Sustainable Development and Agriculture Household Changes in Northeast Thailand: A Case Study of Nalomnoi Village of Udornthani Province

Thesis

by

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THESIS : Sustainable Development and Agriculture Household Changes in Northeast Thailand : A Case Study of Nalomnoi Village of Udornthani Province

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ABSTRACT

THESIS : Sustainable Development and Agriculture Household Changes in Northeast Thailand: A Case Study of Nalomnoi Village of Udornthani Province

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DEGREE : Master of Arts (Social Development)

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The purpose of this study was to evaluate the effects of three exogenous factors namely information, supportable sources and occupational barriers upon three elements of sources of change which were identified as ideology, people's organization and technological inventions. Those were oriented by social change concepts.

To meet the purpose, quantitative methodology was applied. According to quantitative approach, data were obtained by field interviewing 58 agriculture household heads in October, 1994 from Nalomnoi village, Udornthani province.

The study found, the ideology of agriculture household heads could be arisen by the large degree of occupatinal barriers and supportable sources. The rolling and participative of people's organization could be carried on by supportable sources only. For sustainable development, it is worthy to be noted as follow;

Firstly, the compatible agricultural information or wisdom and managing recources from outside and inside village which accordance with village's conditions have to provide for agriculture household heads to detect.

Second, the people's organization where almost of members are the head of farm's families has to establish as the represent of their interests. For this matter, external organization especially non-government and government organization are still considerable.

Third, though those matters are operated. The transposing from actual role (expert or well-known) of development volunteer to gentle village's conditions ("what" and "which" able to do) and people (local opinion known-how or key informance) are concerned equally for the attainment of sustainable development.

Last, if lacking management resources occure. Development firms can select the most crisis village as the first trying.

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Finaly, I highly indebted and grateful to my parent, Mr.nual Buranrom and Mrs.Suwaree Buranrom, for their parenthood, dreams and inspirations upon me which are the causes of my every successes. I am obliged to my kind elder brother Mr.Wachira, grandparent and Mr.R.C Bhujel for their love and encouragement which helped me to step froward in better way and in better direction.

Sukanya Buranrom

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CHAPTER 1

INTRODUCTION

1.1 Background

Post-war II boomed era "development" is well known in third world countries as a tool to set up them from underdeveloped to developed countries where have both high technology and economic growth. The backed up theories were growth and modernization. Believed in trickle down effect, policy makers emphasised on the economic system as the leading sector. Leaving other parts in the soceity, economic has been grown currently in third world.

Poverty, low quality of life and world's forest are the main matter for international as well as local concern in the third world countries especially Thailand where GNP (Gross National Product) has been increase no less than 7.5% per year. Researchers are steered by them to carry out the re-search about valid and reliability of the development concepts. Nowadays, there is against way for these. Sustainable Development (SD) has presented to explain and control the repelling phenomenal. It contains within it two key concepts: 1) the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given and, 2) the idea of limitations imposed by the state of technology and social organization

on the environment's ability to meet present ane future needs.

Altering new development concept, so one part consideration on the development or the trekking a boost for economy which was prevalent at the previous period has added the pressure on the environment. Development for today must be interpreted in the terms of sustainability or considered the grass-root people of the rural areas and the conservation of natural resources for the benefit of future generation together with a progressive transformation of economy and society. Maclellan (1992:639-640) had advised that it is meaning to change the target of development from economic to man and environment upgrading for basic needs and better quality of life in the third world countries both for the present as well as the future generations. Moreover Friesen (1992:1960) advised that environment and society of third countries would be substantially negatively affected if the current economic policies are continued as planed (primarily emphasize economic growth). Rather than continuing with the present economic reforms. So state leaders should consider alternative development strategies that would better take into account their history in order to create in a sustainable future. According to development pillar in Thailand, Prof.dr. Prawes Wasi formulated 5 components for development that imply and cover sustainable development:

1) moral and mind 2) technological and productivity's pattern right 3) quality right of ecology and environment 4) self-reliance in economy 5) cultural and local life style. These are originated in every community but diminished by consumptionism. To returen to previous circumstance, technology and productivity's pattern that rely on ecology seems to play significance role on another (Lianjumroon, 1991:176-177).

For sustainable development responsiveness in Thailand, 6th national five year plan agreed with The 1986 Environment Situation of Thailand Report. This report warned about the environmental declining which might interrupt the development process in the future. So this plan formulated enviroment and natural resources policy. Now it is the implementation period of 7th national five year plan (1992-1996). The plan was considered the accomplishment of social, physical environment together with economic goals. In response to the goal achievement, many of guidelines were given to government organization for appropriate planning process such as providing for popular participation in environmental development programme (National Economic and Social Development Broad, 1991:22-23). To meet the sustainable development goal, Department of Community Development, Ministry of Interior has been perform as the core of bureaucrat. since 1990, integrated farming and forest grown projects have been operated currently all region especially Northeast. This

region is the most poor of Thailand. Northeast people have low quality of life and poverty. Moreover, they are living in exploited and devaluated habitat. Rural Development Information Centre (1993:29) indicated that those people have been suffering by the great troubles i.e, low production of crop (74.9%) and unable to continue to cultivate after seeding season or summer time (74.7%). Moreover, forest area as the base of human life has been declined rapidly. There is only 14,000,000 rais (1 rai = 1,600 square meters) of forest still remain. For rational it should has no less than 42,000,000 rais (Department of Community Development, 1991:3-4). If development tenses in the same way. Dilemma will be extend. Because the community potential in this region is decreased contemporary by the development implementation (Teerasasawat and Deesuankok, 1986:159-162). Lack of intervention power on broad and appended by the interloper factor e.g, debt, Northeast people have been sunk down and down (Srisantisuk and Teerasasawat, 1986:267-268).

Not only the government but also the non-government organizations, the plans of which are formulated based on the concept of the sustainable development. No doubt, this innovation diffuses rapidly to all parts of the society with their environmental and agricultural development project.

All guide to formulate research problems. Is there any change in Northeast Thailand which is the poorest region of the country after the concept of sustainable development came to the front?

1.2 Purposes of the Study

1.2.1 To find the agriculture characteristics of the villages of Northeast Thailand.

1.2.2 To study the physical and non-physical barriers which are counteracting the agriculture system and thereby living standard of the people.

1.2.3 To find out the factors responsible for the change in agriculture after the diffusion of sustainable development.

1.2.4 To propose the suit model for sustainable development in the region (Northeast of Thailand)

1.3 Scope of the Study

1.3.1 Sustainable Development Scope

The concept of sustainable development is diverse which covers social goals, strategies, target points, and has contrary definitions in each country. In actual way, disavdvantage people and environment conservation are the main points. Sustainable development

in this research means only environmental and alternative agriculture information which can encourage 2 matters below.

1. Considering of natural resources conservation.
2. Change of pattern and methodology in agriculture following to alternative agriculture.

These information diffuse directly and indirectly to man in community by a number of channels, for example mass media, government organization, non-government organization and local leaders. Finally, they pilot agriculture household heads to know, accept and practice or adoption. For those three steps has been done consecutively by management resources pool e.g, mass media, government organization, non-government and local leaders.

1.3.2 Scope of Agriculture Household Changes

As the sustainable development is diverse and immense, the change also can be examined in different aspects. For example, methods, rate, direction, scope and sources. But in this research the sources of change will be considered. They cover progressive ideology which leads to the first chain of change, people's organization where continues ideology for change and the adoption of agriculture technology which uprights ideology and people's organization.

1.3.3 Study Area

In accordance with the sutdy of changes in agriculture household in village of Northeast, the 58 of agriculture household heads of Nalomnoi Village were Chosen in October, 1994. This village locates in Tambol Khambong Amphoe Banphue, Udornthani province, Northeast, Thailand

Criteria for selecting the villages to be the study were:

1. The village had been launched by sustainable development programmes from government organization and non-government organization such as integrated farming, forest grown, etc.

2. The agriculture household heads of the village have the facilitation in response to the sustainable development information (environmental and alternative agriculture) from any channels such as not far from the main road, able to approve electrical tools, etc.

1.4 Limitations of the Study

A number of barriers that wrer encountered during the course of the study that have a bearing on the findings need to be mentioned.

Firstly, this research attempts to discover a number of the most effective factors of agriculture household heads in reponse to sustainable development. Those affect on the designed interview.

Secondly, there was limitation of time and resource during study period. A few of agriculture household heads were reported.

CHAPTER 2

LITERATURE REVIEW

2.1 Sustainable Development Concepts

2.1.1 Introduction

By the way of intensive industrial development which did not contemplate about environment and social costs. Many negative impacts which are caused by development process such as pollution, gap between economic and social sector, immoral and strain ~~are~~ occurred. sustainable development is turnout from the development debate for better quality of life from better quality of environment in the society. International organization which have high potential to enforce environmental problem acceptance in the third world is the United Nation, 5th June every years was announced as an environment's day and the united nations environmental program was established for protecting and overwhelming an issue. Moreover, during United Nations Conference on Environment and Development (UNCED) of earth summit at Brazil 3rd-14th June 1992. All nations admitted bout preventing and solving the issues of environment in developing countries which refered to sustainable development.

2.1.2 Definition

Sustainable development was interpreted by Dr.Sanoh Unakul as the development which encourages stability between economic development and stability of natural resources conservation. Even though economic growth consecutively. Store and quality of natural resources are not disgraced (Warunt, 1989:23).

According to Selman (1992:8-9) had referred to World Commission on Environmental and Development who defined sustainable development as the development which meets the needs of present generation without compromising the ability of future generations to meet their own needs.

Follow to Thepsitta (1993:7), it is interpreted as the process which integrated resources utilisation, investment direction and change in organization's structure. This process flows under the needs of the present and the future.

Base on the 3 Priority definitions, there are composed by 3 concepts (Thepsitta (1993:7-10).

1) **Human Needs Concepts**

Food, clothing, residence, employment and better quality of life are the basic needs for the human being.

Though there are some differentials between 2 groups, advantage and disadvantage in the level of quality. The primary they should have is the right to fulfil themselves for higher needs after the sufficient having of the five essentials. Natural and environments are the main derivation of them.

2) Environment Carrying Capacity Concept

The two operations of environment are resources stock keeper and residue carrier of development process. They are restricted by demolishing and intensive used. For functional at the present ane the future, the esteeming administration, the level, rate and amount of technology should be appreciated.

3) Social Equity concept

The following generation in society should obtain the property right of natural resources form their ancestors as the same quality and quantity (intergeneration al equity). But for man in the same period they should help each to gain specially advantage on disadvantage person (intrageneration equity). Two kinds of equity that refer to man in different time are fundamental for the term of social equity. If either one or both is lacked. It is severe to find out the attainment of sustainable development.

2.1.3 Sustainable Development Characteristics

Considering 3 pervious concepts, the characteristics of sustainable development are concluded below.

1. To prevent and preserve natural resources from wastefulness consumption.

2. Man is target group especialy grass-root people.

3. Development courses from down to bottom and all parts of society.

4. to seek for people participation form people organization, non-government organization and business firm in bureaucratic development programme.

5. Holistic dimension that does not emphasise in one sector. Material and mind have been considered equivalent.

In addition, considering about sustainable development characteristics can thrust emphasise following 3 studies below.

Edward B. Barbier (National Institute of Development Administration, 1992:21-23) put emphasis on the 3 units:biological, economic and social. Each system was distinguished by the development goal and described below.

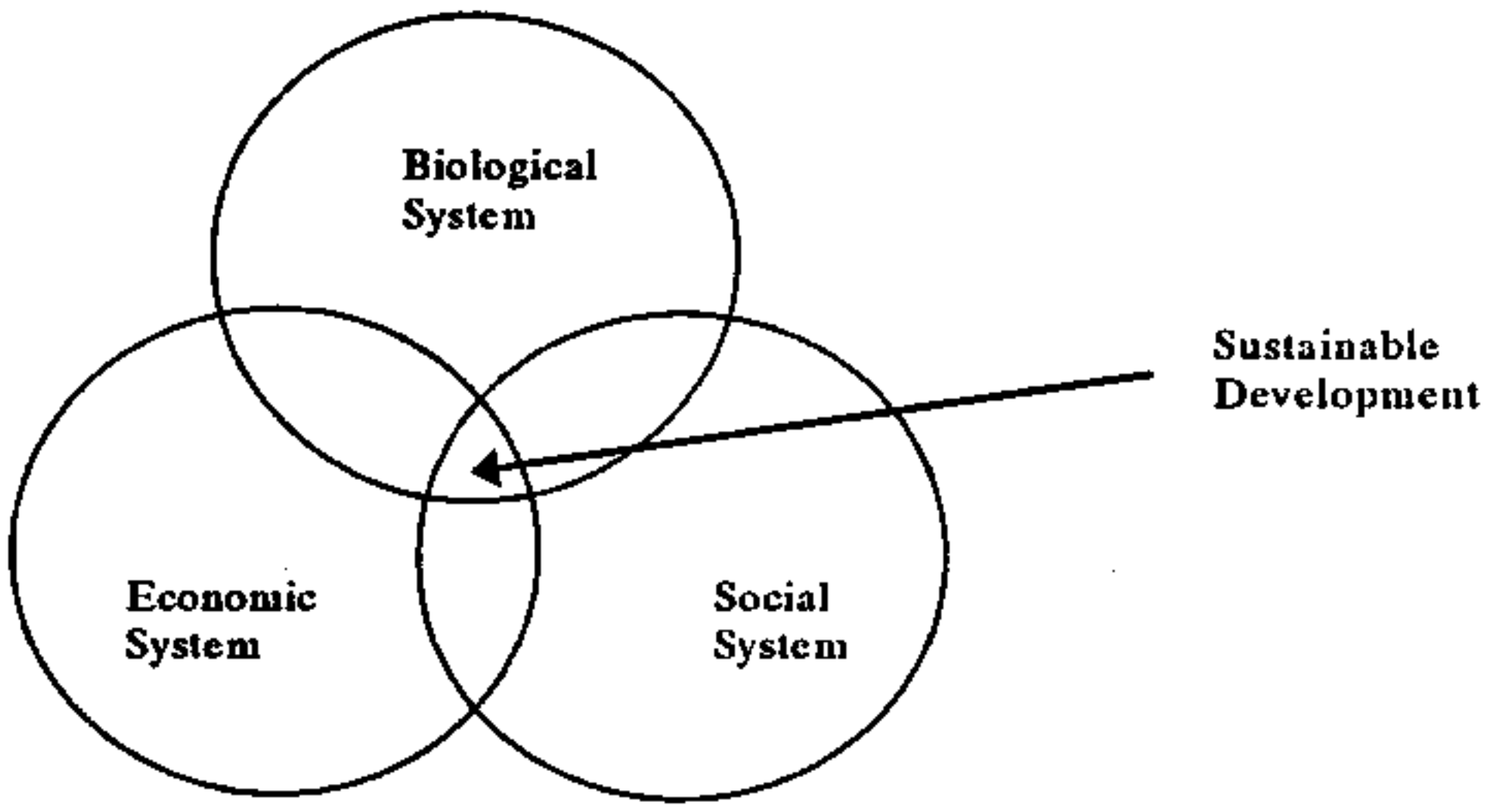
1. Biological goals:Biological goals are described as colourful genetic, defiance and biological productivity.

