Citizen science: creating an inclusive, global network for conservation

Technologies like CyberTracker are creating new opportunities for community participation in science and conservation, helping the plight of endangered species like the black rhino. Photograph: REUTERS

Technology is allowing anyone to contribute to scientific research, with implications for conservation, disease prevention and much more. Louis Liebenberg explains

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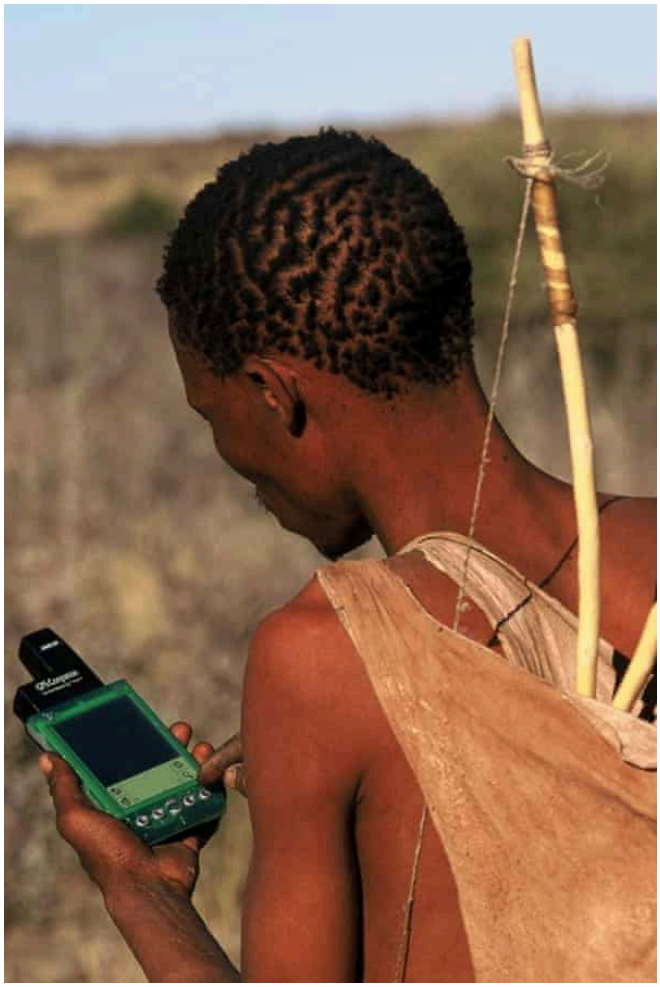
In September 1996 we tested the first iteration of a handheld data capture software called CyberTracker in the Karoo National Park in South Africa. Karel Benadie, a tracker who cannot read or write, selected an icon depicting the black rhino on the touch-screen of an Apple Newton handheld computer. On the next screen, which displayed icons of different animal activities, he selected the icon for feeding. The next screen displayed icons of plants.

One by one he navigated through a sequence of screens that enabled him to capture the information that described his observation and interpretation of the rhino tracks and signs. A Garmin GPS that was hand-wired to the

device captured the exact location. For the first time, a non-literate tracker captured complex data on wildlife behaviour which had practical value to nature conservation and scientific research.



The handheld CyberTracker device enables non-literate trackers like Karoha to observe, interpret and record complex scientific data. Photograph: Rolex/Eric Vandeville

Justin Steventon and I developed the CyberTracker to test a simple hypothesis: the art of tracking may be the origin of science. In 1999 Benadie co-authored a paper published in the journal Pachyderm. This paper demonstrated that a non-literate tracker can create a scientific hypothesis, and independently gather the data needed to confirm this hypothesis.

Science may have evolved more than 100,000 years ago with the evolution of modern hunter-gatherers. Scientific reasoning may therefore be an innate ability of the human mind. The implication of this theory is that anyone, regardless of their level of education, whether or not they can read or write and regardless of their cultural background can become citizen scientists, and make fundamental contributions to science.

From its origins in the Karoo and the Kalahari, CyberTracker projects have now been initiated across the globe. From monitoring gorillas in the Congo, tracking snow leopards in the Himalayas, tracking jaguars in Costa Rica, and researching dolphins in Southern California, releasing the software as freeware has allowed numerous independent initiatives to get off the ground, resulting in unrestricted growth of environmental monitoring projects worldwide.

The outbreak of Ebola in West Africa has resulted in huge cost in human lives and economic losses. Even the indirect economic impact on Africa as a whole has been huge, as tourists have cancelled visits to Africa due to the fear of Ebola. In future it may be more cost-effective to monitor signs of potential outbreaks of Ebola among wildlife, especially along trade routes that may spread Ebola to highly populated areas. During the Ebola outbreaks in Gabon and the Republic of Congo from 2001 to 2003 we were able to show a significant drop in animal numbers by monitoring signs of gorilla, chimpanzee, duiker and bush pig. Wild animal outbreaks began before each of the five human Ebola outbreaks. Twice we alerted the health authorities to an imminent risk for human outbreaks, weeks before they occurred.

CyberTracker projects have been initiated to track snow leopards in the Himalayas. Photograph: Tom Brakefield/Getty Images

CyberTracker is also used in the fight against rhino poaching. Rangers and trackers monitor both the movements of rhino and poachers. The data provide conservation managers with spatial information that increase the effectiveness of anti-poaching operations.

Projects like iSpot, iNaturalist and CitSci enable citizen scientists to share data on biodiversity. eBird is capturing millions of observations on birds, making it possible to track bird migrations across continents.

Over time, technology will become more powerful and costs will fall. As the cost of smartphones is reduced over time, more and more people will be able to participate. As computers become more powerful, we will be able to process more data, and share data globally, even in the remotest areas. Increased awareness and participation can result in an exponential growth of data.

The implications for community participation in science and conservation are far-reaching. Imagine communities throughout the world gathering data, from remote villages in the Kalahari, the Congo, Australia and Mongolia, to school children in New York's Central Park, London, Paris, Tokyo, New Delhi and Beijing. Citizens gathering data on birds, animals and plants. Millions of people all over the world sharing their data in the cloud, creating a worldwide network to monitor the global ecosystem in real time.

Louis Liebenberg is a tracker, author, co-founder and executive director of CyberTracker and an associate of human evolutionary biology at Harvard University. In 1998 Louis was awarded a Rolex Award for Enterprise in the field of applied technology.

https://www.theguardian.com/science/2015/jan/07/citizen-science-creating-an-inclusive-global-network-for-conservation