Building Natural Assets
Re-thinking the Centers' Natural Resources Agenda And Its Links to Poverty Alleviation

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Assessing the Impact of Agricultural Research on Poverty Alleviation

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ABSTRACT

A large number of the rural poor experience ecological poverty because the natural assets on which they depend for their livelihoods are degraded and unproductive. To overcome this ecological poverty they need to be directly assisted in re-building these natural assets. But attention also needs to be given to building complementary financial, human, social and cultural assets. This paper outlines the asset-building framework for poverty alleviation, discusses the characteristics of ecological poverty, comments on the extent of this phenomenon and refers to asset-building solutions to ecological poverty. The major conclusion of the paper is that the CG-supported Centers should re-examine their natural resource management activities to more intentionally work toward reducing ecological poverty through helping rural people and communities (re)build natural assets. This will require the Centers to engage in new, and perhaps, complex partnerships to insure attention to building the financial, social and cultural assets that fall outside the mandates of the Centers, while themselves focusing on a spectrum of means for improving degraded natural assets.

Introduction – Building Assets

With the Ford Foundation's reorganization in 1996 a new program was established – Asset Building and Community Development, "Assets" for short. The signature concept of this program is the notion that reducing poverty and injustice requires attention to helping poor individuals, households and communities "build" a variety of assets --- natural, financial, human, social and cultural (Oliver and Shapiro, 1995, and Sherraden, 1991.)[4] These assets, individually and as a bundle, are special resources that individuals, organizations and communities can use to overcome and avoid poverty and marginalization. An asset is a valuable stock that can be conserved, expanded, or improved and drawn upon as needed. Many assets have the important characteristic of being transferable from one generation to the next. In all societies, control and ownership of assets are unevenly distributed. This skewed distribution is closely related to cultural traditions and forces, historical events and current and past public policies. The result is that far too many people and communities lack the assets needed to take advantage of opportunities or to guard themselves from risks and uncertainties that threaten their economic and social wellbeing. Without these assets they also cannot create a sound legacy for future generations.

Asset building as a poverty alleviation strategy refers to a mixture of activities by which the poor are assisted to acquire individual or collective control or ownership of assets, to effectively manage the assets in hand and to sustain or improve the quality of their assets. Asset building often is assisted by public and private groups – what might be termed asset-building organizations (ABOs)—and is facilitated by good asset-building policies.

In this paper we explore the application of the concept of asset building to the rural and natural resource-based contexts in which CGIAR-supported centers work. We propose the concept of ecological poverty as useful to the analysis of poverty alleviation especially in the world's enormous areas of "less-favored lands." In particular, we discuss the notion of degraded natural assets as a proximate cause of much rural poverty and the importance of rebuilding this natural wealth through various technological means as well as the use of social capital. We conclude with a series of suggestions for how these new approaches should be used to direct NRM research and application in the CGIAR centers.

Assets and Rural Poverty

Poverty is so common in our everyday discourse that it often is an unexamined concept. Most discussions of poverty are concerned with income poverty – the lack of sufficient cash income to meet basic household needs. The critique of income poverty has been developed extensively in the work of Sherraden (1991). It focuses on the notion that typical policy responses to income poverty involve temporary subsidies to income (or consumption) that generate little change in the fundamental ability of families to escape poverty and may, in fact, lessen the likelihood of reducing poverty in the long run. The implications of asset-based analyses of poverty and poverty alleviation is well developed for the links between poverty and financial assets in Oliver and Shapiro (1995), with special reference to urban communities in the United States. With respect to rural poverty, Tony Bebbington, using an assets perspective, carefully examines the concept of poverty and identifies a configuration of assets that

are required to overcome rural poverty and yield the benefits of material well-being along with cultural strengthening and local empowerment.

Bebbington's concern is with rural livelihoods – ways of making a living that depend, in some part, on agricultural and other natural resource-based activities. His central thesis is that for rural people to achieve better livelihoods they need access to five types of "capitals" or assets: "produced, human, natural, social and cultural capitals." (Bebbington, 1999. p. 4 and Seregeldin and Steer, 1994. pp. 30-32)[5] In Bebbington's framework, people's livelihood strategies involve continually managing, substituting, trading-off, and drawing on these assets, accumulated individually or collectively, toward three strategic goals --- making a living, making living meaningful and challenging the structures under which one makes a living. (Bebbington, 1999. p. 5) While each of these five types of assets is important, he gives special attention to social capital. Following Woolcock, he defines social capital as "the norms and networks facilitating collective action for mutual benefit."(Woolcock, 1998. p 155) Social capital is of unusual importance because the collective actions that it underpins -- resource user groups, local coops or cultural associations -- often are the means by which people:

