

# Identifying and Using Human Capabilities in Institutional Analysis

© 2013 by Naveed Paydar

## **Abstract:**

This paper examines the opportunities and challenges involved in incorporating Amartya Sen's capability approach to human development into the Institutional Analysis and Development (IAD) framework. I assume that meeting sustainability goals for common-pool resources (CPRs) requires meeting at least two conditions: *efficiency* in the management of a given resource system and *equity* in the allocation of those resources. So far, the IAD framework provides little explicit attention to issues of equity. I argue for a more explicit account of equity in CPRs by examining how factors in the day-to-day operational level of analysis constrain or empower agents at the collective-choice level of analysis. This is an important, but largely ignored, feature of institutions that is aptly captured by Amartya Sen's capability approach. This paper offers a tripartite argument: in the first section, I draw on Bina Agarwal's (2010) case-study and extend her model on gender inequality in Community Forestry Institutions (CFIs) in South Asia to demonstrate what capabilities are themselves capable of doing when understood in concrete terms. In Section II, I argue for the robustness of capabilities as theoretical entities vis-à-vis CPRs. In the final section, I advance the methodological argument that Amartya Sen's capability approach could be incorporated into the IAD framework with great benefit to scholars and practitioners of CPR management.

**"Individuals live and operate in a world of institutions. Our opportunities and prospects depend crucially on what institutions exist and how they function. Not only do institutions contribute to our freedoms, their roles can be sensibly evaluated in the light of their contributions to our freedom. To see development as freedom provides a perspective in which institutional assessment can systematically occur." (Amartya Sen in *Development as Freedom* (1999), 142)**

**"These difficulties [from "the threat of ignorance"] are potentially subject to resolution when people in human societies achieve capabilities for both self-development and self-governance. Self-development can occur where there is a critical appreciation for using methods of inquiry to provide a general explanation of unfolding possibilities that are assessable and comprehensible to others...A capacity to act so as to foreclose some possibilities that are detrimental to human welfare while leaving open other possibilities that contribute to continued advances in human welfare must occur in a process that parallels that of discovery and innovation." (Vincent Ostrom in "The Foundations of Institutional Analysis and Development" (1988), 11)**

## **Introduction:**

The Institutional Analysis and Development (IAD) framework grew out of an effort to engage Garrett Hardin's thesis in "The Tragedy of the Commons" (1968), in which he argued that given that individuals are interested in immediate self returns and are free to pursue their

preferences, they are doomed to overharvest common-pool resources. Hardin's conclusion was immediately accepted by a number of scientists from diverse disciplines and was commonly adopted by policymakers to justify privatization or state ownership of common-pool resource systems.

The fundamental assumption of Hardin's thesis is that individuals interacting in the context of a common-pool resource system (i.e., a resource system for which it is costly to exclude potential beneficiaries and where the consumption of resources by one user could subtract from the amount available to other users) are presumed to be locked into a system in which the only *freedom* they are able to exercise is that of pursuing their preferences to consume, and therefore it is predicted that they will do so totally and often ruthlessly.

Starting from the 1970s and 1980s scholars investigating CPR management have come to recognize that Hardin's limited view of individual *freedom* does not apply to a number of actual CPR cases. In particular, scholars at the Workshop in Political Theory and Policy Analysis at Indiana University have developed the IAD framework with the intention that the framework "...opens the possibility that resource users could change their own rules" (Ostrom 2007). Thus, individuals operating within institutions should be understood as agents with the freedom to form and change their own rules, and thereby *not*, contrary to Hardin's claims, be doomed to environmental devastation or require rules imposed on them by extra-local authorities.

Ostrom et al. (1997) define *rules* as "prescriptions that define what actions...are *required*, *prohibited*, or *permitted*, and the sanctions authorized if the rules are not followed" (38). It should be noted that rules are distinct from *norms* in the sense that there are no formal sanctioning mechanism for non-compliance to norms. As argued below, an understanding of

both rules and norms is crucial to explaining how some institutions (and not others) are able to overcome certain CPR dilemmas.

The IAD framework distinguishes between three levels of rules operating within all social groups and political organizations ranging from the very small to global in scale: *operational-choice rules* are the rules that individuals use in daily life and affect real-world phenomena directly; *collective-choice rules* are used in making operational rules by determining who can participate, and in what capacity, in operational-level rule-making (most legislatures partake in this type of decision-making); *constitutional-choice rules* first affect collective-choice decision-making by crafting the set of rules to be used in collective-choice activities before affecting operational-choice rules (Ostrom 2007, 4). Of course, there can be *meta-constitutional-choice rules* as well (Ostrom 2005, 58), and perhaps rules go *ad infinitum*. In this paper I focus on operational-choice rules and collective-choice rules.

