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Participation and Benefit Sharing in Community Forestry
Programs

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Abstract

This paper analyzes participation data from four community forestry programs in India. The study examines the impact of factors such as economic status and organizational trust on participation in decision making and implementation activities of a community forestry program. The analysis is based on a sample size of two hundred respondents. One hundred respondents were from non-governmental community forestry programs and the remaining one hundred respondents were from governmental community forestry programs. Findings show that as the participants' economic level increases their involvement in implementation decreases. As trust in the community forestry program increases, participation in decision making increases; but participation in implementation decreases with increasing organizational trust. Olson's theory of collective action is presented as a plausible explanation for the counter-intuitive findings of this study.

A

INTRODUCTION

Several studies have examined the distribution of basic energy sources such as fuelwood and other non-commercial fuels in rural societies; they also examine the relationship between poverty and energy use (Fleuret and Fleuret, 1978; Briscoe, 1979; Douglas, 1982; Vidyarthi, 1984; Bowonder et al., 1985). These studies point toward growing shortages in fuelwood and other non-commercial fuels. At the same time they also show that a large percentage of the rural populations in South Asian countries do not control fuelwood producing assets. Therefore, from the perspective of the rural poor, the energy problem is a problem of decreasing availability of village level fuel resources and also decreasing access to these fuel producing assets. Any remedial measure must produce new fuel resources in the local community and also make these resources available to all in a community. One such measure implemented in India and many other countries in Asia is *Community forestry*.

Community forestry programs have been designed and implemented to address the problem of depleting rural forest resources. "The basic philosophy behind the concept of community forestry is that forests and forestry should be capable of contributing directly to the improvement of the social welfare, including alleviation of poverty and better distribution of income" (Chandrasekharan, 1984, p.2). Participation in community forestry programs is thought to be indispensable for bringing about an improvement in the

welfare of a rural community. Community forestry programs are meant to reach the poor by involving them in tree planting activities on degraded communal lands, private lands and other marginal lands.¹ Community forestry approach is a vehicle for the development of people where the role of foresters is to work with the people and help them generate the needed forest resources (Raintree and Hoskins, 1988; Ruangpanit, 1988).

An integral part of community forestry is the active participation of people from a community in the decision making and implementation activities of the program. The research presented in this paper takes a theory driven empirically based approach to participation in community forestry programs. The study examines the factors that lead to participation in a community forestry program, the nature of participation and the resulting benefits from participating in a program.

The results presented in this paper are from four community forestry programs in Vishakapatnam district of Andhra Pradesh, India. Data were collected from two hundred participants from these four programs during 1989. Of the four community forestry programs, two were implemented by the social forestry division of the government of Andhra Pradesh. The remaining community forestry programs in the study were implemented by two non-governmental organizations in the district of Vishakapatnam. The study used

participant observation and structured interviews to collect the data.

THEORETICAL MODEL OF PARTICIPATION IN COMMUNITY FORESTRY

It is widely accepted that participation of local populations in development programs is crucial for the success of these development programs (Chambers, 1991; Esman and Uphoff, 1984; Korten, 1983; Lisk, 1985; Uphoff, 1991). Through participation, local populations identify their needs and also the relevant goals of a program. The concept of participation in development programs is summarized well by Lisk:

the *raison d'être* of broad-based participation in basic needs-oriented development planning stems largely from the belief that mass involvement in the development process is an effective means of mobilizing and channeling available, and often underutilized, local resources into the production of needs-satisfying goods and services (Lisk, 1985, p.17).

Local populations through participation in decision making and implementation activities help project officials identify needs, strategies to meet those needs and the necessary resources required to implement the various strategies. Participation in initial decision making is a crucial input which affects the outcomes of the program and therefore plays an important role in the distribution of benefits (outcomes) of a project (Cohen and Uphoff, 1980,

p.220). The initial stages of any program determine, to some extent, what the objectives and goals of the program are and who the beneficiaries are. Rural development experts have observed that in the initial decision making stage, when a program is still identifying needs, the participation of intended beneficiaries is often ignored or overlooked (Hoare, 1984, p.82). It is essential to examine the nature of participation and who participates in the decision-making process of the program, particularly in the initial stages of a program, because, "...this is the original stage when needs are being identified, problems diagnosed, instrumentalities proposed and selected, assumptions about local cooperation made, and commitments set (Cohen and Uphoff, as quoted in Hoare, 1984, p. 82).