- gain access to or defend natural assets like trees or water;
- transform assets into income; and
- connect with the market, state and civil society organizations that structure the ways in which assets are acquired, protected and transformed. (Bebbington, 1999. p. 39)

Bebbington's message is that poverty is about more than material well-being and that alleviating poverty requires gaining access to a bundle of assets – financial, natural, human, social and cultural. Clearly, this view of poverty is a more complex one than that on which the idea of international agricultural research centers was constructed and not all five of Bebbington's assets are within the Centers' current mandates. While understanding financial, social and cultural assets may be of interest to the Centers, they are not directly engaged in helping improve any of the three. But they are engaged through their training efforts in helping develop human capital and, of course, have their central focus on the improvement of natural assets.

Ecological Poverty

A large number of the world's rural poor are impoverished, in part, because the natural assets on which they depend for their livelihoods are degraded and unproductive. [6] While various authors have recognized these conditions (Izac and Sanchez, nd. and Fan and Hazell, 1999)[7] Agarwal and Narain have given these conditions a distinctive moniker, ecological poverty. (Agarwal and Narain, nd.) We build on their definition, to describe ecological poverty as a landscape-level scenario in which some natural assets[8] are severely degraded and/or their associated ecosystem functions (e.g. nutrient or water cycling) are impaired with negative consequences for local livelihoods. The poor state of these natural assets limits the possibilities of resource users achieving the outputs needed to sustain the well being of their households. The ecologically poor may be dealing with impoverished soils, decimated watersheds, depleted community forests, unproductive grasslands, or exhausted fisheries. Being dependent on these degraded natural assets to provide subsistence needs and surplus for markets is a major

cause of their impoverishment – measured in their lack of material prosperity, lack of meaningfulness in their lives and inability to effect the rules under which they operate. For them, the productivity of their labor and other inputs is constrained largely, though not entirely, by the diminished quality of their habitat.

While the extent of ecological poverty has not been measured, it may be significant. In a recent paper, Fan and Hazell discuss the concept of less-favored agricultural areas -- those areas with poorer soils, shorter growing seasons, less or uncertain rainfall and so on. (Fan and Hazell, 1999)[9] If one takes less-favored areas as a rough surrogate for ecological poverty, then the extent of ecological poverty can be seen to be considerable. For example, Fan and Hazell note that in China and India "less favored lands account for one-third and 40 percent of total agricultural output, respectively." (Fan and Hazell, 1999. p.2) They also state that globally "some 500 million poor people live in less favored lands." (Fan and Hazell, loc.cit.) These observations suggest that the conditions of rural ecological poverty are widespread and effect a great number of people.

For the ecologically poor, creating sustainable wealth must begin with efforts to (re)build natural assets to which community members have effective access. In some cases this re-building may occur by dealing directly with the natural assets themselves – planting new species of trees or improving water harvesting structures, for example. But as we have seen from the Bebbington framework discussed above, a tree-planting project or a water improvement effort may not be possible without also employing other assets – financial assets to cover costs or social capital for collective action. In many situations, important as the direct technical interventions are, it may not be

possible to ameliorate ecological poverty unless these complementary assets are engaged.

Depending upon the specific ecological setting and the existing natural and social conditions, of course, the entry point that may have the greatest cascading effect will differ. Agarwal and Narain, for example, describe a group of cases in which water harvesting is shown to have several important subsequent effects on cropping, milk production and so forth (Agarwal and Narain, nd.). But one could easily imagine the entry point being better community forest management, improved grasslands or reduced degradation of coastal mangroves.

The fundamental hypothesis is that ecological poverty is a widespread cause of rural impoverishment and can be reduced through the (re)creation of natural wealth – regenerated forests, replenished groundwater supplies, abundant fodder grasses, improved coastal zones. Enhancing this natural wealth both contributes to building other key assets– financial, human, social and cultural – and is dependent on them. Since the mandates of the Centers cover some but not all of the needed assets, Center activities to alleviate rural poverty often are indeterminate unless the Centers effectively partner with other development organizations.

For example, access to significant levels of social capital is important since, nearly always, building natural assets requires local collective action. This is either because the ecological resources are group controlled or because coordinated actions need to be taken by individuals controlling their own resources. But, attention to building or strengthening social capital seldom is a central element of the work of the Centers.[10]

The Centers and Ecological Poverty

Asset building strategies for poverty alleviation and the concept of ecological poverty with respect to natural resource assets contrasts with the concept of income poverty that seems to have guided much CGIAR thinking about poverty alleviation. The dominant assumption that the poor are income poor has legitimized the CGIAR goal to reduce the costs of food in their household budgets. Overall increases in food production -- the prevailing thrust of most CG research -- help lower the costs of food and thus benefit the rural and urban poor.