2. Economic goals:Economic goals are equity enhancing as well as social goals. Throughout economic and social goal have maintained a dialectic relationship with each other in development discussion. Sometimes high mass consumption (economic growth of large scale business) may be conduce unfair distribution income between gropus. Lack of productive capability such as fund, illiterate and technology, disadvantage or low income plush push to unskilled labour in the economic system. Becky J Brown fulfilled this hiatus with small-scale business and self -reliance as alternatives way. They seem to be right, moral and legitimate which may be involved to sustainable development. But during the bending of economic development nainstream. It is scarcely to intensify them.

3. Social goals. because socio-economic system are socialised. If policy maker trend to take grant on economic only. Whole in society will adapt themselves from diversity to uniqueness and lose sustain environment. So for social goas should endure on cultural diversity or heterogeneity society that means institution permanent, peoples right and people's participation in development process. With these man can find the equally in resources sharing.

Sustainable is the result from the full integration among those three goals. The figure 2.1 shows the outcome or sustainable development accoplishment.

Figure 2.1 The Accomplishment on Sustainable Development



Source: Barbier, E. B, "The Concept of Sustainable Economic Development", Environmental conservation, 14(2), 1987 in National Institute of Development Administration, 1992 p.23

Purwo (1992:1076) presented 4 simple ways to investigate.

1. There is pattern to transform resources utilisation which concerned ecology (Ecocentric Reformism).

2. Ecocentric reformism has to change rapidly (Ecocentric Radical).

3. Change depends on technology (Technocentric Reformism).

4. Technocentric reformism has to change rapidly (Technocentric Radical).

Chi (1992 : 3383 - 3385) added interdisciplinary: sociology, economic, political and ecology together with the better quality of life approach.

All characteristic description are concluded as the two main points as follow.

1. To enhance man to consider inaccessible and negative impact from environmental downfall.

2. Technological invention changes in productivity process which are pertained to ecology and man.

Technological inventions change for sustainable development may be appear in many activities and have different model. But, Alternative Agriculture (AA) or Sustainable Agriculture (SA) was conduced for agricultural system. This innovation integrated scientific method and local wisdom.

2.2 Alternative Agriculture Concept

Alternative agriculture means "way of produce and way of life of agriculture household that can upgrade, hinder and uphold ecology. As well, offers socio-economic right, sets up better quality of life both producer and consumer in addition consolidates local organization. (Lianjumroon, 1992:65-66)

Considering about Alternative Agriculture, three dimensions i.e. economic, environment and socio-political are composed. Similar to network of relationship, we can not divide them from one another. For example, agriculture household heads reform the way of produce from market or external purpose which made them lost an economy self-reliance to internal purpose (family, local group and community). That means consumerism has to be scale down. The heads will liberate any fetter from outside and become free to determine "what", "how" and "for whom". consequently self autonomy or self-reliance return to them once again.

To reform way of produce, does not mean resurrecting to the oldest agriculture system or traditional farming that can not predict the certainty of farm production but accommodates consistently the farming which relies on native ecology. In network of ecology relationship, living and non-living things rely on each other. Native known-how of ecological sustainability e.g. genetic diversification in farm can suppress enterprise rate of nature and price turn. Furthermore as genetic pool, it assists to gather useful kind of plants and animals for whole common interest.

Generally man livelihood (way of life and way of thinking) is relied by environment shift and limitation to exist their essential needs within their own boundary. Hazard environment stimulates for the change more immediate.

Hall (1993:42) Presented that Indian hill tribes have lived for centuries by sustainable shifting cultivation. Their land is now being invaded by migrants who use more intensive agricultural techniques. Because of social differences, the invaders have marginalised the indigenous people who feel that humans and forests constitute a single habitat. Because a lot of resources were used man and society are facing deep trouble e.g, inadequate distribution. Moreover, pattern of production which used to fruitful not dependable now. Alternative agriculture was evolved form annihilating of natural resources. There are a lot of type and occure in many places such as traditional agriculture (China), permaculture (Australia), ecological agriculture (India), agroforestry (Nigeria), organic farming (USA and UK), natural farming, sustainable agriculture (Philippines) andbiodynamic agriculture (German) etc. Those are the outcome from environmental situation in each country. Even though they distinguish, they harmonise.

In Thailand, integrated, organic and natural farming are popular patterns that agriculturists applied and integrated them together with their knowledge for farming reform. Integrated farming and natural agriculture are well known e.g. farming experiences of **Maha** (A Buddhist priest who has the third grade up to the ninth grade in the course of Buddhist theology) **Yoo Soontornchai** and **Kamduang Phasi** at two provinces Roied and Bureerum,

Northeast Region. The lessons from the two Northeast agriculturists can be concluded that commercial or intensive farming which was not available for farmer and ecologically suitable. The two farmers tried to seek the way out of their suffering e.g, debt by life review. **Kamduang** said that"...I am likely to most of farmers that unable to seek the fund for investment, unknown to manage the farm product in the uncontrolled market...". Last, he could find that his farm has to be liberated from the market, based on self and family needs and availed to man power and simple agriculture tools (Pongpis, 1993:205-215). The view and experienced of the farmers had been accepted by academic officer and others as the successful of self-reliance farming system and became to a case study for all interested.

Though there are many types of alternative agriculture. They are similarly to one another. The matching and differential characteristics are discussed in the table 2.1

Table 2.1 Matching and Differential Characteristics of Alternative Agriculture

Means	Kinds		
	Integrated Farming	Organic Farming	Natural Farming
1. Mulching	Agreement	Strong Agreement	Strong Agreement
2. Soil upgrading by leguminous plants such as beans, peas etc.	Agreement	Strong agreement	Strong agreement
3. Using Organic compost	Strong agreement	Strong agreement	Weak agreement
4. Minimum tillage or conservative of tillage	Not strict	Not strict	No tillage

Means	Kinds		
	Integrated Farming	Organic Farming	Natural Farming
5. Plant together with animal husbandry	Strong agreement	Strong agreement	Strong agreement
6.iological control for plant animal diseases	Not strict	Not strict	Strong agreement

Source: Lianjumroon (1991), p.102

2.3 Innovations Diffusion Concepts

Sustainable development is the one of the innovation for the change or development today. For goals achievement, it should be created by knowledge, ideology and technology. As well as, can be spread for change. Firstly, social interaction is the only one channel for this process. But as the age of globalization, mass media play role also. Man were exposed their view by more channel. Information stimulates attitude and practice skill to them which possible both positive and negative

interpreters have suggested that the direction of social change in modern societies will increase the direct effects of the mass media in introduction innovation. In this view, commonly called "the mass society thesis", modern societies are producing a greater proportion of individuals with ineffective and unstable interpersonal ties. Hence, more individuals and more susceptible to direct persuasive effects of the mass media (Wirth, 1957:115).

Klappr's (1960:115-116) summary of several decades of research emphasises the complex effects of mass media communication;it can reduce the intensity of attitudes and opinions, and it can covert people to new attitudes and opinions that are contrary to prior ones. Of these divers effects, most research suggest that last one is the least likely, for the reasons cited above. In sum, the mass media appear to be more effective in disseminating new information than in changing behaviour or attitudes. They appear to have little persuasive effect without reinforcement by interpersonal communication in an informal group context.

2.3.1 Mass communication:Interpersonal communication and Diffusion

The relationship between mass communication and interpersonal communication that lead to diffusion of change is called "two-step flow of communication". This

means that communication originating within the mass media goes first to people termed opinion leaders before being transmitted to the rank and file population. Sometime it may be call "two-step flow of influence". Because to study this, the flow of influence was investigated rather than merely the dissemination of information.

There are two different types of opinion leaders as information carriers for interpersonal communication and diffuse information to change.

1) Cosmopolitan Opinion Leaders. Who are more oriented toward the mass media and are likely to be more aware of the advantageous effects of specific innovations. Apparently such opinion leadership is issue specific, that is, exercised in discrete fields. They are more likely than others to belong to secondary groups and organizations (for instance, professional or organizations) than others. As the primary interpreters of mass comunication they are disseminators, who channel information and influence to local group.

2) Local Opinion Leaders. They are more oriecnted to local groups and hold central and strategic power positions in them. At the same time, they are more likely than other local groupd member to have a relationship with cosmopolitan opinion leaders external to the group. They are the gatekeepers who effectively advocate innovations

within the group or who can block the adoption of innovations by group members.

Follow to Mezel and Katz (1965:116), they have suggested that there may be more than two links or stages in the influence process, that is, there may be "multi-step flow". For instance, research about innovations in agriculture has suggested that the flow of influence typically begins with an agriculture researcher who work in college of agriculture or an agriculture firm. When the results of this individula's research is published in an agriculture journal or research bulletin, it is likely to be picked up first by the country agriculture extension agent or the cosmopolitan opinion leader who in turn persuades locally prominent farmers (local opinion leader) to try out the innovation. If they find the innovation a success, other farmers will adopt the new practice.

In this research environmental information as the presentative of Sustainable Development and Alternative Agriculture are the innovation from any channels (mass media and two kinds of opinion leader) which were spread directly and indirectly to agriculture houselhold to accept.

2.4 Social Change Concepts

Social change is ubiquitous, but most members of most societies either delude themselves into thinking that

stability prevails or in times of particularly obvious, discontinuous and rapid change, that return to unchanging normality is desirable and possible.

According to Srisantisuk (1986:26), social change is the change that occurs in anytime and can find the differential by time comparing. Moreover, it means all change in social structure, social relationship and social interaction

Harper (1989:5) has said that change is the significant alteration of social structure through time. He admitted significance as the large in the eye of the beholder and social structure as a potential network of social relationships in which interaction has become routine and repetitive.

For the term "alteration" there are 5 stages, first, Changes personnel, in which new people and role incumbents with different life histories and experiences are continually entering and leaving established structures. These may produce only minimal or gradual changes in the structures that they enter and leave, however. Second, changes in the way parts of structures relate and changes in role relationship e.g.power, authority, communication change in family and the proliferation of new substructures such as new departments in organization or the consolidation or realignment of existing substructures. Third, changes in

the functions of structures, that is, changes in what they do and how they operate. For example a religious organization can come to function as a family Consoling and social service agency. Fourth, change in the relationships between the different structures. For example, since 1990 in an America labour-management relations have evolved from what were often uncivil and violent confrontations to today's ritualised and highly routinized negotiations. Fifth, the emergence of new structures.

Harper has defined the social structures also. They mean a persistent network of social relationships in which interaction has become routine and repetitive such as persistent social roles in groups, organization, institution and societes.

Besides considering the different types of alterations of structure that can occur, there are 5 other brief orienting comments about change 1) Level of change 2) Different time frames 3) Cause of change 4) How change relates to human intentions or agency 5) Some other terms often associated with change.

First, change happens on many levels or the units within which change is taking place. The study of change can focus in aspects of culture such as values, norms, knowledge and technology and can focus on structural units

from small systems to large inclusive ones. To explicit level of change table 2.2 is presented.

Table 2.2 Level of Change

Structure Level	Changes
1. Small Group	- Change in role, communication structure, influence and cliques
2. Organization	- Changes in structure, hierarchy, authority, and productivity.
3. Institution	- Economy, religion, family and education.
4. Society	- In stratification demography and power.
5. Global	- Evolution, international relationship, modernization and development

Source : Harper Charls, L (ed): 1989 p.6.

Second, for different time frames, it is important to distiguish between-long-term economic changes. An assessment is made of the efficacy of alternative processes of interaction between a local community and senior government to establish and support these conditions.

Third, causes of change are exogenous and endogenous. Exogenous changes are the result from bringing in things from the outside such as new technologies, ideas, styles, diseases and so on. For endogenous changes mean change which is caused by the internal features of social systems that would generate change. Follow to Moore (1974:7), even if group were perfectly isolated from the influence of other groups. They include the inevitable gab between shared ideals and actual practices, individual differents and uncertainties in the socialisation process and flexibility and variation in the way of social roles are defined and enacted. Undoubtedly there others, such as the competition for control of power and scarce resources that is likely to exits within social system.

