

Community Capitals: Poverty Reduction and Rural Development in Dry Areas

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Abstract: The lack of water in communities in arid lands is often related to the mal-distribution or absence of other resources. In the past, many communities responded to scarce resources by transhumance, building on cultural capital and social capital to produce sustainable livelihoods. But lack of political capital has reduced the options of transhumant communities. As they settle, new pressures are put on natural capital, beginning a downward spiral of other community resources. Successful efforts to reduce poverty in arid lands invest in many capitals in order to reverse the spiral. Attention to bridging and bonding social capital as an entry to poverty reduction is often more successful than built capital to provide bore holes or wells. Attention to cultural, human, social, and political, as well as natural, financial and built, is required for sustainable development in arid lands.

Key words: Sustainable, livelihood, community resources, poverty reduction, rural development.

All communities have resources. These resources can be consumed, hoarded, or invested. When resources are invested to create new resources over the long term, they are termed “capital”. Communities are poor when the stocks of various capitals are low. Capital flows can sometimes decrease poverty. However, often such flows are only palliative and do not lead to system change. When the external flow of resources is halted for whatever reason, the original state of poverty returns, often with the most disadvantaged even worse off.

Vital, dynamic communities invest their resources, creating an upward spiral of strong capitals. By maintaining balanced investments and being mindful of all the capitals, communities acting collectively can create public goods that allow individual

citizens to increase their well-being and quality of life.

How can communities located in arid zones reduce poverty? Flora *et al.* (2004) identify seven forms of capital that communities must identify and transform for sustainable development: natural, cultural, human, social, political, financial, and built. **Figure 1** shows these capitals and how they overlap. Natural, cultural and human capitals can be seen as the basic resources that can be transformed into social, political and financial and built capitals. Lack of investment in the first three can retard formation of the last four. All capitals have associated risks that can be mitigated by other capitals.

Many economically focused poverty reduction and rural development “success stories” have taken place in agriculturally

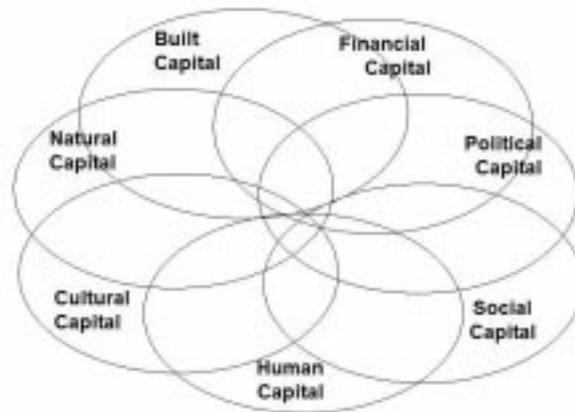


Fig. 1. Community capitals and poverty reduction.

“favorable” areas, where rainfall is adequate or irrigation readily available (Heisey and Edmeades, 1999). This paper seeks to address development in areas where natural capital, specifically water and arable land, is highly limited and how other capitals can be used in complex to compensate. We don’t seek to take an exclusive stance by using classifications such as “arid” or “semi-arid,” using more inclusive terms such as “water-limited” or “dry areas” instead. We address poverty as a community issue, and seek place-based, rather than solely individual solutions. Placed-based solutions to poverty involve turning individual situations of exclusion into community-based mechanisms for inclusion. We believe understanding and engaging all the capitals form the base for poverty reduction.

Poverty is complex and cannot be qualified in equal terms across cultural contexts. Community limitation of any of the capitals can be part of poverty; and poverty can manifest at the individual level in all the capitals. However, exclusion from

one capital may not mean exclusion from all. In conversations with Native Americans about poverty, we have often been cautioned not to mistake lack of financial capital for true poverty. They stress the importance of spirituality, which we put as part of cultural capital, as the real measure of wealth. Lack of financial capital is just one culturally located conception of poverty. Even in a material sense, all of the other capitals are capable of producing wealth (Brody, 1981; Netting, 1968).

