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## Complexity management and multi-scale governance: A case study in an Amazonian indigenous association

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## ABSTRACT

Even if Community Operational Research provides methodologies and tools to support community development, there are no published works illustrating how we can support an assessment of self-governance in an indigenous community using COR tools. In this paper we present exploratory research to provide such support to an indigenous association in the Amazon jungle. To address issues of multi-culturalism, we used a creative choice of methods, which included elements of boundary critique, the Viable System Model, rich pictures and social cartography research. We explore the possibilities that this mixed methods approach to COR offers to clarify the core dilemmas and paradoxes of self-governance for sustainability that such communities are facing. The analysis is done through VSM mapping of the community, at different levels and scales of organisation. Our analysis reveals key paradoxes and dilemmas of self-governance, which is helping them to collectively decide on action paths and their needs to (re) develop certain adaptive capabilities. In particular, we show that loss of power from traditional (spiritual) authorities, and loss of rituals and other cooperative practices have negatively affected indigenous ways of implementing life plans and respecting sustainability principles. This research contributes to COR, in presenting an innovative application of the VSM in an indigenous community, supported by expert facilitation, as the basis for reflecting on their self-governance challenges and acting upon them. It takes into account a more critical and ethnographic approach to research, capable of better dealing with the variety of a multi-cultural context.

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### 1. Introduction

Community Operational Research (COR) has regularly suggested the benefits of using OR methodologies and tools to address core issues for community development. Even if possibilities for community development are affected by community governance structures, we are unable to find any applications demonstrating the ways in which COR might support an assessment of self-governance in communities seeking sustainable development. In this paper, we present exploratory research to support ongoing efforts to improve community governance, using as an example an indigenous association of communities in the Amazon rainforest. The AGF (Amazonas GAIA Foundation) has accompanied this process for more than twenty years, strengthening the governance of these communities, with recent support from the Colombian Home Office. We seek to explain how their current challenges of inter-

organisational governance in a multi-cultural context can be further clarified through our suggested solution approach of systemic intervention.

To design and conduct our systemic intervention, we adapted the Self-Transformation methodology – originally inspired by the Viable System Model (VSM) (Espinosa & Walker, 2017), through a creative choice of methods, including elements of boundary critique, VSM – the Viability and Sustainability (V&S) Self Governance Assessment Framework – see Espinosa (2015, 2017) –, and rich pictures combined with social cartography – a technique already practiced in the umbrella (AGF) project. For this action research project, all stages involving ethnographic and systemic data collection were highly participatory and provided extremely rich data and a fruitful context for discussion among the participants. They were followed by an expert mode VSM diagnosis of the main dilemmas and paradoxes of self-governance for sustainability facing groups ranging from a small community to the regional indigenous association. We then validated this diagnosis with these communities through follow-up meetings and workshops. The results were offered back to the communities, which helped them to enhance their understanding of the different types of

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dilemmas experienced across their governance system, at different levels of embedded organisations and agents. Through the VSM mapping we identified and mapped core self-governance dilemmas, at different levels of organisation (family, community, ethnic group, ecological region), which offered them a more precise and agile context for collective decision making. As a result of effective social learning through this process, the participants have managed to identify and implement some of the most urgent changes to their governance structures. This research contributes to COR, with an innovative application of the adapted methodology in the context of an indigenous community, as the basis for reflecting on their self-governance challenges. The improved version of the Self-Transformation methodology, proved to be useful for dealing with the variety of a multi-cultural context, in this case supported by expert facilitation.

## 2. Literature review

Mingers and White's (2010) review shows that the use of systemic approaches, within OR is an incredibly healthy research field, in terms of the quantity and variety of its applications. Community Operational Research (COR) has illustrated how systemic methodologies (e.g. Soft Systems Methodology (SSM), Systems Dynamics (SD), Strategic Assumption Surface Testing (SAST), Idealised Planning (IP), among others) contribute to support communities exploring their development options, strengthening alliances for sustainable development and other issues (Bandyopadhyay & Datta, 1990; Carter, Jackson, Jackson, & Keys, 1987; Parry & Mingers, 1991; Phahlamohlakaa, & Friend, 2004; Ritchie, Taket, & Bryant, 1994; Rosenhead, & Mingers, 2001). In particular, Johnson and Smilowitz (2008), consider that one of the 'grand challenges' of operational research that COR addresses is how to develop a sustainable society (e.g. regarding food and water security). White, Smith, and Currie (2011) demonstrate that there is a considerable amount of interest in using OR in developing countries, mostly to support issues of poverty reduction and sustainability. We have shown elsewhere an increased interest in complex systems approaches to study sustainability in businesses and societies (Pauca-Caceres & Espinosa, 2011). Tihanyi, Graffin, and George (2014, p. 1535) reveal that there is also a gap in the field of governance studies, regarding research to explain the challenges that sustainability and environmental issues impose and the tensions they bring to hold on power.

