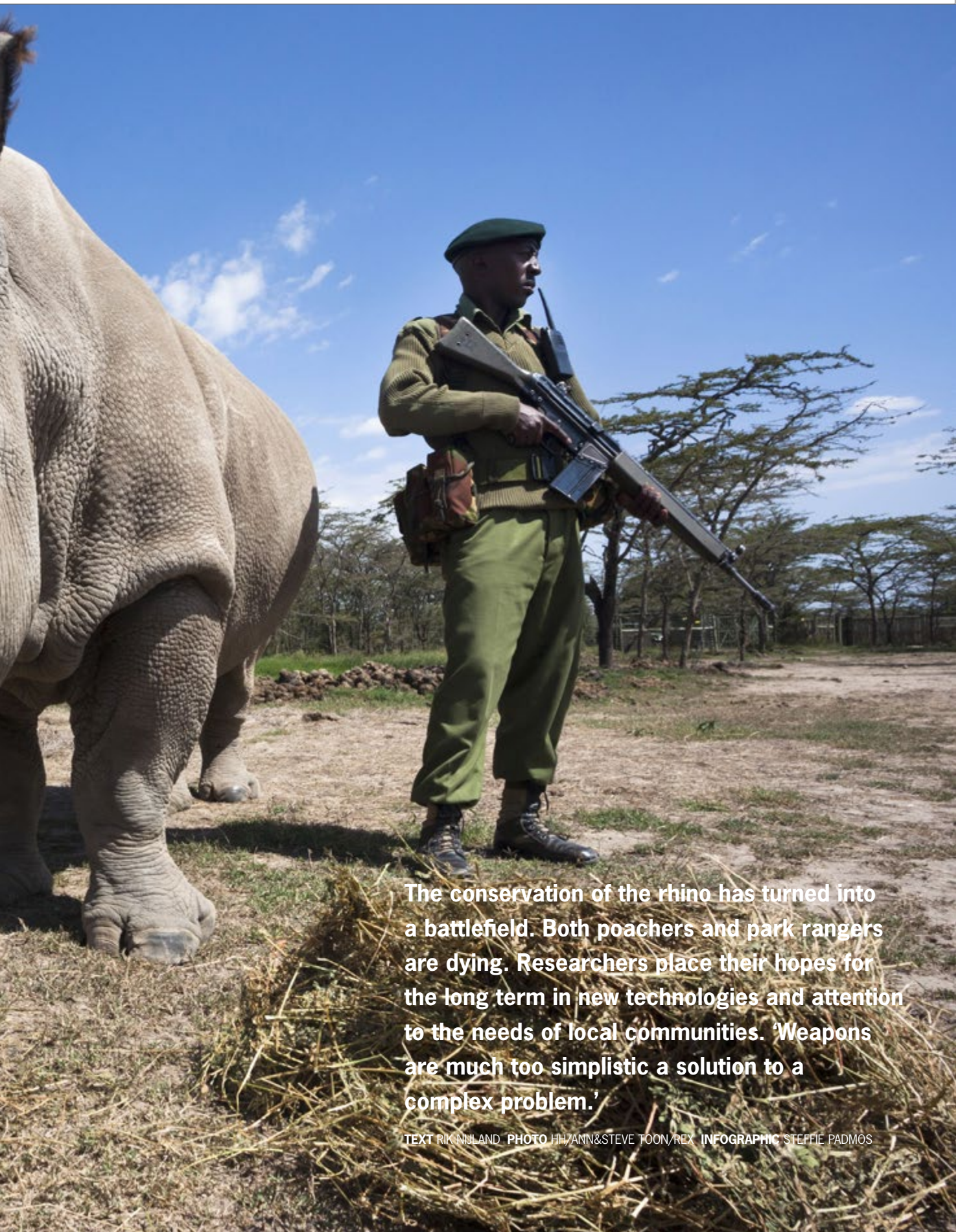






# The battle for the rhino





**The conservation of the rhino has turned into a battlefield. Both poachers and park rangers are dying. Researchers place their hopes for the long term in new technologies and attention to the needs of local communities. 'Weapons are much too simplistic a solution to a complex problem.'**

