Co-creating Water Commons: Civics, Environmentality, and "Power With"

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Abstract: In Andhra Pradesh, Rajasthan, and other parts of India, the Foundation for Ecological Security is working with communities to develop better institutions for managing surface and groundwater. Sketch mapping, participatory hydrological monitoring, experimental games, crop-water budgeting, watershed conservation, and other activities develop shared knowledge of water resources, as citizens consider and carry out improvements. Habitations, containing dozens to hundreds of households, organize to work together, based on universal membership, within nested contexts of larger landscapes and social networks. From a practitioner's perspective, this paper explores ways of facilitating the co-creation of citizenship in water commons.

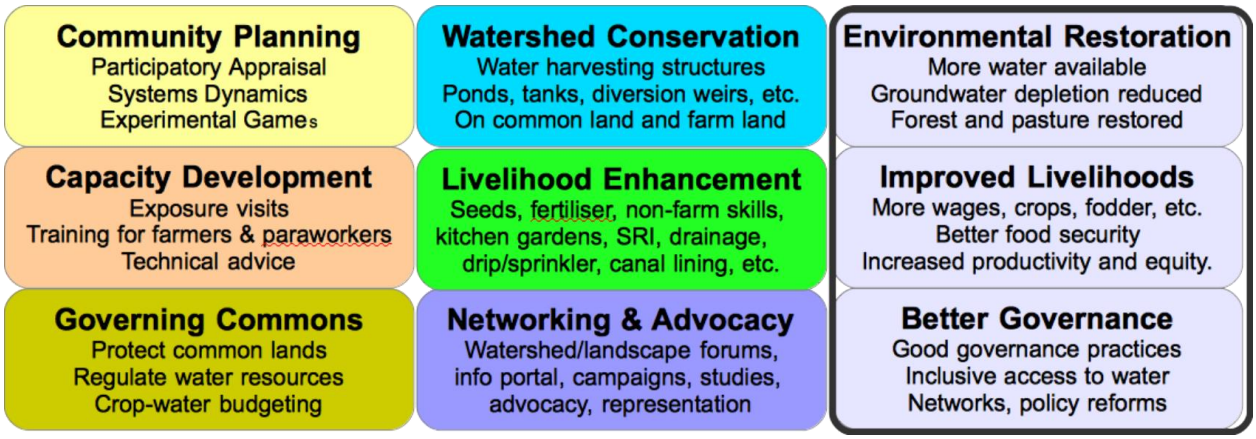
Introduction

For poor and marginalized people in communities of rural Rajasthan, Andhra Pradesh, and other Indian states where the Foundation for Ecological Security works, better access to water can play a crucial role in securing and improving livelihoods. Decentralization under the Panchayat Raj Act and funding for watershed conservation under the National Rural Employment Guarantee Act (NREGA) have created opportunities for stronger local roles in managing small scale water resources. However, organizations and activities to put this into practice are often not well-developed, leaving water vulnerable to depletion, capture, and exclusion. In particular, while tubewells and pumps can make groundwater more profitable for farming, and are seeing increasing use, they also increase the risk of inequitable, inefficient, and unsustainable resource use. Previous projects have offered lessons about ways to restore watersheds, manage groundwater demand, and expand equitable access to agricultural water, approaches that can be incorporated in current efforts.

This paper discusses how the program on Water Commons: Influencing Practice and Policy supports communities in improving water management in rural communities. Figure 1 provides an overview of program activities and outcomes, which are discussed in more detail later in the paper. The program is being implemented by the Foundation for Ecological Security (FES) and partner organizations, with support from Hindustan Unilever Foundation (HUF) and the National Agricultural Bank for Rural Development (NABARD). Activities are proceeding in the states of Rajasthan, Andhra Pradesh, Karnataka, Madhya Pradesh, and Maharashtra, in eight different districts. The program has begun work in over three hundred rural habitations, and will expand to over seven hundred. Activities are mainly located in more remote upper watershed areas, mostly inhabited by poorer, socially marginalized people, including those categorized as Scheduled Caste, Other Backward Caste, and Tribal. Therefore, the program is engaging with challenges of working at scale and with ecological and social diversity. The paper is based on observations as a practitioner advising on program implementation, including information from a learning

workshop held in December 2014 that reviewed experience since the program began in April 2013.