By focusing on operational-choice rules and collective-choice rules I hope to demonstrate a unique approach to institutional analysis for addressing equity concerns in the commons. The approach is unique in two respects: first, it deviates substantially from seminal theoretical work in “new institutional economics” and public choice, in which scholars emphasized the importance of crafting and refining constitutional-choice rules as the main level of analysis for self-government.<sup>1</sup> Second, the approach allows for more direct empirical methods of testing key hypotheses because it does not rely on moral or ethical arguments. Unlike a number of scholars of CPR management who are dissatisfied with the lack of considerations of equity in the commons literature (see, for example, Lélé and Menon’s “Critiquing the Commons: Missing the Woods for the Trees?”), I do not ground my argument in ethical or moral considerations, which

---

<sup>1</sup> See James Buchanan and Gordon Tullock (1965) *Calculus of Consent*, University of Michigan Press, and Vincent Ostrom (1974) *The Intellectual Crisis in American Public Administration*, University of Alabama Press.

would require starting somewhere at the (meta-) constitutional-choice level of analysis and arguing—top-down, as it were—to the operational- and collective-choice levels.

Instead, I argue for a more explicit account of equity in CPRs in a way that is consistent with Amartya Sen’s capability approach: I examine the factors that appear in the day-to-day operational level and assess their impact at the collective-choice level by determining to what extent operational situations constrain or empower agents in the collective-choice rule-making process. Therefore, this paper’s contribution to the IAD literature is to show how situations and rules at the operational level of analysis can affect situations and rules at the collective-choice level of analysis, which is an important, but largely ignored, feature of institutions that is aptly captured by Amartya Sen’s capability approach.

In section I of this paper I focus on operational-choice rules and collective-choice rules as they pertain to community forestry institutions (CFIs) in South Asia. I draw on Bina Agarwal’s empirical work in *Gender and Green Governance* (2010) to show how women can affect rule-making at the collective-choice level simply by empowering themselves through circumstances that occur largely at the operational level or are the outcome of operational-choice rule-making.

In Section II, I show how the concrete conditions that enabled “effective participation” of women in CFIs in Agarwal’s case-study could be understood more abstractly in terms of Amartya Sen’s notion of capabilities. Capabilities are understood as specific conditions that enhance actors’ freedoms to do or be what they themselves value. I also introduce a number of other cases in the CPR literature where the concept of capability seems to be playing an important role for the equity or efficiency outcomes of CPR management.

In Section III, I advance the methodological argument that there should be a more explicit focus of issues of equity within the IAD framework. I suggest Amartya Sen’s capability

approach to human development as one means of doing this. I ground my argument in considerations of *external validity*. I argue that incorporating some notion of capabilities as an additional parameter or variable in the IAD framework will increase external validity when we attempt to implement certain institutional designs especially in the developing world. My aim in this section is to stimulate discussion regarding the values and challenges of incorporating the capability approach into the IAD framework and how this can most profitably be done.

### **Section I. Agarwal's case-study: *effective participation* and the silent strength in numbers**

Bina Agarwal (2010) addresses heterogeneity of community-based institutions involved in common-pool resource management. She asks whether and to what extent intra-group heterogeneity with regard to gender (and to a lesser extent socio-economic class) affects the formation of forest use rules and, consequently, how well sustainability goals are achieved. She demonstrates that the gender composition of groups can affect the formation of rules in complex ways depending on the motivations, capabilities, and resources of individual women, among other things (14).

Agarwal examines community forestry institutions (CFIs) for the management of forest resources in South Asia. Such institutions emerged under the Joint Forest Management (JFM) program that launched in India in 1990. According to Agarwal, there are currently more than 84,000 CFIs in India involving 8.4 million households and 22.4 percent of India's forest land (11). Almost all CFIs in India have a two-tier organizational structure: a general body (GB) consisting of members drawn from the whole village and an executive committee (EC) consisting of nine to fifteen members.

The EC meets every month and acts as the core decision-making body of CFIs: they define rules for forest use and benefit sharing, penalties for rule violation, and methods of protection and monitoring (Agarwal 11). Of course, EC members can be in conflict over forest use rules depending on their holding capacities and priorities.

Therefore, it seems that *who* participates in rule-making, and their *capabilities* of participating effectively, would make a substantial difference to the forest use rules that are ultimately decided upon. Women's effective participation in ECs is especially important in India as women are the primary users of forest resources (firewood), however women face persistent challenges to voicing the rules that are actually instituted.

Two factors have contributed to women's increased presence in local governance in South Asia during the last century or so, albeit with limited success: first, the spread of the idea that women should be part of public decision-making, initially in the late nineteenth and early twentieth centuries and especially in the 1980s-1990s. Second, the shifts in thinking and activism which led to the idea of decentralization and participatory local governance (Agarwal 2010, 63; also see Ostrom 1990 for instances of successful local institutions managing common-pool resources). Although these conditions went a long way in facilitating women's inclusion in local government, they do not by themselves guarantee such inclusion. As in the case of India's CFIs, there are still substantial barriers to women's full inclusion.

