

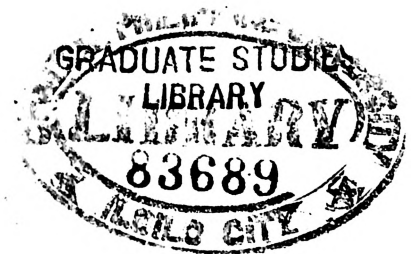
**DETERMINANTS OF SLOPING AGRICULTURAL
LAND TECHNOLOGY (SALT)
ADOPTION IN THE PHILIPPINES**

A Doctoral Dissertation
presented to the Faculty of
Graduate Institute of Mindanao (GIMIN)
Ateneo de Davao University & University of Mindanao
in Consortium
Davao City

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education
Major: Educational Management

by:

WARLITO A. LAQUIHON
May 1987



DISSERTATION ABSTRACT

1. TITLE: DETERMINANTS OF SLOPING AGRICULTURAL LAND TECHNOLOGY
(SALT) ADOPTION IN THE PHILIPPINES

1.1 Total No. of pages 79

1.2 Text No. of pages 71

2. RESEARCHER: WARLITO A. LAQUIHON

3. PUBLICATION:

3.1 Date : 1987

3.2 Place : Davao City

3.3 Region : XI

4. INSTITUTION:

4.1 Graduate Institute of Mindanao (GIMIN)

Ateneo de Davao University and the

University of Mindanao in Consortium

5. SUBJECT AREA: TRANSFER OF TECHNOLOGY

5.1 Reference No. _____

5.2 Description: Determinants of SALT Adoption

5.3 Degree Conferred: Doctor of Education (Ed.D.)

6. SPECIFIC LOCATIONS WHERE COPIES ARE FOUND:

Library

Locality

6.1 DECS XI

Davao City

6.2	University of Mindanao	Davao City
6.3	Atenco de Davao University	Davao City
6.4	Mindanao Baptist Rural Life Center	Bansalan, Davao del Sur

7. BACKGROUND/RATIONALE

Upland farmers in the Philippines share the life of poverty with most of the Filipino families. Education in improved farm technology can contribute to the solution of the problem of poverty, especially for upland farmers.

The Mindanao Baptist Rural Life Center in Bansalan, Davao del Sur developed the Sloping Agricultural Land Technology (SALT) in 1978. SALT has the following objectives:

1. To minimize soil erosion
2. To restore soil fertility
3. To produce food sustainably
4. To generate decent income

This new technology was presented to many farmers, but a few of them adopted the technology.

Concerned NGOs and Government agencies funded the training program for selected representatives from Luzon, Visayas, and Mindanao. These trainees returned to their respective farms and adopted SALT.

In order to discover some factors that contributed to their adoption of SALT, the researcher conducted a study by interviewing sample adoptors from Luzon, Visayas and Mindanao.

8. STATEMENT OF THE PROBLEM:

- 8.1 Main Problem: What are the determinants of SALT adoption according to point of views of adoptors?

8.2 Sub-problems:

- 8.2.1 What are the demographic and socio-cultural profile of SALT adoptors?
- 8.2.2 How were the determinants of SALT formulated?
- 8.2.3 How did the Luzon, Visayas and Mindanao groups vary in their number and ranking of the determinants?
- 8.2.4 How did the Luzon, Visayas and Mindanao groups vary in the number and ranking of the SALT practices adopted?
- 8.2.5 How did SALT adoption affect the income of the adoptors?
- 8.2.6 What relevant problems affecting SALT adoption did the adoptors encounter?

9. RESEARCH METHOD AND PROCEDURE:

- 9.1 The research method was a normative survey, with interview guide as instrument. The subjects were interviewed in their own respective localities by trained interviewers who spoke the dialect of the adoptors.
- 9.2 Null Hypothesis
 - 9.2.1 There is no concordance in the ranking of determinants among the Luzon, Visayas and Mindanao adoptors.
 - 9.2.2 There is no significant difference in the ranking of SALT practices used by the Luzon, Visayas and Mindanao adoptors.
 - 9.2.3 There is no significant difference in the annual net income before and after SALT adoption.

10. STATISTICAL INSTRUMENTS:

The researcher used the following statistical tests:

- 10.1 Kendall's W Test for coefficient of concordance in ranking of SALT determinants.
- 10.2 Kruskal - Wallis H Test - one way analysis of variance for determining variance in ranking of SALT practices.
- 10.3 McNemar Test for significance of changes in annual income of SALT adoptors, before or after SALT.