Participation in implementation activities is also an important part of a community forestry program. Implementation is an important aspect of rural development programs and it includes a) resource contribution, b) administration and coordination and c) program enlistment activities (Cohen and Uphoff, 1980, p.220). Contributions by local people of material resources, crucial information regarding tenure arrangements, preference for a certain type of fuelwood or a certain species of wood etc., have implications for the distribution of benefits of a community forestry program.

Therefore in many development programs much attention is focused on participation of the beneficiaries. Instead of

just focusing on the nature of participation and level of participation, this study also examines some of the factors that lead to participation. Participation in development projects can be viewed as a form of exchange --an exchange of resources between local populations and development projects. Potential beneficiaries contribute information and various types of resources in exchange for some future benefit. The exchange nature of participation in development projects is evident from the previous discussion of participation.

Participation of people in community forestry programs and the reasons for their participation in these programs can be explained using *Social Exchange* and *Actor-System Dynamics* perspectives. According to the Exchange theory proposed by Blau, "mutual trust" is an important factor in determining whether individuals or groups engage in an exchange relationship (Blau, 1964, chap. 4 and chap. 6). "The establishment of exchange relations involves making investments that constitute commitments to the other party. Since social exchange requires trusting others to reciprocate, the initial problem is to prove oneself trustworthy" (Blau, 1964, p. 98). To enter into an exchange relationship, participants must mutually trust one another because the exchange process is voluntary and not coerced. Therefore, participants will become involved in a community development program only if they trust the program goals and personnel. Community forestry projects in the villages of

India are not forced arrangements between the rural people and an outside organization. A community forestry program is introduced to villagers and their participation is sought. The program promises certain tangible and intangible benefits in exchange for villagers' participation and investment. The investment sought from the people can range anywhere from just providing information about the local area to planting trees, raising nurseries, protecting common property with newly planted trees, and attending community meetings organized by the project officials. Given the nature of community forestry programs, villagers must have faith in the goals of a project and in the way a project is designed and implemented. It is also important that the people trust the project staff. The exchange process in a community development program is not a formalized contractual economic exchange process, and there is no formal mechanism to assure an appropriate return for a favor; social exchange requires trusting others to discharge their obligations (Blau, 1964, p. 94).

Therefore unlike a formal contract that can be enforced in a direct one-to-one economic exchange, in a social exchange process it is important for the social exchange actors to build up a framework of trust (Ekeh, 1974, p. 176). To establish exchange relations, both parties must prove themselves trustworthy. In the case of community forestry programs, the burden falls on the program and staff to establish themselves as trustworthy. Villagers must

sense commitment on the part of program staff before they will make investments and participate. Hence, people's trust in a community forestry program and their participation in decision making and implementation activities of the program are positively related.

Taking a somewhat different perspective, actor-system dynamics theory proposed by Burns, Baumgartner and DeVille (1985) draws attention to the different situations and circumstances the actors are in and the subsequent decisions a particular actor tends to make. Actor-system dynamics theory explains the effect of economic status on the level of participation and benefits accrued to participants in a community forestry program. Actor-system dynamics theory postulates that:

initial differences in action possibilities or in resource control among actors lead to unequal payoffs through conflict, exchange, and influence processes (or social interaction generally). The unequal payoffs make for future differentials in the action capabilities and resource control. This is particularly the case where there is little or no institutional or normative regulation to prevent or limit such amplification. (Burns, Baumgartner and DeVille, 1985, p. 33)

The theory suggests that lack of appropriate resources can prevent a person or a group of people from taking risks and successfully competing with others who are economically well off and able to take advantage of the new opportunity.

One of the many challenges of a community forestry program is to convince the economically disadvantaged populations to take the necessary risk and participate in the hope of benefiting. Initiating broad based participation in community forestry is especially difficult when class differences are wide. As actor-system dynamics framework suggests, "... differences in action capabilities and resource control translate into differential probabilities for further accumulation. For instance, advantaged actors can to a greater extent than others generate or exploit new action or exchange opportunities, prevent or control negative consequences or developments, or structure themselves and their environments to their advantage..." (Burns, Baumgartner & DeVille, 1985, pp. 33-34).

