

ECONOMIC AND SOCIAL IMPACT ANALYSIS OF AN UPLAND DEVELOPMENT PROJECT IN NUEVA ECIJA, PHILIPPINES

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INTRODUCTION

Agro-forestation is a system of land management whereby forest and agricultural products are produced on appropriate and suitable areas simultaneously or sequentially for the social, economic and ecological benefit of the community (PCARRD 1979). This approach to forest occupancy management seeks to stabilize shifting cultivators by managing them in forest lands, in contrast to resettling them in lowland, agricultural areas.

As an improvement over the traditional farming technology used in upland areas, agro-forestation seeks to achieve simultaneously the following general objectives:

- (1) to create harmony between natural resource conservation and production;
- (2) to lessen the gap between food, water, and wood supply and demand;
- (3) to implement a land use scheme that is based on ecological, sociological, and demographic considerations; and
- (4) to prevent further forest destruction.

Agro-forestation is therefore primarily a resource conservation

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ERRATASEGURA-DELOS ANGELES' PAPER

<u>Page/Line</u>	<u>Error</u>	<u>Correction</u>
324/line 9	"upand"	upland
324/line 25	"UPLB-YHP"	UPLB-UHP
324/last line	"is successful"	are gratefully
343/line 27	"NIA-IBP"	NIA-IEP
348/line 28, column 5	"3.24"	30.24
353/Table 9, Total, 3rd column	"229.5"	230.5
357/lines 3-4	"One can . . . farm"	omit this sentence
358/line 26	"feasible"	infeasible
359/line 25	"right"	rights
365/line 21	"the research"	in research
373/Table 22, 3rd to last line, last column	"964%"	64%
385/Table 33, Total figure, last column	"1,627.64"	1,627.74
393/References.	"Galvez, J.A. . at at Los Baños"	Galvez, J.A. "Management and Cost of Watershed Reforestation: The Pantabangan and Magat," Paper presented at the PIDS Sponsored Seminar on Economic Policies for Forest Resource Management, held at Club Solviento, Laguna, 17-18 February 1984. Lucero, R.M. "Foraging Activity of Ter- mites in a Grassland Ecosystem." Unpub- lished Master of Science (Entomology) thesis, University of the Philippines at Los Baños, 1981.

strategy which is premised on the multiple use of the uplands. As such, it is expected to produce the following outputs:

- (1) increased forested area and wood production;
- (2) increased production of agricultural crops and livestock;
- (3) improved socioeconomic conditions of the beneficiaries;
- (4) stabilization of forest occupancy;
- (5) improved environment; and
- (6) knowledge of the acceptable, feasible and sustainable agro-forestry cropping systems.

By their very nature, agro-forestry projects have numerous potentials for producing impacts on the various development areas of concern.

The study focuses on agro-forestation projects which involve shifting cultivators. Specifically, it illustrates methods of analyzing the progress and impact of three pilot agro-forestation development projects (AFDP) in the country through the use primarily of secondary information.

Peculiarities in the AFDPs and AFDP Project Evaluation

The AFDPs analyzed in this study were being implemented on a *pilot* (and *small-scale*) basis and were relatively *recent*. Agro-forestation, however, is a *time-intensive* activity which means that the impact of such projects can be observed only after a considerable span of time has elapsed. Given this, the present analysis was limited to: (1) monitoring the *early* impacts on the project cooperators and, possibly, their immediate neighbors; (2) focusing on the *more direct* impacts; and (3) looking into nonproject specific factors which are also relevant to the AFDPs. The analytical framework discussed below, however, allows for the conduct of longer-lived impact studies. This is done to highlight imperative areas of concern which forestry development planners normally fail to consider, as well as to suggest data-gathering thrusts for impact analyses in the future.

An important feature of the country's agro-forestation is that it is still *experimental* and being continuously modified to suit the environmental and social needs of the dynamic populace and the environment where it is being implemented. Thus, alongside the actual conduct of agro-forestry activities are attempts to evaluate

the social, cultural, economic, and environmental *feasibility* of the pilot projects by the project implementors themselves. These imply that *changes within the project implementation bodies* also need to be considered in the impact evaluation. This is particularly important when the implementing unit is also trying out nontraditional methods of project management, such as the multi-disciplinary approach of the Upland Hydroecology program.

In addition to such project-specific peculiarities, "external" factors significantly influence the success or failure of agro-forestation. Upland development through agro-forestation seeks to solve the problems of poverty, production, and conservation altogether. However, these problems in the uplands are caused by many factors: migration into uplands due to lack of lowlands for agricultural cultivation, increasing population, activities of illegal loggers, and overgrazing ranchers, among others. Thus, the success of agro-forestry projects is also linked to the viability of projects and/or policies which address these factors.

