

Western science and traditional knowledge – no gap to bridge

How do indigenous peoples participate more effectively in decisions which influence their lives? The similarities between western science and traditional knowledge suggests an answer. **BY JACK DOWIE**

A widespread belief remains that there is a gap between traditional knowledge and western scientific knowledge. A gap that – at least to those who do not wish to privilege certain groups completely – has to be bridged in some way. The suggested treatments usually involve more and better communication and exchanges based on greater mutual respect, coupled with a greater presence on decision-making bodies.

These people and organisational therapies are based on a misdiagnosis. There is no gap. What we have are two activities with fundamentally different objectives, as distinct as farming and cooking. We need to sort out our ideas, not our organisational acronyms. Western science is a truth-focused, certainty-seeking Knowledge Technology (KT). Traditional knowledge is a decision-focused, uncertainty-respecting and value-based Decision Technology (DT). The KT-DT distinction can be simply illustrated if we ask a key question:

Observations can guide

How many observations does one need

when studying the relationship between a particular ecological sign and the presence of a prey or a predator or a source of pollution?

Western science demands a very large number of observations – hundreds, perhaps thousands – in order to provide the statistical power to detect a relationship of a given magnitude. This demand is completely legitimate, because western science is a Knowledge Technology, gate-keeping the truth for its own sake, i.e. without any weakening of standards for utilitarian reasons such as decision making.

Traditional knowledge – and we can extend this to include much of the tacit knowledge *know-how* that non-indigenous peoples and professionals possess – suggests that a very much smaller number of observations may be optimal.

How many observations do we then need? Possibly as little as seven, the number of bits of information plus or minus two that George A. Miller, professor of psychology at Princeton University, suggested most human beings can hold

in their short term memory.

Israeli psychologist Yaakov Kareev has been exploring the evolutionary origins of this number and concluded that it may indeed have arisen as the optimal number of observations for a hunting group to take into account.

Why might the last seven observations be better than the last 17, the last 70, or the last 700? One obvious reason is that if a larger number of observations takes more time to accumulate, the earlier observations may become out of date and irrelevant if the situation is dynamically changing, as it will be in many indigenous societies.

The other reason is more interesting, because it establishes the key difference between the two technologies. If we use small unrepresentative samples we are more likely to detect a correlation e.g. between a sign and a predator or a prey or a source of pollution that may not actually be present.

How could this possibly be a good thing?

We will – whether we are indigenous people of the Arctic or non-indigenous

people of the urban west – accept lots of false leads in order to maximise our chance of detecting a true lead such as we accept we have to do when e.g. screening for cancer. This is because often it is more important to avoid failing to detect something when it is there (a False Negative) than to wrongly detect something when it is not (a False Positive).

Based on real world consequences

In the real world the criteria for optimal information search must be based on the real world consequences of decisions. These criteria must reflect the actual lived and asymmetric trade-off between False Positive and False Negative errors. In certainty-seeking science, on the other hand, we rightly want to avoid detecting something which is not there at almost any cost.

We have here then a clear and simple illustration of the difference – not gap – between the Knowledge Technology that is a western science and the Decision Technology which is a traditional knowledge. We can also confirm the necessity of a Valuation Technology – a way of establishing the necessary error tradeoffs – for supplying the inputs needed by all types of decisions.

Any type of traditional knowledge must be an amalgam of traditional beliefs. These beliefs are based on the probabilities of things happening or being the case and of traditional values concerning the desirability and worth of particular states, outcomes and processes. The amalgam may be implicit, deep and holistic. It may appear impossible to decompose this whole into its compo-

nents. Possibly it will be against its very spirit and spiritual basis to do so.

New decision processes must be non-traditional

Unfortunately, the number and complexity of decisions affecting indigenous lives are now changing at historically unparalleled speed. These decisions increasingly impact on and involve both indigenous and non-indigenous groups. In order that these decisions be taken coherently and transparently, as well as equitably, they almost certainly require a non-traditional decision process such as Decision Analysis. This is a rigorous way of evaluating options in which the beliefs and values of all stakeholders can be incorporated and their implications explored.

A clear separation of beliefs and values is the price indigenous people will have to pay to participate effectively in decision-making crucial to their lives. If indigenous peoples are to have their own interests fully represented in these analyses and decision-making processes they will need to disentangle the belief and value components of their traditional knowledge and build their capacities in these alternative decision processes. That, rather than simply getting a seat at the table, is the true route to empowerment for indigenous peoples.