Agarwal argues that while these developments did indeed contribute to women's *nominal participation* in institutions of local governance, it is less clear how women's *effective participation* in such institutions has been affected. She notes that women's roles in institutions of forest management are substantially constrained "by being embedded in social norms and contexts where traditional village councils, and long-standing lines of gendered authority,

continue to hold sway” (63). Due to the often restrictive rules and norms of CFIs, Agarwal notes, women’s mere presence at meetings does not seem to be sufficient to ensure effective participation. “A person’s ability to be effective in a public forum requires *both* presence and having a voice, and the former does not guarantee the latter” (172).

The central question I address in this section is whether women in CFIs are likely to participate more effectively, by attending meetings and speaking up at them, if there are more women members in the EC. I leave the question of whether increased women’s participation in CFIs leads to better sustainability outcomes for another discussion. I examine Agarwal’s notion of ‘effective participation’ as a human *capability* that can be measured and explained by its relation to other variables related to individual and community attributes in CFIs.

Agarwal conducts an empirical study to examine whether greater presence of women in the EC leads to more effective participation of women. She identifies three dimensions of ‘effective participation’: attendance at EC meetings, speaking up at the meetings, and holding office. She also identifies a ‘critical-mass effect’, in virtue of which it could be argued that there is a threshold presence that helps women move from being nominal to effective participants in crafting forest use rules.<sup>2</sup>

I focus on Agarwal’s analysis of CFIs in Gujarat, because the trends in women’s effective participation in this region appear to be representative of most CFIs in India and, unlike in Nepal where women in CFIs seem to be less socially constrained, there are relatively few Gujarat women in leadership positions or holding office of any kind in CFIs. I highlight the relationship between Gujarat women’s attendance at EC meetings and the frequency of their speaking up at

---

<sup>2</sup> Agarwal controls for the eventuality that increasing women’s numbers in the group increases the mathematical probability of each woman attending meetings even if the likelihood of each woman attending is *independent* of every other woman’s likelihood of attending. Agarwal tests the female attendance rate’s *dependence* on the percentage of women in the EC through OLS regression (189).

those meetings. Below I outline the results of Agarwal's regression analysis and qualitative data, which suggest that a substantial female presence could make a difference for women's effective participation in ECs.

Agarwal's dependent variable is *effective participation*. In specific instances 'effective participation' is defined as the attendance rate of women; in other instances in her study it is defined as speaking up; in each case, however, it is clearly noted which meaning she takes for effective participation. Table 5.5 in the appendix contains a list of all the explanatory variables Agarwal uses to explain the level of effective participation in each CFI. Among the explanatory variables, Agarwal is especially interested in the gender composition of ECs—how this impacts women's effective participation—which will likewise be our main concern here.

Agarwal found that the EC's gender composition has a significant positive effect on female attendance—this is the result that is to be expected: the more women there are in the EC the lower the percentage of meetings with no women. As shown in Table 5.6 (appendix), the percentage of EC meetings with no women attending is significantly less if ECs have  $\geq 25$ - $< 33$  per cent women (or  $\geq 33$  per cent women) than if they have  $< 25$  per cent women. Agarwal argues that this provides a strong case for having more women on the EC, if we are interested in ensuring at least *some* female presence at each meeting (200).

Agarwal also identifies a potential threshold effect for female attendance rate and gender composition. She found that the average attendance rate for EC women per meeting among ECs with  $\geq 25$ - $< 33$  per cent women is significantly higher by .35 relative to ECs with  $< 25$  per cent women, and significantly higher by .28 relative to ECs with  $\geq 33$  per cent women (Table 5.6). Agarwal offers no hypothesis for why there is a dropping off beyond 33 per cent—she only notes that it may be due to there being dramatically fewer CFIs with more than 33 per cent EC women

with gender information on attendance (201). Agarwal identifies a similar threshold effect for average female attendance in her regression results for CFIs in Nepal, where there is more data on attendance rates in CFIs with  $\geq 33$  per cent women (203). Agarwal's potential threshold effect strengthens the popular policy argument of a number of gender-progressive NGOs (which they have largely accepted without empirical verification) suggesting to have at least one-quarter to one-third women in decision-making bodies (214).

Agarwal's qualitative evidence from focus group discussions and surveys supports the regression results above. One village woman said, "If more women attend, if the tradition in the village changes then we can go to EC meetings regularly," and another village woman similarly noted, "It will help to have more women. It is also important that women attend meetings, because if women do not attend men will take all the decisions" (Agarwal 202).

