

## Taking ‘participatory’ in participatory modelling seriously

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### **Abstract**

Over the last three decades participatory research processes have informed much international development and conservation work in developing countries. Public participation is also a growing legislative requirement in natural resource and environmental management in developed countries. So far, multiple participatory approaches have been formulated and applied in different contexts, including so-called participatory modelling methods. The latter have developed alongside a growing unease and fundamental critique of the participatory approaches and their theoretical underpinnings. One of the central themes running through the critique is the naïveté with which complexities of power relations are assumed to be understood and addressed in participatory approaches. The critique also highlights the danger that participatory approaches become legitimising instruments that simply maintain and reinforce existing power relations. In this paper we engage with the critical literature in the hope of drawing lessons and requirements for participatory modelling. We also empirically evaluate participatory modelling case studies with regard to the fundamental critique. While we do not agree with some demands from the critique that imply abandoning the whole participatory enterprise, we suggest that claims to participatory modelling be taken seriously and that each claim be accompanied by critical reflection. Based on a review of the literature we suggest initial set of questions towards developing a framework for critical reflection.

***Keywords:*** *Participation, Participatory modelling, Power relations, Critical reflection*

## 1. INTRODUCTION

Participatory approaches emerged in 1980s out of dissatisfaction with the then dominant expert-based, externally imposed and top down research, development and conservation planning approaches in developing countries. Participatory research approaches share theoretical roots in different writings that emphasise that local people can and should conduct their own inquiry and analysis in matters of importance to their often complex and diverse livelihood and environmental issues (e.g., Freire 1970, Chambers 1983; Conway 1985).

In the early 1990s Robert Chambers, a leading proponent of participatory approaches, developed and advocated for Rapid Rural Appraisal (RRA) then Participatory Rural Appraisal (PRA) which were designed to reverse roles and shift attitudes of research experts and development professionals so as to provide locals control in inquiry and development interventions. In 1994, PRA was used in around 40 countries, mostly in the developing world (Chambers 1994).

Since then there has been explosion in the numbers of techniques developed, the domains they have been employed in, and the geographical spread of their use: Participatory Learning and Action (PLA), Participatory Action Research (PAR), Participatory Learning Methods (PALM), Participatory Farming Systems Research (PFSR), and *Méthode Active de Recherche et de Planification Participative* (MARP). PLA now has a readership and application in 121 countries (PLA 2009).

What was once on the periphery, contemplated by a few fringe NGOs and academic institutions has now become modus operandi for many and a core aim of governments and international agencies. In developed countries it is now a growing legislative requirement for planning and management of natural resources (Giupponi *et al.* 2008).

In the 1990s, it was difficult to find a development project that did not in one way or another claim to adopt a ‘participatory’ approach (Williams 2004). Today it is increasingly the case that many modelling approaches in livelihood and natural resource management research projects claim to be participatory. Although established approaches such as PRA have occasionally used simple conceptual and visual modelling as part of their toolset to elicit local knowledge of issues at hand, the recent addition of an armory of so-called participatory modelling approaches - employing advanced computational techniques – has become a growing source of concern among practitioners.

As a matter of fact, there is a growing unease and fundamental critique of the participatory approaches and their theoretical underpinnings. One of the central themes running through the critique is the naïveté with which complexities of power relations are assumed to be understood and addressed in participatory approaches. The critique also highlights the danger that participatory approaches become legitimising instruments that simply maintain and reinforce existing power relations.

In this paper we engage with the critical literature in the hope of drawing lessons and requirements for participatory modelling. We also demonstrate challenges in competency requirements, meaningful inclusion and legitimacy issues from recent evaluation of participatory modelling projects. While we do not agree some of the demands by the critique that implies abandoning the whole participatory enterprise, we suggest that claims to participatory modelling be taken seriously and each claim be accompanied by critical reflection. Based on review of literature we suggest initial set of questions towards developing a framework for critical reflection.

## 2. CRITIQUE OF PARTICIPATORY INQUIRY AND INTERVENTION

Since the early 1990s, concerns have been raised about participatory research and development interventions. Many of these concerns manifested as internal criticisms leveled at technical problems and researcher practices, and often led to methodological revisions (eg. Chambers 1994; Nelson & Wright 1995; Guijt & Shah 1998). However, though few there were also criticisms edging at the fundamentals of claims of participation (eg. Ferguson 1994; Mosse 1994).