From an actor-system dynamics perspective, households from a higher economic status will participate more in the decision making as well as implementation activities of a community development program and will stand to gain more benefits from that community development program than households from the lower economic classes. Since trust is an important factor in initiating and maintaining an exchange relationship, from an exchange perspective, those households with higher levels of organizational trust will participate more in the decision making as well as implementation activities of a community development program. The various hypotheses from these two theories are represented in figure 1.

Hypotheses

Based on the above theoretical perspectives the following hypotheses are derived:

- a. economic status of a participant has a positive effect on participation in decision making activities of a community forestry program;
- b. economic status of a participant has a positive effect on participation in implementation activities of a community forestry program;
- c. economic status of a participant is positively related to the benefits from a community forestry program;
- d. organizational trust has a positive effect on participation in decision making activities of a community forestry program;
- e. organizational trust has a positive effect on participation in implementation activities of a community forestry program; ;
- f. participation in decision making activities is positively related to benefits from a community forestry program; and
- g. participation in implementation activities is positively related to benefits from a community forestry program.

Insert Figure 1 about here.

Variables

Economic status and organizational trust are the exogenous constructs in this model (see figure 1). Participation in decision-making, participation in implementation and benefits accrued from a community forestry program are the endogenous variables in the model.

Economic status: Economic status of a participant is determined from the amount of land (wet as well as dry land) owned. Total amount of land owned is used as a proxy measure of economic status. Amount of land owned is a good indicator of economic status in the rural areas of Vishakapatnam district of Andhra Pradesh, India. Access to land is an important factor in assessing any activity that takes place in an agrarian society (Esman, 1978; Briscoe, 1979; Cohen and Uphoff, 1980; Rambo, 1984).² Analysis that is based on the control of productive assets such as land, "...provides an explanation of the hierarchies of power, status and wealth in rural areas and it facilitates the identification of specific groups sharing common occupational and tenure conditions to whom public policy interventions can be addressed" (Esman, 1978, p.2).

Organizational Trust: Participants' trust in a community forestry program and their trust of the project personnel are measured using eight items. Trust is a feeling that decision makers and project organizers will produce outcomes that are favorable to the participant as well as the participant's household. A participant's trust in the

community forestry program is a feeling that the community forestry project has been developed for his or her benefit, and that the program staff are open to the opinions and suggestions of participants. The questions measuring trust were developed from Gamson's and Driscoll's discussion of trust (1968, pp. 39-58; 1978, pp. 44-45). For instance the eight item questionnaire measures if a participant felt "the community forestry program was developed for his or her benefit," and "the decisions taken by program staff were in his or her interest." The questionnaire also measures the level of trust in the goals and objectives of the community forestry program and the intentions of program personnel. All the questions were measured on a five point summative scale that ranged from (5) 'strongly agree' to (1) 'strongly disagree.' The items were scattered through out the interview to reduce any halo effect.

Participation: The concept of "development participation" is very popular but very ambiguously defined. Previous studies have assessed the presence or lack of participation in a community forestry program on scant empirical evidence. In a discussion of participation and its role in rural development, Cohen and Uphoff (1980), underscore the lack of empirical support. Much of the literature on participation is anecdotal in nature. Participation is often endorsed unambiguously on normative grounds even if the empirical foundation is not established. Under these circumstances, there is a real danger that the concept of

participation could become drained of substance and its relevance to development programs disputable (Cohen and Uphoff, 1980, p.213).

Participation in decision making and implementation are measured as a count of the total number of activities in which the respondent has participated. These items assess whether a respondent has or has not participated in a particular activity. Two separate lists of decision making and implementation activities were developed in the field. Community forestry program personnel as well as a group of ten villagers from the program areas helped develop and refine the list of decision-making and implementation activities. It was assumed that all decision-making and implementation activities were equal in importance and all the items were assigned equal weight when the participation scores were derived.

Benefits: Benefits of a community forestry program are wide ranging, including firewood, fodder, fruit (predominantly cashew in this study) and timber. For each benefit the equivalent market value is determined and the total market value across all types of benefits is calculated. Some participants have been compensated in the form of wages for participating in certain community forestry activities. In those cases their income from wages is added to the market value of any other benefits.