Figure 1. Water Commons Activities and Results



The paper is concerned with citizenship as a process of co-creation, where people take part in planning and carrying out changes in their lives (Boyte et al. 2014). Water commons, such as tanks (ponds and small reservoirs) and groundwater aquifers, are examples of common pool resources, where one person's use subtracts from the amount of water available to others and for which it can be hard to restrict access. So people using water are interdependent, and may face social dilemmas, where individual incentives conflict with better outcomes feasible if they could cooperate. Institutions for collective action can enable people to work together in governing commons, to protect and improve shared resources (E. Ostrom 1990). This paper looks at how a systematic process, aimed at building equitable participation among all water users, can promote changes in perceptions, values, organization, and action, creating citizenship in water commons.

While there are many examples of collective action for small scale irrigation systems and other surface water systems (E. Ostrom 1992), groundwater governance is a more difficult challenge, for which examples of successful governance are still relatively rare (Blomquist 1992; Shah 2009). Groundwater is an invisible commons, harder to observe and aquifers are often poorly understood. Monitoring and management are more difficult when water is withdrawn from many wells dispersed across a landscape. Rapid expansion in the use of tubewells and motorized pumps creates different opportunities and problems than manually lifting water from shallow wells or diverting surface streams. When extraction exceeds recharge, aquifers are depleted, wells may go dry, or users be forced to seek water from deeper down at higher costs. Government regulation, typically framed in terms of attempts at requiring licenses for wells, is usually ineffective in controlling withdrawal.

However, there are some traditional examples of effective collective action in groundwater governance (Steenbergen and Shah 2003). The Water Commons program seeks to learn from an innovative earlier project in Andhra Pradesh (Pahuja 2009; Verma et al. 2012; Das and Burke 2013), as well as earlier work by FES focused on protection and restoration of land commons, forest and grazing land.

The first section of the paper looks at ways of seeing commons, influencing how people co-create commons through their perceptions and values about shared water resources, including a range of activities that help people better understand resources and their interconnections. The second section discusses the development of water governance at the habitation level, intended to equitably and democratically include all those concerned with water. The third section describes how people create power by working together: to claim commons, build water harvesting structures, restore common lands, replenish aquifers, and productively balance water supply and demand.

Environmentality: Seeing and Valuing Commons

The co-creation of water commons can be facilitated by changes in environmentality (Agrawal 2005), in how people perceive in their environment and the values they attach to it. Perceptions and values may change as people pay attention to problems, discuss, learn, and engage in attempt to make changes.

A major concern of the program is to help people better understand water as a commons, a shared resource where one person's use affects others, which people can work together to protect and improve. Groundwater is an "invisible" resource, which is often poorly understood and hard to observe. In many cases, people lack a clear understanding of how rainfall recharges aquifers and how groundwater flows underneath landscapes. People may think of water in "their" well as a private resource, focusing on the water on and under their land, ignoring or not understanding how their water use affects others, and how they are affected by others' use of land and water.

The village planning process used by FES includes the development of resource maps and other participatory rapid appraisal (PRA) techniques (FES 2010). For the Water Commons program, making sketch maps of wells is a valuable tool for examining water availability and use. Participatory aquifer sketch maps can show not just the location of wells, but many other features such as depth, size, public or private ownership, whether there is water year round, water quality, when wells were dug or drilled, and whether they have been deepened. Sketch mapping offers a way to quickly combine knowledge from many people in the community. This can create a synthesis that incorporates knowledge from many sources, while bringing people together to better analyze and understand the water they share.

With a map that shows information on many wells, it becomes easier to see patterns, such as how wells may cluster along particular alignments, areas with and without access to wells for irrigation, and well location in relation to recharge sources. Transect walks (walk-throughs) encourage people to go out together to observe and discuss conditions in the field, another way to create shared knowledge and understanding, including dialogue about problems and potential solutions. Such activities can help people observe and consider how water moves through the landscape, how it affects them, and how they might want to change things.

