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Conservation Farming Projects in the Philippine Uplands: Rhetoric and Reality

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Summary. — The phenomenon of agricultural land degradation in the Philippine uplands has been regarded by scientists and policy-makers as a major environmental and rural development problem. Numerous conservation farming projects have been implemented in the past two decades to address this problem, apparently with little success. Most of these projects have espoused the currently fashionable principles of community-based sustainable development. This paper examines case histories of three completed upland conservation projects. The aim is to compare the rhetoric of project documents and evaluations with the reality of on-going land management practices as seen from the perspective of the land managers themselves.

Key words — Asia, Philippines, uplands, soil conservation, projects

1. INTRODUCTION

Worldwide concern for sustainable rural development is a major feature of Asia's global context in the 1990s. Agricultural land degradation, especially soil erosion, though arousing less popular concern than threats to rainforests or wildlife, has long been recognised as a serious environmental and rural development problem, not least in the uplands of Asia (Blaikie, 1995; Blaikie & Brookfield, 1987). It remains an important item on the global agenda for sustainable development (Stocking, 1995). This paper explores the way in which this global issue is being played out at the local level in one Asian country.

Participatory or community-based approaches to environmental management and rural

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development have achieved a rapid rise to prominence since the 1980s (Belshaw, 1997; Brosius, Tsing & Zerner, 1998). There is "an emerging global consensus that the implementation of what has come to be known as 'sustainable development' should be based on local-level solutions derived from community initiatives" (Leach, Mearns & Scoones, 1997a, p. 1). Thus "community-based sustainable development" has come to dominate the policies and programs of national governments, nongovernment organizations (NGOs), and international donor agencies alike. This trend has been welcomed by many observers who see it as contributing to the empowerment of local communities and offering greater potential to meet local needs, while more effectively managing natural resources (Poffenberger, 1990; Murphee, 1993; Pretty & Shah, 1994; Chambers, 1997; Brosius, Tsing & Zerner, 1998).

The implementation of community-based sustainable development has not, however, lived up to the high expectations generated in global fora such as the 1992 United Nations Conference on Environment and Development. Leach, Mearns and Scoones report that "programmes and projects undertaken under this rubric commonly fail to manifest the expected community-led consensus and to translate this into the expected improvements to the environment" (1997a, p. 2). They attribute this failure in large part to faulty assumptions embedded in the approach: assumptions concerning "the existence of homogeneous, consensual 'communities'; the existence of stable, universally valued 'environments'; and of a potentially harmonious relationship between these" (1997a, p. 2).

They argue that, in reality, local communities are socially differentiated and diverse in terms of values, interests and access to power and resources. Hence we need to examine the roles played by different social actors, who may be in conflict with each other, in shaping the local environment. Moreover, recent developments in ecology suggest that local environments themselves should no longer be viewed as stable, equilibrating ecosystems but as "landscapes under constant change, emerging as the outcome of dynamic and variable ecological processes and disturbance events, in interaction with human use" (Leach, Mearnes & Scoones, 1997b, p. 7). Rather than viewing environmental problems in terms of an overall imbalance between communities and their resources, implying that some pre-existing, natural balance can and should be restored, "an emphasis on social and environmental differentiation suggests that there may be many, different possible problems for different people" (Leach, Mearns & Scoones, 1997b, p. 7).

In the same vein, it needs to be recognized that community-based sustainable development inevitably involves an intervention of some sort, typically in the form of a project. This is true whether the development is being promoted by a government agency or an NGO. There is a mythology about development projects which sees them as discrete entities utilising resources to produce predetermined outputs within a specified time-frame. The logical framework approach, beloved of donor agencies, typifies this perspective (Gasper, 1997). Yet, as Long and Van der Ploeg (1989) argue, such interventions involve a variety of social actors, with diverse histories and agendas, from both within and beyond rural communities. Hence a project intervention needs to be recognized as part of "an ongoing, socially-constructed and negotiated process, not simply the execution of an already-specified plan of action with expected outcomes" (Long & Van der Ploeg, 1989, p. 228). Not surprisingly, then, the outcomes of these interventions may deviate considerably from those envisaged in project documents. Nevertheless, the project perspective can result in narratives (expressed for example in monitoring and evaluation reports) which gloss over these deviant outcomes, or which interpret them in terms of unanticipated "obstacles" to the achievement of project goals.

Hence Brosius, Tsing and Zerner (1998) see a need to examine critically projects and programs employing the notion of community-based sustainable development, in order better to understand how actors at various levels are interpreting and utilizing the concept to different ends, sometimes with unintended and adverse consequences.

> The idea of community-based natural resource management offers great promise for addressing the link between concerns about social justice and environmental destruction. At the same time, there are also potentially problematic legal, political, and cultural complexities embedded in community-based programs. For the movement to flourish, both advocates and analysts must remain alert to the contested and changing variety of cultural and political agendas and contexts in which these programs are being imagined or implemented. What is particularly needed is

> discussion of critical case histories examining the development, applications, and consequences of community-based natural resource management projects (Brosius, Tsing & Zerner, 1998, p. 159).

This paper is a contribution to that discussion, focusing on projects for community-based land resource management in sloping upland regions of the Philippines.

The phenomenon of agricultural land degradation in the Philippine uplands has been regarded by scientists and policy-makers as a major environmental problem (Fujisaka, Sajise & Del Castillo, 1986; World Bank, 1989; Garrity, Kummer & Guiang, 1993). The proximate causes of the problem are said to be rapid population growth and widespread rural poverty, inducing lowland farmers to migrate into steeply sloping upland areas where their cultivation techniques are inappropriate and cause accelerated soil erosion (Cramb, 1998). Numerous upland development projects have been implemented in the past two decades to address this problem, particularly through the promotion of conservation farming systems, including bench terracing and contour hedgerows or alley farming. These projects have been undertaken by both government and nongovernment agencies, many with substantial international funding. Almost invariably the projects have espoused the principles of community-based sustainable development, involving a strong emphasis on the participation of local groups in the design and implementation of measures to improve natural resource management. Yet success in disseminating conservation farming systems has been very limited (Cramb, Garcia, Gerrits & Saguiguit, 1999).

In this paper three case studies of upland soil conservation projects in the Philippines are considered, with a view to examine critically the performance of community-based sustainable development in this context. The projects are the Upland Stabilisation Project in Palawan Province, the Magdungao Agroforestry Project in Iloilo Province, and the Cebu Soil and Water Conservation Program, as implemented in the municipality of Cebu City. The case studies were conducted as part of a larger research project intended to explore the socioeconomic factors affecting the dissemination and adoption of conservation farming practices in the Philippine uplands (Cramb & Saguiguit, 1994; Cramb, forthcoming). The three projects were among a short-list of supposedly more successful examples of community-based upland development; two were initiated by a government agency (in Palawan and Iloilo) and one by a nongovernment organization (in Cebu). They also represent the spectrum of upland conditions, ranging from a site with low population density and poor market access (Palawan) to one with high population density in close proximity to a large urban market (Cebu).