On speaking up at meetings, Agarwal found that the greater the percentage of women in the EC the more likely that some or most women will speak up. Specifically, she found in CFIs in Gujarat that the probability of women speaking up at meetings is 5 per cent higher for every 1 percentage point increase in women on the EC (Table 5.8). Table 5.8 also indicates that the probability of at least some women speaking up is 48 per cent greater among ECs with  $\geq 33$  per cent women compared to ECs with  $< 25$  per cent women and also significantly greater relative to ECs with  $\geq 25$ - $< 33$  per cent women (205 and table 5.8).

Agarwal reports that in interviews and questionnaires EC women themselves have consistently said—78 per cent of the CFIs in Gujarat—that the presence of other women "helps them greatly in voicing their views, because of the encouragement, support, and self-confidence this provides" (206). One village woman at the Panchmua CFI in Gujarat noted, "It helps to have more women because then women will not be dominated or feel shy. After all, if there is only

one woman and ten men, how will she speak? Women need each other to be able to speak up” (Agarwal 206-207). Moreover, when women were asked whether their speaking up had changed any EC decisions 17 per cent on average said that it had; remarkably the percentage was twice as high among ECs with more than two women than in ECs with less than two women (21 per cent relative to 10 percent)—again, suggesting the silent strength of numbers (191).

As a follow-up exercise to her study, Agarwal and her field staff attended seventeen EC meetings in as many different sample villages in Gujarat. Agarwal reports that their direct observations at the meetings reinforced many of the conclusions noted above from her regression analysis—it appeared that where there were several women in the EC, at least some turn up for meetings, and where many women turn up for meetings they tend to be more vocal (213).

Agarwal also found that the gender-sensitivity of male leaders in the EC often makes a crucial difference to women’s effective participation, as in one case Agarwal observed in which because the CFI president supported a female EC member’s suggestion—where to put a water trough that would cater to two hamlets—it was accepted by the majority of the EC (213). Agarwal notes, “Although such gender-sensitive male presidents are rare, over time, as women’s presence in CFI decision-making becomes more commonplace, negative male attitudes and social norms are also likely to change, as observed for women pradhans. Here again women’s greater numbers in ECs can help” (213).

## **Section II. Identifying human capabilities in Agarwal’s case and other CPR cases**

Agarwal’s case, outlined above, demonstrates how rule-making at the collective-choice level of analysis can be influenced by measureable factors that constrain and empower individual

women at the operational level. Agarwal found that a greater presence of women at EC meetings plays a critical role in increasing women's effective participation at those meetings.

Women in CFIs encounter a number of gender-specific constraints, such as restrictive social norms that limit women's effective participation by reducing their attendance at meetings and thereby making them less vocal. Below, I set out how we can view effective participation in terms of human capabilities. I also cite alternative CPR cases in which human capabilities seem to play a crucial role. In the process I hope to make clear why identifying human capabilities is important for institutional analysis.

Sen's capability approach operates at two levels: the level of states that are realized, which is measured by functioning, and the level of potential or feasible states, which is measured by capabilities (Kuklys 2005). Capabilities express the alternative combinations of things a person is able to do or be—the various 'functionings' he or she can achieve—and from these combinations the person is free to choose one collection (Sen 1993). Clearly, the person is not free to choose a functioning that he or she is not capable of achieving.

Thus the notion of freedom plays an integral part in Sen's theory. The relevant type of freedom with regard to human capabilities is what Sen calls 'agency-freedom'. He defines 'agency-freedom' as that which "the person is free to do and achieve in pursuit of whatever goals or values he or she regards as important" (Sen 1985: 203). Sen also notes, "The freedom to lead different types of life is reflected in the person's capability set. The capability of a person depends on a variety of factors, including personal characteristics and social arrangements" (Sen 1993: 33).

It is evident that some parts of Agarwal's *Gender and Green Governance* (2010) are an extension of arguments she had previously made in her book *A Field of One's Own* (1994), in

which she draws on Amartya Sen's (1981) entitlement approach to famine. The entitlement approach is the view that what matters for access to food is not aggregate food supply (there could be plenty of food in some area and still have famine), but people's entitlements to food, that is, people's capability to command food. In Agarwal's (1994), such capabilities depended on ownership endowments, access to land and labor, access to forest and common food resources, among other things (Agarwal 1994, 61-62). Similarly, it should be stressed that what matters for effective participation at the collective-choice level of CFIs in India is not only the mere *right* to participate—which is framed at the constitutional-choice level of institutions—but also people's *capabilities* to do so—which are determined in large part by the various opportunities and constraints individuals face at the day-to-day operational-choice level of institutions.

Agarwal (2010) asks a compelling question with regard to Indian women's capabilities of achieving effective participation in CFIs: "How much 'agency-freedom' do women have to act in their own interest or in the interlinked interests of forest management" (48)? The answer to this question depends on the interaction of a number of factors—one of which (gender composition of ECs), as we have seen, does appear to have a significant effect on women's capability to participate effectively in collective-choice situations by affecting their ability to exercise agency-freedom.