Effective management and distribution of freshwater, natural capital, is increasingly fundamental to any poverty reduction or development initiative. Freshwater is a finite resource. Population rise and poor resource management are making water utilization and distribution a pressing issue in an increasing number of areas. There was a six-fold increase in global freshwater consumptions between 1900 and 1995. If present trends continue, by 2025, about two-thirds of the world will live in a “water-stressed” region – where consumption

exceeds supply by 10% (United Nations Environment Program, 2002).

Community solutions are all amenable to policy interventions, as well as shifts in capital allocation by market and civil society actors. Policies to reduce poverty can influence access to or control of any of the capitals. The World Bank definition of reducing poverty includes expanding opportunity, empowerment, and security (World Bank, 2001). These concepts help us broaden our conception of poverty and understand better how a capitals framework helps discover the kind of policies that can lead to poverty reduction, not just poverty alleviation. Of course, just as each type of capital can serve as an entryway to decrease poverty, each can be concentrated in just a few hands and thus increase poverty. As with the World Bank conceptualization, to be successful requires that state, market and civil society institutions are all engaged.

Privileging any single capital over the others can result in their degradation and decreased general well being. Thus poverty reduction cannot be focused solely on increasing GDP (financial capital), but must pay attention to the other capitals as well. “It is difficult, if not impossible, to reach the ‘promised land’ of mutual reinforcement between growth and human development from an asymmetric position favoring growth as a temporal priority” (Ranis, 2005).

This paper is divided into seven sections and a conclusion. Each section analyzes one of the capitals and its relation to poverty

reduction and rural development in dry areas.

Community Capital Analysis

Natural capital

Natural capital is the only capital that is not created by humans, and thus is the most difficult to manage. Natural capital includes the environment – water, soil, altitude, latitude, climate, slope and other locational configurations that cannot be changed¹. Together, the environment and natural resources make up the base around which humans live. Other capitals have evolved, in part, to control the risks associated with natural capital. For example: Community control structures (political capital) regulating a village well or *Qanat*; or the creation of a dam (built capital) for an irrigation system; or putting in terraces to turn hills (built capital) or rangeland into cropland. Most contemporary attempts to mitigate natural risk focus on altering natural resources by using technology, built capital, to turn natural capital into other capitals, often with unanticipated consequences. Technological schemes that aim solely to enlarge financial capital can heighten inequality and community risk.

Assessing natural capital can be quite difficult, but accurate understanding is indispensable. Inaccurate ecosystem assumptions lead to totally ineffective, and sometimes harmful, development strategies. In the 1970s and early 1980s, tremendous resources were put towards “intervention” into African pastoral systems with little to harmful effect (Park, 1992). Ellis and

¹ Global warming is showing that, in fact, natural capital at a macro level may be more susceptible to human action than previously thought.

Swift (1988), based on long-term research in Northern Kenya, argue that assumptions about African pastoral systems with potentially stable (equilibrical) biotic feedback mechanisms are ungrounded and have resulted in severely mislead development programs. “[C]hanges in land tenure systems and existing institutions are assumed to be desirable and are therefore undertaken without consideration of what may be useful or valuable in the existing systems” (Ellis and Swift, 1988). Ellis and Swift show pastoralist systems to be persistent rather than equilibrical. The question then becomes how to aid persistence in an environment controlled by abiotic, chaotic forces, not how to manage the equilibrium of the system with group ranches or grazing blocks. In this view, far from being irrational mismanagers, the decided rationality of pastoralist survival systems comes to light. Spatial diffusion, food substitution, and temporary emigration have allowed pastoralists to persist relatively free of famine. Since, no matter how remote, pastoralists are increasingly influenced by external human forces, simply leaving them alone is not an option. “A cautious approach to pastoral development is to ask if intervention strategies can be formulated which will build upon the best aspects of traditional systems, rather than imposing wholesale alterations upon them” (Ellis and Swift, 1988).

Interaction with the outside world is, in part, a function of natural capital. Rural communities may be both spatially and frictionally distant from population centers².

Poverty may be particularly acute in rural areas where land, water, or minerals are the property of a few social actors, with no accessible alternatives. Lack of access to natural capital can retard or stop the growth of other capitals. And when natural resources are not reinvested in, but depleted, poverty becomes more difficult to overcome. Thus public policies and cultural customs that prevent concentration of control and degradation of natural capital have an impact on poverty reduction.