Migration into the agro-forestation site by noncooperators is a case in point. The granting of land by the government for use by agro-forestry cooperators and initial increases in the latter's income due to improved production and marketing methods would certainly attract others. In the event that kaingin-making by nonproject cooperators occurs, the initial success of agro-forestation's impact on production, income and environmental stabilization will eventually be negated by these in-migrants' activities. This indicates that the external factors (external to the project management) also need to be considered.

Moreover, the pilot agro-forestry projects being studied are found either in watershed areas or are proximate to such areas, which have been given priority for forest renewal due to their crucial role in water and energy sources and in preserving environmental stability. Thus, other development projects which are being conducted in the neighboring areas are: (a) large-scale reforestation, and (b) construction of dams and supporting infrastructure for irrigation services and power generation. Complementarities among the various watershed development activities would therefore affect their respective successes. In the same vein, effective regulation of forest-based activities such as logging, grazing, mining, and the like, also needs to be monitored.

Given all these considerations, the study also sought to under-

stand and document the following:

- (1) the processes through which pilot AFDPs' implementors seek to achieve their objectives;
- (2) the mechanisms through which pilot AFDPs may be expected to produce an impact on the important development areas of concern;
- (3) the interrelationships among various upland development projects;
- (4) data gathering systems relevant to research on upland farmers; and
- (5) policies affecting upland development.

II. CONCEPTUAL FRAMEWORK AND METHODOLOGY

Generally, the progress and impact of agro-forestation on the areas of concern may be traced through: (a) modifications in the sociocultural-demographic-economic and institutional characteristics of the upland farmers; (b) changes in their use of inputs to production; (c) changes in their production and productivity; (d) linkages with development projects and other communities; and (e) environmental changes due to the new mix of vegetative cover in the uplands.

The conduct of agro-forestation entails the reorientation of the cooperators towards practicing conservation-oriented patterns of cultivation. Thus, the immediate impact of agro-forestation is to change the attitudes and perceptions of the cultivators towards production and the environment.

Moreover, agro-forestation conducted in upland areas where communication and transportation facilities are markedly lacking, where relatively few development projects have been vigorously pursued, and where communities are generally distant from more developed (lowland) areas, usually necessitates the building of organizations through which agro-forestry activities are introduced (Cuevas 1979). The organization therefore serves as the venue through which the government enlists the upland farmer to participate in the development process.

Changes in perceptions and organization building, however, would produce positive effects on the behavior of the cooperators as viewed through their practice of suggested agro-forestry cropping

patterns only as long as the necessary inputs are available. Such inputs would include (a) the planting materials, such as seedlings, fertilizers, implements; (b) labor; (c) water; and (d) land. In short land, labor, time and capital would be crucial to the progress of agro-forestation.

Two time frames for impact assessment are discussed: the first pertains to the direct and short-run impacts of AFDP projects which may be validated within the first few years of project implementation; the second deals with impact analysis for longer-lived studies. While the present study focuses on the first set of impacts and project progress, it also presents data which represent baseline information for operationalizing the indicators developed for analyzing long-run impacts.

Hypotheses on Impacts of Agro-forestation

a. AFDP Impact on the Environment

Since a major effort in the initial stage of agro-forestation is to reorient the farmer-cooperators towards conservation concepts, training them in the skills needed to conduct agrisilvicultural practices is a major AFDP activity. Farmers are trained on the whys and the hows of evolving a cropping system which is ecologically and economically sustainable over time. The initial agro-forestry effects therefore are changing attitudes towards conservation in general, and specific environmental issues such as: maintenance of soil fertility, effects of slash-and-burn techniques, the hydrological cycle, and others. Some concrete manifestations of changing perceptions on the ecosystem might be: the discontinuance of kaingin-making, the building of firebreaks, and actual planting of tree crops along with agricultural crops. Such manifestations would reflect the progress of the AFDP towards the achievement of its objectives.

The building of bench terraces and the establishment of contour terraces would have immediate impacts on the environment since they provide structures which arrest soil erosion. They also allow better regulation of water flows and the application of improved rice technologies.

In the long run, the reestablishment of appropriate vegetative cover on open, unproductive areas through agro-forestation is expected to restore the following services especially provided by the

forests to the environment: (a) restoration and maintenance of soil fertility, (b) control of soil erosion, (c) enhancement of the ground's ability to absorb water, and (d) completion of the hydroecological cycle and the food chain.