11. RESEARCH FINDINGS:

The Demographic and Sociocultural Characteristics of the SALT Adoptors

The seventy one SALT ADOPTORS possessed varied sociocultural and demographic characteristics as shown by the greater percentage of them:

- 11.1 Age level - old, more than 30 years
- 11.2 Educational attainment - low, not more than grade six
- 11.3 Literacy status - high, can read and write
- 11.4 Household size - big, more than six members
- 11.5 Years in residence in the community - more than 3 years
- 11.6 Number of years in upland farming - more than 5 years
- 11.7 Number of children who can help in farm work - less than 2 children
- 11.8 The annual income is less than P9,999.00
- 11.9 Land tenure - landowners
- 11.10 Land size - 2 hectares or more
- 11.11 Sloping land area - one hectare or less
- 11.12 Land distance to passable road - less than 2 kilometers
- 11.13 Estimated land topography - sloping
- 11.14 Number of animal power for cultivation - more than 3
- 11.15 Farm equipment - more than 2

11.16 Farm tools - 3 or more

The above profile represents the average SALT farmer in the country.

Determinants of SALT Adoption

As perceived by the SALT adoptors, the following were considered major determinants:

- | | | |
|----|---|---------------|
| 1. | training and exposure to SALT | sociocultural |
| 2. | anticipated benefits from technology | sociocultural |
| 3. | seed availability | biotic |
| 4. | sincerity and capability of sponsoring organization | sociocultural |
| 5. | source of outside income | sociocultural |
| 6. | land elevation | physical |
| 7. | market needs | sociocultural |

The following were considered minor determinants:

- | | | |
|-----|--|---------------|
| 1. | land ownership | sociocultural |
| 2. | government policies and laws | sociocultural |
| 3. | labor availability | sociocultural |
| 4. | rain pattern | physical |
| 5. | dominant farm weeds | biotic |
| 6. | number and kinds of farm animals | biotic |
| 7. | involvement in organizational leadership | sociocultural |
| 8. | sunlight direction | physical |
| 9. | religious beliefs | sociocultural |
| 10. | credit availability | sociocultural |
| 11. | water source for irrigation | physical |
| 12. | presence of structure | physical |
| 13. | dominant farm pest | biotic |

Among the major determinants, 71.42 percent were sociocultural factors, 14.29 percent were biological factors and 14.29 percent were physical. There is a dominance of sociocultural factor.

Among the 13 minor determinants, six or 46 percent were sociocultural, 4 or 31 percent were physical and 3 or 23 percent were biotic. The sociocultural factors were also predominant.

Concordance of Ranking of Determinants

The result showed that the adoptors were in accord in their ranking of the determinants.

Number of SALT practices Adopted

All of the Luzon, Visayas and Mindanao groups followed the standard practices.

Variation in Ranking of SALT practices

The Luzon, Visayas and Mindanao groups did not vary in their ranking of the SALT practices.

SALT and the Net Income of Upland Farmers

The Luzon adoptors increased their income by 98 percent; the Visayas by 94 percent; and the Mindanao - 80 percent. All the adoptors substantially increased their income after adopting SALT. The difference before and after SALT were significant at .001 level using McNemar test for significant change.

Additional Relevant Problems of SALT Adoptors

The following were considered very important:

1. Ipil-ipil trees are infested and dying
2. Stunted growth of ipil-ipil
3. Lack of ipil-ipil seeds for planting

The following were considered important:

1. Inadequate moisture
2. Inadequate capital for materials and labor

The following were considered slightly important:

1. Crops and ipil-ipil are eaten by stray animals
2. Poor and eroded condition of the soil

3. Frequent weeding and maintenance of ipil-ipil

The following were not considered important:

1. The farm work is laborious and tiresome
2. No starting income
3. Ipil-ipil are infested by rats
4. The soil is acidic
5. SALT project compete with rice farms
6. Inadequate seeds and stocks for permanent crops
7. Difficulty in hauling production from hillside
8. Thick cogon grass infested the farm
9. The area is visited by typhoon
10. Farm crops are stolen
11. Need capital for SALT expansion
12. Inadequate follow up supervision
13. Forest land contaminate project
14. Area not too sloping - water becomes stagnant

12. CONCLUSIONS:

- 12.1 The demographic and sociocultural profile of SALT adoptors reflect the population of the country.
- 12.2 Training and exposure to SALT alone were not enough to influence people to adopt SALT. Sociocultural, physical, and biological factors have to be present.
- 12.3 SALT adoptors do not vary in their ranking of SALT determinants.
- 12.4 All adoptors follow the standard practices required for SALT, and do not vary in their ranking.
- 12.5 SALT adoption upgrades income from upland farms.