Access to natural capital in the form of water, arable land, and livestock pasture is often difficult for excluded groups. The lack of access to natural capital impacts human capital in terms of both physical and behavioral health. Local policies that encourage community access to natural capital are important considerations in terms of holistic poverty reduction.

In addition to increased erodibility and generally thinner topsoil (A horizon), soil salinization/sodification is a constant problem in dry lands. The salinization of cultivated lands has increased significantly over the last half century as irrigation has rapidly expanded. Large areas of South Asia have become unarable as a result of poor water management and salt build-up. In 1999, about 20% of all cultivated land was saline, 35% was sodic (Havlin *et al.*, 1999). Annually, for every new hectare of land brought into production by an industrial irrigation project, another goes out of production due to salinization (Marby and Cleveland, 1996).

² Frictional distance, drawn from geography, incorporates time-distance traveled. Lack of roads or adverse seasonal weather conditions increase frictional distance.

Certain crop species can flourish in higher salinity conditions. Market-minded (financial capital focused) production of maize and fruit crops is probably not a good idea, though small-scale subsistence production may be of some use in less marginal areas (Heisey and Edmeades, 1999). Barley, sorghum, millet, and dates have long been grown in dry areas because they have high salt tolerance and threshold saturated extract conductivity³. In a traditional floodplain recession agriculture (Park, 1992) and oasis agriculture (Ilahiane, 2004) intensive fruit and vegetable production is usually carried out only on the most fertile land⁴.

Much of agronomy focuses on “eliminating or minimizing the factors that reduce yield potential” (Havlin *et al.*, 1999), usually by means of purchased inputs (FAO, 2001). The idea seeks to manage risk by disregarding the nuance of natural systems and making them uniform (van der Ploeg *et al.*, 2004). The approach denies reflexivity and could be said to be place-based only in the sense that the “problems” are spatially located. This mentality has been around for a long time, as well exemplified in 1902 by Hardy Webster Campbell, “It is altogether too common an idea that the quantity or quality of the crop depends upon the climatic conditions” (quoted in Hargreaves, 1993). As Jackson (2004) puts it, “They come with vision, but not with sight.” Some novel agronomic research is starting with local expertise and concerns,

and then using scientific techniques “only to fill in the remaining gaps” (van der Ploeg *et al.*, 2004). Information “diffusion” thus occurs bidirectionally, with a horizontal, rather than vertical, power dynamic (Ilahiane, 2004; FAO, 2001).

Cultural Capital

Cultural capital is a human construction that in part arises from responses to natural capital (Netting, 1968). Generally, it is created over generations and includes ways of knowing (what is accepted as evidence), language, ways of acting, and defining what is problematic. In Latin America, indigenous people refer to this as *cosmovisión*. Cultural capital determines how we see the world (what makes up useable resources), what we take for granted (good soil and adequate rainfall; being part of an advantaged social or ethnic group), what we value (construction of poverty), and what things we think possible to change (how resources can be used). Hegemony allows one group to impose its cultural values and reward system on others.

Cultural capital should be thought of as not just an operating system of rationale, but also a rational system of operation, particularly in regard to risk. These are systems that have evolved according to environmental conditions, as mentioned above, politico-economic (Skinner, 1971), historical context, intra-ethnic variation, external political-economic factors that are

³ Saturated extract conductivity is a measurement of the concentration of soluble salts (mmhos/cm) and the threshold is the level at which plant growth becomes affected. Maize (forage, sweet, and grain) averages about 1.7-1.8 mmhos/cm (most apples, citrus and stone fruit crops are worse) while date palms, sorghum, and barley (forage and grain) average 4.0, 4.8, and 7.0, respectively (Havlin *et al.*, 1999). Millet is similar to sorghum (Heisey and Edmeades, 1999).

⁴ Obviously, only annual fruit and vegetables can be grown productively in recession agriculture.

ethnically specific, and intra-communal notions of change and community (Ilahiane, 1999; 2004). Cultural operational structures, somewhat elusively, lie at the intersection of and are influenced by all of these.

