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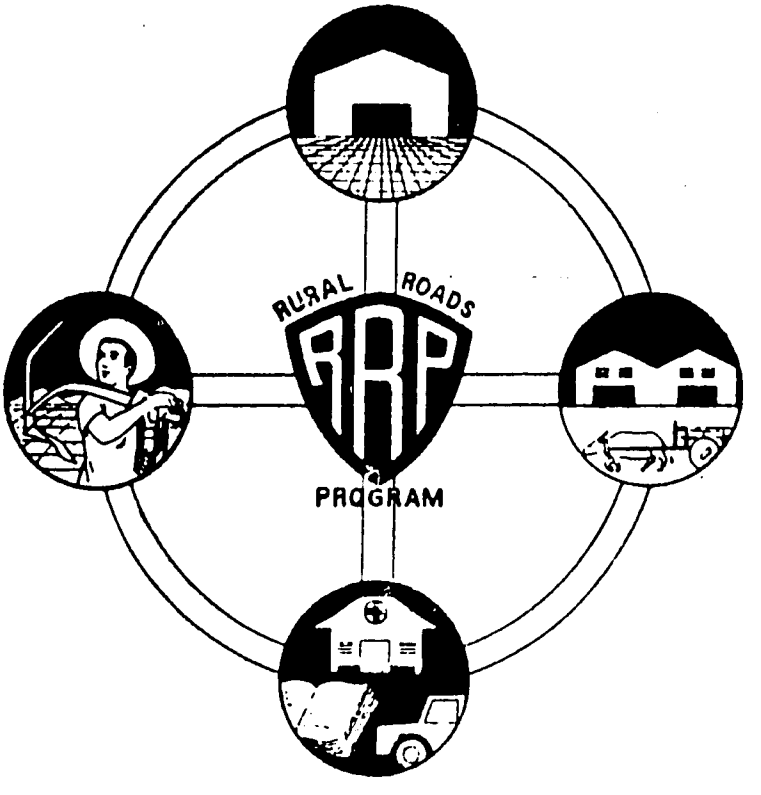
Department of Local Government and Community Development

RURAL ROADS PROGRAM



EVALUATION OF SELECTED RRP I SUBPROJECTS

(AS OF MAY 1977)

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1.0 Introduction

1.1 This brief report is in response to comments (issue No. 1: Beneficiary Impact) made by Roland E. Bobel, PPC/DPRE/PR on the Philippine Rural Roads Program II Project Paper dated October 8, 1976.

In essence, his comments covered the following three major areas:

(1) There should be an analysis of who receives the benefits of the program and the manner by which they are distributed.

(2) An analysis should be made of the land tenure arrangements in the provinces to be assisted by the program.

(3) Evaluation for the program should pay close attention to the beneficiary impact question and the baseline data should include information relevant to this question.

These three concerns are interrelated, and they focus on the important issue of how the benefits generated by rural road projects will be distributed between the rich and the poor.

1.2 To answer these comments, field data were collected and an analysis was made of what benefits rural road projects have generated, and how these benefits were distributed. Used as test cases were road projects completed under the Rural Roads Program I (RRP I). In addition, field data were collected on the road project impact on land tenure. For various reasons discussed below, these before and after studies presented only limited and somewhat inconclusive

evidence on the measurable beneficial impact of feeder road improvement. Therefore, considerable secondary data from other sources, including the USAID sponsored farm to market road study in the Bicol River-Basin (Philippines) and a recently completed feeder road economic feasibility study conducted under the auspices of the ADB, were analyzed to present further insight into benefit distribution.

1.3 Because of the recent construction dates and, therefore, the short time during which road projects completed under RRP I were able to influence the socioeconomic environment in the road's zone of influence, data collected concerning increased agricultural production and beneficial changes in income, health, and other aspects were not conclusive. The economy simply has not yet had time to react to improved accessibility. In addition, because of the provinces cash flow problems, most of the road improvement projects were too short (sometime less than 1 km.) to have made a measurable change in the socioeconomic environment. Finally, without an adequate control group of roads (roads that were not improved) it was difficult to distinguish between changes attributable to non-road improvement related factors (such as introduced by the energy crisis) from bona-fide changes attributable to road improvement.

