# INCOME CHANGES AND THE ANTIQUE UPLAND DEVELOPMENT PROGRAM

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*This report examines whether or not membership in the Antique Upland Development Program is associated with higher income and increases in income. The data show that program cooperators, especially the owner cultivators, are somewhat better off than program non-cooperators. This suggests that non-ownership of land is one constraint on the occurrence of a positive program impact.*

Beliefs that evaluation is inherent in the planning or operation of social action programs have appeared in numerous writings (e.g. David 1979; Bennett and Lumsdaine 1975; Sodusta 1979). The evaluation process has been taken, among others, as a way of determining the worth of an intended intervention, and of finding out the strength and weakness of planned activities. It may also be employed in deciding whether or not to discontinue a program. In such case, the assessment exercise stops after determining whether the desired effect was achieved. No feedback loop from evaluation to planning (in the planning --→ action --→ evaluation flow) may be mandatory. In other types of evaluation, results are used to help the program maximize its impact. That is, there is already a very strong commitment or need for the program's continuance, so that a feedback loop from evaluation to planning is necessary in the planning --→ action --→ evaluation cycle. The loop may include conditions and constraints under which impacts occur (Herrin 1983). The study on which this paper is based comes under the second type of evaluation. The program evaluated is the Antique Upland Development Program (AUDP).

The need for program continuance cannot be overemphasized. The program was among the first of the planned socioeconomic interventions in the upland areas. As the bulk of development schemes and inputs concentrated on urban industries and lowland agriculture, upland areas remained neglected. This thrust continued despite data which consistently showed that upland areas have residents with the lowest incomes, the highest proportion of persons with no education, the smallest farm size, and the lowest social prestige (Castillo 1979:43; Ellevera-Lamberte 1983:16; Sajise 1981:2; Garilao n.d.:1; Bangao n.d.:1-2). Uplanders were re-

fused assistance; instead they were accused of misusing forest resources that resulted in long-term droughts, destructive floods, siltation of rivers and polluting of marine life.

The implementation of the Antique Upland Development Program indicates that government and private entities are paying attention to, and recognizing the actual and potential contribution of, upland areas to national development. By helping the upland people, these entities are also helping to speed up the economic development process.

AUDP's primary goal is to improve the economic condition and quality of life of upland farmers through livelihood projects that are consonant with environmentalists' efforts to preserve and revitalize the forest ecosystem. Such government bureaus as Plant Industry, Soils, Animal Industry, Forest Development, and Agricultural Extension, and entities like the Antique Provincial Government, the University of the Philippines at Los Baños, and the Ford Foundation, pooled resources in 1976 to implement the program.

The AUDP began by helping the upland farmers organize themselves, a strategy which proponents of participatory development would endorse. This was followed by training interested farmers for various tasks. Program technicians, for example, taught them the principles of "self-sufficient small-time farming" designed to make full use of a two-to-six-hectare piece of land. The projects involved in this model were: homelot, woodlot, livestock-pasture, and field crops. New farming methods, high-yield rice varieties, and better types of fertilizer were introduced. Such training and related services as diagnosis of animal diseases, boar castration, poultry and livestock raising, terracing, forest and soil conservation, and, social organization and cooperation were also taught.[1] Financial support to farmers was

available from formal financial institutions through the recommendation of the AUDP.

But the program encountered problems. One was the lack of participation of some farmers. For example, a 40 year-old man with seven children, who tenanted a 0.7-hectare piece of land, did not join the program because he could not afford to buy either a plow or a working carabao. Yet he avoided obtaining project loans. Aware that some farmers had failed in earlier projects, he reasoned, "I am sure that I will fail because I am not educated. I just entrust everything now to the Divine Providence."

A second problem was two-fold: the slowness of loan repayment to credit institutions for farm investments, and the delay of credit institutions in processing loan applications. A number of farmers once applied for loans from a rural bank through the AUDP. Applications were filed early to be in time for peanut planting in September. But loans were not released until December. Feeling that investments on peanuts were futile, most farmers diverted their capital. Some amount went to children's education, others to medicine, household needs, chemicals for mangoes, a buy-and-sell business, and even gambling. As a result, many farmers were unable to pay their loans on time.

A third problem was the difficulty of technology transfer. A typical example was that of a farmer who joined the initial mango fruit raising project and later reported that although the mango blooming chemical recommended by the program proved effective, the recommended pesticide swept all the blossoms to the ground. He suspected that the local climate is different from that of experimental farms where, he was told, the chemical had shown success.

The rest of the paper assesses whether there were changes in income levels after the implementation of the program.