Very often people with power devalue the cultural capital of poor or rural people within a community or region. Ancestral languages are repressed. Traditional foods are denigrated. Customary water and land access rights are denied. This can also happen supra-regionally and with the best intentions. International conservation organizations have recently come under fire for displacing poor indigenous people around the world in the name of biodiversity and conservation, only to have regional poverty soar and biodiversity actually go down (Dowie, 2005).

Again, here the problem of a vertical rather than a horizontal power dynamic becomes apparent. As Maasai leader Martin Saning'o put it at the 2004 World Conservation Congress, "we were the original conservationists. We don't want to be like you. We want you to be like us. We are here to change your minds. You cannot accomplish conservation without us." Over one hundred thousand Maasi "conservation refugees" have been displaced from southern Kenya and the Serengeti Plains of Tanzania (Dowie, 2005; see Natural Capital earlier).

A horizontal power dynamic often needs more than just a level playing field. Empowered (e.g., middle-class) individuals who have been socialized for entitlement through concerted cultivation have very different expectations of power for themselves and their children in society than do poor and working-class individuals

who have been socialized not assert themselves (Lareau, 2002). Understanding the different cultural capital aspects that produce class is critical to affirmatively balancing power and reducing poverty and exclusion.

Excluded people do not trust authority for very good reasons, from the police to aid workers to doctors to teachers. They have experienced strong disapproval – and the threat of having things taken away, from food aid to their children, if they are viewed as "bad parents," for reasons they don't understand. Thus policies to reduce poverty must often start with giving excluded people a platform where they can feel comfortable negotiating with people in authority, beyond the obvious and ineffective ways of not saying anything, begging, or threatening.

Gender is an important variable to consider within the context of cultural capital. Many cultures have gendered divisions of labor and gendered spheres of power. Whereas many economic models treat households as "unitary" in their goals and direction. Kevane (2000) shows that "cooperative conflict" with a bargaining dynamic might be a more appropriate intrahousehold theoretical structure. Examining communities in the Sahel region of sub-Saharan Africa, Kevane finds that because men almost always control the cash income from family plots, women inefficiently seek to allocate labor towards their own private plots so that they have income under their direct control, not because they have divergent values from men, but because they are in different structural situations. Kevane documents how extrahousehold cultural norms can

facilitate or greatly hinder women's intrahousehold bargaining power, ultimately concluding that non-coercive extra-household "policies and programs that change local patriarchal norms could produce more favorable effects for women" than intrahousehold programs that are only able to aid women in working within narrow gendered enterprises (109). Stone and Stone (2000) equally laude the flexibility of cultural norms in their case studies of successful Kofyar women farmers in Nigeria: "This flexibility enabled women of different ages and marital status, if ambitious enough, to prosper on their own".

However, Krieger (2000) cautions that simply encouraging women to work for cash income, whenever they can, may disservice family well-being and child health. Her research in a Cameroonian peri-urban area shows that lump-sum incomes, such as those associated with seasonal cash-crop sales, are often co-opted by husbands or other relatives and cannot be spent on child welfare purchases, such as supplementary nutritious food items. More studies and policy frameworks are needed that consider the possibility that women's small-scale entrepreneurial ventures are fundamentally different from similar male enterprises.

Human Capital

Human capital is the native intelligence, skills, abilities, education, self-esteem and health of individuals within a community. Many assume that small rural communities lack human capital. But this is often more a result of population size and sometimes observer's, cultural prejudices than community native intelligence or lack of

specific skills. Due to the small number of people, there is often not the diversity of skills, education, and training that exists in larger places. Public officials and citizens must take on as volunteers (or volunteered) multiple responsibilities that are carried out by complete departments in cities. When they struggle to fulfill these responsibilities, outsiders often attribute those struggles to lack of native intelligence, rather than task overload.

A number of issues related to poverty are human capital-based, including low levels of education, chronic health conditions, poor nutrition, and low self-esteem. Policies that provide health care and access to food that are not directly income tested are more likely to succeed in rural areas. For example, some schools serve breakfast and lunch to all students in order to avoid labeling students from low income families. Support of programs that involve poor mothers as teachers as well as learners can increase self-esteem at the same time health status is improved. And regular community meals where all are welcome provide non-stigmatized opportunities to provide food for those in need. These non-stigmatizing opportunities are particularly important in rural areas where cultural capital reinforces not taking "hand-outs".