The research methods involved a combination of reconnaissance or "rapid rural appraisal" methods and, in the case of the first two projects, a questionnaire survey of a sample of farmers from within and around the project area. RRA methods, particularly those of a participatory nature, are frequently portrayed as being clearly superior to formal surveys (Chambers, 1997). Our experience has been that both kinds of method have their strengths and weaknesses and need to be viewed as complementary rather than competing approaches. In brief, though the two kinds of methods overlapped and thus reinforced each other, RRA methods were particularly useful for gaining an overview of the characteristics, current status, and trends in the local environment and farming system, and a factual account of project interventions, while the formal survey was most helpful in documenting, quantifying, and correlating the range of farmers' circumstances and responses, and pursuing specific, possibly sensitive questions about project implementation in more detail.

The reconnaissance or RRA methods included: a review of existing municipal, village and project documents; direct observation; semi-structured interviews with focus groups and key informants; resource mapping; time lines; seasonal diagrams; and community histories. The formal survey was administered to a random sample of farm-households drawn from the total population of farm-households in the project village(s) (including "adopters" and "nonadopters" of the project technologies) as well as from a neighboring, nonproject village. Altogether 120 households were surveyed in the Palawan study and 94 households in the Iloilo study. The survey typically involved a single, hour-long interview in the respondent's home, with husband and wife both present, supplemented in some cases with farm inspection. The Palawan study was conducted between November 1994 and February 1995; the Iloilo study between April and July 1995; and the Cebu study in two phases: September 1993 and December 1996. Full details of research methods, secondary sources, analytical procedures, and survey results for each site can be found in the original survey reports (Garcia, Gerrits, Cramb & Saguiguit, 1995a,b, 1996; Gerrits, Garcia & Cramb, 1997).

2. THE UPLAND STABILIZATION PROJECT IN PALAWAN

(a) *The project*

Palawan Province, located to the west of the main Philippines archipelago, is itself an archipelago dominated by the main island of Palawan. Although well-endowed with natural resources and relatively sparsely populated, it is one of the poorest provinces in the Philippines, and one in which natural resources (soil, forests, wildlife, fisheries) are under serious pressure (World Bank, 1989; Eder & Fernandez, 1996). The Upland Stabilisation Project (USP) was a component of the first phase of the Palawan Integrated Area Development Project (PIADP). This phase of the PIADP was implemented in the southern and central municipalities of Palawan during 1982–90. Funding (budgeted at US$85 million) was provided by an ADB loan and grant (US$47 million), an EEC grant (US$7 million) and the Government of the Philippines (US$31 million); however, only US$58 million was spent. The USP was implemented on a pilot basis by the Department of Environment and Natural Resources (DENR), the government agency with primary responsibility for the uplands, in three sites. With a total budget of US$2.1 million, the USP was only a minor component of the PIADP (ADB, 1981, 1991; DENR, nd).

The stated objectives of the USP were (i) to facilitate agroecologically sound utilization of the upland areas and stop further degradation stemming from shifting cultivation; (ii) to develop, test, and promote agroecologically sound farming technologies; and (iii) to improve the socioeconomic conditions of the cultural minorities living in upland areas (USP, 1990). Primary emphasis was given, however, to the elimination of shifting cultivation (*kaingin*). For instance, in project documents the uplands were defined as rainfed areas of hilly to mountainous topography where ecologically destructive human activities (i.e., shifting cultivation and other forms of forest exploitation) were being practiced. Notwithstanding a lack of empirical evidence, shifting cultivation was seen as the cause of serious resource degradation (forest destruction, loss of vegetative cover, erosion, loss of soil fertility, excessive runoff, and declining agricultural productivity) which had deleterious off-site effects such as flooding and siltation.

The means by which farmers were encouraged to abandon their shifting cultivation practices and develop stable, productive, and viable farms involved an integrated community development program with four components: agricultural development; forest resource development; socio-institutional development; and infrastructure development. Under the agricultural development component, improved land management technologies (soil conservation practices, crop diversification, and crop rotation) were developed and disseminated to farmer participants.

Until 1986, project administration and implementation was hampered by a centralized funding and decision-making structure. In the field, securing farmer participation was difficult as a result of language problems and the farmers' marked lack of trust in the government's motives, especially with regard to land. Various project evaluations indicate that farmer adoption of promoted technologies was limited (USP, 1990; ADB, 1991; DENR, nd). This was particularly the case with contour hedgerows and bench terracing, farmers indicating that the technology was too labor-intensive, time-consuming, and expensive. As a result, the project had to pay farmers to induce "adoption" of the technologies. Performance evaluation by the funding agencies encouraged a focus on farm rather than farmer development, reflected in the success in achieving physical development but the weak community participation and organization, and the resort to an incentive-driven extension system. Following project completion, it was envisaged that the DENR would continue to fund the pilot sites and assume greater responsibilities for developing technologies that provided acceptable alternatives to shifting cultivation. But, budgetary constraints limited DENR activities and, at the time of the survey, the project had all but ceased any on-going activities in any of the sites. The USP component was not included in the second phase of PIADP.

(b) *The initial situation*

The USP site selected for this study was Barangay Salogon in the municipality of Brooke's Point, 192 km south of Puerto Princesa, the provincial capital. This village (*barangay*) was typical of upland areas in much of Palawan Province, being characterized by steep slopes (in excess of 30%); shallow, moderately fertile soils; high rainfall (averaging 1,500 mm); poor infrastructure and support services; and a low level of development (Barrera, Salazar & Simon, 1960; PIADP, 1987). Access to the upland hamlets (*sitio*) in the project site was obtained via unsealed roads branching from the east coast highway and heading into the foothills of the central range. These roads were often impassable during the wet season. The interior *sitio* could only be reached on foot over a network of poorly maintained pathways. The hills closest to the highway were a mosaic of cultivated land, land under grass and scrub fallow, and small areas of uncultivable land under forest. Further inland, secondary forest predominated, with patches of cultivated land. Recently burned areas could be seen, indicating the continuing practice of shifting cultivation.