**TEXT RIK NIJLAND PHOTO HH/ANN&STEVE TOON/REX INFOGRAPHIC STEFFIE PADMOS**

## ‘Poaching is seen as doing something for the benefit of the family’

In early March this year, Europe got a taste of the consequences of the lucrative illegal trade in rhino horn when Vince was shot dead in a zoo near Paris. Vince was a young rhino with Dutch roots: he was born in Burger's Zoo in Arnhem in 2012. When Vince's French keepers found him, his horn had been sawn off with a chainsaw.

In the wildlife reserves of South Africa, home to 80 percent of African rhinos, this kind of slaughter is the order of the day. The country forms the epicentre of international poaching: three rhinos die there every day, most of them in the Kruger Park, an extensive wildlife reserve half the size of the Netherlands, on the border with Mozambique. Every year more than a million visitors come to the park to enjoy its nature and see the big five. But another, depressing reality is lurking in the wings. In 2016 poachers killed 662 rhinos in this game park. And glib as it may sound, that represents a big improvement. In 2015, 826 mutilated carcasses were found.

To try and stop the poaching, for the past couple of years the park has been patrolled not only by armed rangers, but also by the South African army. But in spite of this display of force, there are always a couple of poaching gangs in action, says Bram Büscher, professor of the Sociology of Development and Change at Wageningen, and currently visiting professor in Cape Town. Since 2015 he has been doing research from Wageningen on poaching in South Africa, Indonesia and Brazil, using a Vidi grant for innovative research from the Netherlands Organization for Scientific Research (NWO).

‘I saw violence breaking out around the poaching in the Kruger Park six years,’ says Büscher. The huge demand for rhino horns and the sizeable earnings for anyone who can get hold of one are probably driven by

increasing wealth in Vietnam and China (see box). At that time Büscher was studying the relation between social media and nature conservation in cross-border nature reserves in southern Africa. ‘Poaching was such a key issue in that period that there was no way round it in my research.’

### PEACE PARK

Together with the Limpopo National Park across the border in Mozambique, the Kruger forms what has been dubbed a ‘peace park’. Peace parks were the initiative of the NGO Peace Parks Foundation founded by the South African billionaire Anton Rupert, Nelson Mandela and Prince Bernhard, former Dutch Crown Prince and the founding president of the Worldwide Fund for Nature. Nelson Mandela saw peace parks as a conciliatory gesture towards neighbouring countries after the tensions during the years of the apartheid regime. But the peace park has not really brought peace: in the Kruger Park it is not just rhinos who are dying, there are human victims too. In 2015, The Guardian wrote that around 100 Mozambican poachers are shot in the park every year. Park rangers too are frequently victims of the armed struggle over the rhino. Büscher thinks the arms race between poachers and rangers has escalated further than it needed to. ‘Weapons are much too simplistic a solution to a complex problem.’ Racial divisions with roots in the apartheid era play a role in the background, he observes. ‘From our perspective all poaching is bad. White children grow up with soft toys and stories about lions, elephants and rhinos. But many of the mostly black poachers see poaching as a chance to do something for the benefit of their families or communities. Besides, not many of the local residents are particularly interested in the park; they are too busy struggling for

survival. If anything, they associate the park with past oppression: their forefathers had to get out of the area to make way for what is often described as a predominantly white hobby. Many of the nature organizations involved, including the Peace Parks Foundation, are frequently seen as white elite organizations which rarely take an interest in the local black community. In a context of unemployment and poverty, that leads to serious tensions. I don't think you can rule out the possibility of the bomb going off at some point. Of families and entire communities turning against the park.’ So perpetuating the current arms race is not a long-term solution to poaching, in Büscher's view. ‘The Kruger Park has focused too much on militarization in the war on poaching,’ he feels. ‘Communication channels between the park and the local community which had been developed since apartheid have been badly neglected. Of course you can't expect to reform violent poachers overnight just by talking to them, but it is nevertheless very important to show some understanding of people's needs, and to engage with them.’