In the early years of this century, radical critique of participation caught momentum. Noting that previous few scattered but radical critiques on participatory approaches and praxis had been ignored, Cooke and Kothari and numerous other practitioners of participatory approaches who contributed to

their book: *Participation - The New Tyranny?* developed a comprehensive and fundamental case for the systemic (as opposed to mere methodological) tyrannical potential of participatory approaches: the capacity to facilitate and reinforce illegitimate and /or unjust exercise of power (Cooke & Kothari 2001: 4).

Cook and Kothari (2001) identified three interlinked potential and real tyrannies of participatory approaches in inquiry and development interventions. The first is *the tyranny of decision making*. It recognises the enduring control of decision making held by those who initiate, fund, and facilitate so called participatory research despite the rhetoric of role reversal and empowerment. According to these authors, participatory approaches are now captured by and servicing the agenda of international agencies, governments and research institutions instead of transforming them. The emphasis on attitudinal change and professional ethics has tended to depoliticise the participatory research and development agenda and led to inadequate challenge of structural power issues.

The second is *the tyranny of group*. It is linked to what Guijt and Shah (1998) named the community myth: the common treatment of local, community, and grassroots groups in participatory research and development as an undifferentiated, static and homogenous whole. This also often leads to what Agarwal (2001) aptly termed as "participatory exclusion" - capture of participatory processes by local elites, legitimising and reinforcing local power differentials. This can further effectively deny those marginalised in the locality from voicing their needs and concerns. The emphasis of participatory approaches on the local as a locus of change also overlooks how issues researched for development and resource management often have structural causes beyond the local boundaries of the community (ies) involved (Cleaver 2001).

The third is *the tyranny of method*. Cook and Kothari (2001) argue that the popular appeal of participatory approaches to funders and the uncontested received wisdom of benefits from these approaches lead to their widespread and dominant use, in several contexts crowding out other methodologies which may have been appropriate to cultural sensitivities and to promoting inclusion of the poor and marginalised.

Cook and Kothari (2001) question whether participatory approaches need to be pursued further given their actual and potential tyrannical implications. We concur with the importance and seriousness of their radical critique. However, we do not see tyranny as an inevitable consequence of the use of participatory approaches if issues of dominating values, power, knowledge and legitimising systems can be taken seriously. Below we highlight the significance of the radical criticisms in participatory modelling context using a recent evaluation study. Then we explore how Critical Systems Thinking (CST) might contribute to efforts to take the participation in participatory approaches seriously.

### **3. CRITICAL REVIEW OF 18 PARTICIPATORY MODELLING CASE-STUDIES**

In response to the lack of experiential reporting concerning participatory modelling, a wide-scale evaluation study, called the ADD-ComMod project and funded by the Agence Nationale de Recherche (France), was set up to evaluate 18 case-studies across the world (Perez *et al.*, 2009). The project, aimed to: (i) create a robust evaluation framework, then, to (ii) use this framework to evaluate individual projects, and finally to (iii) compare project implementations and outcomes with common metrics. While the different case-studies involved various participatory and modelling techniques applied in contrasted contexts, they are all based on the 'Companion Modelling' (ComMod) approach, a specific form of participatory modelling that uses models as mediating objects to assist collective learning and decision-making processes (Bousquet *et al.* 2002). Strongly entrenched in a post-normal scientific posture (Funtowicz & Ravetz 1990), a detailed theoretical rationale underlying the ComMod approach has been formalized in a collective charter (ComMod, 2004). An evaluation framework, called the Protocol of Canberra (PoC), was specifically designed for the project (Jones *et al.* 2009).

A comparative analysis of 18 individual assessment reports was carried out, involving the semantic coding of information based on the following seven categories of effects: knowledge creation (S), changing perceptions (V), assisting interactions with others (I), changing practices (P), independence of participants (A), legitimacy (L) and creating a discussion forum (E). The analysis resulted in a semantic database containing 600 comments distributed among six groups cross-referencing sources of information (participant, designer or assessor) and judgment values (favorable or unfavorable). Some outcomes from this evaluation exercise are particularly relevant when considering the three potential tyrannies mentioned above.

Two issues raised by the evaluation process relate to the *tyranny of decision-making*: (1) risk of manipulation by one (or several) participant(s) and (2) role of the designers in the participatory process. While significant, the risk of manipulation (mentioned in 44% of case-studies, regardless of the severity of the risk) isn't perceived as a major threat by most participants. The limited range of outcomes explored (44%) or procedural limitations, like excessive turn-over of participants, unclear objectives or cultural barriers (61% overall) are also at play. But these limiting factors cannot overcome the overwhelmingly positive responses from participants regarding the innovative, interactive and user-friendly methods used by ComMod projects (94% of cases). Seldom, participants perceive project designers as manipulating the outcomes of the participatory process (17% of cases)

Questions dealing with the legitimacy of the participants and of the process itself directly relate to the *tyranny of group*. The initial legitimacy of key participants in most case-studies lies in their ability to inform other participants or to manage the resource of concern (89% of cases, both). During the participatory modelling process, problems of legitimacy within the group appear to be recurring but also to be limited in severity (56% of cases). More of a concern is the overwhelming retrospective feeling that potentially key participants had been left aside of the process (94% of cases).