The majority of the population in the project site was of the indigenous Palawano cultural group. Beyond the first mountain range, a largely traditional lifestyle was maintained. The population density was relatively low by Philippines standards (under 70 persons per sq.km) but was higher on the first range than in the interior. Farm holdings were small (2–3 ha) and the majority of the land was under a short-fallow rotation, though some long-fallow (shifting) cultivation was still practiced; in both cases, slash-and-burn (*kaingin*) was the preferred method of land preparation. There had been a trend from long-fallow cultivation toward continuous cropping, necessitated by population growth and a desire to farm in more accessible areas.

The farming system involved the cultivation of upland rice (the staple food), glutinous maize, and root and tuber crops for subsistence, and the production of maize for sale. Perennial crops included fruit and cashew trees, as well as some timber species. Livestock (primarily pigs and chickens) were reared on a small scale. There was limited collection of forest produce and occasional off-farm employment. Most households did not produce enough rice to meet their consumption requirements. Hence, rice production was supplemented by root and tuber crops, and by purchased rice. Maize provided the bulk of household cash income.

(c) *Promotion of conservation farming practices*

Most farmers surveyed were aware of soil erosion and its effects, though none saw it as a significant problem and there were no indigenous soil conservation technologies as such. The main soil conservation measures promoted by USP in Salogon were contour hedgerows (of shrub legumes, grasses and tree crops) and bench terracing. Other technologies promoted included contour canals, ditches, check dams, and soil traps. These were packaged into four conservation farming modules, which included a range of cropping patterns as well as the conservation structures. Demonstration plots for the different modules were established at the project headquarters.

The promotion of conservation farming modules involved bringing small groups of up to 10 farmers to the meeting hall and demonstration plot; here farmers were exposed to a one-day training session and practicum. After the completion of the training session, community organizers provided follow-up training in construction and use of an A-frame for locating contour lines, and establishing hedgerows on farmers' fields.

The extent to which farmers actually participated in developing and selecting technologies was minimal. Moreover, it emerged that most land development was implemented by contract workers, groups of five to 10 farmers, often from the lowlands or other USP sites, who were paid by the project to develop the recommended packages on a participant's farm. (An informant stated that the work was contracted out because the local Palawano were too weak from endemic malaria to implement the technologies in time for a mid-term assessment by the funding agencies.) Often the farmer was not part of this work group or was merely employed as a laborer within the work group, although he/she signed the contract for land development and for the receipt of payment for the work. Not surprisingly, those who did not participate in the actual establishment of conservation measures often did not know how the measures were established.

Hedgerow planting materials were supplied free of charge by the project. Tree seedlings were also made available, regardless of whether land development had been undertaken. Where tree seedlings were distributed in association with land development they were generally planted in the alleys between hedgerows or on the risers or benches of the terraces. Otherwise they were planted largely at the farmers' discretion.

As well as the above material incentives for adoption, farmers on Public Forest Lands (the majority) were issued with Certificate of Stewardship Contracts (CSC), a 25 year nontransferable lease which could be revoked if the recommended agroforestry measures were not implemented. There was also a ban placed on shifting cultivation (i.e., the clearing of any forested area), again with loss of land rights as the penalty, forcing farmers to place more emphasis on intensifying the use of their permanently cultivated parcels. During the project period at least one farmer was evicted for contravening the ban on shifting cultivation and had to leave the area, an event which no doubt made a significant impact on the remaining farmers.

(d) *The farmers' response*

Adoption of the conservation farming packages started soon after the project began, peaking within two years (just before a project review) and declining rapidly thereafter. About 50% of the farmers in the project area had adopted one or both of the core technologies, namely, contour hedgerows and bench terraces (though contour hedgerows predominated). Some of the adopters, as noted above, had merely allowed the project to establish hedgerows or terraces on their farms through paid contract workers, without understanding the purpose of the measures or being convinced of their benefits. Hence, they did not know how to establish or maintain the structures. Significantly, after the project was terminated, around 33% of "adopters" abandoned or actively destroyed the conservation measures established.

There were no major differences in socioeconomic characteristics between adopters and nonadopters. Adopters, however, were more likely to have farms near the USP headquarters. Those at a greater distance may have found this a disincentive to pursuing the necessary training and acquisition of inputs. At the same time, project staff may have been disinclined to promote the technologies on more distant farms. Farmers who were not entirely dependent on public land also had less incentive to adopt the recommended conservation practices. As their claim to land was more secure they had less need for a CSC, hence the threat of its withdrawal was not such a strong inducement to adopt.

Many of the adopters cited control of soil erosion and increased soil fertility as the main reasons for adoption, though a significant proportion indicated that they were merely following recommendations or directives of the USP. Although both adopters and nonadopters recognized a need for soil conservation, they were conscious of the labor input required to implement the recommended conservation measures. Adopters also pointed to adverse side effects of hedgerows, notably their association with increased weed and pest problems, and the long time required to realize any benefits. Nonadopters highlighted the loss of cultivated area to hedgerows and the difficulty of burning a field with hedgerows.

(e) *The impact on the farming system*

The impacts of adopting the conservation measures were not clear. Although adopters generally felt that soil erosion had been considerably reduced (despite the wide spacing of plants within the contour hedgerows on most farms), this did not result in an obvious difference in soil fertility. Hence productivity of major crops cultivated with soil conservation measures (maize, upland rice, and root crops) was not generally affected. There was no positive effect of conservation measures on upland rice yields. The average maize yield for adopters was 40% higher than for nonadopters and 120% higher than for the nonproject farmers. The difference between the project farmers (adopters and nonadopters) and nonproject farmers was attributable to the use of inorganic fertilizer, a practice promoted by the project and widely taken up, regardless of the response to conservation technologies. The difference in maize yields between adopters and nonadopters within the project area may have been partly due to the conservation measures, though the variability of reported yields was high.

Other impacts of the project could be discerned. The restriction on clearing primary or secondary forest for farming, attached as a condition to the CSC, had probably accentuated the pre-existing trend away from traditional, forest-fallow, shifting cultivation. Though the system was clearly still practiced to some extent in the more remote *sitio*, short-fallow cultivation had become the norm, with rotation within or between parcels. In some cases continuous cultivation was practiced.

This trend toward intensification of land use was associated with an increasingly commercial orientation. Project farmers obtained more cash income than nonproject farmers, mainly due to the greater income from maize. This in turn was due to the larger maize area cultivated and the higher yields obtained which, as noted above, were due to the greater use of purchased inorganic fertilizer.

Another impact was that project farmers had planted significantly more trees than nonproject farmers. This was a direct result of the project's seedling dispersal activities. Although the trees did not have an immediate effect on income, they were viewed as a valuable long-term investment. Nevertheless, negative perceptions of trees were that they prevented burning of crop land and reduced rice and maize yields due to shading (these objections applied to the planting of trees together with annual crops), and that they did not give a quick enough or high enough return.