2.0 <u>Findings</u>

2.1 <u>Passenger and freight fare reductions due to road improvement, direct evidence</u>

Two of the roads projects completed under the RRP I program were long enough to enable measurement of a significant difference in road transport charges. One of the projects, the El Salvador-Dalayep road in Misamis Oriental, Mindanao, was an improvement project. The formerly dirt road in bad to very bad condition was improved to a road with an all-weather pavement consisting of 2.6 kms cement and 4.2 kms gravel. Before the improvement, the transportation cost from the endpoint of the road to the local market junction on the national highway was about ₱3 per passenger and ₱70 per ton of shelled corn. Very shortly after the improvement the transport cost dropped to ₱1.20 per passenger and ₱30 per ton of shelled corn, or a reduction of about 60 percent. In addition, the frequency of service of jeepneys serving the barrio gradually increased from 1 trip per day to 4 trips per day. This data, though scanty, was the only information collected directly on a road <u>improved</u> under AID's rural road program that supported the hypothesis that road improvement results in reduced transport costs, and that these costs are substantially passed on to the users of the vehicles.

The other long road was a <u>penetration</u> road newly constructed in Palawan under the IAD rural roads program. Before, only a footpatch existed, and this was replaced by an all-weather gravel road. Since no motorized transport existed on the road prior to improvement, no before and after data could be collected on changes in vehicle transportation price. However, the cost of animal transport before road improvement for the barrio of Cabigaan, 10 kms. from the

local market at the road junction, is estimated at 6 pesos per sack of 50 kilos (See Table 1.1). This can be compared with the present motor vehicle rate of only ₱1.50 per sack, and represents a reduction in transport cost of about 75%.

This data, does support the hypothesis that road improvement results in reduced transportation costs, and that the savings are passed on substantially to vehicle users in the form of lower prices. The next section describes the considerably more extensive indirect evidence supporting the hypothesis.

2.2 Farmer Share of Transport Benefits

The best indirect evidence that improvement of a road leads to reductions in transport charges lies in the simple observation that transport charges over equal distances are higher for poor roads than for good roads. For example, in rolling terrain, the vehicle operating cost of a 12-ton truck operating on a bad gravel road will be about 40% higher than for the same truck operating over a good gravel road. This is a well known fact in the field of transportation economics dealing with road user charges and the economic evaluation of road improvement projects, and the subject need not be belabored in this paper.

In several countries, the truckers and middlemen have such monopoly power that transport savings are not passed on to the farmer. Fortunately, this does not seem to be the case in the Philippines at this time. For example, Leon Mears in his book "The Rice Economy of the Philippines" analyzed the degree of centralization of the trucking

TABLE 1.1: PRICES OF CARGO TRANSPORT BY ANIMAL FOR 22 ISOLATED VILLAGES IN MINDANAO, PHILIPPINES

Barrio	Distance to Local Market (Km.)	Transport Cost (Pesos Per Ton)
Dampil	5	50
Bunal	8	100
Aclan	2	5
Tabon	5	50
Alicapawan	8	96
Manaligao	8.5	106
Bagocboc	26	400
Awang	13	182
Patag	4	20
Tingalan	29	812
Dahilig	15	240
Mapua	8	96
Kauswagan	10	100
Lawaan	15	210
Bal-asan	16	240
Santiago	2	4
Lawit	12	144
Libon	10	100
Libertad	11	132
Tawan-Tawan	5	30
San Pedro	2	6
Mimbuntong	7	98

industry in the year 1972 and found that the condition of perfect competition was closely approximated. Entry was easy and transport savings were quickly passed on to customers. But the truck operation he studied were those located in populated lowland rice growing areas on the island of Luzon, and where the truckers were engaged in transporting palay from lowland farmers to rice mills. Since these conditions might not be true for upland farmers in less populated areas, data were collected on how transport savings might be passed on in the upland areas.

Figures 1.1 and 1.2 show the relationship between the difference in transport price and the difference or gap between farmgate and market price for rice, corn and copra. This data were collected for about 50 barrios in Sultan Kudarat and South Cotabato. Some of the barrios were located on good feeder roads, other barrios were located on poor roads. Also, some barrios were close to the market, others were far away. Thus, a wide range of barrio accessibility was covered. The figured shows the strong relationship that exists between transport price and the difference between farmgate price and market price. In general, and as expected, the lower the transport price, the smaller the difference. It is surprising, however, that the gap between farmgate and market price diminishes much faster than the rate at which transport price cost reduces.

Table 1.2 shows how the gap between farmgate price and market price decreases as transport price decreases. Since the local market price is fairly constant for each crop, the increase in farmgate price is simply equal to the reduction in the gap between farmgate price and market price. The dramatic increase in farmgate price as transport price decreases strongly supports the proposition that savings in transport and other costs are passed on to the farmer. The increase in farmgate price is most pronounced for copra. For South Cotabato, the farmgate price of copra was found to increase by about ₱4.30 per ton for each peso per ton decrease in transport price.