As implied earlier, within different cultural/environmental contexts, useful skills may be conceived of in an entirely different manner. Brody (1981) documents the immense hunting and tracking skill set of Native tribespeople in Southwestern Canada, which, though questioned and downplayed by government officials, continues to provide them with adequate

food in the face of economic poverty. The loss of cultural skills without a significant gain of different useful skills results in a truly dire situation.

Diffusion of new useful skill to rural smallholders has been a severely limiting factor in poverty alleviation, particularly for women. FAO data show that female farmers receive only 7% of all agricultural extension services world-wide and only 11% of the agents are women. This is particularly acute as female-headed households have been steadily on the rise due to armed conflict, HIV/AIDS, and male migration in search of work. Even in male-headed households females usually play a dominant role in child nutrition, health and education. The FAO estimates farm yields would rise between 7 and 22% if women in Africa received the same level of education as men (FAO, 2001; see Cultural Capital earlier).

Social Capital

Social capital is a community characteristic based on the interactions among individuals and groups. It includes mutual trust, reciprocity, collective identity, working together and a sense of a shared future. Bonding social capital consists of interactions within specific groups, and bridging social capital consists of interactions among social groups.

Rural communities often have very strong bonding social capital that makes them suspicious of outsiders there to “help” them. However, strong bonding social capital does not mean that everyone gets along. When there is strong bonding social capital, there are often strong divisions and cliques, often along ethnic or class lines,

within communities that keep the community from effectively organizing in their own behalf. Research by Hernandez (2003) and others suggests that bridging social capital must be present to overcome local “boss politics,” where one individual, or ethnic group, controls access to the outside and hands out favors to those who serve his (or very occasionally, her) interests.

Excluded groups can often use bonding social capital to collectively create bridging social capital and thus build political capital to address situations that limit opportunities. Ilahiane (2004) shows how previously marginalized Haratine (blacks) in Southern Morocco have been able to gain property rights, and thus influence and social status through temporary emigration and remittances. Outside historical-political changes – in this case, French colonialism, surprisingly - have engendered bridging social capital opportunities to subvert and resist oppressive dominating Arab and Berber cultural forces.

When only bridging social capital exists, the community does not work together. While there are many connections to the outside, the efforts of community residents and groups go toward outside interests and causes. Outside programs or agencies determine what is done locally, so there are often diverse projects that are not integrated and sometimes contradict each other. For example, an economic development organization attempts to set up a large export farm that provides part time, low wage jobs with limited or no benefits. This is often done without consulting the people to whom such economic development is supposed to help.

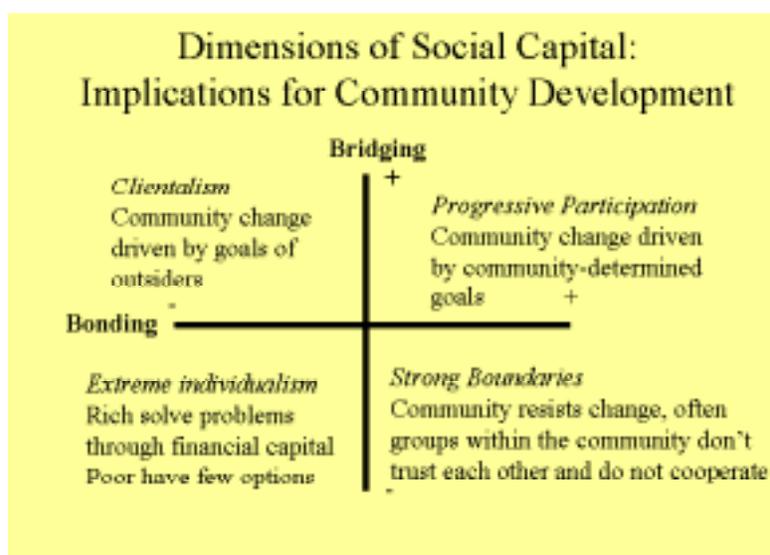


Fig. 2. Authors may please provide caption.