## Methods

I lived in Calaja II, Hamtic, Antique, the study area, for about six months in late 1980 and early 1981. This *barangay* was purposively selected for its representativeness and accessibility. I played the role of non-participant observer to establish rapport with the residents. Respondents were randomly sampled and categorized into *cooperators*, or those participating actively in the AUDP efforts, and *noncooperators*, or those who failed to undertake any of the program activities. Noncooperators were the control group. There were 25 respondents in each group.

I conducted the semi-structured interviews with the farmers. The interview schedule was pretested to allow myself to probe deeper and to enable respondents to raise issues. Follow-up and case studies were also made as months progressed.

The survey instrument was divided into two time-frames, before and after the AUDP implementation. Since the approach was retrospective, it only approximates the classical "pretest-post test control group experimental design", as follows:

|  | *Before* |  | *After* |
|---|---|---|---|
| *Cooperators* | $0_{1,1}$ | —AUDP— | $0_{1,2}$ |
| *Noncooperators* | $0_{2,1}$ | | $0_{2,2}$ |
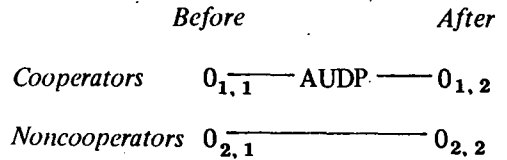
where $0_{1,2}$ and $0_{1,2}$ are incomes of cooperators observed at two points in time; and, $0_{2,1}$ and $0_{2,2}$ are incomes of non cooperators observed also at two points in time. Program net effect (1) is then $[(0_{2,1} \cdot 0_{1,1}) - (0_{2,2} \cdot 0_{2,1})]$ = 1. Expected income is graphically represented by using the above symbols as:
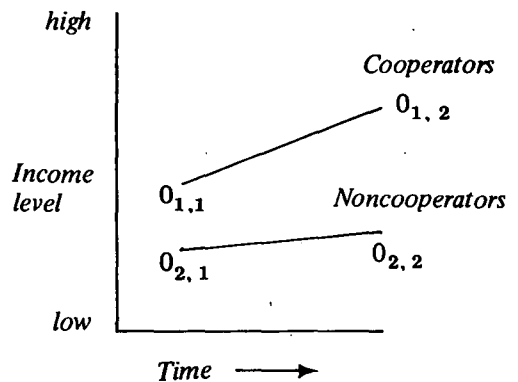
*Variables and Hypotheses*

This paper makes two comparisons: 1) the difference in absolute income between co-operators and noncooperators after program implementation; and 2) the income change of these two groups over time. The first comparison takes income, defined as the total amount of money from all sources that comes into the household in an average year, as the dependent variable; while AUDP cooperation status (cooperator or non cooperator), size of land cultivated by the household, land tenure status of the household, level of education and age of the household head, and household size serve as independent variables. It is initially hypothesized, that if the program had been effective, one could expect that the average income of co-operators would be significantly higher than that of noncooperators. Since other independent factors may have been at work simultaneously with the program, the "effects" of these factors on income should be taken into account. This is to determine whether we can attribute any income advantage of cooperators to their being members of the program and not to other factors. The next hypotheses then are: 1) those operating on larger-sized lands will have higher incomes; 2) owner-cultivators (a land tenure status) will have larger incomes; 3) farmers with higher education will have larger incomes; 4) younger farmers will have higher incomes, and 5) larger households will have higher incomes.

The above factors have logical connections with income level. For example, other things assumed equal in each case, a higher income will be expected from larger land resource base; a farmer who has no landlord to share farm produce with, will have a higher income than one who has; more educated farmers generally have better techniques in crop growing and animal raising, so that higher education contributes to a higher income level; youth means more vigor and stamina in doing farm work, hence the younger groups are expected to have a higher income; and larger households will have greater income because they have more contributors.

If the above factors relate to income, their effects should be controlled as "test factors" or competing explanations to the relationship, if any, between cooperation status and income.

Such control should be made especially when these variables are also associated with a category of AUDP cooperation status. However, since the primary objective here of introducing "test factors" is to find out if the hypothesized existing relationship between being an AUDP member and higher income is not spurious, the existence of an antecedent association between each of these factors and AUDP cooperation status is not absolutely necessary.

The second comparison looks at differences over time in income change of cooperators and noncooperators. The former is expected to have fared better.

In summary, the analysis measures program effects from comparisons of incomes of co-operators and noncooperators after the program, and from comparison of their income changes over time.

*Findings*

*Income Differences*

Studies using income as a variable often confront the issue of reliability. In this paper an effort will be made to establish the reliability of the income data being used (Garson 1976: 279). The study expects that, *ceteris paribus*, households operating on larger farms would have bigger incomes. Table 1 shows the distribution of respondents by size of farm and income.