Fourth, the way social change relates to human intentions and agency or autonomous trends mean the nobody is trying to bring them about. Examples of such trends include shifts in fertility and mortality rates, the composition of population, the growth of metropolitan communities and so forth. Then there are those changes that are planned and intentional such as changes in laws,

allocation of scarce resources, the dissemination of new technologies, change tariffs, taxation, social policies, that are deliberately induced by legislators and the planners of all sorts. Finally, there are those changes that are intentionally sought by broad groups within a population, but are not planned in the bureaucatic sense by elates. This is the province of social movements, whereby people seek a wide variety of changes, e.g. the improvement of conditions for minorities, environmental improvements. In other words three broad varieties of change in relation of human agency: trends, intentional planned changes that relate to an elite decision-making process, and intentional changes that relate to social movements that involve broad segments of the population.

Fifth, some other terms often associated with change, these are progress, process, evolution and development. Any aspect of human behaviour can be seen as a process, which focuses our attention on the active and dynamic aspect of behaviour (the opposite of process is structure). But there are behavioural processes that maintain stability as well as process of change. Change is a process but not all processes are change. Progress implies qulitative improvement or things get better. The notion of progress is inherently value-laden. It is an important normative concept, but not a scientific one. Evoloution is most often used to describe some kind of more or less orderly progression from a simple to a more

complex entity. Not all of change is evolution. Even though evolution is an important type of change and has a central place in some classical theories of change. Change is often decribed as development. We can talk about developmental change in organizations, but among scholars, the notion of development is often used to decribe economic and political change in thrid world countries, or as a rough synonym for modernization. All of these concepts have been associated with change in different ways, but change is the broad, generic, neutral term.

This study pushes emphasis to sources of change that overlap with other in any aspects of change such as level of change (small group and organization) time series (short-term), the way social change to human intention and agency (intentional planned changes that relate to social movement.

2.4.1 Sources of Changes

To distinguish clearly about sources of changes more than above, there are three factors which cause change in society (Andrain, 1975:26-28).

1) Ideology

Hugo, F.Reading (1978:77) has defined ideology as a belief system which protects the interest of an elite,

a socially determined sets of belief, the belief system which indicates the probable social position of the individual and a system of belief. It can be concluded that ideology is a goal or guideline to formulate strategies for change. Generally it stimulates the people to concern possibilities of change and social desire. So it interprets the past, make meaningful present and portray the future idea.

In addition, Samuthwanich (n.d:1,4-5) pointed out the differences between ideology and general belief. Ideology has some specific characteristics; explicitness, integration, comprehensiveness and urgency

The two classified categories can be discussed as follow.

1) Progressive ideology : It is the ideology which rejects the old, traditional and conservative social norms, regulations, methods, beliefs etc, and encourage man towards positive changes for the betterment of the society.

2) Conservative ideology:the ideology in which old and traditional social norms, regulations, methods, and beliefs are followed which is the barrier of change.

Ideology is important stuff because of three following reasons which can stimulate the society to change.

1. It provides the reasons, directions and morale behind the social change.

2. It integrates the conflict between interest groups.

3. It expresses the both sides of beliefs (agreement and disagreement) for decision making or synthesis in society.

So the prior of social change, it has to be ideological change or the process of change in ideology. For social occuring, people must be convinced that change is both possible and desirable hence the need of a systematicset of beliefs (ideology) that postulates the feasibility and desirability of particular change. By specifying the nature of a new person in a new society, political beliefssuggests new way to perceive the world. So ideology supplies the reasons, direction, and morale behind social change.

In any society there is inherent ideology existing that has been reproduced and reproducted inside community, and derived ideology which has been produced and reproducted by outside. For change i.e. acceptance, explanatory ability and solution in agriculture system, peasants created ideology which combines inherent ideology, derived ideology and experiences in everyday life. The opposite factors that retard this process are dominant ideology, economic suffering and constraint, and repressive apparatus of the state. But supporting factors come from external support, economic pressure and political

development. To created new ideology for solution always lacks of continuity. The ways to strengthen peasant, people's organizations should have full autonomy in order to reproduce ideology efficiently and increase their bargaining fower protechng their for interest. However Peasant's barganing far their interest, protection reflects two significant issue. First, peasant perception, peasant problem are the exploitation in production interest sharing. Second, peasants have their own problem to an extent by collective bargaining (Rerngjit, 1991:8-9)

Northeast region of Thailand was rich in old ideology which was based on the family and kinship. Nowadays it is being transformed into modern ideology i.e. consumption which relates capitalism. Due to commercialise farming systems the farmer in this region lost the self-reliance as it depends on the equipment, tools, chemical, services, capital, etc. which are external in source (Chamratphun, et. al, 1993:3.9, 41-42). For attaining on the equity the full co-operstion among the farmer during the rolling of people's organization is required.

2) Organization

As ideology provided the reasons, direction and morale behing social change. Organization provides the means for change. Every leader needs some organization such as a political party, civic association or guerrilla band

to realise his ideological objectives, to mobilise human and material resources and to co-ordinate activites.

Organization can be defined as resources pool (Buchanan, 1977:566). It comes into existence when individuals place the resources available to its (such as skill, money or prestige) under some sort of central control, rather than using its individualistically. Organization must establish certain rules for the use and distribution of their resources. Thses rules may be based on an autocratic-hierarchical principle, whereby one person assumes the role of central co-ordinator, or they may be co-operative-democratic, in which case all members participatc on equal terms in co-ordinating and distributing decision making. Most organizations fall somewhere between these two extremes, and in reality an organization may combine "hierarchical" and "market" features.

The organization in this study has to realise purpose of ideology. Man need organization to mobilise manpower, and resources and to co-ordinate activites i.e. political party, association and interest groups. They may force one another by their authority or seed for group co-ordination for social change. Type of organization which correlates sustainable development was defined as people organization.

People's Organization

Prof. Prawes Wasi has defined people's organization is an organization which is established, managed and continued by the people. Moreover, it can be developed more potential for problem solving especially poverty and able to stateamong crisis situation (School of Social Development, 1991)

For change, people's organization induces all aspects of local wisdom i.e. historical, geographical, cultural, technological, the need, problems and their solution for the members. All are shaped by the pressure of social surroundings or innate view. Moreover, the people's participation which express member's their needs and challenges others interest gorups to sharedecision making is concerned.

Somewhen, people's organization is defined as an organization which is authorised under the law such as the committee on Tambol (sub-district) councial and the committee on village (Wiruchniphawan and Saenthaweesuk, 1988: 7)

In this study, any groups in villages which were established or operated by innate people, government organization or non-government organization for

bargaining and protecting the interests of all members are accepted as people's organization.

The design of organization structures, and the achievement of improvements in efficiency, require a consideration of a following principles (Kuper and Kuper, 1985:566-567).

1. Division of labour. A job is deined which compromises several tasks. By constructing such jobs, a number of advantages can be realized. Training for the job, both inside and outside the organization, can be kept within limits. Not everyone need possess the skills, say and yet with the help of organization rules. When job are created workers and employees can response largely to qualifications available on the labour market, a choice of workers is possible.

Within a certain range, the efficiency of organization can be increased by the greater of division of labour and specialisation. Each worker does a specified task for which few techniques are necessary. Trained on the job, the worker can thus be expected to achieve a high degree of skill in a short time. One problem with this, howevr, is that highly-specialised jobs can reduce motivation, increase boredom, and lead to absenteeism, rapid turnover and a high failure rate. It also requires a high degree of co-ordination.

2. Co-ordination by the standardization of operating procedures. This is a very powerful co-ordination instrument, increase in co-ordination reducing the need for communication. If one simply follows the rules, one need not understand the rational behind the rule and can still achieve a high standard of problem solving. On the basic of standardized operating procedures, it is possible to delegate decisions and still maintain control at the top but the disadvantage with such procedures is that they have a tendency to persist any environmental change requires modifications in the rules.

3. Co-ordination by hierarchy. Assuming that a problem arises on the production floor of an industrial organization. At first a foreman will try to solve problem. If he lacks the necessary competence, he will go to his superior. Very big problems are taken right to the top of the organization. In solving such problems, new policies are formulated which apply to the whole of organization. But decision makers at all levels do not just wait passively for problem to emerge. They also set targets and make plans for the future.

4. Co-ordination by teams. This is another mechanism to support hierarchies. A number of xperts from different hierarchical positions come together for specific tasks. They exchange information or engage in collective decision

making. If certain conditions are met, team are an effective co-ordination instrument.

Considering on the above viewpoint, the co-operative among the people in organization is consequently with people participation or popular participation which seeks for the decision from all level of organization. People participation is the one of fundamental to encourage grass root people from objective to subjective or attain on sustainable development. In Taweethong Hongwiwat's view, it means people or community feasibility to manage, control and distribute resources for the basic needs both economic and social aspects. In participation process people can invent their perception and intellectual by decision making themselves (Pukthing et.al, 1989:3)

Follow to Lisk (1988:15), popular or people participation will be trend to development goal. Generally it should be broadly understood as the active involvement of people in the making and implementation of decisions at all levels and forms of political and socio-economic activities. More specifically, in the context of the formal planning process, the concept relates to the involvement of the broad mass of the population in the choice, execution and evaluation of programmes and projects designed to bring about a significant upward movement in levels of living.

When development aims at the attainment of basic needs oriented goals e.g. sustainable development, the concept of this should be interpreted even more broadly with reference to economic, social and cultural requirement of human well-being as well as to certain concerns of an intangible nature that are nevertheless requisite to the satistificaton of basic needs. For a wider interpretation of popular participation should include its contribution to the satistification of important non-marterial need of human well-being such as equity, social justice, humanism and related freedoms also.

So, there are may ways to explicit popular participation, but group creative, group decision, group implementation and supporting management resources from all members for each organization are accepted as a necessary factors to bring about decentralisation of administrative and resources to the local level and people needs or aspirations responsiveness.

Generally, people organization has not much potential for self evolution and has no meaning of people's participation in the development activities which is conduced by development firms. (Na Chiangmai, n.d:24). Because some tasks of organization which sought to defend the interests of their members by orderly and peaceful means always confronted with obstacles that took of extremes of repression by elates and dominant groups.

In addition to the quality of organization leader who has lesseffective as the protector of member interests and even corrupt following his alliance with the then ruling party and his involvement in official decision making (Huizer, 1988:205, 207). Development process is ceased by these for overwhelming the problem, if people's organization has some pull-factors i.e. external support (government organization, non-goverment organization and local leaders), able to promote efficiency cf activities (productive and informal activities), marketing information pool, and able to evolve occupation, income and employment for all the mambers. The people's participation will be occurred (Thesprasit, 1991:3-4). Moreover, official intervention and support (abandoned repression and adopted instead a more conciliatory strategy by which representative agrarian organizations are given legal recognition under official guidance) and the nature (land demands, implementation of appropriate agrarian reform measures, given the main interest of organization revolve aroundland demands) are important for people participation in agriculture sector (Huzer, 1988:205-207).

3) Technology

Whereas organization and ideology that produce change are mainly political in nature, technology constitutes is an essentially non-political source of change. The industrial revolution that began in England, Holland

and France brought new methods of obtaining change and also raised popular aspirations for change. Industrialiation means new ways of manufacturing and distributing products such as machines, plants, transportation modes, communication media, automation, computer, military weapons which led to profound changes first within those countries and later throughout Latin America, Asia and Africa with the spread of colonialism, a money economy, mass media, railroads, paved highway, tractor and car. In addition the sophisticated weapons were introduced to societies formerly living under subsistence agriculture.

Base on Hugo, F Reading (1978:214), there are many aspects to define technology. They are

1. the body of knowleadge concerning manufacturing and extractive process.

2. the whole or organized sector of the industrial application of science.

3. a societeties's set of techniques for obtaining sustenance.

4. pattern of all the practices for utilizing resources in pursuit of values.

5. all existing means for achieving organizational goals.

In conclusion, it means a technique and process for transforming natural resources to goods and services.

Besides this, technology constitutes is an and essentially non-political source of change.

Components of Technology

According to the School of Social Development (199 1) the followings are the components of technology:

1. Technoware i.e.machineries

2. Humanware i.e. human resource and their intellectual, feasibility, experience etc.

3. Inforware i.e facts, information and knowledge from any medium

4. Ogaware i.e structure, system and management existing in the society.

It is undeniable for the importance of technological progress for economic and social development.

Kuper and Kuper (1985-850) referred to Schumpeter one of a few distinguished economists who put technological progress at the centre of analysis, stessed the importance of new products, process and forms of organization or production factors which have clearly been associated with enormous change in economic structures of developed economies since the industrial revolution.

Ofter of the sociologists who accept technology as one of pool of change was Karl Marx (Andrain, 1975:49-50). Marx emphasized on technology as only one source of change especially technology for producing (how it is produced and who owns it?. He used linear social evolution formula: for investigating the socialchange. Sociely startes from simple to more complex or progress: 1) primitive, 2) feudalism, 3) capitalism and finally 4) socialism.

In primitive society, men hunted and yielded with simple tools which produced unsurplus. For higher stage technology was developed for more surplus (goods and services) in production process. Now almost of the society are in capitalist stage that utilise high technology or intensive machinery for high surplus and consumption.