### USING FIREARMS

Associate professor Frank van Langevelde of the Resource Ecology chair group in Wageningen, who has done a lot of research in African nature reserves, sees no other option at the moment than taking action to protect the rhinos. Using firearms if that is what it takes. But he does acknowledge the risk that the more successful this is, the likelier the problem is simply to relocate. Since South Africa began to have some success in limiting the loss of rhinos, the numbers of poached animals in bordering Namibia and Zimbabwe have been going up – from around 25 in 2014 to 80 and 50 respectively in 2015. ➤



## RHINOS

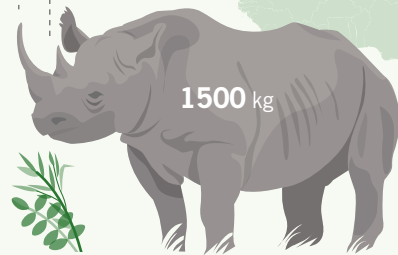
Worldwide, there are five species of rhino left. They are found in Africa and Asia and most are threatened to a greater or lesser extent, due to the rhino horn trade.

### Black rhino

Numbers in the wild:  
c. **5000**

- White rhino
- Black rhino

c. **100 cm**  
c. **50 cm**

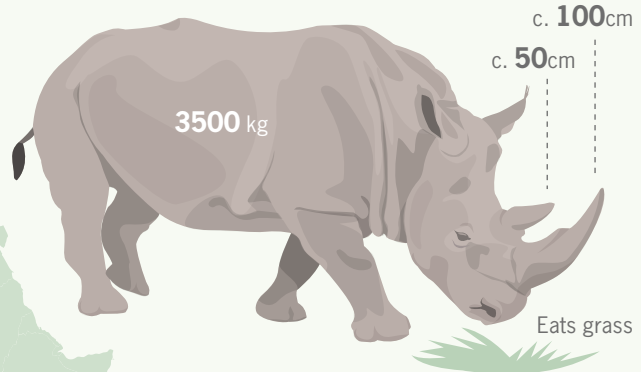


Eats green shoots and acacia leaves and twigs



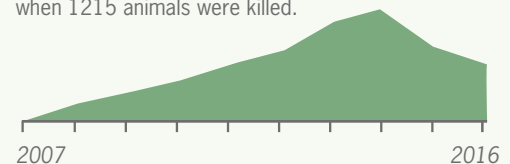
### White rhino

Numbers in the wild: c. **20,000**. The species was considered extinct at the end of the 19th century until a surviving population of 100-200 animals was discovered in 1895.



### Poaching

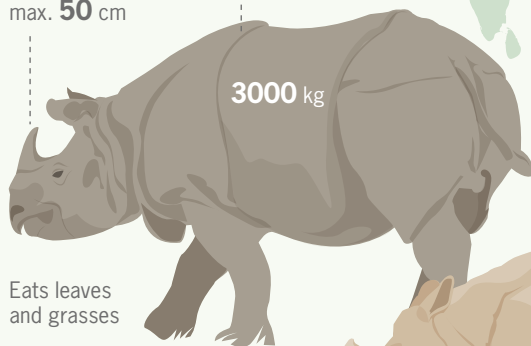
Far and away the most rhinos are found in South Africa, where poaching has therefore been concentrated for the past ten years. The peak was reached in 2014, when 1215 animals were killed.