The Green Revolution strategy was based on the notion that within well-endowed agricultural areas there were limits to agricultural production set by the nature of the plant genetic materials and management techniques available to producers. This condition contributed to inadequate world food supplies and also constrained the demand for rural labor. This situation hit particularly hard the income poor in both rural and urban areas. The new technologies led to significant increases in food supply, that both lowered the cost to those who could participate in the market and increased the supply available for governments to redistribute through various welfare schemes. The new technologies also increased the income of many producers and farm workers. Since future shortfalls would be especially detrimental to the income poor, there remains a continuing rationale for the CGIAR's investment in plant and animal breeding and better management practices for the world's smallholders operating in well-endowed agricultural areas. As a complement to these long-standing activities, much of the CGIAR's newer attention to natural resource management has focused on protecting production gains in well-endowed areas. Less NRM attention

has gone to the needs of the ecologically poor to improve their natural assets as a precursor to attaining production gains. Clearly, increased production in the well-endowed areas should continue to be an important poverty alleviation goal of the Centers. But we need to understand that pursuing this goal alone will largely miss the needs of the ecologically poor. These cultivators operate in troubled ecological settings, the less-favored lands, that do not permit them to use most of the CG's new research products. Moreover, since many of these cultivators will not purchase a significant portion of their food supply, they will gain little from the lower food costs strategy. For them, a CG poverty reduction approach targeted on well-endowed areas alone is simply off the mark. In short, to deal with a greater totality of poverty, attention both to the well-endowed areas and the ecologically poor zones is needed. But is success in the less-favored areas possible? Fan and Hazell write that significant opportunities to focus on the rural poor struggling with ecological poverty now exist. They note: "It now seems plausible that increased public investment in many less-favored areas may have the potential to generate competitive if not greater agricultural growth on the margin than comparable investments in many high-potential areas, and have a greater impact on the rural poor living in less-favored areas" (emphasis added). (Fan and Hazell, p.4)

Of course, it is important to know what kind of public investment is promising and appropriate. Colleagues meeting at a recent Bellagio conference make the case for what they have labeled, agroecological approaches, as a strategy for assisting these difficult ecozones. (Bellagio Conference Report, 1999) Agroecological approaches are those that "utilize the power of biology rather than rely primarily on products

derived from fossil fuels or biocides." (Bellagio Conference Report, 1999. p 5) They reach the following conclusion: "Agroecological approaches are increasing production under environmental conditions that are far from ideal, such as on eroded hillsides of Central America, high barren plateaus of the Andes, semi-arid areas in the West African Sahel, exhausted lands in Eastern and Southern Africa, the rain forest margins of Madagascar, the heavily populated areas of Malawi, the crowded flood plains of Bangladesh, within the war zone of Sri Lanka, and on the sloping lands of the Philippines and remote forest margins of Indonesia." (Bellagio Conference Report, 1999. p. 6)

Finally, it is important to recount that research colleagues also have found that the ecologically poor themselves, under the right circumstances, are prepared to participate in efforts to improve their natural assets. Laing and Ashby concluded the following based on a review of several case studies: " the success cases demonstrate a willingness on the part of resource-poor farmers to make significant investments individually, as with panting trees in Nepal, or through the community, as in the Cangahua soils case and in Katheka, where community investment in erosion-control structures was critical." (Laing and Ashby, 1993. p. 71)

Thus, colleagues of various persuasions and using sundry approaches are concluding that technical solutions to ecological poverty are plausible. Given the considerable need to attend to the ecologically poor and the suggestions that solutions are possible, our core proposal is that the Centers re-examine their NRM activities, some of which may be following an agroecological framework, to more intentionally shape this work

toward reducing ecological poverty through helping rural people and communities rebuild natural assets.

We will now turn our attention to a few examples of current work that we believe do precisely this. Following that, we examine several implications of this strategy for the NRM work of the Centers.