The conclusion of social evolution from Marxist scholarship was deducted from the ecological and political environment of Europe in The Midely Ages. this age was uniquely favourable to the development of strong, independent towns run by and for merchant elates. Merchants and town artisans anywhere are likely to be more rational and calculating than peasants, warriors or court officials. They deal in ponderables that can be weighed and counted, in goods that can be manipulated in predictable ways in profits that foreseen, even if imperfectly. Peasants, on the other hand face a capacious nature and even less predictable elite of repacious nobles and state and have

little of control. Superstition, reliance on magic and resignation tend to characterize peasant thought. The warrior ethic, on the other hand, emphasized boldness, deliberate outbursts on non rational violence, and showy grand gestures that contrast sharply with the towns man's petty and avaricious calculation (Kuper and Kuper, 1985:761).

Along with classic sociologists, technology is temporary but evolves for more advance by time to time. Based on decreased natural resources for higher surplus is the aim of innovation creation. For development, technology as an innovation spreads to societies and leads to change. In agriculture sector of Northeast, time saving technology i.e tractors, maize mills, small tractors and land saving technoloty i.e the plantednew kind of seeds and used chemical fertilizes and pesticides were applied. Such technologies helope increase the farm production. However, agriculturist had to buy these technologies from somewhere else. They had to borrow Money from capitalist for their investment. The ability to pay off the debts highly depended on the weather and prices of farm products that rely. So they sank in debt and have had low quality of life (Teerasasawat, et.al, 1990). Many social reformers opposed and revised to Appropriate Technology (AT) that harmonised hazard enviroment andinhuman situation. Frst of all in 1947, Mahatma, Gandhi, the statesman of India indicated about technology for underdeveloped countries. That should be

concernedpopular and social needs. Followed to him, Schumakerhad written, "Small is Beautiful" in 1973. He has reversed the definition and the goal of the development. More and more he affirmed in gradual development that conduce self or community reliance. If only productive process utilizes native resources.

For substantial, USAID added man power avail totether with internal product usage as possible. Base on the view of UNEP, there are 3 aspects in the sphere of appropriate technoloty i.e, environmental, sociological and economic. All the aspects are discussed.

1. Environmental aspect:means energy and resource thrift, recycling and controlling pollution. In the other hand, it means the integration between the application and conservation.

2. Sociological aspect : basic needs, employment, clutural concordant, and decentralisation are regarded. For the change or development, Appropriate Technology should be created and followed.

3. Economic aspect:similarly to sociological contexts but reach into the micro level i.e community, village and household or individual.

Ruphkumdee (1991) has concluded appropriate technology based on the Thai society. Following Ten points

below are considered characteristics of appropriate technology as material or invention for micro-level.

1. Economize or affordable
2. Utilising the native raw materials
3. Crated by innate labour farce and knowledge
4. Easy to conduct, maintain and control
5. Suitable in sacle
6. Use of as few machines as possible
7. Simple
8. Availability of spare parts or complement
9. Able to promote local co-operation
10. Compatible with the culture of the local society

Appropriate technology can be applied almost the fields such as rural development, industrial development, any kind of national tasks. For the agricultural sector, it covers main activities which influence capital for farming such as water use, producted organic composts and utility, protected, presered and extended the kind of plant and animal. Appropriate technology in this study pushes largely concern in technology which follows to appropriate technology.

2.5 Previous Related Research

Many previous research findings have concluded about the effective factors which can encourage the

attainment of sustainable development (implement in community and re-evaluate in policy broad) from different development projects in many area i.e, no red tape in development organization, the co-operative of innate people and development organization, emphasis on grassroots together with their participation, indigenous known-how and environmental crisis. The findings from previous related researches as the document references of this study are presented below.

Hasan (1992:2128-2130) had studied for local sustainable development planning in Bangladesh. There are 3 important principles which must be addressed for the success of sustainable development in third world countries.

1. Recognition of human beings as part of natural environment.

2. Perspecting the indigenous cluture of very society.

3. Introducting locally-based planning with the participation of its beneficiaries.

However, development programs are pre-determined by the national government in Bangldesh. There is no scope for participation of the beneficiaries in planning process. The local bodies do not have opportunity to formulate plans and therefore, lose interest in mobilizing resources.

Voluntary organization in Bangladesh are fairly new and their emergence is directly related to the failure of government in meeting the hopes and aspirations of rural people. In addition to mobilize more resources for development.

Zewde (1991:963-964) had investigated an integrated rural development project in the social framework to ascertain consistent convergence or divergence between state development project goals and actual programs. The research issue is why underdevelopment persisted in spite of over two devades of intensive development intervention.

The research findings strongly indicate that large-scale bureaucraically organized, capital, expert and high-technology intensive approach did not incorporae the local people, communities and institution into dynamic interactive processes of their own development. As a result, it faced problems in creating a environmental development in which the local people and their socio-economic and political instituions and rural development project could engage in mutually reinforcing effort for rural development and poverty alleviation.

The lesson of this is the need to avoid reliance on bureaucratic project structures to "deliver" development. Development agencies must rely on local potentials and emergent institutions as vehicles of development. They must

only inject measured amounts of external capital, appropriate technology, managerial and other competence -buliding programs directly into local institutions and communities to initiate sustainable development from within.

Xu (1992:3243) had explored the linkages between distributional impacts of forest-based projects and sustainable development. It was identified in the term of an assessment approach for forestry projects or the concept of distributional impacts and distributional impacts assessment that incorporate sustainability criteria. This study indicated that there are the relationship between distributional impacts assessment and other analytical tools in forest-based projects in addition proposed the model from the finding. A model consists of three major components below.

1. Identification of distributional impacts and groups of intrest.

2. Measurement of distributional impacts through an integrated method which included both monearty and non -monetary approaches.

3. An appraisal and evaluation of distributional impacts.

Moreover, his develped model was discussed in United States for the conclusions and implication of future

research and application. A main conclusion is that increased attention to distributional impacts is required to improve the contributions of forest-based projects to sustainable development.

Chi (1993:3383-3385) examined the relationship between the environment and development in developing countries and to discuss how sustainable development can be achieved in these countries. In this study development is defined as the improvement of the people's quality of life, indicated by multi-dinensional:socio-economic-political and enviromental variables. Sustainable development is defined as the continous improvement in people's quality of life without simultaneous degradation of natural environment. It is measured by a time-series evaluation of development performance and the maintenance of environmental quality.

This study argued that the best way to achieve sustainable development is through grassroots participatory efforts beginning at the lowest levels of society and continuing throughout all levels.

The findings had been concluded form making the mistakes by two development countries Kenya and Taiwan.

Current problems of sustainable development in Kenya are caused mainly by widespread poverty, coupled with a long term pattern of rapid population increase. This

study argued that international help and grassroots participation by the people are the best ways to achieve sustainable development in this country.

In Taiwan, it has been regard as an economic "miracle" and "model" for third world development. This study indicated, however, that Taiwan is far from being a "model" because of enormous socio-economic and environmental problems that surfaced in 1980s. Environmental degradation in Taiwan intensified under the ideology of "almighty economic growth" which continues to be pursued by the Kuomingdung government and the capitalist elite. Although an opposition party and grassroots groups have come to challenge the dominant power. The movement of Taiwan toward sustainable development in too slow and may already be too late.

Green (1991:605) explained the transition from conventional to sustainable farming which has been limited. So this study summarized the popular discussion pertaining to planning the farm transition. The following 6 concepts that are useful to take into account when designing sustainable system : 1) vision 2) creativity 3) values 4) an holistic 5) systems perspective of the farm 6) popular participation in the development process.

Farm and farmers characteristics are detailed as well as the potential of each to influence the evolution of

the farm. The outcomes of farm-level planning and activities in the first two transitional years are described. Particular attention is paid to the implications of creative visioning and approaches to problem solving, value adjustments, decision making criteria and the farmers perceived restraining forces. A comprehensive, practical strategy designed to facilitate the farm transition process is constructed. This combines the current popular template for appropriate planning and the theoretical constructs of sustainable development. Finally, procedures for using the strategy are outlined, together with some requirements for the further development.

Pulido (1992:4490-4491), examines the environtal activism of low income, in particular how they define environmental problems, act upon them, and what their proposed solution are. The investigation is based on two in -dept case studies:The early pesticide campaign of the united farm worker's labor union in California and a grazing conflict invloving a community development group in northern New Mexico, Ganados del valle.

Two cases are examples of alternative forms of environmental organizing. In that they are investigated with other components of their lives. Because of their poverty, culture and status as ethnic minorities, these groups are oppressed on sereral levels and thus incorporate environmentalism into these other concerns.

To provide models for other grassroots environmental organizations in how to engage in proactive environmental organizing, or sustainable development. Through sustainable development, low-income minorities are able to address their need for economic development, clutural integrity and civil.

According to Matowanyika (1993:4441), he concluded that indigenous factors also can play an important role in the sustainability. These factors include local activities and social arrangements that promote sustenance, protect and enhance resource bases, foster synergetic relationships, advance intergenertional communication and safeguard socio-cultural continuity. Such a philosophy includes respect for nature by rural residents in Zimbabwe, morality in the nature, restraint in resource exploitation, mutual co-operation and interdependence in resource allocation, mutual exclusion of individuals from outside of give communities and concern for intergeneration communication and sociocultural continuity.

Avila (1991:319) has said that people in families play an essential role in the sustainable development. The research focus is on perception of sustainable development of three members of ten small-farm families in three rural communities of San Juan province, Argentina.

As participants in the development programs with some leasership resposibilities in their communities, these family members were asked questions from which their perceptions of sustainable development could be deduced, what are the concepts and terms used, and how do the issues and symbols come about?

The way in which these small-farm families had been affected by a severe earthquake in 1977 were revealed in all the responses about sustainability. Major categories of change, values, and human attributes perceived by men women and youth with their similar and distinct properties of the three locations emerged from the data. The human a attributes of resilience, endurance, self-esteem and rootedness were emphasized by informants in three areas. Instead of alluding only to the natural environment preservation, informants emphasized the human qualities of the social-cultural environment along with minimal material conditions of the human built environment. These categories are non-professional inputs in the conceptualisation of sustainable development.

Reed (1990:588) purposed the contribution to the clarification of the concept of sustainable development by examining how principles of resource management and local economic development planning might be integrated within the context of resource-dependent hinterland community where faced with economic decline or faced in balancing

short term needs and long term economic and environmental goals. Necessary conditions are identified for sustainable development and a decision-making approach is proposed to meet these conditions.

It is argued that policy set at senior levles of government must be responsible for ensuring the long term productive capacity of natural resources and yet be responsive to local needs and conditions. A framework of this study is proposed for locally-responsive sustainable development planning (LRSDP) to meet these requirements. LRSDP is suggested for localities which seek to work with senior levels of government and to share greater influence in resource management and economic development. LRSDP incorporates both procedural and substantive components including consideration of multiple perspectives, broad participation in decision-making processes and formulation of strategies to address long term environmental and economic changes. An assessment is made of the efficacy of alternative processes of interacton between a local community and senior goverment to establish and support these conditions.

This framework is used to examine the relationships between the community of Ignance, Ontario and the Ministry of Natural Resources. The Ministry established policy directions to support sustainable development and partnership arrangements. Within these directions, a

proactive approach was to be taken to make Crown land available for economic development initiatives and to promote local invlovement in Crown land development.

Two cases within Ignace illustrated three processes of interaction; parternalism, conflict and co-management. The co-management has the great potential for meeting the substantive and procedural goals of LRSDP. Through co-operative arrangemants between local repesentatives and senior governments, a local community can improve its capacity to influence change to make choices about policies and to tailor programs to meet local meeds while ensuring conditions for long-term resource productivity.

The application of co-management, however, remains problematic. The findings indicated that processes resulting form local dependency reduced input from a broad range of participation at the community level in the co-management exercise. In addition, several co-management participations were in a position of conflict of interest. This research suggests a strong potential for a co-management committee to become a select advisory committee from the community to the provincial government. Like other participatory mechnanisms, co-management depends on on-going political commitment of all participants to the goals of co-operation and subtanainability. Tension between immediated demands and future goals for development remains to be resolved over

the long term. Ultimately, political consciousness must be raised to provide conditions for sustainable development.

Wismer (1990:1085) proposed the research finding to answer, how sustainable development can be implemented. The research suggests that implementation for sustainable development in in Canada will require not only community -based initiatives, but also major initiatives coming from public and private sectors for community equity and the integration of environmental-economy relationships.