Unpublished research by economist, Scott Loveridge in Michigan, found that poor people are willing to wait longer than middle class people in order to be sure that economic development activities produce living wage jobs (cf. Dowie, 2005; Lareau, 2002 in Cultural Capital earlier).

There are different ways that the two types of social capital can be balanced – or out of balance – in rural communities (Fig. 2). Exclusion can be present in all of these configurations. Conditions are best when both bonding and bridging social capital are moderately high. People have a collective vision of the future of the community and can mobilize resources both internally and externally to move toward that future. But in this case it is important that the definition of the community is broadly drawn, including migrants (both national and international) and the poor. These folks are often excluded even in

wealthier communities, due to lack of communication.

When both bridging and bonding social capital are low, communities are highly disorganized and mechanisms of social support are practically non-existent. High crime rates and high participation in activities detrimental to human capitals, such as substance abuse, characterize these communities. There is no collective decision making that is cumulative, and governing bodies change often and undo the work of the previous administration. These communities are more likely to let public property fall into ruin through vandalism and/or neglect and choose low taxes over collective benefits.

When bonding social capital is high and bridging social capital is low, the community rejects actions and ideas from “outsiders” – which can include anyone whose great grandfather is not buried there. There is

often factionalism within the community. In these cases, overt concern for poverty is received as a direct criticism. These communities are unlikely to put in targeted projects for poverty reduction and relatively unlikely to institute more comprehensive programs if they are seen in any way to benefit “the other side.”

When bridging social capital is high and bonding social capital is low, the community changes in response to outside initiatives, without the local ownership necessary for maintenance or effective utilization of built capital provided, often through pork barrel politics, as someone in the town is a good friend of a government official who will help the community get around the “bureaucratic” rules that demand demonstration of community capacity or attention to excluded people before awarding grants or loans.

No community fits entirely within any one quadrant. In working with communities, we have found it helpful to have them recall community actions when both bridging and bonding social capital were high, to find out what contributed to the felicitous state of affairs, and use those assets to move forward new programs, including poverty reduction. This often involves outside facilitators, either from government entities or NGOs. A major policy effort to reduce poverty would include facilitation to identify the assets in the community or cluster of communities that could be used to provide community solutions to individual situations of poverty and exclusion.

Political Capital

Political capital is the ability of a community – and of excluded people within

a community -- to influence the distribution of local resources and to determine which local resources are on the table. Political capital includes voice, organization, connections and power. In rural communities, there is a tendency to rely on political connections – a government official or bureaucrat – to mobilize resources, rather than building the ability within the community to plan and to follow rules and regulations that determine rational resource distribution. There is evidence that such “pork” is increasing, ultimately defeating the democratic processes that can determine universalistic decisions about the distribution of public resources. Such political favors destroy any general society goal of equity of access within the community.

Policies should provide opportunities for excluded people, helping them organize and work together and with non-excluded people in order to know and feel comfortable around powerful people. This support can come from the state (cooperative extension) or civil society, including religious organizations and NGOs. There needs to be financial support for such activities. Only through mindful inclusion will the issues of excluded people be part of the political agenda.

In dry areas, the most contentious resources to regulate are necessarily water and arable land. Two socio-political models that have worked quite well in certain areas are the Berber *agdal* system and the communally controlled *qanat*, sometimes called *karez*, system. An *agdal* is a pasture collectively controlled by users with agreed upon opening and closing dates – to allow for biological recuperation. The *agdal* can

vary quite a bit and be arranged at different levels of Berber social organization. Ilahiane (1999) examines the Imilchil agdal system of the eastern High Atlas Mountains in Morocco and finds that it persists despite regular internal conflict because historical-political and ecological factors favor the cooperation. The system is an alliance of local tribal lands and covers an area of about 300,000 ha. Ecological integrity is impressively maintained; verdant agdal pastures contrast with eroded unprotected slopes. Outside aggression originally brought all the tribes together. Traditionally, a pact has been confirmed amongst members by oath and ceremony. In addition to council-appointed pasture guards, religion plays a critical role, as one member puts it, "Allah and the community are the best of all guards in this vast territory because man by himself can't watch over Allah's land" (33). Pact structure permits villages to have a ten km ring of intracommunal pastures around each village, other groups are only to allowed use this land during transit to collective grazing areas. Transgression of the rules is not only enforced by religion, but penalties of 10 to 50% of one's herd can be taken. Similarly to the Ellis and Swift's (1988) pastoralist of Northern Kenya (see Natural Capital section), the alliance is a means to mitigate risk. If one area is negatively affected during a season, all members of the alliance can move their herds to a better off area.