ANALYSIS AND RESULTS

Sampling was done in two stages. Two non-governmental and two governmental projects were sampled in the first stage. These programs were selected from a list of available projects in the district of Vishakapatnam. A list of non-governmental organizations was developed from several different sources. The sources for the list of non-governmental organizations are: Society for promotion of wasteland development (an organization that funds private voluntary organizations implementing community forestry programs to alleviate poverty); and a directory of voluntary organizations developed by the Foundation to Aid Industrial Recovery (FAIR), Hyderabad, India. The researcher listed all the available governmental social forestry projects in the district of Vishakapatnam, with the help of Social Forestry division, Government of Andhra Pradesh. Two programs on the non-governmental list and two programs from the governmental list were chosen for the study.

The second stage was to select the sample of respondents from within the four programs. Respondents were selected within each of these four programs using a quota sampling method. The results are based on a sample of two hundred participants from these four community forestry programs. These four programs reflect many of the characteristics of community forestry programs implemented in India. The results of this study provide initial empirical evidence and

challenge some commonly accepted assumptions regarding participation in community forestry programs.

Of the two hundred respondents, one hundred were from non-governmental community forestry programs and another one hundred were from governmental community forestry programs. Sixty nine percent of the sample were male (N=138) and thirty one percent were female (N=62). The average size of a household in the sample was 5.6 persons; smallest household had one person and the largest had fourteen members. The average age of the participants is forty seven years. The average amount of land owned was 10.55 acres.

A structural-modeling approach is used to test the seven hypotheses. LISREL computer program is used to test the structural model of latent variables and the measurement model of organizational trust.³ Accordingly, LISREL notation is used throughout. The structural model and the measurement model were estimated using the maximum likelihood fitting function (Jöreskog and Sörbom, 1989, p. 19). I tested a null hypothesis of no difference between the population covariance matrix and the covariance matrix estimated by the proposed theoretical model.⁴ A chi-square test is used to assess the fit between the population covariance matrix and the model implied covariance matrix. Models that result in an implied covariance matrix that is statistically different from the observed covariance matrix are ruled inadequate. The chi-square test assesses the adequacy of the fit between the model implied covariance

matrix and the observed covariance matrix. Chi-square is a general indicator of model fit and one looks for low chi-square values and a probability greater than the traditional 0.05 alpha level.

Several other indicators of model fit are referred to in this paper. They are the Goodness of Fit Indicator (GFI), and the Adjusted Goodness of Fit Indicator (AGFI) (Bollen, 1989, pp. 269-291).⁵ GFI and AGFI (adjusted for degrees of freedom) are summary measures of the overall fit of the model. They range from 0 to 1. Indices greater than 0.9 indicate that the proposed theoretical model accounts for the joint variances and covariances among the observed variables.

Findings

Parameter estimates and the model fit indices are shown in Figure 2. The indicators of model fit are also shown in Table 1. The structural model shown in Figure 2 had a good fit (Chi-square = 13.25 with 15 degrees of freedom and $p=.583$). A low chi-square with a high probability level indicates that there is a good fit between the observed variance-covariance matrix and the model implied variance-covariance matrix. Both the Goodness of fit index (GFI), the Adjusted Goodness of fit index (AGFI) are close to one, indicating a good fit of the overall path analytic model (see Table 1). The individual path coefficients are given in Table 2.

Insert Table 1 & Table 2 about here.

As expected, results show that the economic status of a participant in a community forestry program has a significant positive effect on the benefits accrued from the program (see Table 2). Those participants from a higher economic class tend to benefit from any rural development activity in their community. They need not participate in the day to day decision making and implementation activities of a program to benefit from that program. Many evaluation studies of community forestry programs have also shown that participants from the upper economic groups tend to benefit more from these rural development programs (Chowdhry, 1985; Food and Agriculture Organization, 1985a; Cernea, 1991). Results also indicate that participation in decision making and implementation have a significant and positive effect on benefits from a community forestry program. Participants who are involved in decision making and implementation activities of a community forestry program also benefit from the program. These results support five of the hypotheses proposed at the outset.

Insert Figure 2 about here.

The analysis also yields a few counter intuitive findings. All the counter intuitive findings center around the effect of economic status and organizational trust on participation in decision making and implementation. The results indicate that economic status of a participant has a weak positive effect on the participant's involvement in decision making activities and a significant negative effect on participation in the implementation activities of the community forestry program (see Figure 2 and Table 2). Participants from the lower economic classes are primarily involved in implementation of the community forestry program but play a small part in decision making .