CHAPTER 3

METHODOLOGY

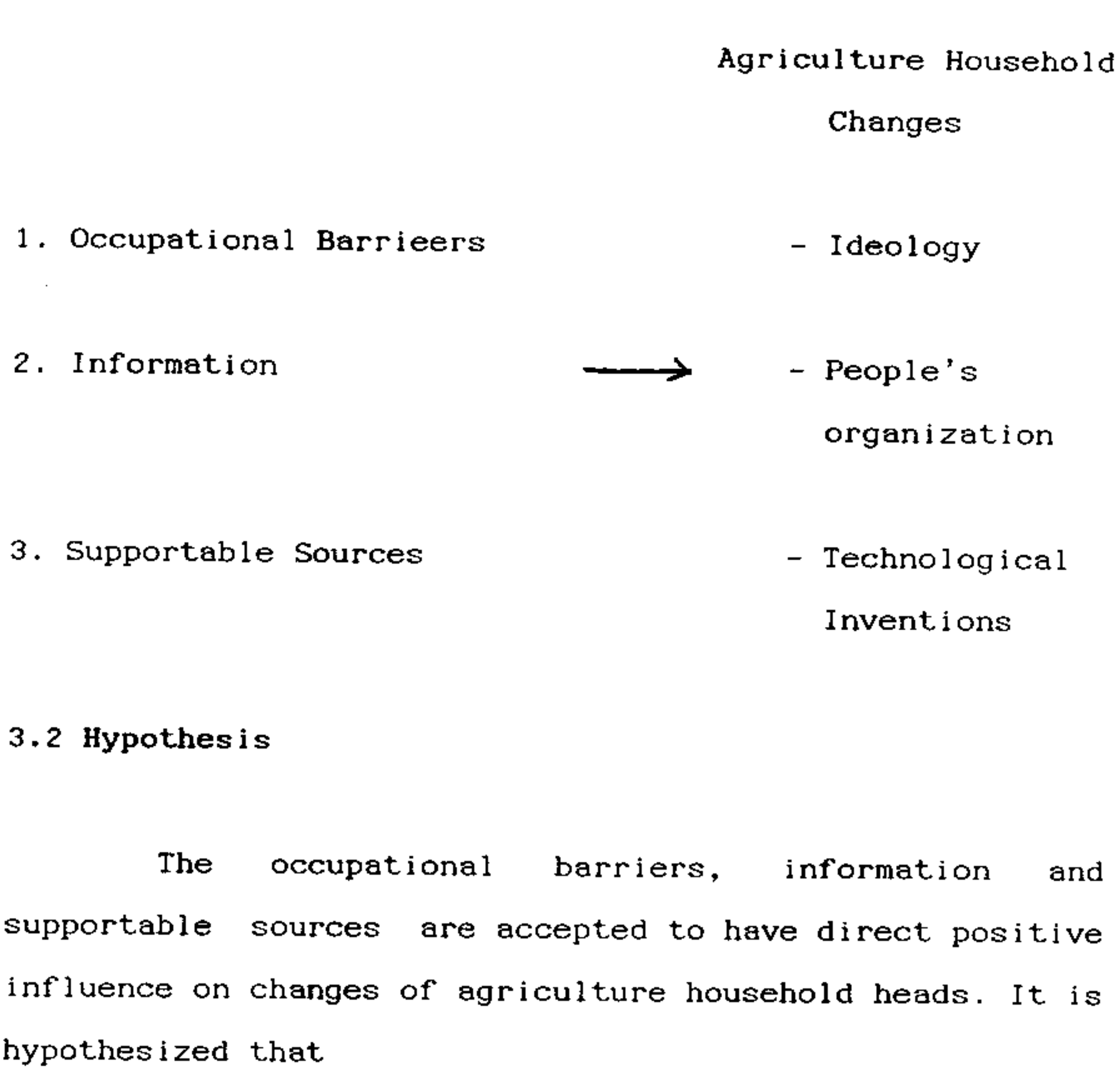
To meet the emergency concerns of sustainable development and agriculture household changes that increasingly set the criteria for achieving grossroots well-being, this research aims to investigate for the most effective factors from quantitative analytical tools. The designed of research incorporated a broad set of methodology which was developed from social science concept. A broad set of methodology are described and ranged below.

3.1 Conceptual Framework

For conceptual framework, total of 6 variables were taken place. All had been done by related concepts and the findings of previous research.

Figure 3.1 below illustrated the brief of the discussion of the three exogenous factors that play role on agriculture household changes:

Figure 3.1 The Conceptual Framework



3.2 Hypothesis

The occupational barriers, information and supportable sources are accepted to have direct positive influence on changes of agriculture household heads. It is hypothesized that

1. Occupational barriers, information and supportable sources have positive relationship with ideology.

2. Occuptational barriers, information and supportable sources have positive relationship with people's organization

3. Occupational barriers, information and supportable sources have positive relationship with technological inventions.

3.3 Definition of Variables

The definition of variables are discussed below.

1. Occupational barriers mean physical and non-physical feters that encounter the efficiency of farming process such as soil quality, water supply, deforestation, land ownership, capital conditions, labour force, agriculture technology and marketing contact.

2. Information means physical environment information i.e. benefit of soil, water, forest that suppor man, animal and plant life and in providing a wide range of useful as well as edible materials, negative impacts from degradation, crisis situation conservation and upgrading campaign including, alternative information from any channel or supportable sources to agriculture household heads.

3. Supportable sources mean people or organization who carries an environmental and alternative agriculture information to agriculture household heads, in addition to the people or organization who sopports the instrumental and equipment to local organization in village such as local opinion leaders (aged person, formal leader in village, etc.), official of government organization, staff of the non-government and mass media.

4. Ideology means needs and attitude of agriculture household heads that take for granted to the essential of their potential and alternative agriculture for overwhelming the occupational barriers.

5. People's organization means the appearance group in village and the participative of agriculture household heads for occupational barriers and other emergency needs of solution.

6. Technological inventions denote as alternative agriculture techniques which agriculture household head utilize in ther facrm for overwhelming occupational barriers.

3.4 Measurement of Variables

In response to statistical analysis, Interval scale was concerned for variables measurement. Base on Likert's scale there are five of agreement degree. But, only 3

scales were operated in this study because of low educational qualification of the sample. The measurement of variables are given in Appendix c.(Question No 2.1-6.8)

3.5 Area of the Study

Banphue district of Udornthani province was selected as an area of emphasis for the community study. Nalomnoi was village where is government and non goverment organization site in response to sustainable development concept was selected for analysing the factors effectiveness for sustainable development and agriculture household changes. The characteristics of this village is described in the Appendix A.

3.6 Unit of Analysis

The units of analysis were agriculture household heads in Nalomnoi village. As some of the agriculture household heads leaf the villages after transplating or harvesting of crops to town specially Udornthani, nearly provinces and Bangkok to work with a view to earn extra money, a chief of the family member, who has decision making power in the family, was selected as a representative.

3.7 Sampling Technique

The sample in this study was drawn by Multi-stage

random sampling technique. There are 9 villages that development programs from government and non-government firms had veen located. According to the study criteria, only of of them was selected as the sample of study. There are 75 agriculture households in village were reported. Follow to Krejcie and Morgan's sample size table 58 of agriculture household heads who were found at accidental occasion were chosen as the sample in this study. The Krejcie and Morgan's sample size table is presented in an Appendix B.

3.8 Research Instrument

Structure interview was selected to collect data. In the interview component there are 6 parts. The ordering are based on the apporpriate sequence; 1) general information, 2) occupational barriers, 3) information and supportable sources, 4) ideology, 5) peoples organization /people's pariticipation, and supportable sources, 6) technological inventions. Expect general information, all are measured by interval scale. To identify the fact and agriculture household heads's attitude in each item used only 3 degrees because of low educational level of the people. The details of all the parts are presented in the Appendix C.

3.8 Reliability Testing

In this study, consensual valid or expert's judgement of contents used as a method in order to measure the validity of interview.

For reliability testing, the pretestes interview in each items was conducted from 20 agriculture household heads to find the internal consistency two weeks before collecting data at Nongkae Village where has similarly population characteristics. Furthermore, and development programms of government organization and non government organization have been sited. The result after pre-test (Cronbach's "alpha coefficient") is 0.8049, After this process some items were edited and revised for field survey.

3.9 Data Analysis

1. Instrument : Computer and SPSS/PC+(statistical software packages for social sciences) were used for electronic data processing method.

2. Statistical techniques: In order to describe general characteristics of the sample sescriptive statistics is concerned. Far inferental statistic, chi-square was selected for testing the hypotheses.

CHAPTER 4

RESULTS

4.1 Descriptive Findings

4.1.1 Characteristics of Samples

1. Sex : A total of 58 household head was taken as samples to study the changes in agriculture household. Table 3 indicates that out of total sample households 38 (65.5%) were males and 20 (34.5%) were females.

2. Age : Almost of respondents (36.2%) was 31-40 years (Table 4.2). Large a number (27.6%) also mentioned as 51-60 years. Moerover, agriculture household heads defined the given currently 41-50 (20.7%) and 21-30 (15.5%) years respectively.

3. Education Background : Almost all of household heads held pre-primary school and primary school which is equivalent to Prathom four and six certificates in Thai educatinal system (see Table 4.3)

So in this part, it can be concluded that almost of hosehold heads hold compulsory level of education. The Table 4.3 shows the percentage of household having different level of education.

Table 4.1 Frequency and percentage of Sex

Sex	Frequency	Percent (%)
1. Male	38	65.5
2. Female	20	34.5
Total	58	100.0

Table 4.2 Frequency and Percentage of Age

Age	Frequency	Percent (%)
1. 21-30	9	15.5
2. 31-40	21	36.2
3. 41-50	12	20.7
4. 51-60	16	27.6
Total	58	100.0

Table 4.3 Frequency and Percentage of Educuation Background

Education Background	Frequency	Percent (%)
1. No Scholling	4	7.0
2. Pre primary	40	69.0
3. Primary School	10	17.2
4. Scondary School	2	3.4
5. High School or College	2	3.4
Total	58	100.0

4. Marital Status: Almost all (81%) of the household heads among them reparted married condtion and live together. There was very low percentage of the singles, married but separate or divorced/widow, i.e 4, 4, and 3% respectively.

Table 4.4 Frequency and Percentage of Marital Status

Marital Status	Frequency	Percent (%)
1. Single	4	6.9
2. Married/couple	47	81.1
3. Married/separate	4	6.9
4. Divorce/Widow	3	5.2
Total	58	100.0

5. Agriculture Activities : base on the data from Table 4.5, most of the agriculture included in agriculture activities, rice field, gardening, livestock and cash crops were taken as the base (31.0%). Most of the farmers followed the complex farming system that means cash crops and gardening were identified by the agriculture household heads as a secondary agriculture activity next to rice. In the village, farming system were also found the characteristics that there was the integrated of 4 activities i.e., rice field, gardening, livestock rearing and cash crops. The detail of each agriculture activity which was deduced from further interview is described below.

Rice field as the main activity was not for sale but was to be given priority to fulfill self-sufficiency

for the agriculture household heads and their family members. All of agriculture household heads who responded the question that rice field was grown in their farms. In the village glutinous rice was planted during the wet season. A second ricd planting during the dry season was not taken place. Although, very few of the farm fields were received irrigation from Huai Heaw where is governed by Department of Rapid Rural Development, Ministry of Interior during the dry season.

Quite a few of agriculture household heads answered the structure interview that gardening was also the significance agriculture activity for home consumption. In gardening, they grew shorter duration vegetables i.e, tomato, garlic, shallot, Chinese kale and leaf mustard after harvesting in their rice field. The water supplied was veined from their fish pond and natural pool (referred to "Nong" in local language). Noticeably, this study did not refer to home gardening which always found in Thai rural society as an agriculture activity although it raises production for home consumption, because of natural cultivation or resurrected grown.

Livestock was identified by the agriculture household head as the one important agriculture activity. Buffalo and cow were regarded as a part of their families to carry out agricultural operations such as plow and transporting of production. These animals serve as their

assets. They were sold when they need in cash or in any emergency need. Poultry was recorded by the agriculture household heads as a partial of livestock also. The tradition rural poultry husbandry was normally found at most of their habitat. The poultry production such as egg and meat from indigenous of duck and chicken were provided for their families. In some case fish was reported by agriculture household heads as the newly livestock activity for commercial required. Nile tilapia, Chinese crap and crap were fed in the village. However, the production from fish pond was not sold. Because this activity just developed in the village under the governed of Department of Rapid Rural Development and the supported from PLAN InternationL (Thailand).

Large number of agriculture household heads said that cash crops was the agriculture activity for earning cash. In the area which were farther away from the water supply, highland or unfertilized land cassava and sugar cane were grown. Since the two kinds of plant can resist droupght and also they are easily marketable fetching. Although, the price of them are always declined, the agriculture household heads still continue growing them. Because they are easily grown and need a small amount of capital investment especially, cassava.

6. Total of Agriculture Land : Base on the answering from question no.1.6, the total of agriculture

land was ranged drom 1-50 rai. The table 4.6 indicates that there was high percentage of 11-20 rai (39.7%) and 1-10 rai (29.4%). Moreover, there was equally among percentage of 21-30 rai, 31-40 rai and 41-50 rai (6%). The further analysis was taken also in this part it was occurred that an average possessed land is 21 rai per agriculture household head. Noticeably, in this study did not keep the habitat land in calculating.

Table 4.5 Frequency and Percentage of Agriculture Activities

Agriculture Activities	Frequency	Percent(%)
1. Rice field and Gardening	4	6.9
2. Rice field and Livestock	4	6.9
3. Rice field and Cash crops	15	25.9
4. Rice field, Gardening and Livestock	8	13.8

Agriculture Activities	Frequency	Percent(%)
5. Rice field, Gardening, Livestock and Cash crops	18	31.0
6. Rice field only	9	15.5
Total	58	100.0

Table 4.6 Frequency and Percentage of Agriculture Land

Agriculture Land(rai)	Frequency	Percent(%)
1. 1-10	17	29.4
2. 11-20	23	39.7
3. 21-30	6	10.3
4. 31-40	6	10.3
5. 41-50	6	10.3
Total	58	100.0

7. Other Occupations: Sampling data by the other occupations as presented in Table 4.7 indicates that within the agriculture household heads interviewed very few of them were reported as having only rice field. This clearly indicated a point that the great percentage of agriculture household heads provided a number of other occupations.

Because farm productions were not for sale especially rice, vegetable and livestock. Moreover, cash crops always confronted with low price in each season. Many of agriculture household heads lack of purchasing power. So they possessed other occupations to earn pittance wage per day for their families. There were the number of agriculture household heads who were engaged in farmhand and labour (off-farm employment). Those occupations were compatible with their education qualification and life experience and were taken place at nearly villages or provinces if the employment opportunity were arisen.