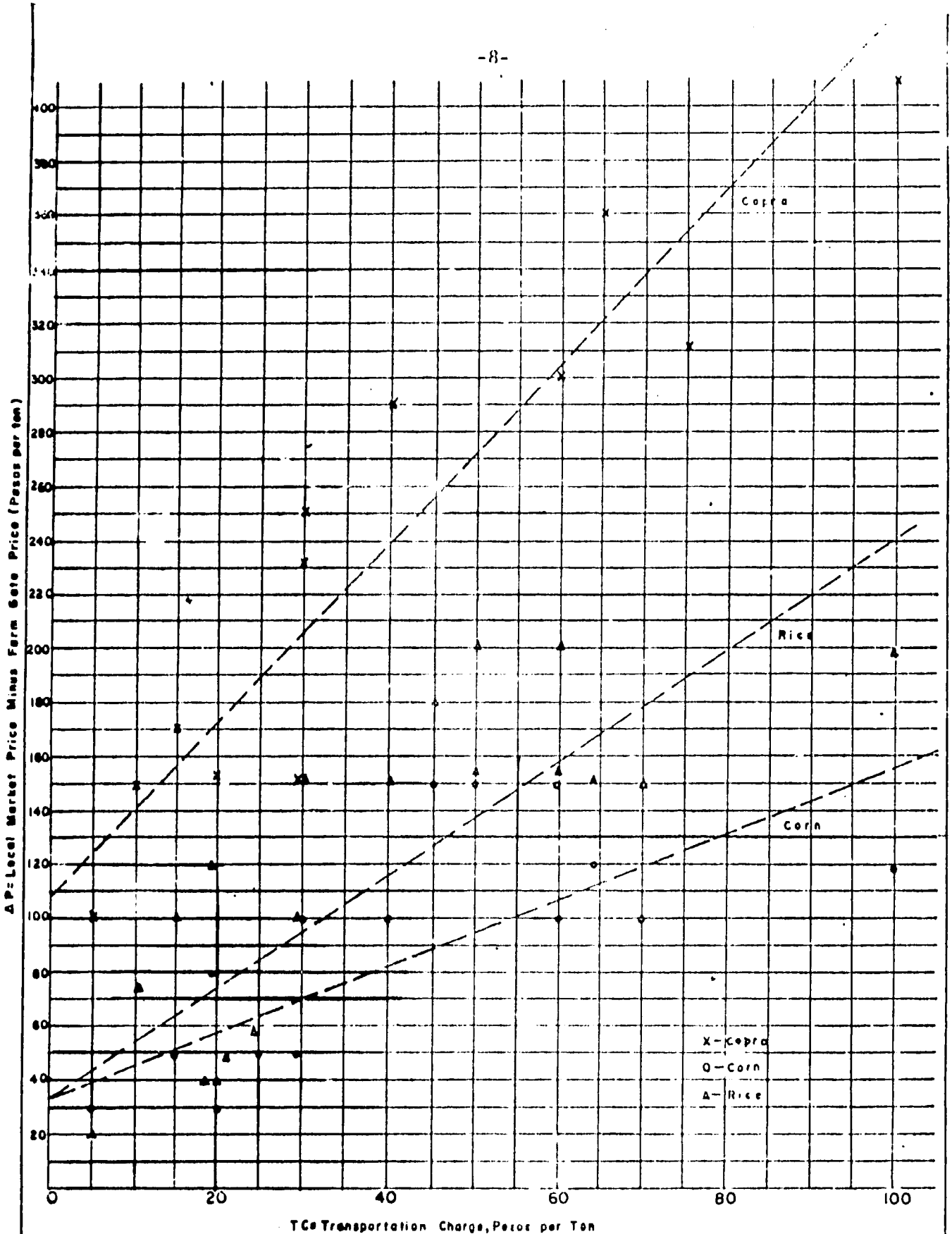

Fig 1.1: Relation Between Price Differential (Price at Local Market Minus Farm Gate Price and Transport Price