### Indian rhino

Numbers in the wild:  
c. **3500**

A single horn max. **50 cm**  
Its thick folds of skin look like armour plating



Eats leaves and grasses



- Indian rhino
- Javanese rhino
- Sumatran rhino

### Sumatran rhino

Numbers in the wild: c. **250**

Shy  
Two small horns



Lives in forests and swamps

Very varied diet

### Javanese rhino

Numbers in the wild: thought to be only **60** left in the rainforest of Ujung Kulon National Park



A single horn max. **20 cm**

Very varied diet and habitat



PHOTO HOLLANDESE HOOGTE

Vets and rangers in the Kruger Park in South Africa have anaesthetized a mother rhino in order to move her somewhere safer.

Van Langevelde thinks the battle will be fought not just with an arms race but also with modern technology. The Kruger Park is making use of drones and ‘smart’ fences which not only keep animals in but also register suspicious movements. The Wageningen researcher hopes to add another resource to the arsenal with SmartParks: a multidisciplinary project that uses an analysis of the movements of fleeing herbivores on the savannah – impalas, wildebeests and zebras – to pinpoint where poachers are active. A patrol can then go out and stop them before they kill a rhino. The idea came from astronomers at the Netherlands Institute for Radio Astronomy (Astron) and staff at NWO, who speculated at a conference in South Africa as to whether it might be possible to spot poachers from space. For a partner who knew about animals and poaching, they turned to Wageningen. With funding from the NWO, a Wageningen postdoc and a PhD candidate set to work in South Africa, collaborating with colleagues from the universities of Twente and Leiden and astronomers from Astron. Their task is to find out whether animals behave differently when fleeing different types of disturbance. The large herbivores of the savannah are constantly on the move, setting up a stampede at the approach of lions, a leopard or a pack of wild dogs – and when tourists get out of their bus or poachers make them uneasy.

‘We think it’s possible to differentiate between different disturbance patterns, if we can get hold of enough data,’ says Van Langevelde. ‘Lions, for instance, ambush their prey, while wild dogs rely on long chases at high speed. Different behaviour patterns are triggered by those predators than by poachers searching for prey without knowing where it is. The poachers usually walk in a straight line, causing a slow wave of disturbance among grazing game,’ says Van Langevelde. ‘Very occasionally poachers come by car or helicopter, but that is easy to spot. More often they come into the park in small groups, operating in the park on foot at night.’

#### REGISTERING ESCAPE BEHAVIOUR

The researchers started a trial in a small game park in South Africa in May. About 140 large herbivores were fitted with collars with GPS transmitters which were tracked with a telecommunication network (LoraWAN). Once it has been shown that movement patterns can be distinguished from each other, the collars will be removed. Eventually a satellite should be able to locate and register the movements of the game using the heat they give off, but that is still a way off at the moment, says Van Langevelde. In the trial period, the researchers are experimenting with tourist buses, walking safaris and poachers. ‘Rangers are going to imitate poachers, even down to really

shooting,’ the researcher explains. ‘That needs doing anyway to feed the lions which are being kept in quarantine in the park to inoculate them. We expect that impalas, zebras and wildebeests differentiate between the body language of hunters and that of tourists out on a walk.’

Van Langevelde has no illusions that the new method will provide the ultimate solution for discouraging poachers. The risk of being caught will increase but will not easily outweigh the lure of the income gained from poaching. ‘I think the best way is to reduce demand by educating and informing people in the Asian countries where rhino horns are popular. That is how the Netherlands managed to make smoking much less socially acceptable.’ He has higher hopes of this approach than of fighting the poaching trade. ‘Good that people work on that too, but in the light of the results with drugs and with human trafficking, I don’t have much faith in it.’

#### LIFTING THE BAN

The Wageningen animal ecologist is fiercely opposed to a free trade in rhino horns. Internationally, the import and export of horns is and will remain banned, but in March this year the South African high court decided to lift the ban on internal trade that had been in place since 2009. A handful of rhino farms in the country have been calling for this for years. They have large stocks of

## ‘Focussing on the animals and ignoring the people undermines nature conservation’

rhino horns – which grow back in two years if they are sawn off carefully. The farmers are keen to cash in this ‘capital’ on the home market. They claim that poaching only got out of hand after the introduction of the ban, and believe a legal trade would take the wind out of the poachers’ sails.