Base on information on the sample by merchant and land owner, one case of agriculture household head was identified as merchant and 12 cases were identifies as a land owners (people who has land for rent). Actually, there was not private grocery in this village but, there was saving group grocery where supported goods for the consumption of the members. This grocery was established by PLAN International (Thailand) in 1990 and had been provided various activities for climbing up the member

difficulties and emergency needs. The one which was identified was small petro station. And for land owners, it could be described that some of agriculture household heads divided their land for rent. Because they lack of family labour force to take grant their farm during seeding season. Those details which did not display in the table were deduced from the informal discussion or interview with the samples.

8. **Income**. The income of agriculture household heads was varied from 5,000 baht to 60,000 baht. According to Table 4.8 very few of them could earn over 30,001 baht per year. Almost of them held 10,001-20,000 (43.1%), 5,000 -10,000 (22.4%) and 20,001-30,000 baht (13.8%), respectively. They average income was 15,443 baht and standard deviation was 443.05. Noticeably, this study did not erase service chage of the agriculture household heads from the total income.

Table 4.7 Frequency and Percentage of Other Occupations

Other Occupations	Frequency	Percent(%)
1. Land owner	12	20.7
2. Farmhand	12	20.7
3. Labour	4	6.9
4. Farmband and Land owner	1	10.4
5. Labour and Land owner	10	10.3
6. Labour and Farm-hand	1	1.7
7. Merchant 8. None	12	20.7
Total	58	100.0

Table 4.8 Frequency and Percentage of Income

Income	Frequency	Percent(%)
1. 5,000-10,000	13	22.4
2. 10,000-20,000	25	43.1
3. 20,001-30,000	8	13.8
4. 30,001-40,000	4	6.9
5. 40,001-50,000	4	6.9
6. 50,001-60,000	4	6.9
Total	58	100.0

4.1.2 Occupational Barriers

On the whole of occupational barriers categories, not serious level did not report. Thus, the serious level was reported higher than no decision. This shows that occupational barriers occurred in village with a large scale (see Table 4.9)

Table 4.9 Total Percentage of Occupational Barriers

Level	Number of case	Percent(%)
1. Serioud	32	55.2
2. No decision	26	44.8
Total	58	100.0

Occupational barriers in this study were measured by the two difficulies. They are non-physical and physical barriers which abased the farm production and purchasing of agriculture household heads. The data from Table 4.10 indicates the significant obstacles of non-physical barriers. Types and degree of agriculture household heads awareness are also shown in the Table 4.10 and described below.

1. Agriculture household heads felt serious 91.4%, not serious 5.2% and none 3.4% with the agruiuculture technologies such as chemical compost, insecticide and small tractor that costly.

2. Agriculture household heads felt serious 67.2%, not serious 29.3% and none 3.5% with the sufficiency of

family labour for transplannng and harvesting that led to employ out-family labour force in each seeding season.

3. The data from Table 4.10 also indicates that agriculture household heads faced with the marketing problems e.g. low price of cash crops as the same degree of family labour condition.

4. Like a chain of problem, high cost of agriculture technology, insufficiency of family labour and low price of cash crops led to high capital investment in village farming system. So when growing season began agriculture household heads had to credit from any pool. This might be the grief in other villages but they felt serious 48.3%, not seious 37.9% and non 13.8%. This barrier seem to be slight. Because they could credit money from the fund of village saving group where charged a few interest from the members. Moreover, it stored chemical compost at lower price than external market.

The data from Table 4.11 shows the physical barriers and the awareness degree of agriculture gousehold heads as the partial of occupational barriers term. Less than 50% of the serious degree of each barrier was judged by the agriculture household heads. That can be concluded that the main occupational barriers in this village is non-physical barriers.

Table 4.10 Percentae of Non-physical Barriers

Non-physical Barriers	Serious (%)	Not serious (%)	None (%)	Total (%)
1. Agriculture technologyi.e costly	91.4	5.2	3.4	100.0
2. Lack of family labour	67.2	29.3	3.5	100.0
3. Low price of cash crops.	67.2	29.3	3.5	100.0
4. High cost in farming	48.3	37.9	13.8	

Table 4.11 Percentage of Physical Barriers

Physical barriers	Serious (%)	Not serious (%)	None (%)	Total (%)
1. Soil quality	43.1	24.1	32.8	100.0
2. Land owner	46.5	46.5	7.0	100.0
3. Sufficiency of water	36.2	32.8	31.0	100.0
4. Cutting timber	3.5	93.0	3.5	100.0

4.1.3 Information and Supportable Sources

Base on Table 4.12, it was clear that the large scale of information was diffused to village. Extremely, of often degree (91.4%) and very less (8.6%) of seldom degree were defined by agriculture household heads.

Data from Table 4.13 displays the result of the structure interview. It could be assumed that environmental viewpoint and alternative agriculture especially conservatin of forest and integrated farming were dispersed.

The data also indicates that more than 85% of the agriculture household heads responded to the "often" degree of received those information. That meant they obtain extremely.

Table 4.12 Total Percentage of Information

Level	Number of case	Percent(%)
1. Often	53	91.4
2. Seldom	5	8.6
Total	58	100.0

Table 4.13 Percentage of Information

Information	Often (%)	Seldom (%)	None (%)	Total (%)
1. Benefit of physical environment	93.1	5.2	1.7	100.0

Information	Often (%)	Seldom (%)	None (%)	Total (%)
2. Negative impacts from degradation	61.4	8.6	0.0	100.0
3. Crisis situation in environment	89.9	10.4	1.7	100.0
4. Environment upgrading campaign	91.4	8.6	0.0	100.0
5. Addressing about Alternative agriculture	86.2	13.8	0.0	100.0

Refer to data from Table 4.15, it shows the main fountains of environmental and alternative agriculture. They were non government organization (PLAN International (Thailand)), government organization (Departemetn of Community Development and Department of Rapid Rural Development). The information were flown by the development project of both such as integrated farming, forest grown and conservation campaign projects. Noticeably, the

agriculture household heads measured the "seldom") degree much more than "often" when refered native opinion leader and mass media as an information pigeon.

4.1.4 Supportable Sources

The data from Table 4.14 displays that the supportable sources had not been provided to village as the full length. A few percentage of often level (39.7%) was revealed. In the other hand a larger scale of seldom level (60.3%) was revealed by agriculture household heads. In this part, the none level was ignored.

Table 4.14 Total Percentage of Supportable Sources.

Level	Number of case	Percent(%)
1. Often	23	39.7
2. Seldom	35	60.3
Total	58	100.0

Table 4.15 Percentage of Information Sources

Information Sorces	Often (%)	Seldom (%)	None (%)	Total (%)
1. Native Opinion leader	6.9	56.9	36.2	100.0
2. Gov. Organi.	67.2	29.3	3.5	100.0
3. NGO	72.4	10.4	17.2	100.0
4. Mass media	17.3	44.8	37.9	100.0

Table 4.16 Percentage of Supportable Sources for People's Organization

Supportable Sorces for People's Organization	Often (%)	Seldom (%)	None (%)	Total (%)
1. Native Opinion leader	10.3	70.7	19.0	100.0

Supportable Sorces for People's Organization	Often (%)	Seldom (%)	None (%)	Total (%)
2. Gov. Organi.	58.6	41.4	0.0	100.0
3. NGO	89.7	10.3	0.0	100.0
4. Mass media	0.0	48.3	51.7	100.0

4.1.5 Ideology

Statistical data of Table 4.17 indicates that there was the number of agreement (81.0%) and there was the vast differential between the currently agree and no -decision (81.0%) and 19.0%). It ws also clear that the greater agreement the higher of progressive ideology.

The ideology of the agriculture household heads in village had been investigated by the various of measurements. There are 5 measurements that are demonstrated in Table 4.18. The measurement concerned on the perception of agriculture household heads in the term of time series, self-confident, and strong agreement in alternative agriculture.

Table 4.17 Total Percentage of Ideology

Level	Number of case	Percent(%)
1. Agree	47	81.0
2. No-decision	11	19.0
Total	58	100.0

According to data from Table 4.18, the ideology of agriculture household heads kept to progressive. They recognized on the agreement of short time series (96.5%), the strong agreement in alternative agriculture (93.1%), need alternative agriculture techniques for overwhelming occupational barriers (86.2%) and had already to utilize an alternative agriculture techniques in farm (70.0%). But for self-confident, the degree of agree and no decision were defined closely by agriculture household heads (56.9% and 41.4%). It can be assumed that agriculture household heads still kept self-confident in their suspensions.

Table 4.18 Percentage of Ideology

Ideology	Agree (%)	No decision (%)	Disagree (%)	Total (%)
1. Solving occupational barriers as soon as possible	96.5	3.5	0.0	100.0
2. Self-confident	56.9	41.4	1.7	100.0
3. Need alternative agriculture techniques in farm	86.2	13.8	0.0	100.0
4. Strong agreement in alternative agriculture techniques	93.1	6.9	0.0	100.0
5. Utilized in farm	70.0	17.2	12.1	100.0

4.1.6 People's Organization, People Participation and Supportable Sources

To bring up the people's organization, it needs of full scale of supportable sources. Even though there was severe of supportable sources. The evident from people's organization quite contradicted. Table 4.19 shows the level of often was funished fully (82.8%). In the contrast way, the seldom level was defined as the lowe (17.2%). In this part none level was not revealed.

In the term of people's organization, Table 4.20 shows that agriculture household heads agreed concordantly that there were many appearance groups in their village (89.7%) of agreement). Moreover, they fellowed to those appearance groups (87.7% of agreement).

Table 4.19 Total Percentage of People's Organization

Level	Number of case	Percent(%)
1. Often	48	82.8
2. Sedom	10	17.2
Total	58	100.0

Table 4.20 Percentage of People's Organization

People's Organization	Agree (%)	No decision (%)	Disagree (%)	Total (%)
1. Many appearance groups in village	89.7	10.0	0.0	100.0
2. Fellow in many groups	89.7	10.3	0.0	100.0

Table 4.21 also shows the most of activities in appearance groups that agriculture household head participated. The agriculture household heads often volted for protecting their interest (82.8%) follow with giving instrumental support (69.0%). In contrast way, for meeting discussion agriculture household heads kept quite quiet (often degree 17.2%) and selom degree 69.0%).

Table 4.21 Percentage of People Participation

People's Participation	Often (%)	Seldom (%)	None (%)	Total (%)
1. Meeting discussion	17.2	69.0	13.8	100.0
2. Voting	82.8	17.2	0.0	100.0
3. Instrument support	69.0	31.0	0.0	100.0

Base on Tble 4.22, the attractive of agriculture household heads participative at the full length of their potential was the feasibility of group activities to liberate emergency needs (such as goods consumption sanitary water, child care and equipment for housing) and occupational barriers. It was found that the feasibility of group activities could detach the emergency needs of the members much more than occupational barriers when compared the degree of agriculture household heads agreement in the feasibility of group activities to release the two obstacles (93.1% and 86.2%).

Table 4.22 Percentage of Feasibility of Group Activities

Feasibility of Group Activities	Agree (%)	No decision (%)	Disagree (%)	Total (%)
1. Release emergency needs	93.1	6.9	0.0	100.0
2. Release occupational barries	86.2	13.8	0.0	100.0

The main supportable sources that had been supported the managerial resources for those appearance groups in village was non government organization who has the flexible (no red tape) and potential much more than government organization and others. Refer to Table 4.16 in the part of supportable sources indicates 89.7% of the often dergree that non government organization had done. In this part, 58.6% of often degree of government organization was delighted by the agriculture household heads. But, for mass media and native opinion leader could create the resource for agriculture household heads to solve their obstacles ordinary when examined the often degree of those. The often degree of native opinion leader was 10.3% and mass media 0.0%

4.1.7 Technological Inventions

Table 4.23 shows the distribution of technological inventions by the given frequency and also indicates the adoption of agriculture technology. Only the moderate (seldom) to low (none) were identified. Comparing the percentage of the two categories, it was clear at there was some scarceness for agriculture household heads to take grant with technolocigal inventions.

Table 4.23 Total Percentage of Technological Inventions

Level	Number of case	Percent(%)
1. Seldom	35	60.3
2. None	23	39.7
Total	58	100.0

Because there was only one aspect of alternative agriculture that agriculture household heads received from any supportable sources that was integrated farming. If agricultural techniques had a strong agreement in integrated farming, the agriculture household heads had operated. Table 4.24 shows the 89.7% of family labour

force, 75.9% of extensive farming, 39.7% of organic compost and 32.8% of mulching were often used.

Table 4.24 Percentage of Technological Inventions

Selected Technological Inventions	Often (%)	Seldom (%)	None (%)	Total (%)
1. Family labour	89.7	10.3	0.0	100.0
2. Extensive farming	75.9	17.2	6.9	
3. Organic Compost	39.7	36.2	24.1	100.0
4. Mulching	32.8	36.2	31.0	100.0
5. Native breed	0.0	0.0	100.0	100.0
6. Natural growth rate	0.0	0.0	100.0	100.0
7. Minimum tillage	0.0	0.0	100.0	100.0
8. Biological control				

The information from open-end questionnairs (question no.6.9-6.10) indicates the justifications which conveyed agriculture household heads to manipulate were:

1. Easy way to try out.

2. Having resources in respones.

3. Given the certainty of agriculture products.

4. Compatible with physical and socio-cultural conditions of village.

For example, agriculture household heads could not mulch their fields by living mulch e.g, mungbean or others after harvesting because of high slope and sandy land when rain fall mungbean seed were flown. So they applied non -living mulch (husk and excreta) that could be found easily in village for this. Morever, they also lacked of family labour to take grant.

The other example that can shown the significant obstacle for agriculture household heads to try out integrated farming was the socio-cultural conditions of the village. The characteristic of settlement of village was cluster type. The habitat of agriculture household heads was divided from their farm fields. That laid the difficulty for them to take care their farm where situated a lengthwise of their homes.

