



INTERNATIONAL COUNCIL FOR SCIENCE

... strengthening international science for the benefit of society...



# Science and Technology at the World Summit on Sustainable Development

26 August  
to 4 September 2002  
Johannesburg, South Africa



WFEO/FMOI



*twas*  
the third world academy of sciences



# Science and Technology at the World Summit on Sustainable Development

26 August  
to 4 September 2002  
Johannesburg, South Africa



WFEO/FMOI



*twas*  
the world academy of sciences



## Session 4

### Linking Traditional and Scientific Knowledge for Sustainable Development

#### ORGANIZED BY:

UNESCO - Local and Indigenous Knowledge Systems Project (LINKS)  
International Council for Science (ICSU)  
Tebtebba Foundation

#### IN COOPERATION WITH:

International Chamber of Commerce (ICC)

#### TOPICS / PANELISTS

#### **Opening Session**

##### *Opening by Indigenous Spokesperson*

P. Settee, Director, Indigenous Peoples Programme, University of Saskatchewan, Canada

W. Erdelen, Assistant Director-General for Natural Sciences, UNESCO

V. Tauli-Corpuz, Executive Director, Tebtebba Foundation

T. Rosswall, Executive Director, International Council for Science (ICSU)

##### *Introduction to the Theme*

J. Fenstad, International Council for Science (ICSU)

J. Carino, Tebtebba Foundation

D. Nakashima, Head, Local and Indigenous Knowledge Systems Project (LINKS), UNESCO

#### **Sub-theme A**

#### **Local and Indigenous Knowledge for Environmental Assessment**

*Chair:* J. Carino, Tebtebba Foundation

*Farmers' meteorological knowledge in Gujarat, India*

P. Kanani, Associate Professor, Gujarat Agricultural University, India

*Cree knowledge for comprehensive environmental, social, and cultural impact assessment: A partnership in James Bay (Québec, Canada)*

R. Saganash, Grand Council of the Crees, Canada

*Indigenous knowledge and foresight: A Cree elder's environmental impact assessment*

M. Roué, Research Director, Centre National de la Recherche Scientifique (CNRS/MNHN), France

#### **Sub-theme B**

#### **Countering the erosion of knowledge, revitalising transmission**

*Chair:* V. Chinapah, Education Sector, UNESCO

*Recognizing, promoting, protecting, and integrating IKS into the mainstream*

C. Odora-Hoppers, University of Pretoria, South Africa

*The endogenisation of education in South Africa*

O. Ntsoane, University of the Northwest, South Africa

*Culturally appropriate curricula and strategies for working with indigenous children and youth*

S. Saenmi, Executive Director, Inter Mountain Peoples Education & Culture in Thailand Association (IMPECT), Thailand

*Strengthening indigenous knowledge and traditional resource management through schools*

R. Nari, Department of Environment and Conservation, Vanuatu

#### **Sub-theme C**

#### **Keepers of traditional knowledge: Issues of protection and sharing**

*Chair:* G. Glaser, International Council for Science (ICSU)

*On traditional medicine and medicinal plants*

M. Addy, University of Ghana, Ghana

*Te Kete a Tini Rauhanga: Investigation of the native medicinal flora used by Tuhoe Maori*

H. Kereopa, Te Kapu a Rangī Trust, New Zealand

M. Leach, Waikato University, New Zealand

## INTRODUCTION

The topic of traditional knowledge is experiencing resurgence on the international agenda, as is the need to develop stronger links between these forms of indigenous expertise and scientific discovery. This full day of presentations and lively debate involving indigenous knowledge holders and scientists (including indigenous scientists) from a wide range of natural and social science disciplines attracted a large audience and generated active discussion regarding a number of challenging issues. The event also provided the opportunity to launch the ICSU/UNESCO report entitled *Science, Traditional Knowledge and Sustainable Development*.<sup>8</sup>

## PRESENTATIONS

### **Opening Session**

The event was launched with guiding words from Ms. Settee of the Cree First Nation of Canada. Subsequent opening speakers highlighted the urgent need for scientists and indigenous peoples to establish strong and equitable working relationships in order to move together toward sustainable development. They also detailed important progress on this issue following debates that arose at the 1999 ICSU General Assembly regarding linking scientific and traditional knowledge, as was recommended at World Conference on Science (Budapest 1999), co-organized by UNESCO and ICSU. This debate led to the formation of a special Study Group with a mandate to distinguish among traditional knowledge, science, and pseudoscience. The joint ICSU/UNESCO report on *Science, Traditional Knowledge and Sustainable Development* contains the conclusions of this Study Group.

Underlining the dominance of science in contemporary society, Ms. Carino recalled Einstein's warning about 'worshipping the tool and profaning the sacred.' She emphasized that scientists bear a particular responsibility to pave the way for broader acceptance of indigenous knowledge. Similarly, Dr. Nakashima welcomed the growing recognition of traditional knowledge, but warned against the dangers of tokenism. As the roots of indigenous knowledge run deep and touch all aspects of people's lives, he stressed the need for comprehensive approaches to understanding traditional knowledge in all of its complexity.