These services, in turn, yield the following results: (a) control of surface runoff; (b) minimized sedimentation of streams and reservoirs, thereby assisting the maintenance of irrigation and other water systems; (c) stabilizing of the flow of water during the dry and rainy seasons and minimization of the occurrence of extreme droughts and flash flooding; and (d) control of pests and plant diseases.

b. Impact on Participation/Women in Development

Agro-forestation needs to be implemented through the formulation of strong farmers' organizations. This is emerging as a necessary condition for a sustained effort at agrisilvicultural practices (Mindajao 1978; Cuevas 1979). More specifically, the setting up of organizations may be necessary for the following: (a) the conduct of activities with cooperation and mutual support; (b) the preservation of peace and order, and (c) as a prerequisite for establishing linkages with government agencies for the latter's provision of inputs, facilities, and the like. The effectiveness of organizations in carrying out a project which seeks to benefit the poor members of upland communities should thus be analyzed.

With organization building and a shift to more labor-intensive farm techniques, the allocation of household time for farm, marketing and organization needs will increase. This implies more involvement of women and children in farm-based activities, the distribution of the produce, and decision-making. Collective arrangements in labor supply, for instance, are manifested in the strong practice of the *bayanihan* system. This is expected to become noticeable in the short run, when increased incomes are not likely to be realized yet, when paid labor is not yet feasible, and when surplus family labor exists. In the long run, when higher cash incomes are generated, children will be spending more time in school, women will be able to set up cottage industries with available capital, and wage labor may be observed in the farms.

Changes in farm technology would also affect women's participation. Vergara (1985), for instance, noted that harvesting by

Manobos is generally done by women, while the men stand by on guard against tribal enemies.

An indicator of the progress of agro-forestation should be the continued participation of the farmer. A successful AFDP would imply low drop-out rates among initial farmer-cooperators, and the expansion of the coverage of the project to neighboring communities.

The success of agro-forestry is expected to positively affect political stability in the uplands in the long run. A crucial factor to consider, however, is the ability of government institutions to cope with the demands of agro-foresting communities which have strong organizations and have large mass bases. Actions of institutions which are not responsive to the rational demands of such communities would only create tension in the uplands and alienate such areas from the government. This is all the more important when the communities already feel that they have been treated unfairly, such as those in Pantabangan which have earlier been dislocated in favor of development projects which benefit the lowlanders. The extent and nature of interaction between the upland communities and representatives of government agencies in the uplands would thus critically determine the outcome of agro-forestation itself, as well as other developments in the uplands. Unequal access to or participation in the project benefits, however, breeds conflict. This seems to be a common occurrence especially where Christians and cultural minority groups are concerned.

The demands of strong organized agro-foresting groups on existing institutions may be complicated further, since agro-forestation seeks to solve problems of poverty, production, and conservation altogether. The failure to address any of these may result in short-lived projects, and more difficulties will beset the implementation of upland development projects in the future.

c. Impact on Production/Productivity

The direct influence of agro-forestation on production and productivity would cover both agricultural and timber production. In the short run, the agricultural production of *kaingero*-cooperators would increase due to the cultivation of agricultural crops employing better techniques, the encouragement of animal raising, and the use of improved inputs, such as soil and fertilizer (from ipil-ipil leaves

or animal manure). Better marketing links would encourage the upland farmer to diversify his agricultural crop production. In the long run, the raising of forest crops like fruit trees, ipil-ipil, and other fast-growing species would increase wood output. And, should land tenure be assured for a considerable length of time, the growing of hardwood trees would be encouraged.

Immediate impacts on production may be seen by looking into the mix of crops being planted and the animals being raised, and the use of inputs. The mix of crops of upland farmers — if it is to address the problems of poverty and lack of linkages with formal markets and lowlands — must help the farmer achieve a certain degree of self-reliance in basic commodities and market orientation. In the long run, farm surpluses and the desire to accumulate more capital will lead to more market participation by the uplanders. The development of adequate and fair marketing arrangements is therefore important to generate cash income.

Again, it is needless to stress that increases in production and productivity will be experienced only when the inputs to production are available. Thus, availability of control over production inputs is crucial to the choice of the right cropping pattern. Access to land, an important factor of production, is one question which agro-forestry project cooperators and implementors are still tackling. An improved land stewardship policy may be seen in the recent consideration of 25-year leases for forest occupants, though its operationalization is still being studied. Earlier, forest occupancy permits were revised to cover two years instead of one year; however, its effectivity remains to be balanced against the time intensiveness of agro-forestation.

Furthermore, agro-forestation would indirectly influence production and productivity through:

- (a) improved environmental conditions, allowing adequate water supply for irrigation, and maintaining lowland soil fertility;
- (b) the prevention of flash flooding and minimization of the extent of flooding;
- (c) the prevention of further encroachment on growing secondary forests, allowing them to mature into timber producing trees;