Two recent factors have adversely affected the system: trucks and the intercession of the Moroccan federal

government. Whereas in the past, it might take two weeks and great effort to move a herd from the low Sahara pastures to the mountains, now herds are loaded into double-decker trailers and taken off anywhere overnight. The result is not only greater facility of exploitation, but also faster ecological degradation – contrary to the whole system. Disputes of the past were resolved internally, through a confederated council, or sometimes violently, but collective interest against risk and anarchy always prevailed. Nowadays conflicts can be appealed to local and regional courts, which close pastures until the disputes are resolved – often years later. However, even once they happen, court orders often fall on deaf ears, because the courts do not control confederated agdal enforcement mechanisms. The result is both structures undermine each other⁵.

Ilahiane's example illustrates not only both effective bridging and bonding social capital, but also how socio-political relationships are "not just frozen in time but keep evolving and redefining the historical circumstances that brought them about". It is crucial to point out that this constant, and for the most part positive, negotiation is largely possible because all parties are able to position themselves equally; all members are part of hierarchies that balance each other out.

Michel Bonine's (1996) examination of *qanats*, subterranean water conduits, in the central plateau of Iran shows how even within a classed society effective political regulation of water resources can be

5 They do not necessarily have to contradict. Pamela Stanbury (1996) shows how participatory water control and maintenance can be integrated with state bureaucracy in Sri Lanka, but his is across^a the same culture. Ilahiane says that Berber and Arab cultural difference have in part muddled the^c situation in Morocco.^h

ieved across class lines⁶. Qanat construction is very expensive and often only the very wealthy can afford the initial investment, in the past this sometimes, but only sometimes, prompted abuse. However in the 1960s, Iranian land reform made water rights more equitable. A social hierarchy still exists and the upper classes live upstream from lower, but because the Qanat is often the sole source of water, the collective management necessary to ensure water supply fosters social cohesion.

Financial Capital

Financial capital includes debt capital (such as a bond issue or a low interest loan from a governmental entity), investment capital (as when an industry that wishes to expand pays a portion of the sewer system expansion in order to make that expansion possible), savings (when the water utility rates include enough to put into a fund for repair and replacement), tax revenue (which can support water and sewer systems or repay a bond), tax abatements (which are often given to new industries who make heavy demands on local utilities), and grants. Eligibility for grants, ideally, should involve a commitment to poverty reduction. Grants are community's favorite source of funding and contribute to the cargo cult mentality that someone will build a road or a foundation will provide the money for the hospital. And when a grant application is made and turned down, a sense of victimization is reinforced.

High inequality is always associated with high rates of working poverty, suggesting that there is a need to have policies in place where the wealthiest individuals and firms invest in increasing opportunities for good jobs. Such investments would include technology, which increases labor productivity and allows for better wages, but does not necessarily create them, and *training workers*, which also increases labor productivity and most often higher wages.

On-going research by NC-1100 (a research committee of the Agricultural Experiment Stations in the North Central region of the US, which includes the dry regions of the Dakotas, Nebraska, and Kansas) suggests that increase in industrial agricultural production is related to increases in a variety of measures of poverty. In multiple regression equations, per cent of the county income from agriculture highly predicts the presence of working poor. Further, as more and more landowners leave rural areas, the notion that farm subsidies are for rural development becomes even less believable. An important policy issue to address is how to reconcile the dependence of the agricultural sector on farm payments with the need of outside financial capital to support a variety of programs aimed at community capitals enhancement.