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The media on the poles

During the last year the focus of the world media has again turned to both poles. The stories, like the polar lands, are dramatic: collapsing ice sheets, growing ozone holes affecting climate, contaminants in the food and peoples of the north, oil and gas interests squaring off against caribou. They fascinate us, they can frighten us, but they are remote to most of us. Or are they? After the record-breaking summer in Europe and devastating wild fires in both hemispheres, climate change is very much on our minds. The contaminants found in indigenous peoples are not from local sources but from thousands of kilometres distant. And regional conflicts have forced us again to consider the riches of these vast lands. The stories have been featured from England to Ethiopia and from Iceland to India.

Below is a selection of 2003 media stories on the poles. You will be able to find a larger collection of media stories on the poles on our web site www.grida.no/environmenttimes and we are happy to accept contributions of other stories to include in our online archive.



Guide to drilling for oil in the Arctic

The Guardian, UK, January.
An interactive tour of the debate about drilling for oil in the Arctic National Wildlife Refuge in Alaska and an account of the various interests at stake. The guide provides links to relevant stakeholders. www.guardian.co.uk/flash/0,5860,534962,00.html

Warming warning for Antarctica

The Guardian, UK, September.
This story tells how the face of Antarctica will change in the next 100 years as ice melts, glaciers retreat, penguins move south and green plants begin to colonise bare rocks of the Antarctic peninsula. www.guardian.co.uk/climatechange/story/0,12374,1038161,00.html



Bear facts

The Guardian, UK, March.
This story is a close-up on polar bears and talks about how a polar bear cub that was rescued after its mother was killed by hunters has made headlines across Canada, but global warming means that other members of his species may not be so lucky. www.guardian.co.uk/climatechange/story/0,12374,911315,00.html

White House persists in Alaska oil fight

The Associated Press, US, March.
A story on the political play behind the debate on drilling in the Arctic. The story talks about how the Bush administration, rebuffed by the Senate, will not give up the fight this year to open an Alaska wildlife refuge to oil drilling.

Canada's climate change close up

BBC News Online, UK, July.
A story and video talking about beaches turning to mud and changes in wildlife which are among the signs of a warming climate recorded by an Inuit community in Canada. <http://news.bbc.co.uk/1/hi/sci/tech/3103111.stm>

The UK's Arctic graveyard

BBC News Online, UK, October.
In this story the BBC tells how they visited Murmansk to look at an old graveyard in the midst of what they thought would be a chilly, muddy mess, gritting its teeth against the Arctic gales and the worst that centralised planners could do to scorch and scar the forests and the tundra. http://news.bbc.co.uk/1/hi/world/from_our_own_correspondent/3175866.stm

Arctic ice shelf splits

BBC News Online, UK, September.
The news story about the breaking of the Ward Hunt Ice Shelf. The story talks about how the largest ice shelf in the Arctic has fractured, releasing all the water from the freshwater lake it dammed. <http://news.bbc.co.uk/1/hi/sci/tech/3132074.stm>

Malaysia treads on ice

The Antarctic, January.
This story reveals how Malaysia is moving to become the first Muslim nation to join the Antarctic Treaty, in what would mark a big change of heart for its Prime Minister, Mahathir Mohammed. www.antarctican.com/pages/news/newsfr.htm

Antarctic ozone hole grows to record size

CBC, Canada, September.
In contrast to 2002, the hole in the ozone layer over the Antarctic reached a record size this year, the United Nations' weather organization says. Measurements over and near the southern-most continent suggest the ozone declined more quickly this year than in 2002. www.cbc.ca/storyview/CBC/2003/09/17/ozone_hole030917

Antarctic ozone hole brings stronger winds: study

CBC, Canada, October.
New studies from a Canadian scientist show how the ozone hole over Antarctica is likely changing wind patterns and ocean currents in the southern hemisphere. www.cbc.ca/stories/2003/10/10/ozone031010

Look for Hepatitis C warning signs

Juneau Empire, Canada, October.
Alaska Epidemiology estimates that as many as 6,000 Alaskans are infected with Hepatitis C virus, yet only a small fraction of them are aware of it, as it can take as long as 20 years to manifest itself. Warning signs include: yellowing of the skin or eyes, nausea and vomiting, extreme fatigue, loss of appetite, dark urine and abdominal pain. www.arctichealth.org/recentnews.php

Antarctic group sets up asset management

Computerworld, UK, August.
This series of stories focuses on the Australian Antarctic Division (AAD), which conducts research and conservation for the protection of the Antarctic environment, and how the division implements asset management software at its Tasmanian headquarters and offshore bases which are inaccessible most of the year. <http://antarctica.computerworld.com/index.php?id=104967114&fp=16&fpid=0>