Finally, the *tyranny of methods* is well described by the questions regarding the independence of participants in relation with the participatory process they were subjected to. In almost all cases (94%), participants admit that methods in use were brought in by designers as exogenous instruments. Nearly the same proportion applies to the lack of self-confidence among participants to carry out continuation independently. These two negative aspects have to be analyzed cautiously, as a majority of participants' comments are largely enthusiastic about the process itself. Hence, they may have developed unrealistic expectations during the experience.

#### **4. SYSTEMS BOUNDARY CRITIQUE AS CRITICAL SOLUTION**

Like participatory approaches, systems thinking has also been subject to radical critique. These have shifted the field's paradigms and catalysed the emergence of new systems approaches (for details see eg. Midgley 2000). While there are two notable sets of radical criticisms that led to Soft Systems Thinking (SST) and CST respectively, we will focus on the latter for at least two reasons. The first reason is that many of the radical criticisms on soft and hard systems thinking that led to CST were essentially similar to those currently leveled at participatory approaches and therefore have direct relevance to this paper. The second reason is that CST provides a pluralistic platform for combining systems methodologies with critical participatory methods resonating with what is often attempted in participatory modelling.

Critical Systems Thinking (CST) arose primarily out of a critical appraisal of the inadequacies of both hard and soft systems approaches to dealing with issues of pervasive power relations that influence inquiries and interventions in a system of concern (Thomas & Lockett 1979; Mingers 1980; Jackson 1982). While hard systems thinking is altogether indifferent, soft systems thinking provides insufficient regulative or managerial response to issues of power and inequalities that are at the core of participatory approaches (e.g. Jackson 1982). CST attempts to provide a sufficient critical response to handling issues of power and inequalities. Here inequality is considered to go beyond the classical view of coercive relations between classes. It includes gender, wealth, authority, expertise, race, disabilities and generation-related inequities that often lead to the neglect of views and interests of those who have no voice in inquiries and decision making process, but who suffer their consequences.

CST was also a result of foundational work by Churchman (1970), Ulrich's (1983) and later Midgley (2000) on how to critically deal with value judgments that inevitably enter in applied systems research and interventions. They particularly problematise systems boundaries as repositories of value judgments that are often outcomes of the dynamics of power relations. Here the exercise of bounding a system is not only conceived in terms of its spatial and temporal focus but also in its normative and social (pragmatic) consequences for inclusion, exclusion and marginalisation of people, their different issues, values, expertise and ideas for alternative solutions pertinent to the system of concerns.

Ulrich (1983) has developed heuristics for boundary critique which are now applied in different research and intervention contexts where issues of exclusion and marginalization are prevalent. Example applications include in health systems (Ulrich 1983); in evaluation of services for people with disabilities (Midgley *et al.* 1998); and in community water shed management (Baker *et al.* 2004).

Ulrich’s (1983) heuristics for boundary critique contain 12 basic questions that assist to critically consider four sources of influence on any applied inquiry and intervention. These sources are (i) the motivations for (value-basis), (ii) control of (power-basis), (iii) expertise in (knowledge-basis) and (iv) legitimacy of the inquiry and intervention of interest. The questions given in table 1 are to be answered in is/ought mode. They assist critical reflection on who and whose concerns, values, knowledge and system of legitimacy are included, excluded and marginalised.

While boundary critique may be valuable in any applied research it can also significantly contribute in participatory inquires including participatory modelling given the radical critique of participatory approaches discussed above. Ideally, a claim that an inquiry/intervention is participatory is that all people who are and will be affected by the inquiry/intervention have been actively involved regardless of their values, power, expertise and argumentative skills, satisfying what Habermas (1984) calls an “an ideal communication situation”. This communication situation is an ideal participatory discourse model, where assumption can be subject to critique and all viewpoints can be heard unhindered by external contingent influences (such as power relations) and constraints originating from the structure of communication itself (such as conceptual frameworks, and complex modelling techniques and linguistic norms employed).