Participants with higher organizational trust participate more in decision making but are not as involved in the implementation (see Table 2).

These findings are contrary to postulates of exchange theory and actor-system dynamics theory. We have to look elsewhere to explain why economic status might have a positive effect (though not significant in this study) on participation in decision making while having an inverse effect on participation in implementation. We also have to look elsewhere to explain the negative effect of organizational trust on participation in implementation.

Olson's Theory of Collective Action

Olson's theory of collective action is one plausible explanation. It might explain why participants with greater organizational trust tend to participate in decision making

and not in implementation. The same theory might explain why participants from a higher economic status participate in decision making but not in implementation. In brief, Olson's collective action theory explains how private goods associated with participation in decision making and public goods associated with participation in implementation shape the involvement of individuals from different economic and social strata.

Organizations and collective action are necessary to further common goals and common interests. There is no need for an organization if the same goals and interests could be achieved through individual unorganized action (Olson, 1971, p. 7). According to Olson, "organizations can therefore perform a function when there are common or group interests, and though organizations often also serve purely personal, individual interests, their characteristic and primary function is to advance the common interests of groups of individuals" (Olson, 1971, p. 7). Olson observes that in pursuing the goals of a community or a group, an organization must also serve purely individual interests of some members of a community. This is to ensure that there is a broad based support for the collective action undertaken for the good of the community.

Olson's theory seeks to explain the link between collective goods and private goods in any collective or community action. Olson distinguishes between collective goods and private goods. Collective goods or public goods,

by their nature, are available to everyone. If a good is available to one individual for consumption then it cannot be withheld from the others. The restoration of degraded village common lands is beneficial to not one individual but all individuals in that village. Income generated from trees grown on the village commons will benefit not only those who directly contributed to the development of village commons but potentially also those who did not. Since these resources have been generated on common property, they are considered public goods and therefore cannot be easily withheld from those who did not contribute their fair share in the first place.

Given the nature of public goods, "... any group in which participation is voluntary, the member or members whose shares of the marginal cost exceed their shares of the additional benefit will stop contributing to the achievement of the collective good..." (Olson, 1971, p. 31). On the other hand, "... if an individual in a nonmarket group prospers, he may well then have an incentive to pay a larger share of the cost of the collective good" (Olson, 1971, pp. 37-38). Any individual who abstains from the production of a collective good has enormous bargaining power because "... he may be able to demand for himself most of the gain that would come from any group oriented action" (Olson, 1971, p. 41). It is then logical to conclude that by not participating in collective action, an individual will achieve the maximum expected value from the collective good.

Olson proposes that selective incentives have to be offered to mobilize a community's capacity for collective action and to discourage free riders (Olson, 1971, p. 51). These selective incentives are private goods and are consumed individually unlike the collective or public good which is enjoyed in common. Therefore, for an organization to successfully involve a broad spectrum of the community to produce a collective good, it must also selectively offer private goods to individual members.

Private goods are offered to those individuals who might otherwise choose not to contribute to the collective action thereby undermining a community's capacity to produce a collective good. Selective incentives or private goods can be tangible as well as intangible. Selective incentives might be professional contacts, social prestige and contacts with people in influential positions. In summary, those who see themselves prospering from the public or collective good will participate in collective action. And by providing selective private goods, those individuals whose costs would otherwise outweigh the benefits are also engaged in collective action.

DISCUSSION OF FINDINGS FROM A COLLECTIVE ACTION FRAMEWORK

The study results indicate that participants from the lower economic groups were active in implementation activities of the community forestry program. Those with higher organizational trust participated actively in

decision making but not in implementation activities. Those involved in decision making essentially engaged in such activities as planning the location of the various nurseries, identifying common property where a community plantation could be established and providing the project officials access to the villagers. Individuals in the villages such as priests, teachers, postal service personnel, lower level government officials and others related to them generally indicated greater levels of organizational trust in the community development program. Some of these individuals are used to dealing with government personnel and other outside banking or lending institutions. Therefore, these semi-professionals, and lower level bureaucrats with some social standing in their communities were not as skeptical of community forestry programs. They were more accepting of the program personnel and provided the community forestry program an initial access to their communities. To maintain an ongoing involvement of these semi-professionals, and lower level bureaucrats in the community forestry program, they were granted selective incentives by the development program personnel. These incentives ranged from providing employment to an unemployed member of the family to social prestige that came from being involved in decision making activities of the community forestry program. These selective incentives are above and beyond any collective good that would have resulted from the program.