(f) *Discussion*

The case study shows that it is possible to get traditional shifting cultivators in a marginal environment to adopt intensive soil conservation practices, but only by incurring a high economic and social cost, and then without any assurance that the investments will be maintained, let alone emulated by surrounding farmers.

The farmers in Barangay Salogon were resistant to the adoption of the recommended conservation measures, especially bench terracing, because they did not see soil erosion as a major problem, because the technologies were labor (and skill) intensive while labor was their major limiting factor, and because the technologies did not fit with their existing farming practices, particularly their system of fallowing and their use of fire for clearing plots. Farmers were more accepting of tree-planting, but on separate plots, not in association with annual cropping.

To overcome this resistance, a mixture of inducement and coercion was used. The provision of planting materials, fertilizer, and money for labor overcame the major material constraints to initial adoption. At the same time, the very presence within the *barangay* of the project staff, combined with their authority to grant or withdraw cultivation rights based on adherence to project requirements, exerted strong pressure to adopt recommended technologies and land-use practices.

Adoption induced or coerced in this way, sometimes even without the direct participation of the farmer, was never likely to be sustainable once the project concluded. Farmers did not maintain the conservation measures and many actively removed them. They lacked the understanding, conviction, or resources necessary to adopt the technologies in the true sense of the term, that is, to maintain and reestablish them beyond an initial trial period.

This is not to say that the conservation technologies introduced were entirely inappropriate. The trends toward intensification and commercialization of the farming system will make hedgerow technologies of some form increasingly attractive. On some farms continuous cropping of maize using plough cultivation and inorganic fertilizer had become the major source of cash income, and there was some indication that contour hedgerows had helped to maintain yields in this context.

Nevertheless, the USP itself was clearly not a community-based project and, largely as a consequence, its interventions were not sustainable. In this case, the rhetoric of community-based sustainable development was a smokescreen for what was essentially a coercive, top-down intervention based on preconceived notions of environmental and development needs.

3. THE MAGDUNGAO AGROFORESTRY PROJECT IN ILOILO

(a) *The project*

Iloilo Province occupies the southeastern portion of the island of Panay in the Western Visayas. Barangay Magdungao is located in Passi Municipality, approximately 50 km north of Iloilo City. In 1979 the DENR initiated an Integrated Social Forestry (ISF) project in Magdungao. However, there were few activities until the start of the Magdungao Agroforestry Project (MAP) in 1984. The MAP was implemented in three stages over 1984–91 as part of the Philippines-wide Rainfed Resources Development Project (RRDP), funded by DENR and the United States Agency for International Development (USAID). The budget allocations for stages 1 and 2 were ₱1.067M and ₱2.753M respectively. No figures were available for the third, extension phase (1990–91). Thirty percent of funds came from the DENR and 70% from USAID (DENR, 1987, 1989, 1991a,b; USAID, 1982, 1991).

The broad objective of the MAP was to address the environmental and socioeconomic problems of the site by developing a "community-based, participative, sustainable, integrated agroforestry project" (Garcia, Gerrits, Cramb & Saguiguit, 1996). The specific objectives were: to establish a strong and viable community-based approach to agroforestry development; to increase land productivity through the adoption of sustainable and economically viable agroforestry techniques; to uplift the socioeconomic well-being of the community; to provide a sufficient supply of fuelwood for industrial (i.e., the adjacent sugar mills) and domestic use; to provide a learning laboratory for the improvement of social forestry practices; and to improve local environmental conditions. Thus the MAP was to serve as a model for the DENR's Integrated Social Forestry Program throughout the Philippines.

The strategies by which these objectives were to be attained were: a participative, community-based approach where farmers were included in planning, decision-making, management and implementation, with the long-term view of transferring responsibilities to the farmers; provision of secure land tenure through the issuance of Certificate of Stewardship Contracts (CSCs); extension and training in agroforestry and community development; encouraging farmers to adopt conservation farming and practice crop diversification on cultivated land by providing technical and material assistance; communal reforestation; the development of infrastructure and facilities; and the development of linkages with other agencies to encourage on-going development.

In 1986, after funding delays, the MAP finally became fully operational. During this year farmers were organized into work groups and provided with training and monetary and material incentives to adopt conservation measures. Cross-farm visits were organised for project staff, key farmer leaders, and participating farmers. There was a notable increase in farmer adoption of soil conservation technologies by the end of the year. In 1988 the project established and registered the Magdungao Farmers' Association Incorporated (MAFAI) which progressively took over management of the project. In 1989 the MAP became a DENR pilot site for the implementation of Communal Reforestation Contracts. A "project assessment and transformation planning meeting" in 1989 led to an extension of the project until 1991 to allow for community strengthening and the gradual phasing out of DENR/RRDP support. In December 1991 external support ended and the project was devolved to the municipal agricultural office.

(b) *The initial situation*

Magdungao has an annual rainfall of 1,800 mm, but the dry season from January to April severely limits crop production. The project area in the north of the *barangay* comprises rolling to steep hilly and mountainous regions. Soils range from loams to clays and are generally susceptible to sheet and rill erosion (Alicante, Rosell, Barerra, & Aristorenas, 1947). Annual cropping dominates the landscape.

The *barangay* as a whole was characterized by poor infrastructure and services, and the project area was relatively inaccessible. The population growth rate was 3.1% and the population density was 125 persons per sq.km (about double that of the Palawan site). The majority of the residents of the upland hamlets had migrated from the nearby lowlands in search of cultivable land. As in most other upland sites, the extent of household and community interaction was largely limited to local neighborhoods, but this was further inhibited by the division of the community into opposing clans, a fact which had considerable bearing on the implementation of the project.

Upland households generally owned only one or two parcels of land with an average area of 2–3 ha. Farmers operated diverse farming systems dominated by the production of annual crops (rainfed bunded rice, upland rice, maize and vegetables) but including livestock and perennial crops. Rice was the staple crop. Maize, vegetables and coffee were the main cash crops, although households also obtained cash from the sale of livestock, fruit, and forest tree produce. Farmers perceived farm productivity to be declining due to resource degradation (i.e., soil erosion and reduced soil fertility) but, paradoxically, indicators of household welfare were felt to be constant or improving.