12.6 Some problems crop up but they can be solved.

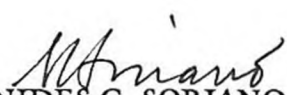
13. RECOMMENDATIONS:

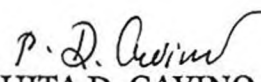
13.1 Further studies should be made with greater samples.

13.2 More leguminous trees suitable for SALT should be identified, collected and multiplied.

13.3 More variants of SALT should be developed and tried.


WARLITO A. LAQUIHON
Researcher


LEONIDES G. SORIANO, Ph.D.
Professor, Graduate Institute
of Mindanao
Adviser


PAQUITA D. GAVINO, Ph.D.
Vice President for Academic Affairs
University of Mindanao
Chairman, Panel

CHAPTER ONE

Background and Problem

This chapter puts into a nutshell the poverty of much of the nations. Then it particularizes on the poverty of the Philippine uplands and the role of education in helping upgrade it.

Background

Global

Education has a major role to play in bringing about change through the adoption of appropriate technology in developing countries (Bohler, 1977, cited in Sorrels, 1980).

It is often education that is called upon to cultivate new attitudes and transform old behaviour into those needed for improving rural welfare (Sorrels, 1980). The need to improve the welfare of the vast majority of the humanity is an agendum that cannot be postponed. For as Mellor (1966) puts it:

Much of this humanity is ill-clothed, ill-housed, ill-fed, ill-educated and in ill-health. Nearly half of the world's population lives on countries with average per capital income under \$100 per year.

Schumacher (1975) also sadly noted that in many places in the world today the poor are getting poorer while the rich are getting richer, and the established processes of foreign aid and development planning appear to be unable to overcome this tendency.

In the Philippines

Poverty is a fact of life in the Philippines (DLSU Integrated Research Center, 1983). Citing the World Bank study of poverty in the Philippines, the Center notes that:

. . . the percentage of all families below rural/urban poverty lines appeared to have increased from 36.1 percent in 1971 to 54 percent in 1975. Of all families — rural and urban — below the poverty line, 61.1 percent relied on agriculture as their main source of income, 7.2 percent on fishing and hunting and 0.8 percent on forestry and logging.

Focusing on the Philippine uplands, Lamberto (1983) reports that one striking observation is the fact that of the 20 delineated upland provinces, 17 are included in the NEDA roster of distressed or less developed areas within the country, signifying that generally, upland provinces are

relatively poor and therefore most of their residents belong to the most disadvantaged rural populace.

Sevilla (1983) finds that of the estimated 7.5 million upland occupants approximately 4.5 millions at present live below poverty level, that is have annual incomes of less than P3,000.00 per family. The same researcher notes that:

. . . not only are uplanders poor according to socio-economic indices, but that they also perceive themselves as poor relative to lowlanders and other uplanders. In the communities studied, from 75 to 100 percent considered their situation worse than that of other upland dwellers while 60-70 percent thought that they were equally unfortunate; none said they were better off than other uplanders...

Among the upland communities that have been described in terms of their residents' formal educational attainment, at least half of the household heads in remote tribal communities are considered illiterate (Sevilla, 1983).

Assessing the general Philippine educational system, Occeña (1985) underscores that:

. . . Unadapted Western educational methods, standards, and instructional materials, instead of bringing unity and progress, caused the derangement of cultures particularly in the Philippines... The lack of appropriate technologies resulted in the rapid decimation of natural resources, and conflict between traditional and modern values... It is not surprising, therefore that with the acculturation of developing countries, even the educational system eventually becomes irrelevant, not being keyed to the fundamental, indigenous "persona" of the communities the system was ostensibly designed to serve.

Specifying on the Philippine uplands, Sevilla (1983) stresses that the quality of education offered by upland schools is often poor relative to the lowlands. He points out that:

. . . Books and teaching methods are outmoded, buildings are old and dilapidated, while teachers are underpaid but overworked for they have to assume responsibility for implementing almost all of the government programs. Multigrade classrooms are especially difficult to handle for the teachers and confusing as well for the students...