SULTAN KUDARAT

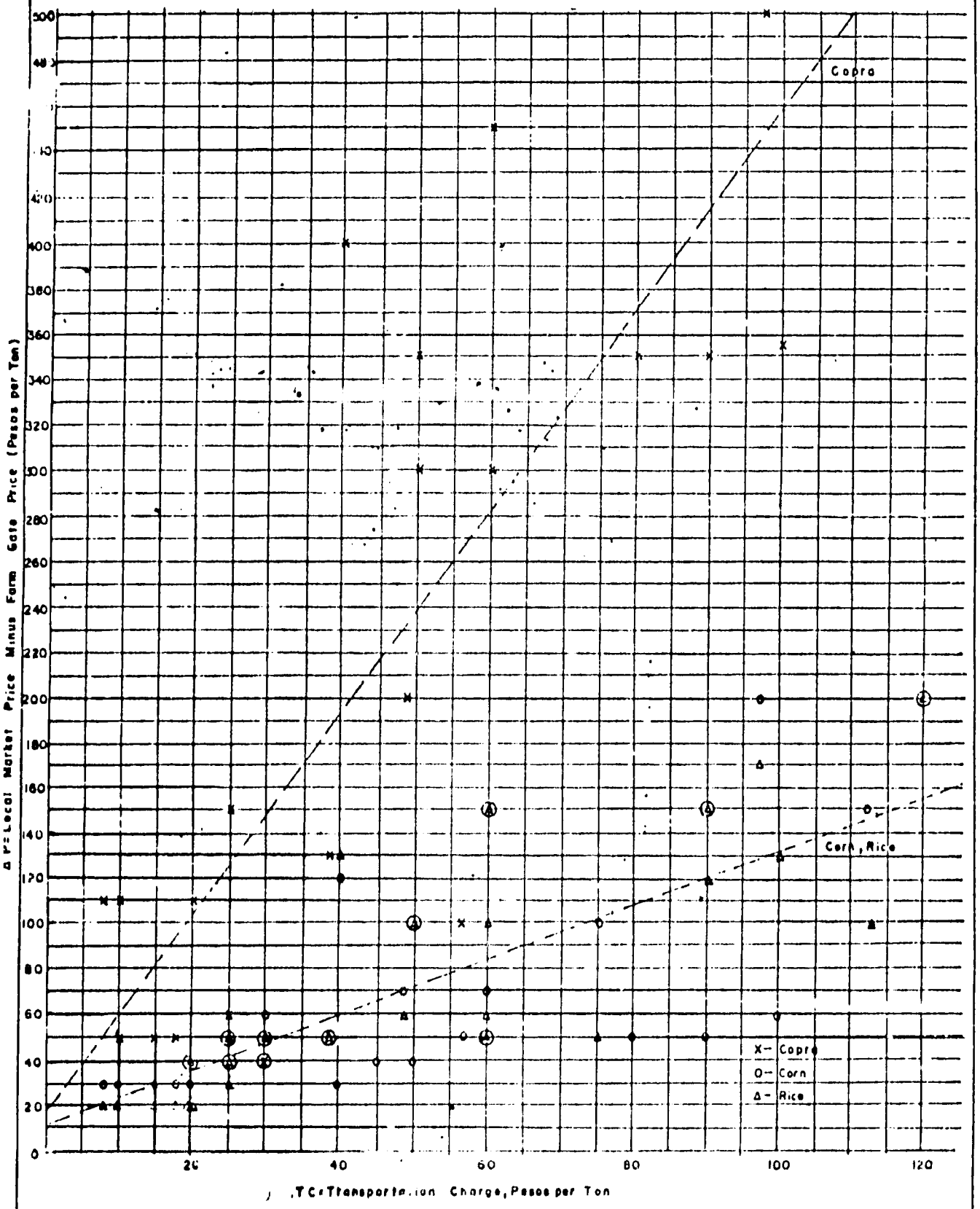

Fig 1.2: Relation Between Price Differential (Price at Local Market Minus Farm Gate Price and Transport Price

SOUTH COTABATO

For Sultant Kudarat, the increase in farmgate price for copra is ₱3.28 per ton for each peso per ton decrease in transport price. For rice and corn the increase in farmgate price, is more closely related to the decrease in transport price, and for each peso per ton reduction in transport price the farmgate price was found to increase by about ₱1.20 per ton.

The fact that the increase in farmgate price, especially for copra, exceeds the decrease in transport price indicates that other factors besides transport are involved. One such factor is the middlemen. In general, the degree of monopoly power that the middleman can exert will be highly correlated with the quality of road, and therefore trnasport price. The worse the road, the more the copra buyer can depress the farmgate price. In addition, when roads are bad, buyers must include important other costs in addition to transport costs. For example, one important cost is the risk of spoilage of his purchased goods because of delays caused by the poor road, or the risk of loss of his vehicle. All these costs will be drastically reduced after road improvement, and the increase in farmgate price levels can therefore be expected to exceed the reduction in transport price.