It is notable that the most important constraints to EC women's effective participation in collective-choice decision-making that Agarwal (2010) considers—e.g., a limited number of female EC members attending meetings—are not imposed from above, from the level of constitutional-choice rules, nor do they appear to come from the collective-choice level itself, because there is substantial evidence that women's effective participation in collective-choice situations tends to increase as a result of increased female presence at meetings.

If such constraints to effective participation do not arise from the constitutional-choice or collective-choice levels of decision-making, where do such constraints come from? Agarwal answers, “Where membership is not an obstacle, social norms can still circumscribe [the effective participation of] women in various ways” (178). Thus, examining the notion of effective participation from a capability point of view entails identifying the individual characteristics and social arrangements that facilitate or constrain an individual’s agency-freedom to achieve effective participation.

According to Agarwal, women’s capabilities to achieve effective participation in community forestry institutions in India depend in great measure on how they respond to restrictive social norms. Agarwal notes that gendered social norms, whether internalized by women or imposed by threat of gossip, reprimand, or violence, restrict women in male-dominated CFIs in myriad ways, placing strictures on their visibility, mobility, and voice (182). Such gendered behavioral norms also create subtle hierarchies, such as requiring women to sit on the floor or on one side or at the back of meeting spaces, and, when senior family males are present, women hesitate in attending meetings, speaking up at them, or opposing the men publicly—“The hierarchy that marks ‘respectful’ family behaviour thus carries over into community spaces” (Agarwal 182).

In alternative CPR cases, effective participation may not be the most valuable functioning, as it appears to be in Agarwal’s case. Therefore, in such cases, the capability sets are interested in identifying would likely turn out to be quite differently. It is important to note that even in alternative CPR cases where effective participation *is* in fact the most valuable functioning, the relevant capabilities might nevertheless be quite different, i.e., individuals may not be constrained by social norms at all, but perhaps by poverty or ecological factors that

prevent them for participating effectively. This aspect highlights the highly context-specific nature of capabilities.<sup>3</sup>

In Agarwal's case, I highlighted women's presence at meetings as a capability for effective participation, however there are additional gender-related variables that may play a part in women's capability to participate effectively. Agarwal found that women's effective participation also depends in some measure on whether EC women are literate—illiteracy tends to reduce women's self-confidence in speaking up and negatively affects men's attitudes toward women who do speak up; women's economic status—surprisingly, women from landless households attend and speak up more at meetings because they are less constrained by social norms and status considerations; the prevalence of problems of special concern for women, such as firewood shortages; whether NGOs or the forest department have played a part in the formation or functioning of the CFI—because such organizations tend to infuse less conservative attitudes than those traditionally prevalent in the community; higher male outmigration, which can increase women's domestic work burden and thus increase their time constraint and so adversely affect their ability to attend to community service; similarly, age is also a significant indicator—older women are typically relieved from tasks at home by daughters-in-law and are thus able to attend EC meetings more frequently (197-199). Any of these variables can potentially be analyzed from the perspective of the capability approach.

Jentoft et al. (2010) demonstrate how small-scale fishers on the coast of the Bay of Bengal in Bangladesh and Lake Victoria in Tanzania "...become victims of social and institutional forces, which are difficult to change from the bottom-up because they require the

---

<sup>3</sup> Capabilities are defined derivatively from functionings. "Capability is thus defined in the *space* of functionings. If a functioning achievement (in the form of an *n*-tuple of functionings) is a *point* in that space, capability is a *set* of such points (representing the alternative functioning *n*-tuples from which one *n*-tuple can be chosen)" (Sen 1993: 38).

sort of entitlements and capabilities that small-scale fishers typically do not have” (361). Due to their lack of necessary entitlements and capabilities, and their lack of resources to pursue alternative sources of livelihood, they argue, fishers in both instances tend to overharvest and thus deprive themselves collectively of the resources.

Jentoft et al. argue that rather than defining the tragedy of the commons as a market failure—where “freedom in a commons brings ruin to all” (Hardin 1968)—this tragedy should be seen as an entitlement and a capability failure (361). Contrary to Hardin, they note, Sen’s concepts lead to a governance approach that intends to enhance the freedom of small-scale fishers rather than to limit it (346).

Jentoft et al. show that the capability failure of small-scale fishers in both Bangladesh and Tanzania is the result of asymmetrical exchange relations with money lenders (359). In both instances, fishers lack access to the formal credit market (i.e., banks) due to lack of collateral assets, such as land; therefore, the fishers rely on informal lending transactions in which the contract (often verbal) binds the fisher to the lender to sell all the fish he catches to the lender at the price the lender determines (350).

