

Local solutions for future challenges: the COBRA project,
(Community Owned Best practice for sustainable Resource Adaptive management in the Guiana Shield, South America)
an innovative framework for the viability of indigenous communities

Participatory hypermedia and community sustainability

Presenting author: Céline TSCHIRHART

Authors: Andrea BERARDI¹, Jaylaxshmi MISTRY², Céline TSCHIRHART³

New significant funding initiatives are on the cusp of being implemented across the developing world to mitigate climate change, preserve biodiversity and insure the sustainable development of local communities within their environment. Payment for Ecosystem Services (PES) for example, manifested in international programs such as Reducing Emissions from Deforestation and Forest Degradation (REDD+), hold significant promise, but there are still great uncertainties with regards to which groups will benefit, with some critics arguing that these initiatives may potentially diminish the power of local communities for controlling the management of their own natural resources. Established community owned solutions for the management of ecosystem services have the potential to act as showcases for the world in determining the most effective and efficient use of these emerging funding streams, in order to maximise social justice and ecological sustainability.

Of the many approaches proposed to assess a system's sustainability, one of the most holistic and rationalised frameworks is that of System Viability (SV) put forward by Bossel (1999, 2001, 2007). SV can be characterised by properties or "orientors": distinct aspects of system viability that designate important qualities of system survival and development. These orientors have been simplified and adapted within the COBRA project for practical use in engaging a range of stakeholders. In order to be viable, a system must have the ability to exist, to resist, to be flexible, to be adaptable, to have an ideal performance and to co-exist with other systems at a range of scales (Figure 1). Each orientor must therefore be composed of measurable indicators that allow assessment of system sustainability.

SV can be used as a tool for exploring community-based resource management strategies by identifying a number of indicators at community level under each orientor category, and integrating the values under distinct orientor indices in order to identify the strengths and/or weaknesses under each orientor. For example, a community might be very strong at

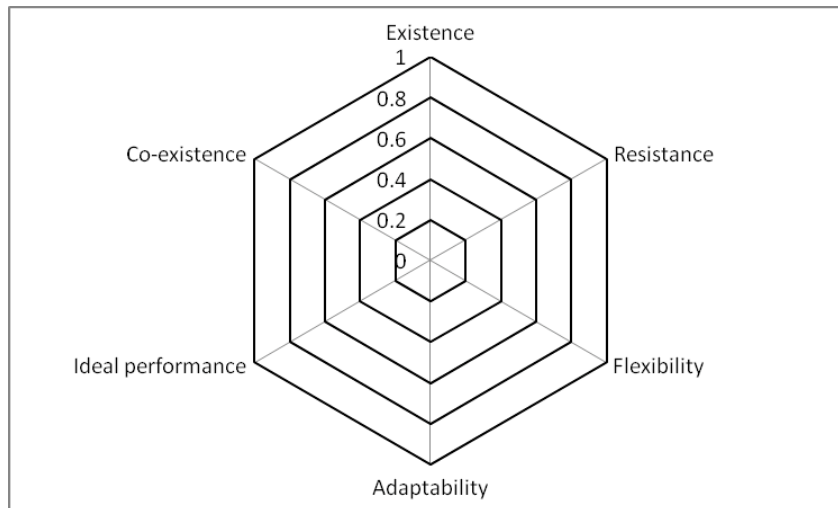
¹ Lecturer in Environmental Information Systems, The Open University, London, andrea.berardi.ou@gmail.com

² Senior Lecturer in Geography, Royal Holloway University of London, j.mistry@rhul.ac.uk

³ Post-Doct. Research Assist. in Geography, Royal Holloway University of London, celine.tschirhart@rhul.ac.uk

resisting change, but may show significant weaknesses in adapting to change. SV differs markedly from other tools for exploring community-based resource management strategies in that it recognises the tensions inherent in any action. For example, resources allocated to increase resistance, may take away resources from adaptability. The ultimate aim of the SV approach is to encourage equal attention to all orientors. Visually, this can be represented as a smooth, symmetrical "wheel" (Figure 1), as opposed to an irregular shape.