In particular, COR researchers recognise the need to conduct new research on how systemic approaches may support democratic and participative decision making, and changes in the organisational structure that may enable coordination and cohesion within community organisations (Blanc & Kledal, 2012; Cleveland, Muller, Tranovich, Mazaroli, & Hinson, 2014; Midgley & Ochoa-Arias, 2004). Midgley (2011) suggests that social learning results from the interplay between competences and experiences that defines practice, and is generated through participation and reification mechanisms, where meaning is created and negotiated. Research about communities of practice (CoP) address these issues, as shown by Barab, MaKinster, and Scheckler (2003), Kling and Courtright (2003), and Hara (2009).

However, apart from few exceptions (e.g. Franco, 2013; Henao & Franco, 2016; Rubenstein, Wallis, Ison, & Godden, 2016; Franco & Montibeller, 2010; Tavella & Hjortso, 2012; Thunhurst & Ritchie, 1992; Flood, 2001; Bawden, 2005; Cuéllar-Padilla & Calle-Collado, 2011), there is still limited evidence of how participatory and facilitated approaches may enable actors to address complex and uncertain problem situations during COR interventions. We were unable to find any COR intervention aiming to enable actors to address issues of governance in communities in the Latin America region.

Within COR and systems approaches, and given one of the authors' expertise, the Viable System Model is a clear choice for studying organisational and governance structures (Beer, 1979, 1981). Beer (1983) explained how the VSM theory could inspire innovative ways to support communities and societies in developing more democratic governance structures. There are nowadays multiple VSM inspired methodologies and applications in business, governments and NGOs (see for example Espejo & Harn-den, 1989; Hoverstadt, 2008; Espejo & Reyes, 2011; Pérez-Ríos, 2012). His original proposal on using VSM to address issues of societal viability and governance, has also been further developed: Türke (2008) explains in detail how the VSM can guide governance studies and offer examples of application in rural Germany and Switzerland. Espejo (2009), Medina (2006), and Leonard (2015) reflect on Beer's Cybersyn project aiming at redesigning the governance structures in Chile. Schwaninger (2012, 2015) presents theory and application of the VSM to analyse issues of governance, with an example in a Swiss county.

We have developed the viability and sustainability framework (V&S) and a related toolkit to study issues of self-governance for sustainability (Espinosa, 2015; Espinosa & Walker, 2017). We have shown how these tools helped to enhance self-organisation in an eco-community (Espinosa & Walker, 2013); and in adapting strategy and structure of a large building enterprise (Espinosa, Reffico, Martinez, & Guzman, 2015). Tavella and Papadopoulos (2014) applied our methodology for organisational Self-Transformation within a member-driven food cooperative in Denmark, and demonstrate how the intervention helped members to tackle issues more effectively, enhance democratic and participative decision making, and support changes in the organisational structure derived from co-design that foster coordination and cohesion. A key lesson from previous applications was that intentional communities have a very strong identity and clearly engrained ecological values in their individual and group decision making and actions: this is an issue we explore further in this new research context.

In this paper we present a systemic intervention that seeks to generate a significant commitment of the indigenous communities of a critically endangered eco-region (the Amazon jungle) in their self-assessment of their current and traditional governance structures. Our systemic intervention revealed important governance dilemmas and paradoxes (Lozano, Carpenter, & Huisingsh, 2014), some of which were new to them, and they needed to find effective ways to deal treat them effectively. The accompaniment of this community-based reflection demonstrated how our intervention helped members: to jointly and quickly agree on the key dilemmas of self-governance, and on ways of addressing some of them more effectively; to collectively think and co-design changes in their governance structures and processes that foster coordination and cohesion in a relatively short period of time, having a significant impact on their community practices.

## 3. ACAIPI: self-governance system of the Pirá Paraná River communities

The work that follows involves the people and ecology of the Pirá Paraná River (PPR) in Vaupés, a remote part of the Colombian Amazon rain forest which was only contacted by modern society in 1970, and still relies heavily on traditional ways of living and governing, dating back to well before the Spanish invasion of South America starting in the 15th century – see Fig. 1. During recent decades, with the support of the AGF (Amazonas Gaia Foundation) and more recently of the Ministry of Interior, these communities developed their own system of government, through ACAIPI, an indigenous association. While ACAIPI has played a significant role for associated indigenous groups, these communities still face

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