The Mahatma Ghandi National Rural Employment Generation Act (MNREGA) provides substantial funding for watershed conservation works in rural communities. This is primarily intended to provide earnings for poor villagers, as a social safety net that is supposed to guarantee at least 100 days of employment per person each year. The Water Commons program is working to improve the planning and implementation of water harvesting structures funded through MNREGA, enhancing impacts in terms of greater water storage capacity. This includes support for participatory resource assessment, planning of specific works, community organization, and training of community members and officials involved in implementation. In

some districts, FES works as a Project Implementing Agency, with an opportunity to work directly to improve the quality of implementation, while in others it provides support, for planning and by training NREGA "mates" who supervise the work done in the field. Collective action for watershed conservation offers a way for households and communities to have an impact on water commons, to feel a sense of efficacy, not just being passive recipients or observers but actively working to improve water commons.

Some works are built on common land, creating and enhancing common property. Even where works are built on the land of individual farmers, there is the opportunity during planning to negotiate to ensure that additional people, not just landowners, can benefit from improved water supplies, a way to create more equitable, pro-poor benefits. As in other commons such as grazing land, governance in water commons often functions through a mix of property institutions, including common property, private rights, and a government regulatory framework.

An interesting earlier project, the Andhra Pradesh Farmer-Managed Groundwater Systems Project (APFAMGS) emphasized Participatory Hydrological Monitoring (PHM), collection of local information about rainfall and well water levels by village volunteers (Pahuja 2009; Das and Burke 2013). This information was made available through tables and charts painted on the walls of village buildings, as well as through public meetings. While it would have been possible to simply provide secondary data, locally-gathered information was considered more credible and relevant for making decisions, in contrast to secondary data from rainfall measurement stations or monitoring wells located farther away and recorded by others. There are important questions about the sustainability of APFAMGS activities (Verma et al. 2012)and about the pathways through which change may occur (Bruns 2014a; Bruns 2014b). APFAMGS does offer innovative ideas about ways to have an impact through an approach that emphasizes information and voluntary coordination, in contrast to the typical, and ineffective, presumption that water governance must be imposed through licensing to control well digging and water withdrawal. In the coming year, the Water Commons program will try to do more to support community level monitoring of rainfall and well water levels, including through manual rain gauges and measurement of open wells. Measurement of water levels in tubewells has turned out to be more difficult, since it can require installing extra pipes, but is being done in some cases.

A core activity developed by APFAMGS was crop-water budgeting (CWB). Information on rainfall and the percentage of rainfall infiltrating into the ground was used to estimate the amount of water available for use in the forthcoming dry (Rabi) season. Farmers were asked about what crops they planned to grow, which could then be used to estimate water demand. The balance between demand and supply could be displayed on a series of posters, compared, and discussed as part of local meetings. While such estimates are relatively crude and simplify aquifer hydrogeology that is often complex and poorly understood, crop-budgeting has proved useful for stimulating local discussion about problems and opportunities in balancing water demand and supply, in a way that leads to significant changes in farmers crop choices and water consumption.

APFAMGS took a somewhat unique approach to improving groundwater governance, in that it relied on a voluntary, information-based process for influencing decisions about water, rather than trying to establish or impose regulations. Surprisingly, the voluntary approach resulted in substantial shifts in cropping patterns, typically from rice to tomatoes or other crops that would consume less water. Such changes had the potential to reduce risks and increase incomes for farmers, creating a win-win situation in terms of reducing water consumption and increasing benefits for farmers. In 2014, the Water Commons program began crop-water budgeting in an

initial set of communities, which will be expanded further, with consideration and adjustment in relation to local conditions such as return flows in aquifers and availability of alternative crops.

In contrast to attempts to install flow meters and measure or control groundwater extraction, crop-water budgeting shifts attention to the choice of crop, which can be a reasonable proxy for water consumption, and is much easier to understand and monitor. Under some conditions, a coordinated shift to water-saving crops can create a solution that enables all those involved to be better off, as long as they feel assured that others will also cooperate, so that a voluntary, shared strategy may be capable of providing significant benefits (Bruns 2014b). In other cases, communities may also choose to make rules to prohibit certain crops, or only allow them in years of abundant rainfall, adaptively adjusting to changing water availability. Experience from earlier projects also illustrates ways communities can take steps to promote sharing of water from existing wells and construction of new wells and expand access to more people in the community (Reddy, Reddy, and Rout 2014), and these are also being suggested and considered during community planning.