Figure 1. Star diagram to measure system viability



Ensuring the sustainability of the Guiana Shield region, South America, is of utmost importance. This region covers an area of 2.5 million square kilometres and is part of the world's largest contiguous block of tropical forest, and home to an extremely rich diversity of plants and animals. Most importantly, the region is inhabited by hundreds of thriving indigenous communities, whose knowledge and skills are indispensable for effective conservation of the region.

Within COBRA, one of the main objectives is to compile and disseminate locally owned solutions to our changing world. We aim to do this by experimenting with a novel bottom-up communication approach, taking advantage of advances in information and communication technologies and the traditional audio-visual, dynamic and non-linear way that indigenous communities see the world. "Participatory hypermedia" is a term that captures our particular approach.

Hypermedia can be defined as a system where various forms of information, including data, text, graphics, video, and audio, are linked together to create a non-linear medium of information. The advent of the Internet, digital photography/video, and now, most significantly, participative online media such as YouTube, is resulting in a visual media explosion. With these tools, the relational, circular flow of information is strengthened by the increasing participation of citizen users - from passive recipients to 'prosumers', citizens

that simultaneously produce and consume content on the Internet. A visual approach to communication takes a marked departure from the linear logic of the written form. Maps, diagrams, photographs, video and physical models, are all forms of visual communication. The strength of these techniques is that they can focus, once again, on relational logic since visualisation is dominated by sight, rather than sound, allowing us to 'take-in' more information simultaneously, with the positioning of components becoming as important as the components themselves. At the same time, open participation on the Internet is undermining the hegemony of professionals and specialists on the creation and distribution of knowledge. Increasingly accessible forms of visual communication, such as video recordings on YouTube, are also undermining the power of written forms of communication. Without imposition and manipulation, citizen participants are transforming the way we create and share information, with the potential to engender a new holistic shared memory for tackling our most urgent problems.

Our participatory hypermedia approach will first involve two indigenous communities - the Makushi in Guyana, and Tiriyo in Brazil. Having introduced the concept of SV, these communities are currently recording their solutions for surviving and developing in their environment using visual techniques of Participatory Video (PV) and Photo Stories (PS). In other words, they are collecting information on locally-owned indicators of System Viability through PV and PS. One of the major challenges for us academics, trained in a textual way of thinking, has been to explain the SV framework in highly visual ways. The key issue is to express these concepts without losing information in the textual to visual translation.

We are also keenly aware of potential limitations of our approach, including: communication problems when explaining the objective, concepts and methods of the project in a multilingual context; finding the right balance between giving as much guidance as needed *and* leaving as much freedom as possible to the communities to give their own perspectives; coping with the power issues that might be emerging from the process. In terms of dissemination, towards the end of our project, video and photostories will be presented and discussed by Makushi and Tiriyo "champions", to a selection of other communities within the Guiana Shield, in order to stimulate dialogue and engender viable practices within the Guiana Shield, and maybe further. Furthermore, the results of the COBRA research (grassroots videos/photos and scientific research) are to be blended and presented in a hypermedia database that will be available as visual material is made available by the communities (<http://projectcobra.org/>). The database aims to allow users (e.g. indigenous peoples, policy makers, citizens) to search and collate a range of text, photographic and video assets to address particular interests and/or concerns. Rather than being directed through the online experience in a linear way, there will be a range of facilities which will allow users to customise unique navigational experiences that suit their needs and may allow them to discover information which they may not have anticipated. Eventually, we are also hoping that users may be able to add their own resources to the

database, thus allowing it to evolve with the unpredictable context and advancing needs of the user community.

However, using hypermedia is not only about dissemination. In COBRA, we want to promote community-owned solutions within the Makushi and Tiriyo communities, by: (1) raising awareness on the whole range of determinants crucial to community sustainability through participatory visual methods; (2) empowerment in visual media, as essential tools to communicate with relevant stakeholders at different levels. We hope this participatory exchange of scientific and technological knowledge, and then its broad dissemination will pave the way to a more integrative, and grassroots, form of environmental and cultural conservation. By visualising the communicative process, we are placing indigenous communities in control, allowing them to use a medium that they are comfortable with, in order to publicise solutions that they own.