(c) *Promotion of conservation farming practices*

As mentioned, the MAP was designed to be a community-based, participative project which sought to address the socioeconomic and environmental problems of the site by focusing on community development and farmer adoption of agroforestry technologies. Initially project implementation was hindered by delayed release of funds and until 1986 project activities centred on community preparation, land surveys and issuance of CSCs, development of a demonstration farm and central nursery, and selection of participants. The project became fully operational in 1986 and during this year farmers were organized into work groups and provided with training, and monetary and material incentives to adopt conservation measures. In addition, the site became a training center for DENR staff and ISF participants.

While the project promoted a suite of agroforestry and soil conservation technologies directed at soil conservation and fertility management, contour hedgerows and contour bunds were the key soil conservation technologies recommended. Adoption was encouraged by the provision of training, cross-farm visits, the organization of work groups, and the provision of monetary and material incentives. In addition, the project encouraged crop diversification, nursery management and fruit and forest tree cultivation, the integration of livestock, and the development of aquaponds and bunded rice. Most of these practices were encouraged by the provision of material inputs (Iturralde, 1991; Oliva, 1991).

Overall, project implementation was beset by problems. These included: (i) delayed release of funding, (ii) issuance of CSCs over land previously classified, not as Public Forest Land, but as Alienable and Disposable Land, (iii) faulty establishment of hedgerows as a result of the inadequate supplies of planting material and inadequate training and supervision during establishment and maintenance, (iv) negative effects stemming from the provision of material and monetary incentives to encourage farmer adoption of recommended technologies, (v) conflict between clans and associated allegations of corruption within MAFAI, and (vi) rapid withdrawal of support from the site and the associated devolution to the municipal agricultural office.

(d) *The farmers' response*

Survey respondents included adopters of MAP-recommended practices, non-adopters within the project's sphere of influence, and nonproject farmers. The three groups did not differ significantly in household characteristics. There were also few differences between the adoption categories in terms of their landholdings. In general, however, it appeared that adopters had greater tenure security than non-adopters (by virtue of holding CSCs and Certificates of Land Transfer (CLTs), issed by the Department of Agrarian Reform (DAR)). While more adopters rented land than the other groups, a greater proportion of the other groups were entirely dependent on rented land. Nevertheless, the mistaken issuance of CSCs over land which had previously been classified as Alienable and Disposable caused much mistrust of the project, confused the land tenure situation, and placed the basis of the project, (i.e., better stewardship through provision of tenure security) in doubt. At the time of the survey CSCs had not yet been replaced with titles.

Adopters indicated that their rationale for adopting contour hedgerows and/or contour bunds was the need for soil conservation, improvement of soil fertility, and the opportunity to obtain planting materials. But, there were problems with the technology as extended to the farmers, as well as with the quality of adoption. Hedgerow establishment was limited by the lack of suitable species and an inadequate supply of planting materials, the latter resulting in wide within-row spacing of plants. Incorrect establishment and hard trimming resulted in the further development of hedgerow gaps which were not corrected by in-fill planting. Overall, the quality of hedgerow adoption had a detrimental impact on the effectiveness of hedgerows as a soil conserving and fertility management measure. By implication, poor quality adoption limited the contribution of the contour technologies to increased productivity.

(e) *The impact on the farming system*

The main impact of the project on the farming system appears to have been an increase in farmers' cultivation of fruit and forest trees. In addition, there was evidence that by stimulating the development of bunded terraces and hence wet rice cultivation, the project had encouraged farmers to substitute wet rice for upland rice, thereby freeing land and labor for the cultivation of maize and vegetables for sale.

The recommended soil conservation measures were implemented on sloping lands on which maize, upland rice and vegetables were cultivated. While contour hedgerows, contour bunds and terraces were visible throughout the project area, yield data suggest that they did not have major productivity effects. Other than for the first or wet season cropping of maize, no yield differences were observed for maize and upland rice between the adoption categories. Higher yields during the first maize cropping may have reflected improved soil fertility, better fertilizer use efficiency, or better moisture conditions.

The project had livestock dispersal programs for buffaloes, horses, goats and pigs, and also provided participants with ducks and chickens. The dispersal of horses and goats failed completely, and the data indicate that adopters did not greatly benefit from the other dispersal programs as all adoption categories had similar numbers of the various livestock.

In line with the lack of impact on most farm enterprises, the MAP does not appear to have resulted in increased household cash incomes. Adopters and nonadopters had similar average annual incomes (₱22,000), these being significantly greater than that obtained by the nonproject farmers (₱14,000). For all groups the sale of maize, vegetables, and livestock were the most important sources of income.

At the commencement of the project, farm-household problems were identified as low income, poor health, poor nutrition, low agricultural productivity, and environmental degradation. At the time of the survey the main problems cited by all groups were inadequate food supplies and financial problems (relating to food, health, and farm inputs). Although resource degradation was now seen to be less of a problem, the main social and economic problems remained.

Despite the lack of quantitative evidence for any project impact on productivity and incomes, adopters felt that the biophysical characteristics of their farms were improving (i.e., reduced soil erosion, increased soil fertility and soil moisture, and reduced inorganic fertilizer requirements), whereas nonadopters and nonproject farmers indicated declining resource quality and farm productivity. The capacity of contour bunds and hedgerows to lead to the development of terraces, however temporary in this case, would account for the perceived differences in biophysical conditions. All groups felt, however, that household welfare was constant or improving, suggesting that larger economic changes were underway, dwarfing the project's conservation efforts.

(f) *Discussion*

The implementation and success of the MAP was significantly affected by various problems within the community, within the project, and with the recommended technologies. Yet despite these problems there were high levels of adoption. Much of this was attributable to the material and monetary incentives offered by the project. On some farms the recommended technologies had evolved into stable terraces requiring minimal maintenance. Where this had not occurred there was a marked decline in the use and maintenance of hedgerows. Farmers' attitudes reflected a concern for erosion, but even so it was unlikely that the recommended technologies would be sustained. This is attributable to the labor requirements and delayed returns associated with the technologies, as well as the evolution of the farming system away from one of the enterprises (upland rice) to which the technologies had been applied.

Thus the case study has shown that high rates of adoption of soil conservation measures are not necessarily indicative of a successful and sustainable upland development project. The shortcomings of the MAP were many and related to the scale of the project, the large number of project interventions, the promotion of inappropriate technologies, the use of monetary incentives, inadequate community organization, and the rapid withdrawal of support at the project's end. Once again, the rhetoric of community-based sustainable development failed to be translated into a genuinely particpatory project which responded to farmers' diverse goals and circumstances.