4.2 Analytical Findings

Regard to the analysis of crosstabulation or chi-square test, scoring were given to investigate the relationship between each pair of variables are chi-sqare

and signficance value. But in this study signiticanee value was accepted to indicate the signticant of the relationship or estimate the relationship between the variables. In this study, the limit reached was accepted is 0.05. If the given significance 0.05. There is reltaionship between the variables or significant.

From the above criteria, the out-put from electric data processing in nine tables below show that among the variables included in the model of sustainable development and agriculture household changes, four pairs of variable were significant or had positive relationship. The review of data analysis below shows four pairs of variable that were significant.

1. Occupational Bariers by Ideology (Table 4.25)
2. Information by Technological Invention (Table 4.30)
3. Supportable Sources by Ideology (Table 4.31)
4. Supportable Sources by People's Organization (Table 4.32)

It was seen that there was significant in Table 4.25 (significance value 0.04838). It was also hypothesised in this study that occuptional barriers was highly valnerable to modifications within ideology. Table 4.25 shows the vital criteria which influenced agriculture household heads to arise their progressive ideology. That is the large

level of occupational barriers. Given such a high percentage of those occupational barriers on agriculture household head's agreement (92.3% and 71.8%) is evident.

Table 4.25 Crosstabulation of Occupational Barriers by Ideology

Value lable: Occupational Barriers: 2=Serious, 1=Not serious

Ideology: 2=Agree, 1=No decision

	No decision (1)	Agree (2)	Row total (3) (%)
Not serious (1)	2(7.7%)	24(92.3%)	26(100.0%)
Serious (2)	9(28.2%)	23(71.8%)	32(100.0%)
Column total	11(19.0%)	47(81.0%)	58(100.0%)

Chi-Square=3.89683, DF=1, Significanc=0.04838

Base on Table 4.26, people's organization trend to rely by occupational barriers. The large percentage was fulfilled in both cells of often degree when stimulated by occupational barriers.

Even though there were quite a large of occupational barriers in village and they influenced agriculture household heads to arise their progressive ideology. They could not attach the people's organization and the participative over all the members. The result shows the un-significant value (0.28891) which much more than the accepted limit reach in this study.

Table 4.26 Crosstabulation of Occupational Barriers by People's Organization

Value lable: Occupational Barriers: 2=Serious, 1=Not serious

People's Orgnization: 2=Often, 1=Seldom

	Seldom (1)	Often (2)	Row total (%)
Not serious (1)	6(23.1%)	20(76.9%)	26(100.0%)

	Seldom (1)	Often (2)	Row total (%)
Serious (2)	4(12.5%)	28(87.5%)	32(100.0%)
Column total	10(17.2%)	48(82.8%)	58(100.0%)

Chi-Square=1.1246, DF=1, Significance=0.28891

It was assumed that there are the influence of occupational barriers among the endogenous factors, ideology, people's organization in addition technological inventions in this study. The out put data in Table 4.27 proves the contrast of hypothesis likely to the afore table. There is not clear to distinguish there is a large percentage of Technological Invention frequency when enfluenced by degree of occupational barriers, (50%:50%) and (31.3%:68.7).

Table 4.27 Crosstabulation of Occupational Barriers by by Technological Inventions

Value lable: Occupational Bariers: 2=Serious, 1-Not serious

Technological Inventions: 1=Seldom, 0=None

	None (0)	Seldom (1)	Row total
Not serious (1)	13(50.0%)	13(50.0%)	26(100.0%)
Serious (2)	10(31.3%)	22(68.7%)	32(100.0%)
Column total	23(39.7%)	35(60.3%)	58(100.0%)

Chi-Square=2.10745, DF=1, Significance=0.14658

Arising the progressing ideology of agriculture household heads by information, Table 4.28 is reported. Though the crucial of frequency and agreement are defined (100.0%) and 79.2%). The against of hypothesis was accepted in this case. There was the larger significant value than the limit

reached (0.25779). So there was not a role of information to play on ideology.

Notiecably, one cell in the table shows the lowest frequency or percent (0 and 0.0%). In this part, it can be said that the cell with expected frequency lower than 5 was appeared and may be cause the conclusion fallacy, But there is not over than 50% of all cells. So in this study accepts the result and skips to re-evaluate for the property scale of variable measurement or extends for the larger of sample size. This is also used to explain the appearance in Table 4.29, 4.30, 4.31 and 4.32.

Table 4.28 Crosstabulation of Information by Ideology.

Value lable: Information: 2=Often, 1=Seldom

Ideology:2=Agree, 1=No decision

	No decision (1)	Agree (2)	Row total (3) (%)
Seldom (1)	0(0.0%)	5(100.0%)	5(100.0%)
Often (2)	11(20.8%)	42(79.2%)	53(100.0%)
Column total	11(19.0%)	41(81.0%)	58(100.0%)

Chi-Square=1.28061, DF=1, Significance=0.25779

In this study, information for agriculture household heads was included as an important part of extension in people's organization. The result also shows high appeared frequency and percentage in both information and people's orgnization (100.0% and 81.1%). However, the information could not motivate the poeple's organizatin and seeking for the participative over all the members under the utmost diffusion. This part was made clear by the significant value (0.28567) in Table 4.29 which much more than the limit reached.

Table 4.29 Crosstabulation of Information by People's Organization

Value lable: Information: 2=Often, 1=Seldom

People's organization: 2=Often*, 1=Seldom*

	Seldom (1)	Often (2)	Row total (3) (%)
Seldom (1)	0(0.0%)	5(100.0%)	5(100.0%)
Often (2)	10(18.9%)	43(81.1%)	53(100.0%)
Column total	10(17.2%)	48(82.8%)	58(100.0%)

Chi-Square=1.13994, DF=1,Significance=0.28567

Regarding the utmost diffusion of information for the accepted technological inventions it can be said that agriculture household heads could be accepted technological inventions by this wasy. Table 4.30 reports hardly degree (seldom) and percentage (66.0%) of agriculture household heads when response to highly

information. But significant. valus(0.00391) which accepted the hypothesis is reparted. So technological inventions was the only one which responsed to information

Table 4.30 Crosstabulation of information by Technological Inventions

Value label: Information:2=Often, 1=Seldom

Technological Inventions: 1=Seldom*, 0=None*

	None (0)	Seldom (1)	Row total
Seldom (1)	5(100.0%)	0(0.0%)	5(100.0%)
Often (2)	18(34.0%)	35(66.0%)	53(100.0%)
Column total	23(39.7%)	35(60.3%)	58(100.0%)

Chi-Square=8.32650, DF=1, Significance=0.00391

Table 4.31 draws low frequency and agreement of supportable sources and ideology (31.5% and 0.0%). In the

other hand high frequency and agreement are identified (68.5% and 10.0%)

It was regarded that supportable sources have a role to play within ideology. While considering the signicant (0.00282), the role of supportable sources was seen to be recognized.

Table 4.31 Crosstabulation of Supportable Sources by Ideology.

Value lable: Supportable sources: 2=Often, 1=Seldom

Ideology:2=Agree, 1=No decision

	No decision (1)	Agree (2)	Row total (3) (%)
Seldom (1)	11(31.5%)	24(68.5%)	35(100.0%)
Often (2)	0.(0.0%)	23(100.0%)	23(100.0%)
Column total	11(19.0%)	47(81.0%)	58(100.0%)

Chi-Square=8.92036, DF=1, Significance=0.00282

According to Table 4.32, not only ideology but also people's organization which responsed to supportable sources. The highly Percentage of poeple's organization is relied by the number of supportable sources (71.4% and 100.0%). The significant value (0.00483) was also reported as there was a linkage between the poeple's organization in village and supportable sources which were promoted over all sustainable development programmers.

Table 4.32 Crosstabulation of Supportable Sources by People's Organizations.

Value Lable: Supportable sources: 2=Often, 1=Seldom

People's organization:2=often*, 1=Seldom*

	Seldom (1)	Often (2)	Row total
Seldom (1)	26(28.6%)	25(71.4%)	35(100.0%)
Often (2)	0(0.0%)	23(100.0%)	23(100.0%)
Column total	10(17.2%)	48(82.8%)	58(100.0%)

Chi-Square=7.94048, DF=1, Significance=0.00483

The result shows the contrast of hypothesis with the highly represented significant value (0.53860). Though the appearance in Table 4.33 exibits the rolling of technological inventions in reponding to supportable sources (42.9% 57.1%) and (34.8% 65.2%). The supportable sources could not attach the accepted of technological inventions by agriculture household heads. So there were two factors which responsed to supportable sources. They are ideology and people's organization.

Table 4.33 Creosstabulation of Supportable Sorces by Technological Inventions

Value label: Supportable sources:2=Often, 1=Seldom

Technological inventions: 1=Seldom*, 0=None*

	None (0)	Seldom (1)	Row total
Seldom (1)	15(42.9%)	20(57.1%)	35(100.0%)
Often (2)	8(34.8%)	15(65.2%)	23(100.0%)
Column total	23(39.7%)	35(60.3%)	58(100.0%)

Chi-Square=0.37815, DF=1, Significance=0.53860

In analytical part, it can be concluded that even though there are the large of occupational barriers, information and supportable sources. They can be arisen scarcely changes in agriculture household heads. In the the other word, it can be said that the ideology of agriculture household heads can be arisen by the large of occupational barriers and supportable. The rolling of people's organization can be carried on supportable sources only. In addition, technological inventions can be accepted by information.

CHAPTER 5

SUMMARY, DISCUSSIONS AND RECOMMENDATIONS

5.1 Summary

In Thailand, the issue of sustanable development had recently been incorporated in the mainstream of developmental implications, especially concerning aspects of forest conservation and integrated farming. Various stuides have indicated that for innovation diffusion, two kinds of opinion leader are main gates. For sustainable development, emphasis on the grassroots and deep troubles in their occupations are the main considerable points. If many main factors challenge to development site, then changes as the objective of development will be occurred. In recognition of this matter, the main objective was to carry out a study of such exogenous factors e.g. occupatinal barriers, information and supportable sources on changes in agriculture household heads that exist mostly in grassroots peolple of Thai society.

A sample was drawn by the multi-stage sampling technique for 58 agriculture household heads from Udornthani province base on Krejcie and Morgan's sample size in response to the crucial points or purposes of the study. The are description of the characteristics of

agriculture, agriculture system, occupational barriers in addition factors responsiveness sustainable development were reparted. The findings can be concluded and described below.

5.1.1 Characteristics of Agriculture in vllage of Northeast.

1. Characteristics of Agriculture Household Heads

It was accepted that agriculture household heads in village were dominated by men in farming system. The population characteristics of agriculture household heads were laboured-age, pre-primary education background and couple condition.

2. Characteristics of Agriculture System

There were 4 activities which were performed in farming system, rice, shorter duration vegetables, livestock rearing and cash crops. Fish pond and vegetables were grown in the possessed land of agriculture household heads where were been indicated by The Farmng Research Institute, Ministry of Agriculture and Cooperative that sufficient for attaining integrated farming. But, for cash crops always found at unfertilized or high slope land.. Cows and buffaloes were fed in village common ranch and poultry were fed at the habitat of agriculture household heads. The main objective was not

for sale, but for consumed in home except cash crops. In emergency nees, those productions for family were sold.

Those actvities seem to be successful within integrated farmng, but had no colourful genetic in farm. Thers were 2-4 kinds of plants and animals. Moreover, there quite a few recycling of farming resource. For this part, each farm should has more species and usefully of every element of farming resources to increase the farming production. So agriculture activities in vllage held agriculture household heads to primary self-reliance that means farmers found food sufficient.

Because the main objective of agriculture system was not for sale. The main sources of agrculture household heads income were from other occupatons. From farmhand and labour, they could earn pittacne wage per day for their families.

5.1.2 The Occupational Barriers in Village.

Between physical and non-physical barriers, agriculture household heads met with non-physical barriers much more than physical barriers especially, lack of labour, technologies so expensive, high interest of credit and low price of cash crops. Because of these conditions, almost of them left their farms for rent or idle land to nearly villages and provinces to add their incomes.

5.1.3 Factors Responsivenss for Sustainable Development and Agriculture Household Changes

Although there were the large of exogenous factors such as enronmental and alternative agriculture information, non-physical barriers and supportable sources from non-government and government. The three bloodlines of sources of change such as ideology, people's organizaton and technological inventions could not be arisen as the full length. The study found that the ideology of agriculture household heads can be arisen by occupational barriers and supportable sources. The people's organization can be roll by supportable sources. In addition, the accepted technological inventions can be proved by the information.

So it can be said that all of exogenous factors (occupational barriers, information and supportable sources) can influence some of changes. It is essential for the responding organization to consider the weak and advantage of them for rolling sustainable development.

5.2 Discussions

Previous researches pointed out the most effective factors for the achievement of sustainable development. Hasan (1992:2128-213) and Zewde (1991:963-964) argued that

flexibility and power of development organizations should be regarded as non-goverment organization. Those organization has to provide for local needs and conditions in addition the participation and discussion from the development objectors or grassroots (Reed, 1990:588), (Chi, 1993:3383-3385), (Green 1991:605) (Wismer, 1990:1805) and (Avila, 1991:319). Moreover, Matowanyika (1993:4441) added the indigenous factors which included local known-how such as local activities and social arrangement which promote sustenance, protect and enhance resource bases, foster synergetic relationships, advance communication and safeguard socio-cultural continuity. As well as Avila (1991:319) and Green (1991:605) had put the severe of environmental and the out come from farm as the gather speed factors.