Implementation activities were primarily labor intensive activities like preparing land to plant trees, building of village nurseries for plants, actual planting of the trees and protection of trees planted on village commons. Those who were involved in implementation were generally from a lower economic class. They participated in many of the implementation activities because achieving the collective good would mean a higher standard of living than they could ordinarily hope for. If the goals of the community forestry program were achieved it would mean more income and availability of resources that could be converted to cash. The opportunity cost of not participating in the community forestry program was much greater for many of the individuals from a lower economic class. Therefore, the lower economic classes had an incentive to pay a larger share of the cost to realize the collective good. This cost, in many community forestry programs, tends to be in the form of greater participation in implementation activities of the program. One small farmer's comment reflects the varying motivations of participants from different economic groups -- "those meetings to discuss the project are for big people who go there to socialize over tea and biscuits and that is not for me; people like us will give up a whole day of work to plant trees that might provide wood for our ploughs."

One final observation is in order. Participants from a higher economic class were marginally involved in decision

making activities and had low levels of participation in the implementation activities of the program. At the same time, the analysis indicates that there was a direct positive effect of economic class on benefits. A possible explanation is that neither private nor public goods are enough to induce participation from those in the very upper economic classes. Rich households in traditional village societies stand to gain from any general development in their villages. Besides, many of these rich farmers with large tracts of land were already engaged in commercial tree growing. A community effort to grow trees for local and commercial use was not enough of an incentive to participate. These large land owners were already well connected socially, economically and politically to incur any additional benefits from participating in the decision making activities of the community development program.

In general, however, the project personnel, by providing a combination of private goods and public goods, were able to involve participants from different economic and social classes. Olson's collective action theory therefore provides a plausible explanation for the results of the study.

CONCLUSIONS

There is much discussion about the importance of participation in development programs. This is especially true in the case of community forestry programs. To be successful, community forestry programs have to mobilize an

entire community. Mobilizing economically and socially stratified rural societies can be difficult because of competing and conflicting interests. On the surface it seems that those who are economically well off in a community do not have sufficient incentive to take part in any development activity that produces only a collective good.

At the same time any collective good is in the interest of the poor and the marginalized populations. For these disadvantaged populations, the benefits of a communal plantation or any other collective good from a community forestry program outweigh the costs associated with participating in implementing a community forestry program.

These differing interests of the economically well off and the poor can be resolved. The results of the study offer some understanding of how community forestry programs through a range of private and public goods are able to bring the poor and the economically well off to accomplish a collective goal. The study indicates that for the better off segments of the community to participate in a community forestry program, they have to be offered private goods that can be consumed individually. On the other hand, the poor and not so well off populations in a community are motivated primarily by the collective or public goods offered by a community forestry program. This study is an initial step toward explaining these different types of incentives and their role in collective action programs.

NOTES

¹ Community forestry strategies have been discussed at great length in the literature. See Arnold (1992) for an excellent review of community forestry. Also see also, FAO (1985b), for a discussion of community forestry strategies.

² For a good synopsis of the landholding and social structure literature see Newby (1980). Newby summarizes the sociological literature on the relationship between access to land and economic status in subsistence economies.

³ LISREL (Version 7.16) computer program developed by Jöreskog and Sörbom combines econometric-type models with latent variables rather than observed variables. This approach, commonly referred to as the LISREL approach, is capable of linking psychometric-type indicators to a latent variable.

⁴ In a structural equation model the basic hypothesis is $\Sigma = \Sigma(\theta)$ where Σ is the population covariance matrix and $\Sigma(\theta)$ is the covariance matrix implied by the theoretical model being tested. For an extensive discussion see Bollen (1989, chap. 4).

⁵ Bollen (1989) provides a good description of the various indices and the advantages and disadvantages of using these various indicators of model fit. Bollen also provides the calculations for the various indices.