Some Examples of Centers' Research and Ecological Poverty

While the CG Centers may not have intentionally conceptualized their natural resource management programs as means to build natural assets and deal with ecological poverty, there are some interesting examples of such efforts. Those who are familiar with CG work around the world will, no doubt, be able to supply additional illustrations. One engaging example to consider is the work of ICRAF, CIFOR and others on the Indonesian island of Sumatra. This is a case of working to avoid ecological poverty by insuring against the loss of natural assets that had been constructed by villagers in the area of Krui – their damar agroforests (Fay, et al., 1998.). The Krui research team documented the success of local people in managing these forest resources sustainably and persuaded the government's Forest Department to legitimate continued community management of these agroforests. Mistaken appropriation of this natural wealth by the state could easily have created the conditions of ecological poverty for these rural communities.

As Sanchez has noted (Sanchez, 1999), in this case the important intervention was a policy one not a technological one – what we would call an asset-building public policy. Significantly, the policy recommendations were backed by a sound understanding of the biophysical conditions and outcomes of the agroforests in

question. It is hoped that the example of Krui will create other opportunities throughout Indonesia to allow local communities to protect such forest resources or create new ones and thus either avoid or surmount ecological poverty.

A second illustration is the promising work that ICRAF is undertaking in East Africa and southeastern Mexico to deal with the problems of declining soil fertility which they regard as a matter of investing in natural resource capital. In western Kenya, degraded soil resources that are deficient in N, P and K are being rebuilt through the use of *Tithonia diversiflia* as a green manure. While there are limits and possible problems to its use, it has been shown to significantly improve the soil asset and produce higher crop yields.

This work promises a solution both to the current condition of these soils as well as a means of improving the basic ecological function of nutrient cycling. Without this intervention cultivators face ecological poverty related to the degraded conditions of their soil asset.

No doubt other important examples exist within the NRM work of the CG-supported Centers. One useful exercise would be to assemble a number of such examples of Centers combating ecological poverty.

Natural Resource Management and Ecological Poverty

The fact that many of the rural poor face ecological poverty and that reducing their impoverishment requires assisting them to build natural assets has important implications for the CGIAR-supported Centers, particularly their natural resource management (NRM) programs. As expressed in the recent CGIAR System Review Report, the Centers conduct much of their NRM research to “protect” the basic land

and water resources on which agriculture depends -- usually in the high-potential areas. To reach the ecologically poor, NRM work also needs to devote attention to the *restoration* or *regeneration* of basic natural resources and ecological functions in the less well-endowed regions. Thus, the NRM programs of the Centers should be more than just a convenient means to deal with what some may see as a current development fad, sustainability. Recognizing that ecological poverty is a key constraint for many rural households necessitates assigning a high priority to researching ways and means to reverse ecological degradation and create equitable natural wealth in the world's ecologically marginal rural communities. The ecological poverty paradigm creates a clear conceptual link between the CGIAR's mission to reduce poverty and the Centers' growing NRM activities. Eroded hillsides, deforested watersheds, overgrazed pastures and degraded coastal areas all represent potential natural assets to be built, in part, through NRM research by CG-supported Centers and their collaborators. In this way, the CG centers would work toward ameliorating both income and ecological poverty – recognizing the similarities and differences between the two and developing appropriate pathways to deal with each.

The ecological poverty paradigm gives renewed importance to the Centers' NRM efforts and a sharpened goal-- to find and invent a spectrum of sociotechnical means for building natural wealth in localities and regions impaired by ecological degradation. Until the potential natural wealth has been re-built, and ecological poverty reduced, cultivators, herders and fishers will be restrained in their ability to invest in the production technology represented in improved plant varieties, better fisheries management or animal production technologies. Overcoming ecological

poverty can create the conditions for many more rural cultivators to utilize the research-improved cultivars that have benefited their counterparts elsewhere who already enjoy the natural wealth of adequate water supplies, healthy watersheds and non-eroded soils.

As Fan and Hazell have noted, successful development of less-favored lands will require "new and improved approaches" and stronger partnerships with local farmer organizations, NGOs, national policy makers and others. (Fan and Hazell, p. 33) Or, to put it in Bebbington's framework, overcoming ecological poverty will require attention to more than just natural assets – it will also require someone giving attention to associated financial, human, social and cultural capital. This is precisely why various partners are needed.

Reducing ecological poverty can be aided by new technologies and genetic materials, perhaps even biotechnologies. But, with or without these technologies, success also will be highly dependent on access to other assets identified above including effective collective action at local levels such as rural settlements and districts. Several important implications follow from this.

First, the NRM work of the Centers must include explicit attention to policy matters. This will need to be accomplished either through a Center's own expertise or through close cooperation with other CG-supported centers, including IFPRI, or non-CG organizations of policy excellence.