Habermas's participatory discourse model plays only a regulatory role by providing ideal requirements as criteria for genuine participatory process. Critical reflection using Ulrich’s boundary questions (shown in table 1) prior and during inquiry may help determine whether and to what extent that claim for genuine participation is being or can be achieved. Critical reflection after inquiry would also explicitly address the sources of influences for concerned others (but not involved in the inquiry process) to see and critique whether the claim to the inquiry being participatory was taken seriously.

**Initial Set of Questions for Critical Reflection (Source: Ulrich 2000)**

<b>The value basis of the participation:</b>
(1) Who is (ought to be) the client or beneficiary? That is, whose interests are (should be) served?
(2) What is (ought to be) the purpose?
(3) What is (ought to be) the measure of improvement or measure of success?
<b>The power basis of the participation:</b>
(4) Who is (ought to be) the decision-maker?
(5) What resources and conditions of success are (ought to be) controlled by the decision-maker?
(6) What conditions of success are (ought to be) part of the decision environment?
<b>The knowledge basis of the participation:</b>
(7) Who is (ought to be) considered as competent provider of experience & expertise?
(8) What kind expertise and knowledge counts (should count) as relevant?
(9) What or who is (ought to be) assumed to be the guarantor of success? That is, where do (should) those involved seek some guarantee that improvement will be achieved?
<b>The legitimisation basis of the participation:</b>
(10) Who is (ought to be) witness to the interests of those affected but not involved?
(11) What secures (ought to secure) the emancipation of those affected from the premises and promises of those involved? That is, where does (should) legitimacy lie?
(12) Is there any sense of self-reflection and responsibility built into the participatory modelling approaches implemented?

**5. DISCUSSION AND CONCLUSIONS**

Thus, what are the lessons we’ve learnt from these theoretical and empirical exploration of participatory modelling? We concur with the seriousness of criticism that participation is tyranny. The evaluation of 18 case-studies across the world also confirm the significance of the criticism. However, despite the seriousness and importance of their radical critique, we do not agree with Cooke and Kothari’s proposal to dump the participation praxis altogether (2001: 15). We think participatory approaches can play a more benign but still transformative role if reforms suggested by several scholars (eg. Hickey & Mohan 2004; Williams 2004; Christens & Speer 2006) are carefully considered in every practice and discourse of participation.. These reforms include a broader move for analysis of impacts of political network and social structures; a nuanced attention to stakeholder representation; and a treatments of local communities not as undifferentiated and static wholes but as dynamic political spaces of power relation. If critically applied the level of engagement and the innovative nature of

participatory modelling (ComMod approach in our case) can also contribute to overcoming the limitations and shortcomings that have been raised by participants and in the radical critique.

To prevent uncritical application and self-labelling of participatory modelling we call for a critical reflection on the fact that, in applied research, value and boundary judgments are invariably made for pragmatic or other reasons (eg. Churchman 1971; Ulrich 1983; Midgley 2000); more so when we claim a need for participatory approaches. Despite diversity of approaches, multifarious domains and contexts, the need for participatory research arises because of a universal right of people to be involved in decisions about their own destinies. Nothing can replace their capability to define and share knowledge on issues of interest, subsequent decisions and possible actions.

Finally, in participatory research there is no value-neutral position for a facilitator, modeller or designer (in the sense of being in an external place to observe the system under investigation). The only scientific and adequate way out is to engage into critical reflection to lay open the boundary judgments made and how external and internal power relations are handled. Continuous refinement, development application of tools for critical reflection are required to deal with serious and important issues raised against participatory approaches including participatory modelling.

### ACKNOWLEDGMENTS

The evaluation research of 18 participatory modelling case-studies was part of the *Agriculture et Développement Durable – Modélisation d'Accompagnement* (ADD-ComMod) project, funded by the Agence Nationale de Recherche (ANR, France).