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Figure 1. Hypothesized model of participation and benefit sharing in community forestry programs

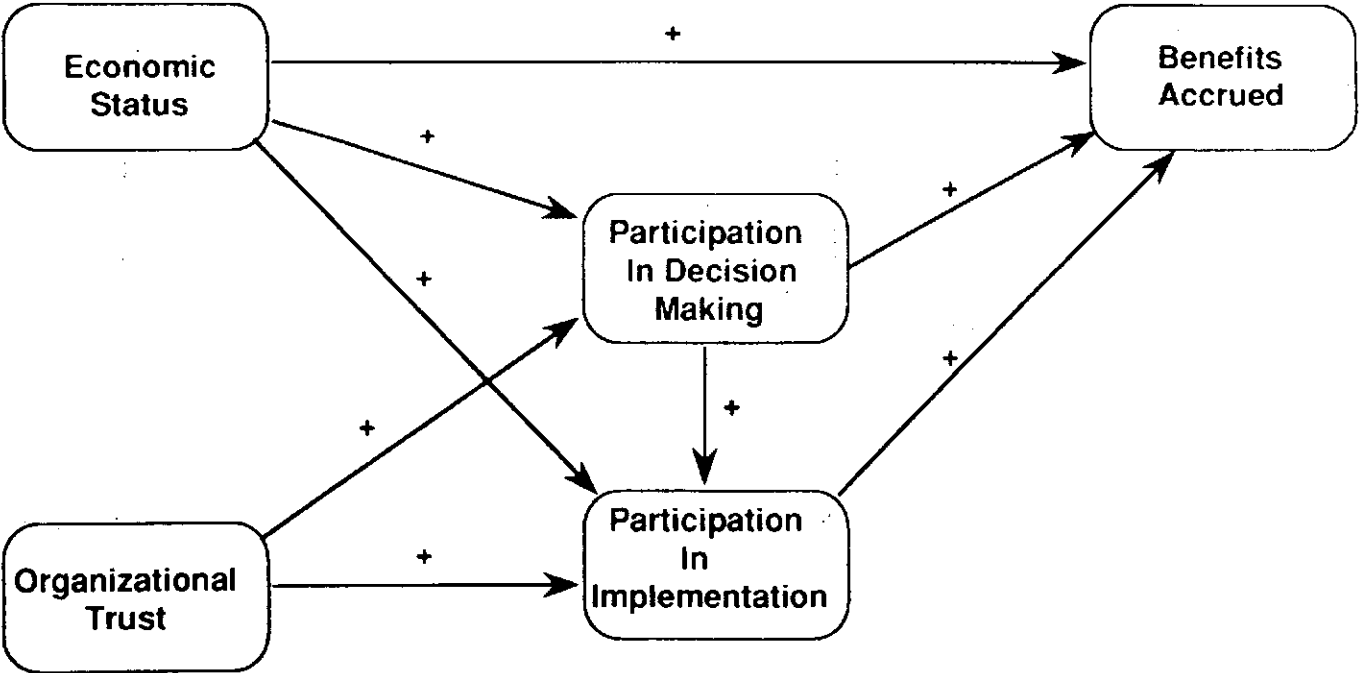
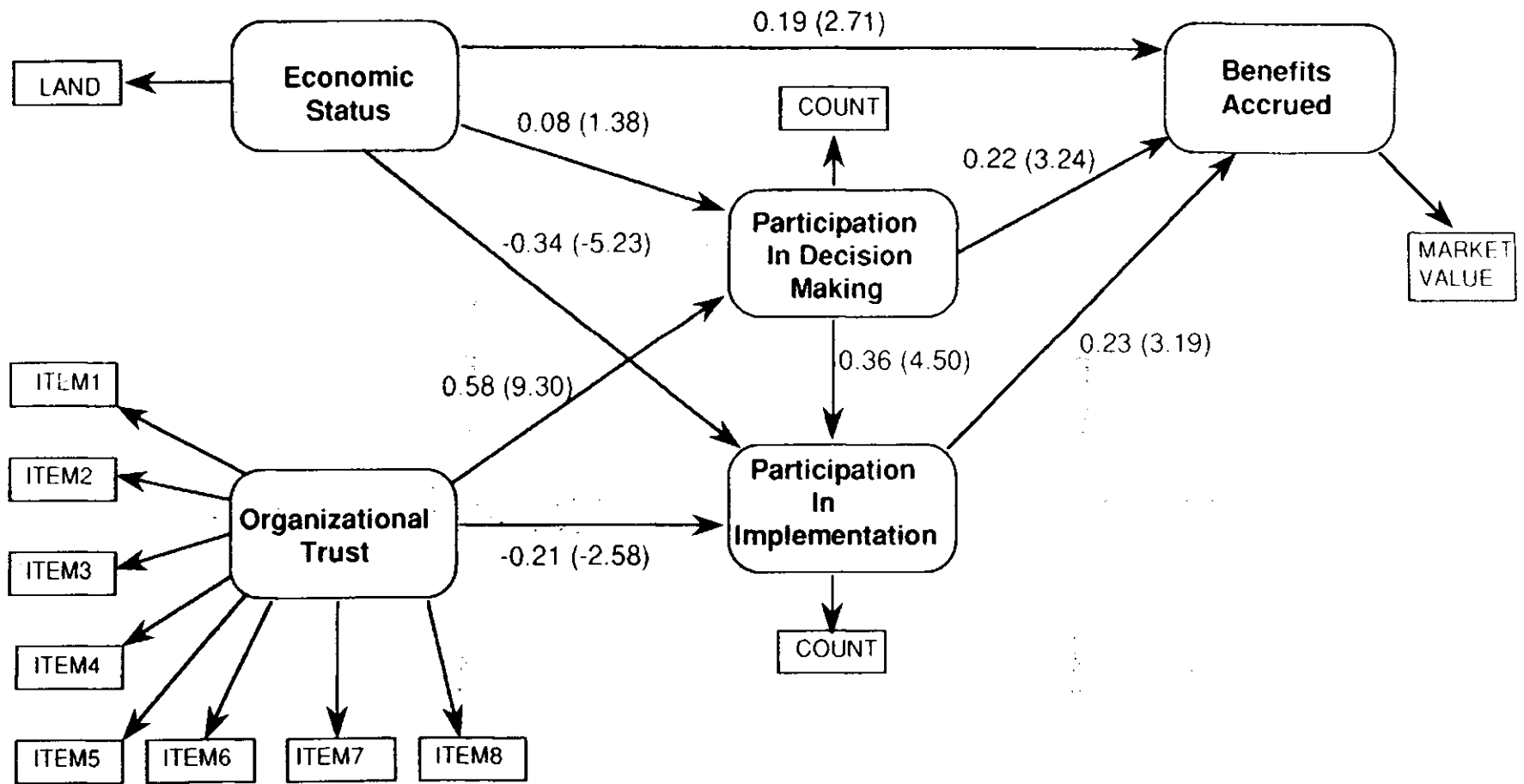