4. THE CEBU SOIL AND WATER CONSERVATION PROGRAM

(a) *The project*

The Province of Cebu is located in the Central Visayas Region and is dominated by the long, narrow island of the same name. It is the most densely populated province in the Philippines and soil erosion has long been recognized as a serious problem (Barrera, Aristorenas, Hernandez & Lucas, 1954; BSWM, 1986). In 1981 a staff member of World Neighbours, an international NGO focusing on rural community development, approached officials from the Department of Agrarian Reform (DAR) and the Department of Environment and Natural Resources (DENR) for assistance in selecting upland sites which would benefit from a soil and water conservation program. Barangay Guba, 25 km to the north-west of Cebu City, and Barangay Tabayag in Argao Municipality, 88 km south of Cebu City, were recommended. In both sites preliminary meetings introduced World Neighbours and discussed farmers' problems and their underlying causes, i.e., loss of soil fertility due to soil erosion and lack of nutrient cycling. As a result of these discussions, the Cebu Soil and Water Conservation Program (CSWCP) commenced in these two *barangay*. In 1988 participants in the CSWCP and a related coastal development program combined to form the Mag-uugmad Foundation Inc. (MFI), *mag-uugmad* being a Cebuano term for tiller, farmer, or an advocate for change or development. In 1989 the MFI established training centers at Guba and Tabayag. Initial funding for the CSWCP was provided by World Neighbours. Most of the on-going funding has come from World Neighbours and the Ford Foundation. Income is also derived through training personnel from other projects and organizations, and consultancy work (Garcia *et al*., 1995a; Gerrits, Garcia & Cramb, 1997).

Underlying the farmer-based extension system utilised by World Neighbours and the MFI is the principle that a sustainable farming system must be economically viable, environmentally sound, and culturally and socially acceptable. To achieve sustainable systems World Neighbours and MFI use a six-step community development methodology: (i) start where the people are—plan with the village people to develop, implement, monitor and evaluate a flexible project plan; (ii) discover the limiting factors (constraints to sustainable production); (iii) choose simple and appropriate technologies that fit the local situation; (iv) test the technology on a small scale on the farmer's field and under his/her management conditions; (v) evaluate and monitor results; (vi) develop farmer-to-farmer extension systems to transfer technology and develop project sustainability.

The method of extension of conservation technologies in Guba and Tabayag was based on the organisation of farmers into work groups (*alayon*) and the utilization of successful adopters as part-time farmer instructors. Farmers interested in implementing soil and water conservation technologies on their farm organized or joined a work group which then worked on each of their farms in rotation. On each farm the owner and farmer instructor designed a suitable farm plan, and the latter then demonstrated how the technology should be implemented. Each group and its individual members initially received some material or financial support, which formed the basis of a revolving fund. Community organisation was undertaken before phasing out the program from the site. Broader dissemination of the technologies and of the extension methods was achieved by training the technical staff of relevant government and private agencies.

(b) *The initial situation*

The project site considered here included Guba and nine other upland *barangay* in the hinterland of Cebu City. Together these *barangay* covered an area of 78 km^2. Annual rainfall was 1,600–1,800 mm, with no distinct dry season. The site was 200–600 m above sea level and the terrain ranged from rolling to very steep. Soils were heterogenous but primarily acidic, heavy clay loams with slight to severe erodibility and susceptibility to water-logging. The area was about 25 km northwest of Cebu City center and could be accessed by gravel roads. The population growth rate averaged 1.7% over 1980–90 and the population density in the latter year was 239 persons per sq.km, considerably higher than at Magdungao (Flieger, Redido, & Nazaret, 1995).

The primary source of livelihood for most households in the project area was farming, with maize being cultivated for subsistence, and a variety of cash crops (predominantly vegetables, mangoes, and flowers) providing cash income. Local employment opportunities included contract bagging, spraying, harvesting and hauling of mangoes, contract firewood and charcoal production, and the purchase and sale of bamboo. Off-farm employment (especially in Metro Cebu) also provided some cash income.

Average farm size was 1 ha with a range of 0.25 to 2 ha. Lands in the project area were a combination of Alienable and Disposable Lands and Public Forest Lands. Most land was privately owned (with or without a formal title), however, about 30% of farmers rented part or all of their land under a share-cropping arrangement. Most of these had stable, long-term tenancy agreements with local or absentee landlords. Local landlords were also farmers and usually rented out their land because they owned several spatially separated parcels; their landholdings were reported to be up to 7 ha in size. Absentee landlords resided in Metro Cebu or as far afield as Manila and were reported to have landholdings of up to 70 ha.

In the early 1980s the farming system was dominated by the cultivation of maize for subsistence and the production of perennials (mango and banana) and livestock (cattle, goats, pigs, and chickens) for sale. There were two croppings of maize per year.

The increasing accessibility of the site, increasing commercialisation of the system, and MFI facilitation of vegetable marketing, has seen farmers restrict maize cultivation to the first cropping and utilize the second cropping period for the cultivation of vegetables (mainly string beans, tomato, capsicum, and ginger). Some were planting vegetables in both seasons and purchasing most of their maize requirements. Cut flower production was becoming more widespread, although still generally limited to chrysanthemum production for All Souls Day in November.

Most households had a range of fruit trees, the most important being mango. Despite high input requirements for bagging, spraying, harvesting and hauling, the sale of mangoes was a significant source of income. Bananas were grown for home consumption and sale.

Households raised a range of livestock including buffaloes, cattle, goats, pigs and chickens. These were raised as a source of food, income, and manure. Recently extension services had promoted penned pig production and widespread adoption had occurred.

At the time of the survey the most important sources of income were maize, for subsistence, and mangoes, vegetables and livestock, for cash.

(c) *Promotion of conservation farming practices*

CSWCP activities focused on the introduction of soil conservation technologies (MFI, 1989). In Guba these technologies included soil traps and check dams, contour canals, contour bunds, contour hedgerows and the associated practices of contour ploughing and alley cropping. Together, contour canals, contour bunds and contour hedgerows were the main soil conservation technologies promoted. Using the A-frame, farmers identified and marked contour lines at regular intervals down the slope. These were ploughed and the loosened soil removed and placed above the contour line thereby forming the contour canal and the contour bund. Next, grasses and leguminous shrubs were planted on the bund to form contour hedgerows. Initially most adoption involved napier grass hedgerows. The overly vigorous growth of napier grass led to its partial replacement with leguminous shrubs. Trimming of hedgerows was to occur every one to two months. Trimmings were to be fed to livestock or applied as a mulch to the alleys.

Assistance was offered on the proviso that farmers either joined or established an *alayon* group. The project then provided: (i) wages to farmer instructors, (ii) extension materials and support during preliminary group meetings, (iii) capital for a revolving fund through which *alayon* groups could obtain farm tools, and (iv) goats for a goat dispersal program.