The small-scale fishers’ agency-freedom is thus constrained with regard to their relationship to the money lenders. Furthermore, it is likely that small-scale fishers’ are so constrained with regard to many of their social relationships as a result of their poverty. Sen argues, “[P]overty essentially involves relationships to things, to people and to institutions that limit their action space, deny them of basic entitlements, and block them from developing and employing their individual and collective capabilities” (Jentoft et al. 359).

A desirable functioning for such small-scale fishers could be to have fair conditions for loan agreements or to sell their fish at a price that is reasonably close to market value. Their

capability of achieving such functionings is determined in large part by their relationship to other individuals and institutions, which is constrained due to their poverty. Jentoft et al. show how fishers' poverty in Bangladesh and Tanzania results in degradation of the resource system due to restricting their agency-freedom to associate in productive institutions. Thus efficiency—not just equity—appears to be an important aspect of the capability approach. In the following section I outline the opportunities and challenges involved in merging the capability approach with the IAD framework.

### **Section III. Using human capabilities in institutional analysis**

The methodological implication of the claim that operational situations and rules can affect collective-choice situations and rules is to develop tools that can be used to analyze such relationships that lead to parsimonious or concise theory building. The capability approach to human development offers this analytic perspective, which can usefully be applied to institutions to understand the efficiency and equity consequences of common-pool resource management.

The potential benefits of the capability approach to issues of equity in CPRs is relatively straight-forward given the sustained scholarly and policy discourse on the capability approach by the international community in recent years, for example, in the United Nations Human Development Index (United Nations Development Report 2011). Its potential benefits to efficiency in CPR management, however, are less obvious.

The most immediate efficiency issue for which the capability approach appears to contribute to CPRs is with regard to external validity. External validity refers to the validity of generalized inferences from particular (or a set of) situations to alternative situations about which one has less knowledge or familiarity. With regard to CPRs, external validity is important

whenever we want to extend claims (say, about configurations of variables that tend to facilitate particular conservation or sustainability goals) from one social-ecological context to another.

I suggest that one more parameter or variable (reference to human capabilities) could make a big difference to external validity. The motivation behind this suggestion is intuitive: when scholars or policy-makers recommend a certain institutional arrangement that has proven to be successful for a given forest conservation goal, say in Norway, it is important that they take into account human capabilities—perhaps with respect to levels of trust and reciprocity and social norms—if the forest system to which they wish to apply a similar institutional arrangement is in the Democratic Republic of Congo. (Incidentally, Norway appears at the top of the list of the Human Development Index, whereas the Congo is last.) This is of course an extreme example; however, as I have demonstrated in reference to Agarwal's case-study, there are cases in which a more nuanced approach to human development and institutional analysis can be achieved via the capability approach.

There are a number of challenges, however, to incorporate the capability approach into the IAD framework. The most obvious of which is exactly where to fit it in. Another important question is how to connect capabilities to other methods commonly used by CPR scholars such as agent-based modeling within action situations. The IAD framework is a multi-disciplinary and multi-method framework that identifies concepts and structures them in relation to other relevant concepts. Concepts are included in the IAD framework in so far as scholars and practitioners of CPR management widely think that they are useful for understanding how sustainability is achieved by institutions involved in CPR management.

## **Conclusion:**

As a number of scholars of the commons have observed, Garret Hardin's (1968) formulation of "The Tragedy of the Commons" presupposes a very limited conception of individual freedom. A key component of the IAD framework is that it assumes that individuals have the freedom to form and change rules within institutions at three levels of governance: the operational-choice, the collective-choice, and the constitutional-choice levels.

However, how do we account for cases in which the relevant rules seem to be in place at the constitutional-choice level (for example, CFIs that allow women to participate in framing forest use rules) but we observe unexpected results at the collective-choice level (for example, village women in India who want to participate in framing forest use rules but fail to do so by not attending meetings or not speaking up at them)? Given that the apparent failure at the collective-choice level does not stem from the constitutional-choice level, it makes little sense to try to address it or remedy it from that level.

In this paper I have expanded the discussion of individual freedom with regard to institutions governing CPRs by engaging Amartya Sen's capability approach. I argued that the capability approach, which derives from Sen's notion of agency-freedom, is a useful tool for analyzing the relationship between operational-choice situations and collective-choice situations.

In reference to Agarwal's case-study, I showed how women's *functionings* (effective participation) in CFIs was mediated in large part by their agency-freedom and particular capability set. I identified one capability of women participating effectively, which we understood in terms of the impact that increased women's presence on EC committees has on both increased attendance and speaking up at meetings. There are doubtless many other capabilities that would empower women and thus lead to the same functioning, since effective

participation is general enough *functioning* to be plausibly achieved in a number of ways. One of the important lessons from Agarwal's case-study is that scholars are not limited to explain what goes on at the collective-choice level of decision-making by appealing to *only* what occurs at the constitutional-choice level of decision-making.