As part of comparative international research, FES has cooperated in carrying out experimental games involving small groups of villagers, simulating the use of a shared aquifer (Meinzen-Dick et al. 2014). Typically, this involves a choice between two crops, one of which provides more profits and consumes more water. If everyone chooses the thirsty crop, the aquifer will be quickly depleted, and those who choose the thirsty crop get more benefits, a simple model of a tragedy of the commons (Hardin 1968; Hardin 1998). The situation poses a challenge, whether people can cooperate to achieve a more sustainable and equitable use of water. Playing the game, followed by discussion, gives an experiential approach through which villagers can learn about some of the challenges involved in managing a shared resource. This game is now being tried out more widely as part of implementation in program villages, as one of several tools for developing awareness and stimulating consideration of options for water management.

The approach applied by FES is not just a matter of directly implementing specific activities to change water management, but instead starts from a foundation of participatory appraisal and planning, which can help create shared understandings and values concerning the current situation, priorities, and options from improving water management. The process stimulates not only learning about natural processes, such as surface and subsurface water flows, but also questions about who gets access to water, and how current use may reduce water available in the future, evoking questions about values related to equity and sustainability. This can be seen as a process of changing environmentality, a change in culture, in perceptions and values, as well as changes in organization and action.

Citizenship: Inclusive Habitation-level Governance

During the 1990s, much of FES' work focused on developing Tree Growers' Cooperative Societies. Analysis of this experience led to a conclusion that organizing around user groups can result in excluding potential participants, particularly those who are poorer and socially marginalized (FES 2004). On the other hand, local government at the Panchayat scale is much larger than rural settlements, and so is usually too large a scale for organizing management of resources that are primarily used by much smaller sets of people. The government-determined boundaries of "revenue villages" often incorporate multiple settlements, and frequently do not fit well with the social networks that link people. Thus there appears to be a gap in governance, a lack of organization at the scale of the settlements where people live, have their everyday face-

to-face interactions, and with whom they share resources such as land and water. In response to this, and based on lessons from earlier experience, the Water Commons Program focuses on an inclusive approach to organizing at the habitation level. This is done within the context of also developing a wider network of social connections across landscapes of ridges and valleys containing shared forests, pastures, and stream networks, as well as administrative jurisdictions of Panchayats and blocks. While the scale of organization depends on settlement patterns and other local conditions, typically a Village Institution may cover one or several habitations with a total of hundreds of households, though some Village Institutions may only include dozens of households.

The planning process discussed above is intended to create a Village Perspective Plan, and a habitation-level organization, establishing a governance organization at a suitable scale. In English, this usually referred to as a Village Institution. In contrast to projects that seek to formalize an existing informal group of users, this is deliberately designed to create a more inclusive body that involves all relevant stakeholders, including those who use water for domestic use, livestock grazing, and other activities, not just irrigation. The goal is to have an organization able to govern commons, such as shared pasture or forest, as well as water bodies such as tanks and aquifers. Development of governance occurs through a series of meetings that involve developing common understandings, norms, agreements, and rules that may be recorded in by-laws for the organization. Unlike water user groups or forest user groups, this organization is not tied to a specific sector or agency, but instead is intended to be able to work on a range of issues, including but not limited to shared land and water.

For FES, universal membership is a key principle for promoting social justice. Earlier projects sometimes focused only on those who chose to join a cooperative society. It turned out that this tended to exclude non-members, including those, often poorer and socially marginalized, who relied on common land for collecting fuelwood and non-timber forest products, and grazing, including small ruminants: sheep and goats. The organization should include everyone in the community, not just farmers or landowners. In particular this means including women, poor people, landless, and members of scheduled castes and tribes. Earlier projects showed the risks of having a management board dominated by village elites, without wider accountability. There is a need to allow everyone a voice in decisions, and the opportunity to share in implementation and benefits. So now major decisions are brought before a village assembly of all eligible adults, the Gram Sabha. Enabling a more democratic process to happen usually requires being pro-active about inclusion, since otherwise there are many tendencies that risk leaving people out due to gender, poverty, caste, and related issues, such as lack of literacy, being less assertive about speaking, and being preoccupied with daily subsistence. At a practical level this requires paying attention to things such as who is informed about and invited to meetings, reaching out and persuading people to try attending, holding meetings at times and places that are convenient, encouraging people to voice their views, promoting representation of all stakeholders among leaders, and finding ways to equitably share benefits.