Opponents, such as Van Langevelde, are afraid that the legally marketed horns would be smuggled abroad, because export is still illegal. ‘In South Africa itself there isn’t a market for them but in Asia the demand is huge. There are so many people who want to get hold of one that I don’t think this will curb the poaching. It will still be lucrative. You might also start getting fraud with wild game, like what goes on in the caviar business in the Caucasus. There is a ban on fishing wild sturgeon but the fish farms are not producing enough caviar. All the caviar that is sold is labelled “farmed” but research reveals that much of it comes from wild sturgeon. A similar thing will happen with the horns.’

### INCOME FROM TOURISM

According to Van Langevelde, for the time being the prevention of rhino poaching is a matter of combining technology, weapons, penalties and, where possible, local participation. In the sparsely populated country of Namibia, there has been some success with reducing poaching by giving local villages a share in the profits from tourism. ‘That won’t work in the Kruger Park, which lies in a densely populated area. A lot of poachers enter the park via Hoedspruit and Nelspruit, a region with a population of half a million.’ It would not be realistic to seek to share the profits of the Kruger Park with them. Last year 800 people were arrested for poaching, but there are many ready to take their place. In the short term, prevention – stopping those animals from being shot – is the only solution. Whatever Büscher may think of it, patrolling by the army is necessary, sadly.’ Professor of Sociology Büscher realizes his

plea for de-escalation and dialogue can only offer a solution to poaching in the long term. He nonetheless believes that restoring trust is essential. The local communities around the Kruger Park – millions of people – are experiencing far-reaching changes, he explains. ‘Small-scale farming still plays an important role but there is little land available. What is more, young people are turning their backs on the way of life of their parents and grandparents. They prefer a modern lifestyle. “Can’t those people start a farm instead of poaching rhinos?” people in the Netherlands sometimes ask. But this is to ignore the fast pace at which rural South Africa is changing. At the moment, some of the local population feel that they are being taken more seriously by the crime syndicates than by the Kruger Park or the government. In a context like this, if we concentrate solely on the animals and ignore the people, we undermine nature conservation and in the end we cuddle the rhino to death.’ ■

### MARKET FOR HORNS

A rhino horn is worth more than its weight in gold. The end users are said to pay between 60,000 and 100,000 dollars a kilo.

The main constituent of rhino horn is keratin, the tough fibrous protein that nails and hair are made of too. In Asia, rhino horns are a traditional ingredient in medicines against cancer and other diseases, as well as being used to make little bowls or jewellery, or the handles of traditional Yemeni daggers.

The market for horns has peaked in different countries at different times,

shows research by Save the Rhino/TRAFFIC. Up until the 1970s, Japan was the biggest user, particularly for medicinal purposes. When the international trade was curbed, from 1977, the government instructed producers to use alternative ingredients. The trade then shifted to South Korea, but government legislation took effect there a few years later too. The turnover in Yemen has dropped just as dramatically, partly thanks to an information campaign and because of economic instability. At present the main markets for rhino horn are in China and Vietnam.

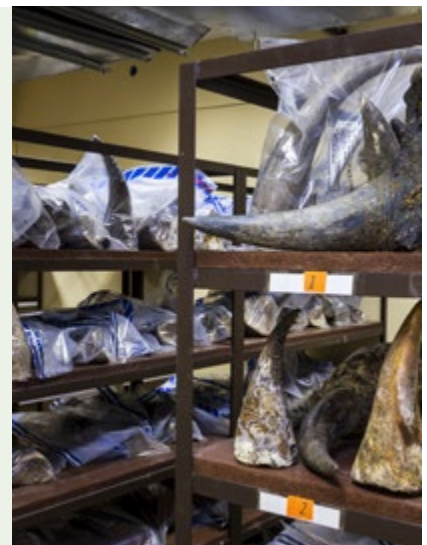


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