### REFERENCES

- Agarwal, B. (2001), Participatory exclusions, community forestry, and gender: an analysis for South Asia and a conceptual framework, *World Development*, **29** (10):1623–1648.
- Baker V, Foote J, Gregor J, Houston D, Midgley G. (2004), Boundary critique and community involvement in watershed management. In *Dew K., and Fitzgerald, R. (eds): Challenging Science: Issues for New Zealand Society in the 21st Century*, Dunmore Press, Palmerston North, 88–107.
- Bousquet F., Barreteau O., D'Aquino P., Etienne M., Boissau S., Aubert S., Le page C., Babin D. and Castella J.C (2002), 'Multi-Agent Systems and Role games: Collective Learning processes for Ecosystem Management'. In *Janssen, M.A. (ed.) Complexity and Ecosystem Management: the theory and practice of multi-agent systems*. Edward Elgar Publishers: 248-285.
- Chambers, R. (1983), *Rural Development: Putting the First Last*, London: Longman.
- Chambers, R. (1994), Participatory Rural Appraisal (PRA): Analysis of Experience, *World Development*, **22** (9):1253-1268
- Christens B. & Speer P. W. (2006), Tyranny/Transformation: Power and Paradox in Participatory Development, Review Essay, *Forum Qualitative Research* 7: 2 (22) Online [URL]: <http://nbn-resolving.de/urn:nbn:de:0114-fqs0602223>
- Churchman, C W. (1971), *The Design of Inquiring Systems*, New York,: Basic Books.
- Cleaver, F. (2001), Institutions, Agency and the Limitations of Participatory Approaches to Development In *Cooke ,B & Kothari, U. (eds): Participation: The New Tyranny?* Zed Books, London.
- ComMod (2004) *ComMod: a companion modelling approach, Charter Version 1.1*, Online [URL]: <http://cormas.cirad.fr/ComMod/en/charter/content.htm>
- Conway, G. (1985), Agroecosystem Analysis, *Agricultural Administration*, **20**: 31–55
- Cooke ,B. and Kothari, U. (eds) (2001), *The Case for Participation as Tyranny*, In *Cooke ,B. and Kothari, U. (eds.): Participation: The New Tyranny?* Zed Books, London.

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Ferguson, J. (1994), *The Anti-politics Machine: 'Development', Depoliticisation, and Bureaucratic Power in Lesotho*, Minneapolis, MN: University of Minnesota Press.

Freire, P. (1970). *Pedagogy of the Oppressed*, New York: The Seabury Press

Funtowicz, S.O. and J.R. Ravetz (1990), *Uncertainty and Quality in Science for Policy* Kluwer Academic Publishers, the Netherlands.

Guijt I. and Shah M.K. (1998), *The Myth of Community: Gender Issues in Participatory Development*, London: IT Publications

Giupponi, C., Mysiak, J. and Sgobbi, A. (2008), *Participatory Modelling and Decision Support for Natural Resources Management in Climate Change Research*. Online [URL]: <http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm>

Habermas, J. (1984). *The theory of communicative action. Vol 1: Reason and rationalization of society*, Boston: Beacon Press.

Hickey, S. and Mohan, G. (2004), *Participation: from tyranny to transformation?* Zed Books, London.

Jackson, M.C. 1982, The nature of soft systems thinking: The work of Churchman, Ackoff and Checkland, *Journal of Applied Systems Analysis*, 9: 17–29.

Jones N.A., Perez P., Measham T.G., Kelly G.J., D'Aquino P., Daniell K., Dray A. and Ferrand N. (2009), Evaluating participatory modelling: Developing a framework for cross-case analysis, *Journal of Environmental Management* (submitted).

Midgley G, Munlo I, Brown M. (1998), The theory and practice of boundary critique: developing housing services for older people, *Journal of the Operational Research Society*, 49: 467–478.

Mingers, J.C. (1980), Towards an appropriate social theory for applied systems thinking: Critical theory and soft systems methodology. *Journal of Applied Systems Analysis*, 7: 41–50.

Mosse, D. (1994), Authority, gender and knowledge: theoretical reflections on the practice of participatory rural appraisal, *Development and Change*, 25:497–526.

Nelson, N & Wright, S. (eds) (1995), *Power and Participatory Development: Theory and Practice*, Intermediate Technology Publications, London.

Perez P., Aubert S., Dare W., Ducrot R., Jones N., Queste J., Treuil G., Van Paassen A., (2009). Evaluation et Suivi de la Demarche ComMod. In : Etienne M. (ed), *La modélisation d'accompagnement : une démarche participative en appui au développement durable*. Editions QUAE, Paris, France (in press).

Participatory Learning and Action (PLA) (2009), *PLA notes*, Online [URL]: <http://www.planotes.org/about.html#b>

Thomas, A. R. and Lockett, M. (1979), Marxism and systems research: Values in practical Action, In Ericson, R.F. (ed), *Improving the Human Condition*, Louisville KY.

Ulrich, W. (1983), *Critical Heuristics of Social Planning: a new approach to practical philosophy*, Haupt: John Wiley.

Ulrich, W (2000). Reflective practice in the civil society: the contribution of critically systemic thinking. *Reflective Practice*, 1, (2): 247-268.

Williams, G. (2004). Evaluating Participatory Development: tyranny, power and (re)politicisation *Third World Quarterly*, 25(3): 557-579.