

# Empowering Communities: power devolution in Community-Based Natural Resource Management

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Community-based Natural Resource Management (CBNRM) focuses on the collective management of ecosystems in a way which promotes their better government, while also improving human well-being. A central objective of CBNRM initiatives is transferring power and ownership to the communities (Shackleton, Campbell, Wollenberg, & Edmunds, 2002) to manage their own resources without permanently damaging, depleting or degrading them (Fabricius & Collins, 2007). CBNRM is considered to have numerous benefits: it promotes sustainable use of natural resources, enables communities to generate income and develop more secure livelihoods, and promotes community development and creation of local institutions (Fabricius, 2009). To achieve such benefits, CBNRM programs depend on and build upon different forms of Capital (Pretty, 1999, pp. 2–3), which interrelate at several phases of the programs (Berkes, 2004).

Despite their benefits, CBNRM initiatives often fail (Fabricius, 2004; Fabricius & Collins, 2007). In several cases, failure has been attributed to uneven distribution of the benefits, lack of empowerment, low community participation and failure to resolve conflicts (e.g. Milupi, Somers, & Ferguson, 2017). Measham and Lambasi (2013) for example, observed that the success or failure of such initiatives is linked to power devolution: communities with higher level of ownership tend to have more effective CBNRM programs. On the contrary, where there is little community involvement in planning or decision-making, where the benefits are not distributed to the community, and where there is little local ownership of the resources of the CBNRM program, people do not identify with or, in some cases, care to understand the purpose of the initiatives, and the overall development of the programs fails (Johnson, 1999; Shackleton & Campbell, 2001; Sibanda, 2004). This study intends to study power devolution, a key component of governance, distribution of benefits of natural resources, and community participation as the building block for successful CBNRM program.

**Hypothesis & Model Structure:** We identify four forms of Capital crucial for the success of CBNRM initiatives, namely *Knowledge Capital* (e.g. technical knowledge and skills, management capacity, institutions and decision-making processes); *Human Capital* (participation of community members through labour and/or management); *Physical Capital* (e.g. infrastructure, monetary funds, or other developed physical structures); and *Natural Capital* (natural resource(s) targeted by the CBNRM initiative). Of these forms of capital, some are available at some level at the initiation stage of a CBNRM project (e.g. Natural Capital), while others (e.g. Human and Knowledge capital), despite being usually available in the target communities, still need to be carefully developed and deployed. Physical Capital is not usually available at the time of the inception and thus needs to be developed over longer periods of time.

As identified above, the level of *Power Inside the Community* is a main driver for CBNRM. Power is operationalized as “control of decision-making, control of the benefits and expenditures of the CBNRM program, distribution of responsibilities, jobs and contracts, better overall status for the community, etc.” (Jones & Mosimane, 2000, p. 82) or “power to control access to resources (natural resources, human resources, information, funding)” (Rozemeijera & van der Jagt, 2000, p. 10). Lower levels of power inside the community can lead to “apathy and disillusionment” (Johnson, 1999, p. 219; see also Johnson, 1999; Shackleton & Campbell, 2001; Sibanda, 2004), or low levels of *commitment* at the communal level. Regarding the *timing* of

power transference to the community, decisions can be made according to fixed time-plans at early stages of the project, with external actors often leaving the communities before capacity has been built (Rozemeijera & van der Jagt, 2000). We explore an “adaptive transfer of power” mechanism by which the levels of the Capitals are monitored, and the time to transfer the power to the community is adapted accordingly.

To explore the devolution dynamics in CBNRM projects and the above hypothesis, we developed a System Dynamics model (a simplified version of the model is presented in Fig.1). A number of assumptions were used in the development of the simulation model, the most important being the use of a relatively long Time Horizon (100 years) and high delays in the building of the Capitals. Moreover, we have, perhaps boldly, assumed that actors will invest maximally in the building of Physical Capital, and we do not make any representation, in monetary terms, of the financial benefits of the programs (see Suppl. Material).