TABLE 1.2 - OBSERVED INCREASE IN FARMGATE PRICE FOR A ONE PESO PER TON REDUCTION IN TRANSPORT PRICE, FOR RICE, CORN, AND COPRA IN SULTAN KUDARAT AND SOUTH COTABATO

PROVINCE	INCREASE IN FARMGATE PRICE, PESOS/TON
Sultan Kudarat	
Rice	2.08
Corn	1.21
Copra	3.28
South Cotabato	
Rice	1.20
Corn	1.20
Copra	4.41

3.0 Accounting for Beneficiary Impact in the Evaluation

3.1 There are at least ten groups of beneficiaries that will gain from road improvement and that can easily be identified.

These include:

(1) Squatters and tribal minorities

(2) Tenant Farmers

(3) Lessee Farmers

(4) Small owner operators, less than 7 has.

(5) Large owner operators, more than 7 has.

(6) Large commercial plantation operators

(7) Transporters

(8) Middlemen

(9) Passengers of Public Transport

(10) Passengers of Private Transport

Each of these groups can be placed in a fairly well defined income class, and the relative size of these groups will vary distinctly between roads. Major feeder roads already in fairly good condition will have a small proportion of the beneficiaries in group 1 and perhaps 2. Minor feeder roads in upland areas will have some beneficiaries in group 1 and fewer in group 4. Penetration feeder roads will have a large proportion in group 1 and few in the other groups. At present the Provincial Development Staff (PDS) that were trained and developed under the Provincial Development Assistance Program (PDAP) do not take into account the distribution of benefits between the beneficiary groups. Implicitly, the

benefits are valued equally between groups. Thus, an additional peso accruing to a low income tenant farmer is valued the same as a peso accruing to a rich landowner. This approach is consistent with traditional economic evaluation methodology that has been used extensively and is still being used by international lending organization such as the IBRD and ADB. This approach ignores the "equity" or income distribution objectives of the government, and results in low priorities for the minor feeder road running into the upland areas. Rather, the high priority goes to the large rural roads in already fairly well developed and affluent lowland areas. This was observed to occur with road projects evaluated under the AID sponsored SIP and RRP I programs (another reason for the low priority and sometimes unfeasibility of minor feeder roads were the unrealistically rigid minimum DPH design standards adopted by the studies such as a 6 meter pavement width).

Starting in the late 1960's, the basic ideas of social benefit cost analysis were developed in landmark publications such as the "Manual of Industrial Project Analysis" (Paris; OECD 1969) and "Guidelines for Project Evaluation" (UNIDO, 1972). Social benefit cost analysis explicitly takes into account the project impact on income distribution and thereby includes the equity objective in the analysis.

In the simplest terms, this is accomplished by specifying distribution weights to be assigned to each beneficiary income group.

Rigid derivation of these weights is complex, and is an activity that cannot be performed on a project by project basis. Rather, it is the function of the central government planning agency (such as NEDA in the Philippines) to develop these weights for the various geographic regions and income groups. In the absence of scientifically derived weights (NEDA is in process of developing distribution weights but progress is very slow), weights derived for use in previous studies may be used in the interim. For example, the Project Paper for the Bicol Secondary and Feeder Roads Project Loan, November 1975 includes a social soundness analysis that addresses the incidence of benefits, and suggests the following weights:

TABLE 3.1: DISTRIBUTION OF WEIGHTS BY INCOME GROUP (1965)

Beneficiary Group	Family Mean Income	Ratio (1)	Weight
Low Income	₱1,436	1.77	1.77
Middle Income	₱4,191	.61	1.17
High Income	₱9,500	.27	1.00

(1) Ratio - ratio of mean income of group to mean income of the Philippines (₱2,541 in 1965)

This table can be updated to reflect 1977 income levels by applying the same ratio in column 3 to the estimated 1977 average income level of ₱5,000. Table 3.2 shows the results.

TABLE 3.2 DISTRIBUTION WEIGHTS BY INCOME GROUPS (1977)

Beneficiary Group	Mean Family Income	Ratio	Weight
Low Income	₱ 2,826	1.77	1.77
Middle Income	₱ 8,247	.61	1.17
High Income	₱18,693	.27	1.00

As shown in Table 3.3, the application of these distributional weights can have a marked effect on the benefit/cost ratio. Without the distributional weights the B/C ratio is only 0.8, and normally this hypothetical project would be rejected. With distributional weighting the B/C ratio improves to 1.12, an increase of 40 per cent, and the project would become feasible. Other examples can be conceived illustrating the reverse, i.e., where a project favoring the high income groups would be economically feasible without distributional weighting but would become infeasible after the application of distributional weights.