For the period before the implementation of the AUDP, those with larger farms had the mean income advantage of ₱954 over the mean income of those with smaller farms. This advantage is statistically significant at the .01 level, using a one-tailed $t$ test, with 23 degrees of freedom giving allowances for heteroschedasticity.[2] For the period after the program was implemented, the ₱998 advantage of those with larger farms is also statistically significant. The direct relationship between farm size and income is further validated by Pearson's $r$ but we shall come back to this later. The hypothesis therefore is substantiated.

Table 2 shows selected variables of respondents after the implementation of the AUDP. The cooperators had significantly greater farm sizes, education of household heads, household size, and income. Significance is also shown by the point biserial ($r_{pb}$) measure of

Table 1. *Income Distribution by Size of Land Cultivated by Farmer Households*

| Land size | | No. of households | Average income | Standard deviation |
|---|---|---|---|---|
| | | | **1972-1975** | |
| Large | ( > 1.5 has.) | 18 | ₱2,262 | 1,486 |
| Small | ( ≤ 1.5 has.) | 32 | 1,308 | 418 |
| | | | **1976-1980** | |
| Large | ( > 1.5 has.) | 24 | ₱2,609 | 1,403 |
| Small | ( ≤ 1.5 has.) | 26 | 1,611 | 754 |

Table 2. *Test on Difference of Means Between Cooperators and Noncooperators Relevant Variables After the AUDP*

| Variable | Means of Cooperators | Means of Noncooperators | Difference of Means | Standard error | t value | d.f. |
|---|---|---|---|---|---|---|
| Land size (has.) | 2.2 | 1.1 | 1.10* | 0.35 | 3.11 | 36 |
| Age | 43.6 | 34.3 | 4.28 | 3.20 | 1.34 | 48 |
| Years in school | 4.6 | 2.7 | 1.90* | 0.64 | 2.97 | 48 |
| Household size | 7.6 | 5.0 | 2.60** | 0.65 | 2.62 | 48 |
| Household income | 2,718 | 1,462 | 1,256** | 294.65 | 4.26 | 37 |

\* p < .01, two-tailed
\*\* p < .001, two-tailed

Table 3. *Relationship Between Cooperation Status and Relevant Variables*

| Cooperation Status and: | correlation | t value |
|---|---|---|
| Land size | $r_{pb}$ = .44 | $t_{48}$ = 3.40* |
| Age of household head | $r_{pb}$ = .25 | $t_{48}$ = -1.79* |
| Years of schooling | $r_{pb}$ = .40 | $t_{48}$ = 3.30* |
| Household size | $r_{pb}$ = .36 | $t_{48}$ = 2.67* |
| Household income | $r_{pb}$ = .52 | $t_{48}$ = 4.22** |
| Land tenure | $V$ = .25 | $x^2_1$ = 3.06 |

\* p < .01, two-tailed
\*\* p < .001, two-tailed

**Table 4.** *Relationship Between Relevant Variables and Income*

| Income and: | correlation | t value |
|---|---|---|
| Land size | $r = 0.37$ | $t_{48} = 2.76**$ |
| Age of household head | $r = 0.16$ | $t_{48} = 1.12$ |
| Years of schooling of household head | $r = 0.11$ | $t_{48} = 0.77$ |
| Household size | $r = 0.32$ | $t_{48} = 2.34*$ |
| Land tenure | $r_{pb} = 0.18$ | $t_{48} = 1.27$ |

\* p < .05, two-tailed
\*\*p < .01, two-tailed

relationship. Table 3 includes a land tenure dichotomous variable (owner-cultivators and tenants) which is related to cooperation status. However, the Cramer's $V$ association value of 0.25 for land tenure and cooperation status is not significant suggesting that the two farmer categories, cooperators and noncooperators, have statistically similar age levels and land tenure composition.

Table 4 shows Pearsonian $r$ and Biserial $r$ levels of relationship between independent variables, size of land tenure, education and age of household head, and household size and the dependent variable, income. Only the size of cultivated land and size of household individually exhibit a linear relationship with income. Hence, only the effects of these two factors need to be controlled when relating cooperation status to income. It may be noted that although higher educational level is associated with being a cooperator, education does not covary with income (Table 4). Since the interest here is on whether there is a direct link between cooperation status and income and not on the antecedent causes of cooperation status, education need not be controlled when relating cooperation status to income (Blalock 1972: 449). A second-order partial correlation coefficient equal to 0.46 was calculated with an $r_{12.34}$ formulation (where 1 = cooperation status, 2 = income, 3 = household size and 4= land size). An $F_{1, 48}$ test on the coefficient resulted in a value of 12.33, which is statistically significant at the .01 level. Hence there is a positive linear relationship between cooperation status (a dummy variable where cooperator = 1 and noncooperator = 0) and income with household size and size of land held constant.