In my discussion of other CPR cases, I argued that the capability approach is useful not just for consideration of equity, but for efficiency outcomes as well. In the last section I addressed the problem of external validity as another important motivation for incorporating Sen's capability approach into the IAD framework. Operationalized and included in the IAD framework as a potential variable or parameter, capabilities can only improve the problem of external validity.

## Works Cited

- Agarwal, Bina. 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge, UK: Cambridge University Press.
- Agarwal, Bina. 2010. *Gender and Green Governance: The Political Economy of Women's Presence Within and Beyond Community Forestry*. Oxford, UK: Oxford University Press.
- Agarwal, Bina, Jane Humphries and Ingrid Robeyns (eds). 2005. *Amartya Sen's Work and Ideas: A Gender Perspective*. London, UK: Routledge.
- Baviskar, Amita (ed). 2008. *Contested Grounds: Essays on Nature, Culture, and Power*. Oxford, UK: Oxford University Press.
- Buchanan, James and Gordon Tullock. 1965. Ann Arbor, Michigan: University of Michigan Press.
- Esquith, Stephen and Fred Gifford (eds). 2010. *Capabilities, Power, and Institutions: Toward a More Critical Development Ethics*. University Park, Pennsylvania: Pennsylvania State University Press.
- Jentoft, Svein et al. 2010. "Freedom and Poverty in the Fishery Commons". *International Journal of the Commons*. Vol. 4, No 1.
- Kuklys, Wiebke. 2005. *Amartya Sen's Capability Approach: Theoretical Insights and Empirical Applications*. Berlin, Germany: Springer.
- Lélé, Sharachchandra and Ajit Menon. 2003. "Critiquing the Commons: Missing the Woods for the Trees?" *The Common Property Resource Digest*. No. 64.
- Nussbaum, Martha. 2000. *Women and Human Development: The Capabilities Approach*. Cambridge, UK: Cambridge University Press.
- Nussbaum, Martha. 2011. *Creating Capabilities: The Human Development Approach*. Cambridge, Mass: Harvard University Press.
- Nussbaum, Martha and Jonathan Glover (eds). 1995. *Women, Culture, and Development: A Study of Human Capabilities*. Oxford, UK: Oxford University Press.
- Ostrom, Elinor. 2007. "Engaging Impossibilities and Possibilities". *Arguments for a Better World*. 2009. New York: Oxford University Press.
- Ostrom, Elinor. 2005. *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.

- Ostrom, Elinor, Amy Poteete and Marco Janssen. 2010. *Working Together: Collective Action, the Commons, and Multiple Methods in Practice*. Princeton, NJ: Princeton University Press.
- Ostrom, Elinor, Larry Schroeder and Susan Wynne. 1993. *Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspective*. Boulder, Colorado: Westview Press.
- Ostrom, Vincent. 1988. "Foundations of Institutional Analysis and Development". Workshop in Political Theory and Policy Analysis. Bloomington, Indiana.
- Ostrom, Vincent. 1973. *The Intellectual Crisis in American Public Administration*. Tuscaloosa, Alabama: University of Alabama Press.
- Sen, Amartya. 1999. *Development as Freedom*. Oxford, UK: Oxford University Press.
- Sen, Amartya and Martha Nussbaum (eds). 1993. *The Quality of Life*. Oxford, UK: Oxford University Press.
- United Nations. 2011. Human Development Index. *Human Development Reports*. Accessed at <http://hdr.undp.org/en/statistics/>. Accessed on Dec. 6, 2011.

## Appendix

Table 5.5. Participation: list of explanatory variables

### Explanatory variables included in the regressions

<b>Gujarat</b>	<b>Nepal</b>
<b>EC characteristics</b>	<b>EC characteristics</b>
Gender composition of the EC	Gender composition of the EC
Percentage EC women from landless household	Average age of EC members
Average land owned by all EC members	80% single caste: $\geq 80\%$ EC members are from one caste
Percentage illiterate female EC members	Percentage illiterate female EC members
	Gender gap in illiteracy
	Number of EC members
<b>CFI characteristics</b>	<b>CFI characteristics</b>
Who initiated the CFI?	Who made forest use rules?
CFI formation period (before and after 1995)	CFI formation period (before and after 1996)
Forest protection method	
<b>Village characteristics</b>	<b>Location characteristics<sup>a</sup></b>
Gini coefficient for land owned by villagers	Number of toles to which CFI members belong
Percentage village households with migrant males	Percentage member households with migrant males
District where CFI is located	District where the CFI is located
<b>Special interest characteristics</b>	<b>Special interest characteristics</b>
Firewood shortages faced by majority of village households	Firewood shortages faced by majority of member households
	<b>Individual characteristics of EC members</b>
	Literacy, age, land owned, marital status, caste, prior experience of serving on the EC

*Note:* <sup>a</sup> As noted in Chapter 4, for Gujarat we have village-level characteristics since each CFI is linked with a specific village, but in Nepal there is no clear set of ‘village characteristics’, since a CFI can cater to people from several toles. Hence, for Nepal, I have used ‘location characteristics’ instead.