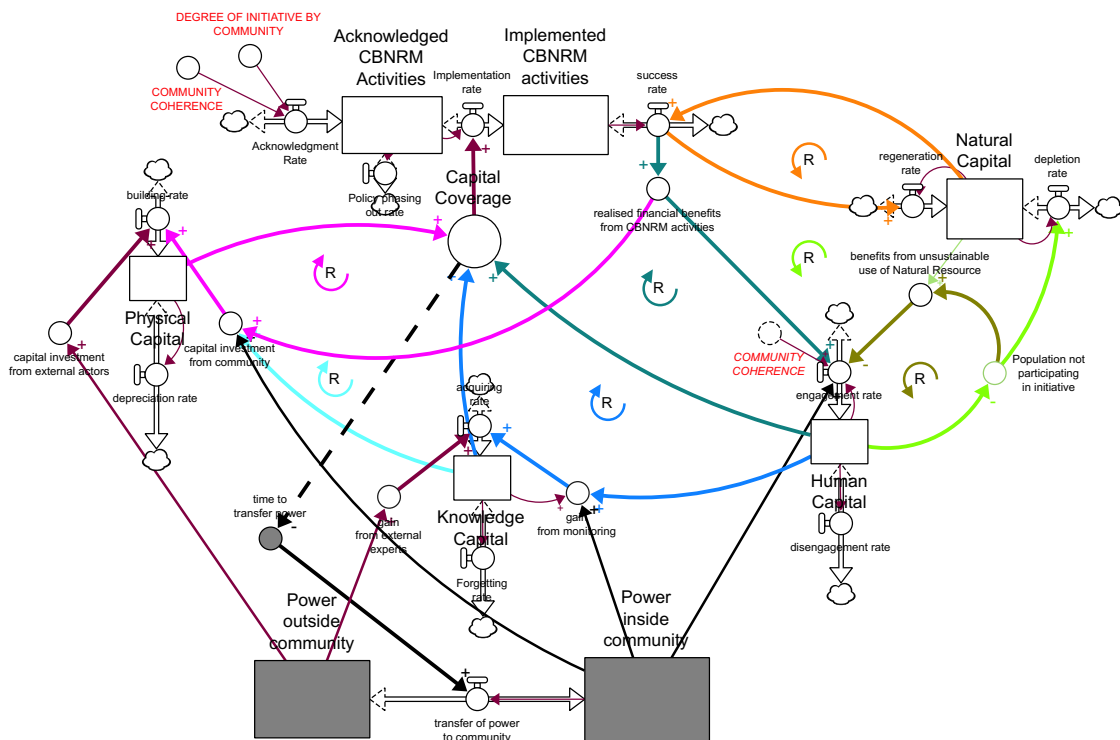


Figure 1: Simplified Stock and Flow Diagram of the develop model

**Analysis:** We will start by looking the dynamics under different decisions about the devolution of Power to the community: from a decision where the community maintains 50% of the Power over the initiative to a decision of absolute devolution, or 100% transference of Power to the community. Our results are presented in terms of the *Wellbeing Index*, in which, following Pretty’s framework (1999), we take into account the levels of all forms of Capital represented in our model (Knowledge, Physical, Human, Natural), the benefits from the initiative, as well as the level of Power Inside the Community as a measure of inclusion in and ownership of the benefits associated with the CBNRM initiative.

As we can see in figure 2, the overall Wellbeing of the community presents better at higher levels of Power devolution. The latter leads to increased participation by members of the community (Human Capital). Higher participation increases the probability of overall success of the policy, leading to more benefits for the participants, and hence even more participation next time around. Broader participation additionally decreases unsustainable use of Natural Capital and, with the additional positive effects of the initiative’s success on the natural resource(s), the latter stops being depleted at the same rate. Knowledge and Physical Capital do suffer to some extent at higher values of power inside the community due to the absence of external actors who

are able to invest more in Physical Capital and transmit Knowledge faster. However, the increases in Human Capital in combination with the higher authority (power) of the community to monitor their activities and learn from their experience, leads the Knowledge Capital to start increasing over time. Knowledge combined with the benefits acquired from the implementation of the program can be then transformed to Physical Capital. The building of these different forms of Capital lead to higher probabilities of success for CBNRM activities, which further increases the willingness of the community to participate (Human Capital).

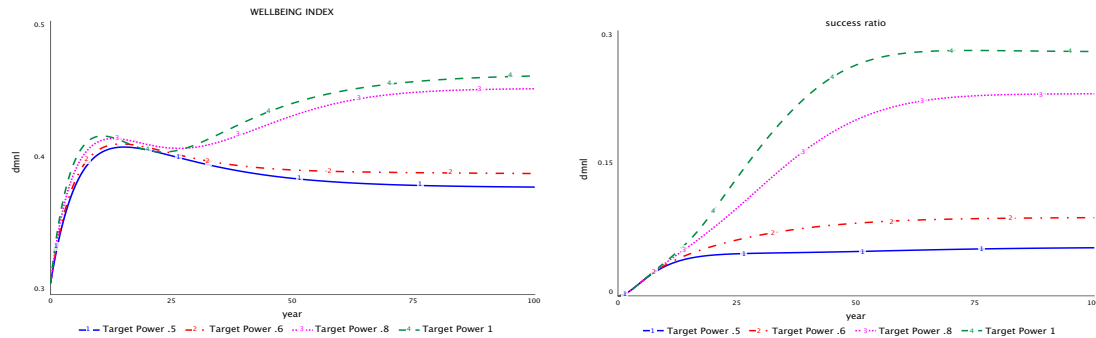


Figure 2: Wellbeing Index and Success ratio for Baseline Scenario

All communities and initiatives are, of course, not identical. We will further explore two characteristics that might influence the overall dynamics presented above, namely:

*Community Coherence:* the degree of social coherence in communities. Communities with lower levels of coherence “often take longer to reach consensus, tend to develop weak social cohesion and leadership, and may lack community spirit” (Thakadu, 2005, p. 209). Hence, a main influence of Community Coherence is on the building of Human Capital, as higher coherence can facilitate more broad local participation.