Indeed, abject poverty in the Philippine upland communities is no longer debatable. In fact, it is already a way of life for many Filipino uplanders. And certainly poverty is but one of the main elements in the vicious cycle of underdevelopment (Figure 1) now gripping the nation, particularly the upland areas.

But can something be done to help upgrade the quality of life of the uplanders? Sevilla (1983) observes that several efforts have been made to better the living conditions of migrant settlers through education, focusing particularly on areas as forest conservation and agroforestry.

As a tool for upland upliftment, Vergara (198a) notes that:

Agroforestry, defined in simple terms as a sustainable production system which integrates woody perennial and annual food or cash crops (sometimes including livestock) on the same piece of land represents a fundamental departure from the traditional mutually exclusive relationship between agriculture and forestry. It is regarded as a form of land use that has a high potential to simultaneously satisfy three important, sometimes conflicting objectives: (1) protecting and stabilizing the ecosystem; (2) producing high levels of outputs of economic goods (food, fuel), small timber, fodder, organic fertilizer) on a sustainable basis; and (3) providing stable employment, improved income and basic materials to rural populations.

Sloping Agricultural Land Technology (SALT) is one variant of agroforestry (Figure 2). Developed by and practiced at the Mindanao Baptist Rural Life Center (MBRLC) in Bansalan, Davao del Sur since 1978, SALT has four-fold objectives: to minimize soil erosion, to restore soil fertility, to produce food sustainability, and to generate decent incomes for upland families (Watson and Laquihon, 1985).

To achieve its objectives, this upland farming system grows diversified food crops (both short and permanent crops) between thick contour rows of leguminous shrubs and trees spaced 3 to 4 meters apart.

When these leguminous shrubs and trees (preferably a combination of *Leucaena*, *Gliricidia*, *Sesbania*, *Flemingia*, *Rensoni*, etc.) are 1.5 to 2 meters tall, they are cut to about 40 centimeters from the ground. Their trimmings provide excellent mulch, green manure, and organic materials for the crops in the alleyway. Meanwhile, their roots and stems effectively hold the soil in place.

More importantly, the crops grown in the alleys provide the family with adequate food and income. Presently, the average annual net income of the 9-year-old SALT demonstration farm in Kinuskusan, Bansalan, Davao del Sur, is P14,000 per hectare. This net income is over nine times higher than the average net income of the traditional upland farming system which is only P1,600.00 per hectare per year.

Statement of the Problem

SALT is found technically feasible and economically viable at the MBRLC experimental fields since its development in 1978. However, it seems that the technology is not so socially acceptable, especially during the first five years of its existence. The adoption rate of SALT by the upland farmers leaves much to be desired. Watson and Laquihon (1981) noted:

Thousands of farmers have visited our demonstration SALT. During such visits, some become so excited that they hopped from one alley to the next without waiting for the tour guide. To our knowledge, of the thousands who had visited our SALT farm, no farmer criticized the system; but neither did many return home to establish a SALT project.

Interestingly, however, at the middle of the year 1982 many national and even international organizations and their respective farmer-cooperators started to adopt SALT (Table 1). In fact, Rev. Watson has gained international recognition for his pioneering role in SALT and was conferred the prestigious “Ramon Magsaysay Foundation Award for International Understanding” in 1985 for encouraging adoption of SALT.

An important question should then be asked: What makes upland farmers adopt technologies like SALT? Studies proposing to seek answers to this and related questions concerning upland development are timely and in order. Hence, this research.

The problem of this study, therefore was focused on the inquiry on what are the determinants of SALT adoption in the Philippines according to the viewpoints of its adopters.

More importantly the study focused on the following questions:

1. What is the demographic and socio-cultural profile of the SALT adopters?
2. How were the determinants for SALT adoption formulated?
3. How did the Luzon, Visayas and Mindanao groups vary in their perception of the rank in importance of the determinants?
4. How did the Luzon, Visayas and Mindanao groups vary in the number and rank of SALT practices adopted?
5. How did the SALT adoption affect the income of the adopters?
6. What relevant problems affecting SALT adoption did SALT adopters encounter?

Assumptions Underlying this Study

This dissertation takes the following as its underlying assumptions: (1) SALT adopters of the