### **Sub-theme A**

#### ***Local and indigenous knowledge for environmental assessment***

The session on how local and indigenous knowledge is applied to environmental assessment began with a presentation on the meteorological knowledge used by farmers in northern India. Professor Kanani stressed that official weather forecasts in India are either too imprecise or too short-range to be of use to farmers. As a result, farmers rely upon traditional knowledge and beliefs to take important decisions such as crop choice and cropping patterns. Presenting results from 11 years of interaction with an informal network of local knowledge holders, Prof. Kanani highlighted how traditional assessments of key weather events, such as the onset and nature of the monsoon, have proved to be both reliable and useful. In addition to providing a valuable service, this network has restored people's confidence in traditional knowledge and skills.

Anthropologist Dr. Roué examined the contribution of indigenous knowledge to assessing environmental impacts that will result from large-scale development projects. Through the detailed testimony provided by R. Saganash, an indigenous elder from sub-Arctic Canada, Dr. Roué demonstrated that the Cree accumulate ecological knowledge in a methodical, empirical, and analytical manner that bears many similarities to science. However, said Dr. Roué, unlike science, Cree knowledge is holistic. Thus, by inter-relating numerous elements (material, social, spiritual, etc.) in a complex web of relationships, this approach surpasses science's as yet faltering efforts to mobilise interdisciplinary cooperation to deal with complexity.

### **Sub-theme B**

#### ***Countering knowledge erosion through revitalizing transmission***

Professor Odora-Hoppers opened this session with a resounding condemnation of the role science has played in the

8. *Science, Traditional Knowledge and Sustainable Development*. International Council for Science and UNESCO. © ICSU 2002. ICSU Series on Science for Sustainable Development No. 4 (24 pp.). ISSN 1683-3686.

cognitive subjugation of indigenous knowledge and world views. Citing the Budapest Science Agenda as a ‘monument of hope’, she called for a decolonisation of the mind to create cognitive space for all knowledge heritages.

Mr. Ntsoane then described the institutional resistance he encountered when introducing studies in indigenous knowledge into the curriculum at the University of the North West. Sharing his experiences in the classroom, he said that the students themselves—many of whom are conditioned to compartmentalised western modes of learning and thinking—provided the most difficult, but also most rewarding, challenge. By guiding them in the re-discovery of Afro-centric epistemologies and other sources of knowledge, such as elders from their own communities, he bolstered confidence in their own languages, knowledge, and traditions.

Concluding the session on education, Mr. Saenmi described the impact of formal education on indigenous children in the mountainous areas of northern Thailand. Obligated to use Thai language and learn formal subjects with no indigenous content, school has become a vehicle for assimilation. Mr. Saenmi outlined IMPECT’s efforts to join forces with cultural experts, such as community elders and religious leaders, to establish alternative cultural education using local curriculum materials.

### ***Sub-theme C***

#### ***Keepers of traditional knowledge: Issues of protection and sharing***

The third and final session on issues of traditional knowledge verification, protection, and sharing confronted two quite different perspectives on the relationship between science and traditional knowledge. Recognising that the majority of sub-Saharan Africa relies upon traditional practitioners for health care, Professor Addy called for scientific validation of traditional practice for reasons of efficacy, safety, and quality control. She argued that such a process of verification, standardisation, and regulation of medicinal herbs is an essential step for traditional knowledge to contribute productively to Africa’s future.

In contrast, H. Kereopa, a Maori tohunga (traditional healer) offered quite a different view. Presenting jointly with Dr. Leach, a Maori biochemist, they described a collaborative study of Maori practices of healing and medicine, that ‘brings together the baskets of knowledge from science and tradition.’ Both presenters agreed that validation is not the primary goal of this project. However, the study does use biochemical analysis to identify the bioactive ingredients from medicinal plants and includes a remarkable revenue-sharing agreement that could provide economic benefits by allowing the Maori to retain full intellectual property rights. However, as H. Kereopa masterfully illustrated, traditional medical practice cannot be reduced to chemical formulae. It brings into play the full environment, including the social and spiritual. In many cases, he said, the actions and processes that are part of the healing act may be as important—if not more important—than the actual plants administered.

### **DISCUSSION AND SUMMARY**

Questions from the floor after each set of presentations touched upon a wide range of topics, only a few of which can be reported upon here. Some called for more exhaustive scientific verification, such as statistical analyses for traditional meteorological predictions, while others questioned the validity of science, which in today’s market-dominated world has increasingly become a subset of economics. In the education domain, indigenous spokespersons questioned whether attempts to ‘endogenise’ education might at times amount to little more than a ‘translation’ of Western ways and values. The need to develop appropriate and effective methods for recording, protecting, and revitalising indigenous knowledge was also a key concern.

Finally, participants recognised that both traditional knowledge systems and science, whether in the domains of environmental conservation, education, or medical practice, each had their place and that continuing their respectful co-existence, encouraging open dialogue, and strengthening synergies are mutually beneficial goals.

*Report prepared by Jonathan Breaker and Douglas Nakashima*