Habitation organizations are linked to wider-scale Panchayat institutions, particularly the assembly and council. Legally, Panchayats have authority to govern ponds, tanks, some small irrigation schemes, and other small-scale water resources within their jurisdiction. Thus, Panchayats can reinforce local authority to govern water commons. Panchayats play a central role in planning and implementing watershed conservation works under MNREGA.

In some areas where FES has already been working, people from habitations in a wider area have already convened to discuss common issues at a "landscape" level, for example where many communities share use of the same land for grazing livestock and collecting forest products. The Water Commons program is working with these existing networks, as well as bringing together habitations located in the same sub-basins.

While the program focuses on organizing at the habitation level, some water bodies are primarily used by much smaller groups of people. In such cases, smaller user groups may also be an appropriate scale to organize. Rather than separate or completely independent user groups, this can be done within the context of a wider habitation-scale organization, which can thereby help to protect broader interests. The goal is not to always avoid organizing special-purpose user groups, but to have such groups nested within a larger organization, and prevent having the water resource captured exclusively by a narrow group.

The program takes a "nested" or polycentric approach to organization at multiple scales. The program starts from working directly in specific communities, but also seeks to promote consideration of policy changes that can improve larger scale water commons, including linkages between those living in upstream catchment areas and downstream water users. Organization, analysis, and problem-solving at the community level can help identify ways in which government action favors or impedes success in managing water commons. Cross-scale linkages improve communications between communities and with government agencies at multiple levels, providing opportunities to discuss shared problems, and potential solutions. This may include upstream-downstream conflicts concerning water quantity, or quality. As the program proceeds, more attention will be directed at broader basin scale issues of water management and policies. The polycentric approach provides a way of addressing problems and opportunities that exist at multiple scales, rather than relying only on a single type of organization and scale.

At times, FES may help to directly analyze issues and propose changes. More important are the opportunities for communities to advocate for their own interests. This may include topics such as becoming more aware of and better able to apply policies that legitimize and strengthen local management of commons, such as in using the authority over small scale water resources created by the Panchayat Raj Act. Earlier work on land commons helped communities to use legal options for obtaining greater rights over pasture and forest lands, including pushing agencies to practice the policies already enacted. Similarly, communities can pursue the rights they are supposed to have to employment under MNREGA, including adequate funding, timely planning and implementation, and proper administration of works and budgets. Much of this work concerns not sweeping "stroke of the pen" policy reforms (Korten and Siy 1988), but instead the slower, day-by-day struggle by community organizations, at multiple scales, to put into practice policies that already exist on paper.

Power With: Working on Shared Water

Power includes not only "power over" to command, compel, and impose; but also "power to," capabilities to act; and the co-creation of "power with" by which people can work together to make themselves better off (V. Ostrom 1986; Boyte et al. 2014). News, policy debates, and even many studies tend to focus primarily on power in the sense of centralized authority, imposing top-down rules, an assumption that solving societal problems is primarily a matter of government decisions and actions. However, the ineffectiveness of government regulation of wells is just one of many illustrations of the limitations of "power over," problems of command-

and-control solutions which are typically recommended for managing groundwater. For a common pool resource such as water, each person alone has only a small impact on water use, and so has little capability, little "power to" make a difference acting on their own. However, in dealing with a water commons as a shared resource, people can work together, collectively creating "power with" sufficient to make meaningful changes.

In FES' earlier work, many communities enacted and enforced rules to protect common land and promote ecosystem restoration, for example through prohibiting fires and halting grazing until trees grow tall enough to tolerate grazing. This has included making rules, monitoring, and, when necessary, enforcing fines and other penalties against violators. Such enforcement can draw support from community norms and customs. Experience has shown that it may also be supported by local police and Panchayats, and that this may happen even without requiring explicit legal authorization for such local regulation. This is not simply or always a matter of voluntary cooperation, but also forms of coercion. There is both the soft power of perception and persuasion, as well as the hard power of penalties and punishment, applied in ways that are seen as legitimate and acceptable by community members. So, power with may be combined with or reinforced by power over.