Figure 2. Structural equation model of participation and benefit sharing in community forestry programs



Note -. $\chi^2= 53.25$, d.f.=43, $p=.136$; goodness of fit index = 0.960; adjusted goodness of fit = 0.927; root mean square residual = 0.040

Table 1.

Goodness of Fit indices for Structural Model of
Participation and benefit sharing in development programs

Model ^a	χ^2	df	p	GFI	AGFI	RMR
Model1	92.26	49	<.001	0.931	0.889	0.04
Model2	53.25	43	0.136	0.960	0.927	0.04

^a Model1 is less restrictive with uncorrelated measurement errors among the items measuring Trust and Model2 has four correlated measurement errors among the items measuring Trust.

Table 2.

Standardized and Maximum Likelihood parameters for
Structural Model of participation and benefit sharing in
community forestry

Parameter	Standardized Estimate	ML Estimate	Standard Error	Critical Ratio
Econ-->Benefit	0.19	0.19	0.070	2.71**
Econ-->Dec-Mkg	0.08	0.08	0.058	1.38
Econ-->Implmn	-0.34	-0.34	0.065	-5.23**
Trust-->Dec-Mkg	0.58	0.66	0.071	9.30**
Trust-->Implmn	-0.21	-0.24	0.093	-2.58**
Implmn-->Dec-Mkg	0.36	0.36	0.080	4.50**
Dec-Mkg-->Benefit	0.22	0.22	0.068	3.24**
Implmn-->Benefit	0.23	0.23	0.072	3.19**

**p = < 0.01.