Let us now examine income changes over time. Table 5 gives numerical values to net income changes as $(O_{1,2} - O_{1,1}) - (O_{2,2} - O_{2,1}) = I$; where $O_{1,2}$ is average income observed with the first group (cooperators) after program implementation, $O_{1,1}$ is average income observed with the first group before the program, $O_{2,2}$ is average income observed with the second group (control group/noncooperators) after the program, and $O_{2,1}$ is average income observed with the second group before the program. $O_{1,2} - O_{1,1}$ is meant to measure income change due to the program and other factors; $O_{2,2} - O_{2,1}$ income change arising from factors other than the program. Subtracting the two net observations gives income change due to the program. Note that in Table 5, the total sample on the average had a positive net change. But when the sample is broken down into owner and tenant groups, only the owner's income held, while that of tenants declined. This suggests a case of specification, where benefits accrue to owner cultivators only. This is confirmed in Table 6, where the time averages of individual income change are used. One notes that only the owner cooperators have a confidence interval on average income change that does not span zero. This proves that a positive impact of the program is limited to owner-cultivators only, and that the advantage of cooperators over

noncooperators observed earlier is confined to farmer-owners only.

## Discussion

Despite economic, social and technical difficulties, the AUDP is continuing. The present study gives evidence that the program is accomplishing something. This is proof to concerned agencies that upland development is feasible.

For the program, being a farmer tenant appears to be a constraint while being a land-owner seems to be a decided advantage. It appears logical for the AUDP to exert more effort in helping the tenants while not neglecting the small owner-cultivators. There is need to help farmer tenants so that the benefits they derive from the program will be at least proportional to, if not as much as, those which the owner-cultivators enjoy. Since land ownership structures cannot be drastically changed without grave social and political consequences, some program aspects could instead be reinforced. The animal and poultry raising (especially goat-

raising) aspect of the program showed promise. The program should look for ways of working closely with the tenants on this aspect.

The constraints observed are poverty and lack of capital. With projects, the program could help in the acquisition of much needed capital. But care should be taken in order to avoid failures. People could form attitudes toward development projects through vicarious experiences. If the rate of project failure is high, they may reject the projects of the program. They may also reject projects independent of the AUDP.

Lynch's (1979:9) note to researchers and research evaluators is relevant here. Evaluation research, though as noble in its objectives as the program itself, does not always come up with results that would endear the researcher to those for whom the research was conducted. This means that sometimes it does. Oftentimes, however, the evaluator faces the displeasure of program personnel and sponsors. "No good evaluation goes unpunished" was Lynch's summary of his convictions. The researcher should note this well.

Table 5. *Net Income Changes Due to the Program*

| Group | Cooperators | | | | Noncooperators | | | | Net Income change |
|-------|-------------|---|---|---|----------------|---|---|---|-------------------|
|  | $(0_{1,2}$ | $-$ | $0_{1,1})$ | $-$ | $(0_{2,2}$ | $-$ | $0_{2,1})$ | $=$ |  |
| Total sample | (2,718 | $-$ | 2,062) | $-$ | (1,462 | $-$ | 1,240) | $=$ | 434 |
| Owners | (2,847 | $-$ | 2,044) | $-$ | (1,337 | $-$ | 1,081) | $=$ | 547 |
| Tenants | (2,303 | $-$ | 2,120) | $-$ | (1,576 | $-$ | 1,388) | $=$ | $-5$ |

Table 6. *Confidence Interval as Income Change Set at $\propto$ .05*

| Group | Average change/ difference of means | Standard error | n | t value | Confidence interval |
|-------|-------------------------------------|----------------|---|---------|---------------------|
| Total sample | 439 | 788.90 | 50 | 2.02 | ± 225 |
| All cooperators | 656 | 1,035.04 | 25 | 2.06 | ± 426 |
| Owners | 803 | 1,026.40 | 19 | 2.10 | ± 494 |
| Tenants | 189 | 916.59 | 6 | 2.45 | ± 917 |
| All noncooperators | 221 | 710.73 | 25 | 2.10 | ± 293 |
| Owners | 257 | 565.61 | 12 | 2.20 | ± 359 |
| Tenants | 189 | 845.36 | 13 | 2.18 | ± 511 |

## Notes

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[1]The AUDP approaches drew from the experiences of earlier development activities, for example, the famous Comilla Model (Choldin 1969:483-485; Clayton 1961-681).

[2]$F$ tests on income variances show that the mean income distribution of those with large farm sizes has significantly greater scatter than the mean income distribution of those with small farm sizes. Hence, adjustments have to be made to obtain an approximation of the correct degrees of freedom dissimilar to the usual $n_1 + n_2 - 2$ (Blalock 1972:227). Adjustments are also made with subsequent $t$ tests of this kind if $G_1^2 \neq G_2^2$

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