Communities can claim commons by acting to manage and regulate their use. This may involve asserting existing claims, or making new ones. In earlier activities supported by FES, many communities have claimed common lands, which had formally come under the jurisdiction of government agencies or had been encroached by private individuals. This claiming may occur in the context of local customs and norms, and may or may not be backed by formal government authority. For forest land (which in practice is often used for grazing) a variety of mechanisms are available through which communities may be able to gain authority for governance, depending on whether the land is under the jurisdiction of the Forest Department or the Revenue Department. Such claiming of commons may involve struggling to obtain agency recognition and cooperation, or to reassert community control over land that has been taken by private individuals.

In the case of water, there is less experience and fewer legal and administrative mechanisms available for claiming commons. However, as mentioned above, Panchayats are supposed to have authority to manage local resources. Panchayats may reinforce habitations by legally recognizing and empowering habitation-level management organizations. Implicitly, plans for watershed conservation works on non-private land assume the power to make changes, and so constitute a way of asserting local authority to govern commons.

Water harvesting structures, funded through MNREGA and other sources, help to retain rainfall, storing it above ground, or in the soil and aquifers. Collective action creates shared infrastructure, and shared water. Examples include digging farm ponds, excavating trenches, constructing small check dams and diversion dams, and improving tank embankments and outlets to increase storage. Thus, collective action constitutes a form of "power with" through which people can transform their environment.

Water harvesting structures can have a significant impact on aquifers. Hard-rock aquifers, which underlie many but not all of the project areas, have relatively little storage capacity compared to alluvial aquifers along rivers. However, somewhat paradoxically, limited storage capacity seems to mean that people may be better able to see the impact of action to recharge hard-rock aquifers, and so more motivated to change their behavior to work on recharging

groundwater (Shah 2009). This can transform perceptions and actions, so that rather than being helpless, people can see their power to change their environment, gaining a sense of efficacy.

Activities such as planning watershed conservation works offer an opportunity to expand access beyond those who happen to live nearby, or those on whose private land works are built. Rather than leaving benefits to be easily captured and others excluded, specific arrangements can be negotiated. Another example of expanding access and avoiding exclusion is when a rule is agreed forbidding pumping for irrigation once water reaches a designated level, reserving the remaining water for livestock. So, "power with" may involve negotiation of multiple interests, crafting coalitions and compromises that encompass a broad group of water users.

Coordination in considering and adjusting cropping patterns to fit available water supplies is another example of how people gain power through cooperation in a commons. This may include voluntary sharing of information that allows coordinating strategies, choices that are more effective, and more attractive, when there is assurance that enough others will also cooperate. This may involve building consensus about what crops should or should not be grown in the dry season. Alternatively, there may be specific rules, with sanctions, that prohibit particular crops, completely or only allow them under certain conditions, such as when rainfall has been abundant. Coordinated strategies, norms, and rules are all mechanisms for collective action, for acting more effectively through cooperation (E. Ostrom 2005; Bruns 2014b).

Cooperation creates "power with." This may happen on its own in a voluntary way, as in coordinating strategies for crop choices. "Power with" may also be backed by norms, and associated social pressures, or by rules with enforceable sanctions. Legislation may provide an enabling framework. Organization at the local level expands the range of options, the capabilities available. Power takes many forms, and co-creation of water commons depends on the "power with" created by cooperation.

Conclusions: Co-creating Water Commons

This paper shows how a range of activities can support communities in co-creating water commons, developing inclusive governance of shared waters that increases access to benefits and adaptively balancing water demand and supply. Activities such as making sketch maps of wells, monitoring rainfall, and planning to build water harvesting structures can help reshape how people look at their environment, and the values they associate with it. In particular, they can help people to understand water as a shared resource, one which needs and can benefit from cooperation. Discussion and action as a community can create an inclusive organization that facilitates cooperation, people with shared ideas, and agreements, about water as a commons. In contrast to a narrow focus on a user group, the concepts of universal membership and inclusive democratic decision-making provide a way of promoting a commons whose governance is broadly shared among stakeholders as citizens of water commons. Water commons are created, protected, maintained, and improved through specific actions on the ground. This includes asserting and gaining recognition of claims, making improvements such as building water harvesting structures, and coordinating collective action about how commons are used, co-creating "power with" through cooperation.

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