(d) *The farmers' response*

In 1981 a leading farmer at Guba formed a five-member working group (*alayon*) with his siblings to implement some of the conservation techniques introduced by World Neighbours. In 1982 the group expanded and established the new technologies on 23 farms. In 1983 increasing farmer interest led to the formation of three more groups. As farm development occurred, farmers in neighbouring *barangay* also enquired about the technologies.

Maximum expansion of the project occurred during 1983–84. The project supported 20 farmer-instructors in eight of the 10 upland *barangay*. Each farmer-instructor managed three to four *alayon* groups. At the peak of the project there were over 70 *alayon* groups operating in the project area and over 1,000 farmers had adopted the hedgerow technology. Thus the project became widely known as the most successful conservation farming project in the Philippines.

Following the end of the project in Guba and surrounding *barangay*, farmer-instructors no longer received wages and their activities correspondingly decreased. Similarly the activities of the *alayon* groups diminished, mainly because most, if not all of the *alayon* members had established the soil conservation measures on their farms. Farmers reported that the *alayon* groups had no further tasks to accomplish, although some continued to assist members in everyday farm operations.

(e) *The impact on the farming system*

Adoption of contour bunds, canals, and hedgerows, and ploughing of the resultant alleys, resulted in rapid development of terraces. Once terraces had formed contour canals were no longer necessary and consequently were not maintained. Terraces were used for maize and vegetable cultivation and, to a lesser extent, cut-flower production. The effects of hedgerow adoption and terrace development as reported by farmers were: reduced soil erosion, better maintenance of soil fertility, a consequent reduction in inorganic fertilizer requirements, crop diversification, increased crop production, a supply of fodder for livestock, and an overall increase in household welfare.

Several problems relating to the on-going utilization of the technologies (particularly contour hedgerows) had emerged at the time of the survey. The development of contour canals and terraces resulted in greater retention of water on the field and increased percolation into the soil. In other contexts the resultant increase in soil moisture would be considered desirable because it extends the cropping season and reduces production risk. The project area, however, had heavy clay soils. During the second cropping when rainfall was higher, greater retention and infiltration of water resulted in water-logging problems throughout the area, with greatest problems being reported in Barangay Guba which had the heaviest soils. Some farmers dealt with the problem by constructing temporary drainage canals which were subsequently ploughed out. Other farmers suggested the need for permanent drainage canals. MFI staff were aware of the problem and were recommending the use of raised beds to farmers.

A more general issue was that, throughout the project area, hedgerow quality was observed to be in decline. Where hedgerows still existed, weed species were becoming dominant. In many farms hedgerows no longer existed and, while some terraces were stable, others were reverting to the natural slope. Several fields appeared to be in long-term fallow or abandoned. The explanations offered by farmers were as follows. (i) Hedgerows were difficult to maintain. This was because some hedgerow species were short-lived; hedgerows were adversely affected by two droughts (1987 and 1989); large ruminants were frequently tethered on the terraces during the dry season, often without the landowner's permission, resulting in overgrazing of the hedgerows and damage to the terraces; and hedgerows were difficult to re-establish once cogon grass (*Imperata cylindrica*) had taken hold. (ii) Some farmers felt that hedgerows no longer needed to be maintained once soil erosion had been controlled and the terraces had formed. (iii) At the peak of adoption, farmers established contour hedgerows over their entire farm. Later it was found that land was required for alternative purposes, e.g., tethering of livestock, and farmers consequently abandoned some of their hedgerows. (iv) In some cases land was left idle because of household labour shortages, old age, illness, death, or outmigration.

(f) *Discussion*

The widespread adoption of conservation technologies at the project site was due to the interaction of several factors, including site-specific factors (e.g., close community interaction, stable land tenure, increasing accessibility and market linkages leading to commercialization, the evolution of the farming system towards new enterprises), appropriate extension systems (e.g., farmer-to-farmer extension, traditional labor exchange systems), and appropriate technologies.

Replication of the project's success would require utilization of the project's farmer-to-farmer extension and labor exchange systems. The results of the study also suggest the importance of appropriate technology, acknowledging the heterogeneity and complexity of upland environments (especially compared to the lowlands) and the role of site-specific factors in determining the success or failure of interventions, and using this knowledge to identify site-specific opportunities (or "system gaps") which maximise the chances of project success.

The future of the site would appear to involve further intensification of vegetable and cut flower production (with finance provided by market intermediaries), a move to perennial crops, more off-farm employment, and less farming as land prices increase and farmers sell their land to wealthy urban residents. In addition, increasing government regulation of land use to protect watersheds vital to Cebu City is likely. In this context, soil conservation technologies will continue to be worthwhile in the more intensive, high-value cropping systems. Continued utilization and adaptation of these technologies, however, will require a continuous extension presence.

The conclusion from this case study is that project interventions need to promote appropriate technologies (those that address the farmers' needs directly) at the appropriate time (as determined by the stage of evolution of the farming system) and with the genuine participation of farmers (utilizing farmer-instructors and small, close-knit working groups), though not necessarily of the whole community. The dynamic nature of upland farming systems implies that "one hit, single message" extension projects will not result in sustainable utilization of recommended technologies. Given the evolution of upland farming systems, promotion of step-wise adoption of conservation technologies is likely to be more successful in encouraging the on-going practice of conservation farming. This suggests the need for an adaptive management approach which recognizes the need for a continuous extension presence.

5. COMPARATIVE ANALYSIS

All three projects had been identified as successful examples of community-based approaches to the promotion of sustainable upland development. Yet, on examination, only the CSWCP at Guba could be considered successful (though not perhaps in the long term), while the MAP at Magdungao was of doubtful benefit and the USP at Salogon was clearly a failure. A comparison between the CSWCP and the other two projects sheds some light on the requirements for successful intervention in the uplands. It is useful to examine separately the socioeconomic factors influencing success and the nature of the interventions employed.

(a) *Socioeconomic factors*

Several characteristics of the socioeconomic environment in Guba and surrounding *barangay* appear to have been favorable preconditions for the success of the CSWCP. First, population density was high (239 persons per sq.km), meaning that farming land was scarce and valuable and that continuous cropping on small plots was the norm. This increased the risk of soil erosion at the same time as it increased the incentive to conserve the soil resource. Population pressure was less in Magdungao (125 persons per sq.km) and Salogon (less than 70 persons per sq.km), and in the latter site rotational or shifting cultivation was still practiced. In such circumstances the incentive to adopt permanent soil conservation measures is considerably reduced.