Table 5.6. Gujarat: factors affecting women's attendance in EC meetings (mixed-gender CFIs)

	Dependent variables	
	Percentage meetings with no EC women	Female attendance rate <sup>a</sup>
Equation no.	1	2
Statistical method	OLS (r)	OLS (r)
No. of observations	32	32
$R^2$	0.64	0.62
<b>Explanatory variables</b>	<b>Coef.</b>	<b>Coef.</b>
GenComp4: dummy ( $\geq 25$ – $< 33\%$ EC women = 1) <sup>b</sup>	–35.96***	0.35***
	(0.004)	(0.001)
GenComp5: dummy ( $\geq 33\%$ EC women=1) <sup>b</sup>	–20.00†	0.07
	(0.102)	(0.512)
Average land owned by all EC members (ha)	–21.88**	0.24***
	(0.015)	(0.000)
% EC women from landless households	–0.12	0.003*
	(0.413)	(0.052)
Who initiated the CFI: dummy (villagers =1)	31.73***	–0.21**
	(0.003)	(0.017)
CFI formation period: dummy (post-1995=1)	–19.73*	0.09
	(0.076)	(0.370)
Gini coefficient for land owned by villagers	150.82**	–1.09**
	(0.025)	(0.033)
% village households with migrant males	0.46	–0.004*
	(0.109)	(0.052)
Constant	7.66	0.55

Notes: (a) Average proportion of EC women per meeting.

(b) Reference category GenComp3: Dummy ( $< 25\%$  EC women=1).

OLS (r) = OLS regressions with robust standard errors.

Numbers in parenthesis are  $p$ -values. Significance: \*\*\* at 1%,

(\*\*) at 5%,

(\*) at 10%, † at close to 10%.

The difference between the coefficients of GenComp4 and GenComp5 (the gender composition intervals  $\geq 25$ – $< 33\%$  and  $\geq 33\%$ ) is not significant even at 10% in Eqn. 1, but it is significant in Eqn. 2 at 5%.

Table 5.8. Gujarat: factors affecting women speaking up in EC meetings (mixed-gender CFIs)

Equation no.	Dependent variable: Do women speak up in EC meetings: dummy <sup>a</sup>			
	1		2	
Statistical method	Logit		Logit	
No. of observations	34		35	
Pseudo $R^2$	0.54		0.38	
<b>Explanatory variables</b>	<b>Coef.</b>	<b>ME</b>	<b>Coef.</b>	<b>ME</b>
GenComp2: % EC women	0.35** (0.016)	0.05** (0.013)		
GenComp4: dummy ( $\geq 25$ – $< 33\%$ EC women = 1) <sup>b</sup>			–0.99 (0.398)	–0.21 (0.430)
GenComp5: dummy ( $\geq 33\%$ EC women=1) <sup>b</sup>			4.03 (0.172)	0.48*** (0.007)
% EC women from landless households	0.06** (0.020)	0.01** (0.033)	0.05 (0.151)	0.01* (0.094)
% illiterate EC women	0.006 (0.785)	0.001 (0.786)	0.01 (0.522)	0.002 (0.527)
Protection method: dummy (guard=1; patrol or informal lookout=0)	5.27** (0.030)	0.59*** (0.001)	2.75** (0.037)	0.42** (0.010)
District2: dummy (Panchmahals=1)	–5.31** (0.037)	–0.77*** (0.001)	–5.04 (0.128)	–0.81*** (0.002)
District3: dummy (Sabarkantha=1)	–5.08* (0.076)	–0.82*** (0.001)	–1.94 (0.303)	–0.40 (0.288)
Firewood shortage: dummy (if most have shortages = 1)	3.45* (0.086)	0.67** (0.022)		
Constant	–10.42		0.19	

Notes: (a) If some or most women spoke up in any one of the last 3 EC meetings = 1; if none spoke up = 0.

(b) Reference category is GenComp3: dummy ( $< 25\%$  EC women).

The marginal effect (ME) is for a discrete change from 0 to 1 for dummy variables, and for a one unit change for continuous variables.

Numbers in parenthesis are  $p$ -values. Significance: \*\*\*at 1%,

(\*\*) at 5%,

(\*) at 10%

In Eqn. 2, the difference between the coefficients of GenComp4 and GenComp5 (the gender composition intervals  $\geq 25$ – $< 33\%$  and  $\geq 33\%$ ) is significant at the 10% level.

#### *Difference in models*

In Eqn. 1, gender composition is a continuous variable. In Eqn. 2 gender composition is constituted into interval dummies; also firewood shortage was not included in Eqn. 2 due to ‘hidden collinearity’ (see n. 25 in the text on what ‘hidden collinearity’ implies).