TABLE 3.3 ILLUSTRATIVE TABLE SHOWING INCREMENTAL INCOME DUE TO ROAD IMPROVEMENT ACCRUING TO VARIOUS BENEFICIARY GROUPS, THE DISTRIBUTIONAL WEIGHTS, AND THE WEIGHTED INCOMES

Road	Barrio	Tenant Farms: Tenant Share (Pesos)	Tenant Farms: Owner(1) Share (Pesos)	Leasehold Farms: Tenant Share (Pesos)	Leasehold Farms: Owner(2) Share (Pesos)	Amortizing Owner Farms (Pesos)	Public Transport Users (Pesos)	Private Transport Users (Pesos)	Commercial Truck Users (Pesos)	Total	B/C(3) Ratio
	1	8000	12000	9000	4500	3000	1000	500	750		
	2	6000	9000	8000	4000	2000	2000	1000	500		
	3	4000	6000	6000	3000	1000	3000	1500	250		
	4	2000	3000	5000	2500	500	4000	2000	200		
Weighted Incremental Income by beneficiary group		20000	30000	28000	14000	6500	10000	5000	1700	115,2000	$\frac{115,200}{144,000}=0.8$
Average Per Capita Annual Income by Beneficiary Group		500	3000	700	3000	1000	600	4000	1000		
Distributional Weight by Beneficiary Group		1.77	1.0	1.77	1.0	1.17	1.77	1.00	1.17		
Weighted Income by Beneficiary Group		35400	30000	49560	14000	7605	177000	5000	1989	161,254	$\frac{161,254}{144,000}=1.12$

(1) Owner share assumed at 60% of total farm income
(2) Owner share assumed at 33% of total farm income
(3) Assumed cost of project is 144,000

4.0 Feeder road Improvement and Land Tenure

Where feeder roads are improved or constructed there is considerable danger that, in the absence of covenants protecting the tenure of small farmers and ethnic minorities, powerful interest groups may end up capturing the benefits of the road improvement. This is especially true for penetration roads. For example, after a recently constructed (under AID auspices) penetration road in Palawan running from the poblacion of Aborlan into the foothills and ending in Kabigaan (about 10 kms. long), the land titles of about 10 ethnic minority title holders were cancelled in favor of lowlanders. In addition, there are 120 minority farmers that hold no title to their ancestral land, and are in danger of suffering relocation.

Table 4.1 shows the inverse correlation between tenurial status in a barrio and the accessibility of the barrio. In a recently conducted survey of feeder roads, it was found that farmers tilling land within easy access to the poblacion on local market are more likely to be tenants than farmers tilling land in more remote areas. For example,the table indicates that about 40% of the land in the barrio closest to the poblacion is tilled by tenants, whereas only 9% of the land in remote barrios is tilled by tenants. The conclusion to be drawn from this data is that feeder road improvement making barrios more accessible would have a regressive impact on the small farmer tenure in the roads zone of influence.

This conclusion drawn from a limited survey of 5 feeder roads is also supported by the much more ambitious survey in 1975 made by the Social Services Research Unit of the Bicol River Basin Council. And, they state that, without vigorous enforcement of the current land reform laws, the improved areas and greater value of land due to feeder road improvement will encourage the wealthier and better educated landlord class to move in, purchase land, and establish a tenancy relationship.

It will therefore be necessary to, concurrent with or prior to road construction, support vigorous implementation of land reform along the feeder roads proposed for improvement. Though neglect of land reform implementation will not decrease the expected increase in land productivity, it will reduce the beneficial impact feeder road improvement may have on income distribution.

TABLE 4.1: AMOUNT OF LANDOWNERSHIP OF BARRIOS ALONG FEEDER ROADS VERSUS BARRIO ACCESSIBILITY

Measure of Barrio Accessibility	% of Land Operated By Tenants
Easy access (transport cost less than 2 pesos per passenger trip)	38
Medium access (transport cost between 2 and 4 pesos per passenger trip	24
Difficult access (transport cost between 4 and 6 pesos per passenger trip)	18
Very difficult access (transport cost more than 6 pesos per passenger trip	9

From a survey of 40 barrios in Misamis Oriental and South Cotabato May 1977.