Second, unlike Salogon where farmers did not see soil erosion as a serious problem, farmers at Guba were reported to be acutely aware of the problems caused by soil erosion (i.e., declining soil fertility and crop productivity), but were unaware of how to address these problems. Hence they were well-primed to absorb the CSWCP extension message linking soil erosion, soil fertility and crop productivity and to adopt the recommended soil conservation technologies.

Third, proximity to, and the increasing accessibility of, the large urban market of Metro Cebu allowed farmers in Guba and surrounding *barangay* to commercialize their farming systems and thereby gave them greater incentives to conserve their lands. The commercialization process, though clearly evident, was less well advanced in Magdungao and Salogon. In Guba the link between conservation technologies and commercial vegetable production, which was on the increase, provided the short-term economic incentive for adoption. When an extension worker spoke to farmers about vegetable cultivation, soil conservation technologies were presented as an integral component of such cultivation. In Salogon and Magdungao, the recommended conservation practices were not seen to be tied to profitable new enterprises. In Salogon, greater benefits were realized through adoption of more intensive maize cultivation based on inorganic fertiliser, and in Magdungao, farmers were more interested in increasing bunded rice production; developing terraces for hill rice cultivation was a low priority.

Fourth, security of tenure is recognized as a precondition for investment in soil conservation. In Guba, despite a high incidence of tenancy, the length of tenancy agreements (in some cases intergenerational) indicated a very stable land tenure situation. Accordingly, large numbers of tenants voluntarily established conservation measures on their rented land. In

Salogon, though the Palawano had ancestral claims to their land, they were regarded by the project as tenants or licensees of the state. Their insecurity of tenure relative to the state was used to coerce farmers to adopt conservation practices, but this proved unsustainable once the project presence was removed. In Magdungao, confusion over the status of land had engendered considerable resentment and undermined the effectiveness of Certificate of Stewardship Contracts as an incentive to adopt conservation farming. Thus the most appropriate means of ensuring security of tenure varied considerably from site to site.

Fifth, in the case of Guba, linkages within and between the various communities were well established. Obviously a farmer-to-farmer extension system would benefit tremendously from such favorable community relations. In Magdungao, by contrast, there were few linkages beyond the *barangay* and serious rifts within. In Salogon, the primary communities were in fact hamlets which were small, dispersed, and relatively isolated.

(b) *Extension approach*

Several facets of the extension system used by MFI in the CSWCP also contributed to the success of the project in Guba: (i) a focus on farmer groups rather than whole communities; (ii) use of a farmer-to-farmer extension system; (iii) use of cross-farm visits; (iv) absence of hand-outs, other than a minimal starter-package; (v) a long-term approach. The USP and MAP relied more on project extension workers, on conventional extension techniques, and on direct payments to farmers to adopt the recommended packages. As with most projects, they had to be implemented within a specified period and to have quantifiable measures of success by the end of this period. This seriously constrained their extension strategy. In contrast, the CSWCP was implemented with a long-term perspective, and even after the project in Guba was formally completed, the MFI was still active in the area and capable of responding to new problems as they emerged.

The role of small working groups deserves particular emphasis. The MFI made use of the traditional labor exchange system (*alayon*) to facilitate adoption. The *alayon* groups reduced the labor burden faced by each household; increased the rate at which information was disseminated; allowed for the sharing of draught animals, planting materials, and other resources; and facilitated the pooling of capital at the time of group formation to purchase farm tools. The other two projects did not build on traditional group activity in this way (although the MAP did organise farmers into groups for farm development work). In Salogon, contract groups from outside the area were used to establish conservation measures, sometimes with little farmer involvement. This was the very antithesis of participatory development.

6. CONCLUSION

There are several broad conclusions arising from these case studies which may assist those involved in efforts to promote sustainable development in the Philippine uplands and elsewhere.

(a) The case studies support the conclusion that rural communities are not homogeneous, harmonious groupings with a single development agenda, but comprise diverse social actors with different needs, priorities, and capabilities. The role of specific community characteristics has been underestimated in upland development projects in the Philippines. It has been generally assumed (in fact, it is part of the cultural ideology) that rural communities are well-functioning, cooperative social systems which can readily utilize and maintain project interventions, given an input of "community organizing" by project personnel. Communities at the *barangay* level do not, however, necessarily form a viable basis for resource management projects. The consequence is that projects like the USP and MAP, despite their participatory rhetoric, easily resort to a classic top-down, transfer-of-technology approach, ignoring the social dynamics of the communities they are targeting. Greater success has been achieved through the voluntary formation of often quite small groups of farmers with the motivation and the leadership to succeed, and with on-going support from committed actors and organisations beyond the local community.

(b) Upland farming systems and their biophysical and socioeconomic environments are not static but are continually changing, requiring farmers to adapt to new constraints and opportunities. Hence, even at Guba, a decade or more after widespread adoption of hedgerows, changes in farming conditions led many farmers to tneglect or abandon their hedgerows. While this may be taken to suggest that farmers' utilization of contour hedgerows (and to a lesser extent of established terraces) was "unsustainable," this conclusion implies a steady-state concept of sustainability which can be misleading. Analyzing the "sustainability" of farmers' utilization of soil conservation technologies is difficult because it presupposes that the recommended technology remains appropriate in terms of meeting farmers' needs and, by implication, that the farmers' environment is static. While change may occur slowly in upland farming environments, the fact remains that these environments are dynamic, hence in a sense "every technology has its day." If it is acknowledged that upland systems are dynamic, there is a clear argument for a continuous extension presence focusing on farming systems development, through which appropriate conservation practices are continually being tested and promoted, where "appropriate" is determined by the stage of development of individual farming systems.

(c) Upland development projects are not discrete, self-contained systems capable of delivering predetermined outcomes, but are superimposed on diverse and dynamic communities and rural environments, with their own pre-and post-project trajectories. Hence upland projects frequently fail to deliver the expected outcomes in terms of community-based resource management, but project documents typically attribute failure to particular "obstacles" which undermined an otherwise well-conceived project. Rather, interventions need to be long-term in nature, accommodating various stakeholders, and adaptive rather than prescriptive in the technology and other changes promoted. While NGOs such as the MFI have been very successful in pursuing this kind of intervention, the potential to "scale up" such programs to achieve the coverage required is severely limited (Edwards & Hulme, 1992, 1996; Constantino-David, 1992; though see Garrity, Mercado & Stark, 1998 for a promising counterexample). There is, therefore, a strategic role for the state in coordinating an ongoing program (rather than a series of resource-intensive projects such as the USP and MAP) for upland development and conservation. To the extent that the rhetoric of community-based sustainable development obscures this reality, it is an ideology which is inimical to the interests of marginalized farmers and resource users.

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