Another way of decreasing poverty is to enhance entrepreneurship. Specifically in agricultural areas of the global south, where competition for land can be extreme,

⁶ Qanats vary in diameter, distance and seasonal flow, but all originate within aquifers at higher elevation and travel to a town or village as the sole water source. The gradient of a qanat is almost horizontal - too steep and they will erode internally, too flat and too much water will seep out. Because qanats usually originate within alluvial fans the water is quite pure and salt-free - good for agriculture.

alternative non-agricultural enterprises can diversify occupational opportunities. However, the degree to which entrepreneurship contributes to poverty reduction is an empirical question requiring serious study.

For the rural poor, access to credit is critical in gaining access to the build capital they need to be productive workers. Many are too “high risk” under current banking practices, leaving them at the mercy of predatory lenders. The UN declared 2005 the “International Year of Microcredit” (UN, 2004). Microcredit programs have shown great success at poverty alleviation around the world, particularly with their preferential stance towards women. Cultural norms, legal status, or land ownership claims, have been used to disproportionately deny credit to rural women (FAO, 2001). Affirmative action lending programs are a good step, but not sufficient in themselves (Kevane, 2000; Kriegar, 2000; see Cultural Capital earlier).

For the rural poor, one of the most common forms of non-repayable debt comes from medical emergencies. Thus more policies are needed that increase access to affordable medical care.

Built Capital

Built capital is human-constructed physical infrastructure used as tool for production of other capitals. It includes buildings, vehicles, roads, electronic communications systems, and sewer and water systems. When communities are not mindful of inequalities, built capital can continue to privilege the fortunate within the community and exclude those already marginalized in terms of where the sewer

is laid or the road is paved or the bus passes. Built capital enhances other community capitals when it serves multiple users, it can be locally maintained and improved, it links local people together equitably, and it links local people, institutions and businesses to the outside.

Particularly in dry areas built capital can offer large benefits, but precautions should be taken to ensure that it does not undermine democratic control of resources. The introduction of the irrigation technology, specifically the modern well and diesel pump has had a devastating impact on communal water regulation. Wells burrowing deeper and deeper into the ground have lowered the water table by several meters annually in some areas. This combined with the high financial investment and skills necessary to build and maintain a well and pump have caused a true tragedy of the commons. Many qanats in Iran (discussed in Political Capital earlier) have dried up because of intensive well drilling, in turn ruining much arable land and displacing whole villages (Bonine, 1996; Marby and Cleveland, 1996).

Qanats are proven sustainable technology; that have existed for 2,000 years without damaging water tables. They run on passive energy (gravity) and can be built and maintained with simple tools. High human capital is still necessary, but it can be locally transferred (apprenticeship) and does not need to be brought in (Bonine, 1996).

Marby and Cleveland (1996) point out that massive damn projects have not only displaced millions around the world, but also have been shown to increase spread

of diseases by water and vectors with high water dependency (e.g., mosquitoes).

Affordable housing is a huge issue for the rural poor in temperate dry areas, where being homeless can mean harsh exposure to the elements. Guaranteeing loans for the construction of low cost housing and heating/cooling, including allowing such underwriting for manufactured housing, could increase the rural housing stock available for the poor.

Conclusions

The capitals framework provides a way of addressing poverty reduction in a place through community-based solutions for individuals that lack access to any of the capitals. For example, very often a lack of social capital can keep an individual from accessing land or getting a good job, which would provide the financial capital to buy built capital that contributes to the local tax base. Ignoring cultural capital can result in ineffective, paternalistic poverty reduction programs that do not build on the cultural capitals of excluded people and instead try to displace that cultural capital, decreasing self-esteem (human capital) and further alienating those individuals (social capital).

Resource scarcity is particularly acute in dry regions. Thomas Park (1992) reasonably argues that class stratification is rooted in the need for systems of resource allocation. Ellis and Swift (1988) show that, even amongst pastoralists, hierarchies appear when a population needs to reduce its size. Hierarchy is almost always culturally too complex to confront directly. By providing alternative opportunities, based on appreciative inquiry, and utilizing

alternative capital configurations, marginalized groups may be able to dig themselves out (cf. Ilahiane, 2004). There will eventually be limits to all avenues, and population reduction, or at least stabilization, - through education and access to birth control, not force - should be discussed in any context.

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