Second, attention to reducing ecological poverty also will need to proceed based on a far greater understanding of the limits and possibilities of social capital and collective action and the impacts of property arrangements on managing and controlling natural

wealth. Neither of these topics, of course, are ones which the CG system has made a central matter. Thus, few CG-supported Centers have a critical mass of research staff expert in these issues. This underscores the importance of the work of the recently established System Program on Collective Action and Property Rights (CAPRi) which connects selected researchers and increases attention to these matters. Being clear about the phenomenon of ecological poverty underscores the need to expand attention to collective action and property arrangements. Many of the technical and management solutions for reducing ecological poverty will require coordinated actions by local groups of individuals or households, sometimes even groups of settlements, and clear rules about the control and ownership of these enhanced natural assets.

Third, translating NRM research into ecological poverty alleviation will require the Centers to engage in new, and perhaps complex, partnerships to insure the needed attention to building assets (financial, social, cultural) that fall outside the mandates of the Centers.

Colleagues at ICRAF in discussing their approach to natural resource management have clearly stated a position consistent with this point:

"In this approach a research institution and its partners accept joint responsibility for ensuring adoption and impact of NRM innovations. While retaining and continuing to strengthen strategic research functions, agricultural and NRM research institutions will now additionally serve as responsible and committed development partners." (Izac and Sanchez, pp 10-11)

One interesting application of being a committed development partner is CIP's engagement with the multiple associates organized as CONDESAN (the Consortium for the Sustainable Development of the Andean Ecoregion).[11]

Moving Forward

Making the CG Centers more effective instruments for alleviating rural poverty must begin with a fuller understanding of poverty--thus the importance of this meeting. In this paper we have focused attention on ecological poverty--the absence of a healthy natural environment that can be managed to yield sustainable livelihoods--a condition experienced by large numbers of rural people around the globe. We propose the Centers increase their efforts to understand and address this persistent source of rural poverty by making these tasks important elements of their NRM missions. The Centers can assist in alleviating this form of rural poverty through NRM activities that help individuals, groups and communities rebuild natural capital that can be accessed in equitable ways.

We also believe that understanding and addressing ecological poverty is aided by use of an assets framework. That framework posits that overcoming poverty requires people to have access to a bundle of assets -- including financial, natural, human, social and cultural. Ecological poverty has as its most proximate cause poor natural assets. However, both additional causes of and the solutions to these degraded natural assets lie with other elements of the asset bundle, especially the social capital needed to undergird collective action.

Because alleviating ecological poverty requires attending to a number of critical assets, only some of which are within the scope of the Centers, typically a set of

“responsible and committed development partners” will need to act in alignment. NRM staff of the Centers need to be encouraged to act in these linked ways to ensure their research-based options for alleviating ecological poverty are known and tried.

Endnotes

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[4] One memorable quote from Sherradan's book is the following "while incomes feed people's stomachs, assets change their heads." p 6.

[5] This framework has parallels with that of Seregeldin and Steer.

[6] The connections between poverty and environment have been the subject of wide discussion. In this paper, we give less attention to the causes of environmental degradation and focus on the implications of that despoilment for rural poverty. Clearly, while the causes of environmental conditions may lie with the rural users, often the problems are the result of inappropriate policies, actions by powerful outsiders, or even the outcome of natural forces.

[7] For example, in a recent paper discussing new ways to think about NRM research at the centers, Izac and Sanchez has stated that this new approach pertains to "the poorest of the poor (who do not have access to the resources needed to benefit from green revolution technologies). And Fan and Hazell's recent paper concerns opportunities for greater gains in the so-called "less-favored agricultural areas." We

suspect there may be a considerable overlap in the areas and effected people referred to with these various descriptions of resource degradation.

[8] Others have preferred the term natural capital. We find especially concise and to the point the definition offered by Izac and Sanchez (Izac and Sanchez, nd. p. 2): natural capital is "defined as stocks of resources generated by natural biogeochemical processes and solar energy that yield useful flows of services and amenities into the future. We would only add that those "natural biogeochemical processes" often are manipulated by human actions.

[9] Also, in their summary of a Bellagio Conference, Norman Uphoff and Miguel Alteri state the following: "An estimated one billion people—one sixth of the world's population and a much greater percentage of the poor—live and work in situations where their farming, herding or fishing operations can not benefit much from mainstream agricultural technologies." (Bellagio Conference Report, 1999. p.5)

[10] One interesting example of Center collaboration to include attention to social capital is the work that CIAT has done in its watersheds activities in the Rio Cabuyal region of Colombia. (Ashby, Knapp and Ravnborg, 1998)

[11] More information on CONDESAN is available at www.cgiar.org/cip/condesan.