*Initiative by community:* the degree to which the CBNRM project has emerged from within the community (bottom-up). We here assume that, if the community itself acts as the initiator, there will be sufficient initial agreement among its members leading to higher engagement and higher probability of participation. However, scarcity of financial means and institutional knowledge is to be expected due to the lack of external actors’ resources.

We investigated, under different scenarios, what is the optimal level of Power to be transferred to the community and whether the mechanism of adaptive transference of that Power (through monitoring the levels of the forms of Capital) produces better overall results in the success of the CBNRM program and the Wellbeing of the community. Summarized optimal results for each of the scenarios are presented in Table 1.

Our simulation results suggest that, at communities with lower level of social Coherence, communities should optimally control a high degree of power but not an absolute one: a 100% transference of power to the community seems to not be best managed by its members when those are connected with weaker social ties or where conflicts prevail. At those with average or high level of coherence, CBNRM programs benefit from full devolution of Power to the communities.

The degree to which the communities themselves have initiated the CBNRM programs seems to be another important factor: when communities have been the main initiators, absolute devolution of Power might not work that well. Without the support of external actors, especially at the initial stages of the program, full power over the program leads to somewhat less optimal results than cooperation with external actors. Regarding the optimal timing to transfer the Power of the CBNRM initiative to the community, our analyses suggest that, when the decision is to transfer all the Power to the community, monitoring the level of Capital Coverage to decide when to give the power to the communities (adaptive transfer) leads to better results, except in cases where the community is highly coherent. In such cases, the delays involved in the adaptive mechanism actually lead to depletion of willingness and participation by community members.

Similarly, when external actors are maintaining some of the Power over the resources and benefits of the CBNRM project, the adaptive transference mechanism might not be optimal: waiting for sufficient levels of Capital to be achieved can lead to erosion of the community's willingness to be actively involved in the project.

	Low Communal Coherence	Average Communal Coherence	High Communal Coherence	
Low Initiative by community	80%	100%	90 to 100%	<i>Optimal Power to community</i>
	<i>Only at 100 % power transference</i>	YES	YES	Adaptive transfer optimal?
Average Initiative by community	80%	100%	90 to 100%	<i>Optimal Power to community</i>
	<i>Only at 100 % power transference</i>	YES	-	Adaptive transfer optimal?
High Initiative by community	80 to 90%	90%	90 to 100%	<i>Optimal Power to community</i>
	<i>Only at 100 % power transference</i>	<i>Only at 100 % power transference</i>	-	Adaptive transfer optimal?

Table 1: Optimal level of power with adaptive or non-adaptive transfer

**Discussion:** First, there are some significant limitations in our work: Communal Coherence has been used as a proxy to reflect elements of Social Capital. In further iterations of the model, Coherence needs to be endogenised and additional elements of Social Capital should be considered. Moreover, internal to the community processes of negotiation, conflict resolution as well as the development of Knowledge Capital need to be more explicitly represented. Most importantly, this study has aimed to test the dynamics of power devolution and its impacts more from a theoretical standpoint. As such, applying this study in a real-world case can pose further additional limitations both in the quantification of variables and in its structural components.

*Transferring power to the communities* is not an easy decision. However, our model was able to exhibit that communities do indeed benefit from higher levels of Power over CBNRM initiatives, mainly due to the effect of such Power in the commitment at the local level and the involvement of a larger portion of the targeted population. The *Coherence of the Community* emerged as a significant factor influencing what are the optimal levels of Power to be transferred to the communities, as well as the overall results of CBNRM. It is therefore imperative that the level of Coherence in the community in question is both carefully evaluated prior to decisions related to power transference, and that actions are taken to further build Coherence during the initiative.

That is not to say that external actors should be underestimated in CBNRM. Their presence is extremely valuable, especially at the initial stages of a program, and their expertise and resources can greatly benefit communities, particularly those that initiate CBNRM project in a bottom-up way. The *timing* when external actors withdraw from such projects is also important for their success: if Power is transferred too fast to the community, before it has managed to build capacity for such Power, this can lead an initiative to suffer due to the lack of proper Capital formation. Especially when the target levels of Power to the community are lower, it is better that external actors transfer this Power to the community faster, while at higher levels, their assistance in the building of the Capitals becomes more important. When the communities are receiving full Power over the initiative, it is beneficial that the transferring of such Power happens in an adaptive way; that is, with mechanisms that monitor the level of Capital formation before external facilitators decide to leave the community to its own resources.

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