The study proved both of the contrast and agreement with the previous resarches. Even though, sustainable development had been roll in village by the esteeming of government and non-government organization to seek the sustainability of farming and environmental resources that means the benefit of grassroots. Moreover, agriculture household heads met with occupation barriers. It could attach scarcely the objectives of development which were defined under the terms of ideology, people's organization and technological inventions in this study. The controversial of the hypothesis may be caused by;

1. Environmental and alternative agriculture had been provided to general of villagers who may be not the agriculture household heads or the dominant of families farm. So it is weakly to change the pattern of agriculutre system.

2. The development programs did not ensure that maximum benefits were derived from the change in farm which follow alternative agriculture by the most number of agriculture household heads.

3. The selected techniques of alternative agriculture which were provided to agriculture household heads was not compatible with physical, economy and socio-cultural conditions of the village. They was retarded to try out such techniques.

4. The development programs did not formulate criteria for determinng appropriate techniques of alternative agriculture which would be necessary concern under the capacity of physical, economy and-socio-cultural of the village. In this part, the regarding to whom had well known of those conditions is required.

5. Lack of the full mobilization of agriculture household heads resources in order to response to develop farming system. Becaruse agriculture organization which gather agriculture common interest was not establish in village. It was found that there were only other or relevant organization which were complex of members as well as diverse of goals.

6. There are vastly differential between realise and laboratory farm. The agriculture household heads felt cold during integrated farming training program or observing in laboratory agriculture field. The confusion still kept in their mind because of the different of background between them and the trainer or agriculture technician.

Those can be concluded the factors that caused the failure on sustainable development in village. That is development programs could not find the full of grassroots participative and indigenous factors which concern the capacity of the villge. As well as there are other factors which should be concerned for attaining sustainable development wihtin agriculture system in village of Northeast.

5.3 The Proposed Model for Sustainable Development and Agriculture Household Changes

One of the objectives of this study is to find the effective factors and propose model for sustainable development. The study of sustainable development and agriculture household changes found certain pertinent facts concerning the relationship between people's organization and supportable sources and between technological inventions and information.

To propose the suit model for sustainable development in agriculture sector, it has to integrate those three elements (occupational barriers, information and supportable sources) to improve agriculture household heads pitiable conditions and to increase their purchasing power. Based on the findings, it can be deduced as follows:

1. The compatible information and managing resources have to provided to village for crafting progressive ideology of agrciculture household heads, establishing people's organization and seeking the participative from all the members.

2. The people's organization has to establish as the represent of the common interest of agriculture household heads.

3. Almost of the members of appearance people's organization are agriculture hosehold heads. This is an essential to indicate that the people's organization is set by their common interest.

4. Because the realize of poeple's organization right seldom occurs in each village for agriculture household heads. So the external organization espeecially non-government and government organization are still considerable to invoive such organization whose efforts and inputs can be utlized in the most effective without duplication of work and relevant of the agricultural potential of the village.

5. The compatible information especially the alternative agriculture techniaues which should be transferred to agriculture household heads to try out has to be spread. That means it should be provided under the pressure of village'conditins. It is important for external development organization also to evaluate and take steps to seek such information.

6. To make the agriculture household heads aware of the new agricultural techniques or alternative agriculture which concerts with village's conditions. It had to provide the realize of agricultural experience both internal and external and introduce to agriculture household heads to regulate as the main stream of agriculture development. Internal agriculture experience means local farming knowledge or the agriculture household heads known-how which has helped the farmers to survive for long time under the capacity of physical environmental of village but was ignored in the past. External agriculture experience means the outside local agriculture wisdom such as training or learning in the sucessful of alternative agriculture farms. Equal life experience and life historical, it is easy for agrculture household heads to expose and share their views one another.

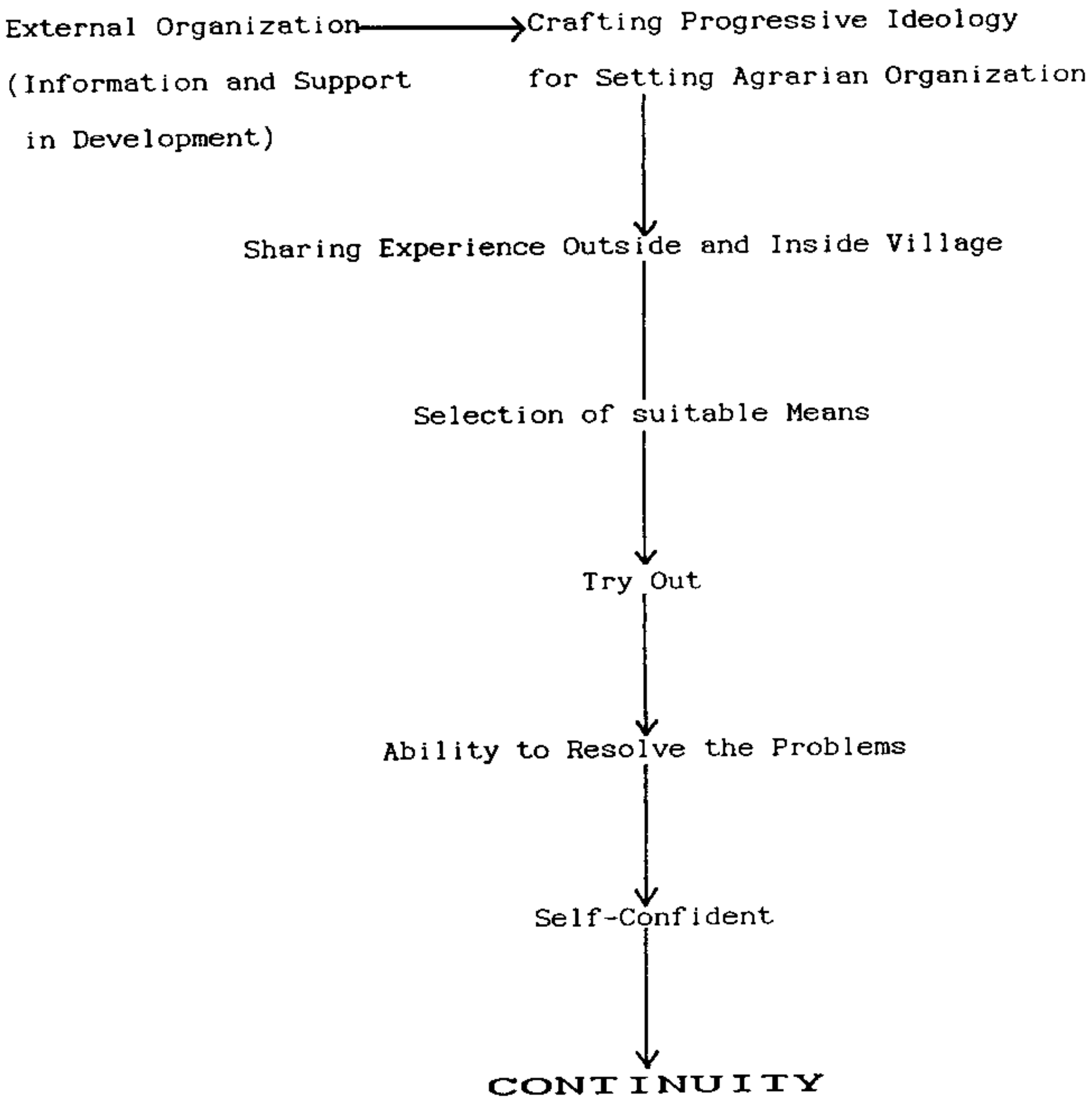
7. If the agriculture household heads can detect the easy way to undertake the selected alternative agriculture techniques and such techniques have the most effective in their farm. The more progressive ideology can

be arisen and their presented organization can be continued and achieved also.

8. It has to propose that to fine the compatible information and work with agriculture household heads any development volunteers have to transpose their actual and current role from expert or well-known to conundrum in the village's conditions and local farming techniques. That means they have to gentle and respect the people, local wisdom etc, and try gracefully to understand.

According to the findings the conceptual and empirical framework of proposed model for sustainable development and agriculture household changes is exhibited in fgure 5.1

Figure 5.1 The Conceptual and Empirical Framework of Proposed Model for Sustainable Development and Agriculture Household Changes.



5.4 Recommendations

The external development organization is the one of the important consideration to response sustainable development in agriculture household heads appeal. To set up farmer organization and to synicate the local intellectual and scientific findings which compatible with village capacity are the actual and essential role. Based on the study findings, the suggestion for external development organization to venue the first chain of the successful of an event is the discerning of village capacity and condition. They are presented as the term of "what" and "which" that able to do under physical and socio-cultural presure at development site. In the other word, development volunteer should concern the analysis of village farming systems properly that begins with the identificaton of significant potential and capacity of economy (labour, etc.), physical (soil, raining, water pool, etc which the farmer responses and identify in varying degrees.),-socio-cultural conditions (human settlement, etc), and so on. Each propagates the acceptance of farmer. The problem for the analysis is to sort out the various of reality, define the significant one and match them with the farmer's goal and priorities. So the crucial of this point is to identify situations in which existing farm resources are inefficiently used. In this part, sometimes local opinion leader known-how had been concerned as the key informance or the village

capacity well-known for the meaningful to integrate available development inputs from the various sources. Equally, external development organization should concern on the emergency village as the first trying to lie sustainable development. In addition, it can be said that the concerning on village conditions and the emergency needs of each village are tied together.

Only after the gathering Compatible information, and understanding its meanings for the agriculture hosehold heads, take respect to innate people together with selected the critical village as the first trying, it can plan appropriate changes in farming system for sustainable development. So the planning process involves the scientific with the agriculture household heads in deciding what modifications and innovations to try.

APPENDICES

APPENDIX A

VILLAGE CHARACTERISTICS

Geography : Nalomnoi is the village situated in Khambong subdistric of Banphue district in Udornthani province. It is 14 km far from Banphue and covers area of 3,000 rai. Out of total area, 1,000 rai is covered by agriculture, 250 rai by Timber Grown Project, 250 rai by public ranch and 500 rai by others. It is veined with man made reservoir, named Huai Heaw, which is governed by Department of Rapid Rural Development, Ministry of Interior in 1974,

Population: According to 1994 census, there were 146 people living in that village. Out of total population, 77 were males and 69 were females.

Economy: Nalomnoi was the 2nd development level village under the crtierial of Departmen of Community Devlopment, Ministry Interior

Profession: It was evident from 1994 census that all of 75 households in village were in agriculture sector. The farmers could operate their possesed land much more than 90%. Rice field was core activity. The farm production (paddy) was 300 kgs per 1 rai. The minor activities were livestock rearing and vegetables grown.

Farming System: The farming system of the village was complicated and rotated. To really understand the system much data collection and analysis would be needed. That is beyond the scope of this study. This

section, thus attempts to present only general picture of the system.

The rotational farming system in village was dom by crop production. Livestock rearing was less important. Out of 90% inatedof agricultural land was used for rice, vegetables, cash crop and livestock rearing. Rice, vegetables and livestock products were presented as the first trying to enough staple for family consumption. but cash crops i.e casava and sugarcane were grown to earn cash.

According to the calendar of agriculture activities in figure below, it is clearly illustrates the rather complicate of rotation cropping pattern.

Figure of The Calendar of Agriculture Activities in Village

Rice field	May-June (seeding), July-Aug. (transplanting), Sept.Oct. (taking care of), Oct-Dec. (taking care of, harvesting and treashing processing)
Vebetables	Feb.-Apr.(planting, taking care of and harvesting).

Cash crop	1. Casava. Mar.-June. (plnnting and weeding), Oct.-Feb. (harvesting) 2. Sugarcane. May-June. (planting), Oct-Feb. (garvesting).
Livestock	Jan.-Dec. (taking care of cow and chicken).

Land Possession: The data from table below presents almost of farmers have own land and posses 6-10 rais 30 households, 11-20 rais 15 household and 21-50 rais 30 households.

Land(rai)	Households
6-10	30
11-20	15
21-50	30

Migration: After paddy season, it was found that 20 households felt village to big cities especially Bangkok. In this case, 30 were male and 20 were female. Average age was 15-20 yrs.

Energy: Firewood.

APPENDIX B

Determining Sample Size For Research Activities.

Population	Sample size	Population	Sample size
35	32	500	217
40	36	550	226
45	40	600	234
50	44	650	242
55	48	700	248
60	52	750	254
65	56	800	260
70	69	850	265
75	58	900	269
80	66	950	274
85	70	1,000	278
90	73	1,100	285
95	76	1,700	313
100	80	1,800	317
110	86	1,900	320
120	92	2,000	322
130	97	2,200	327
140	103	2,400	331
150	103	2,600	335
160	113	2,800	338
170	118	3,000	341
180	123	3,500	346
190	127	4,000	354

200	132	5,000	357
210	136	6,000	361
270	159	7,000	364
280	162	8,000	367
290	165	9,000	368
300	169	10,000	370
320	175	15,000	375
340	181	20,000	377
360	186	30,000	379
380	191	40,000	380
400	196	50,000	381
420	201	75,000	382
440	205	100,000	384
460	210		
480	214		

Source: Krejcie, R.V, & Morgan, D.W, Education and Psychological for Measurement, (1970):607-610, in Boonyarattaphunt, 1991, p.182.

APPENDIX C

INTERVIEW FORM

Topic: Sustainble Development and Agriculture Household Changes in Northeast of Thailand : A case study of Nalomnoi village of Udornthani Province.

Part 1. General Information.

1.1 Sex:

( ) male

( ) female

1.2 Age:----------yrs.

1.3 Education background:

( ) no schooling ( ) secondary school

( ) pre-primary ( ) high school or coolege

( ) primary school ( ) university

1.4 Marital status:

( ) single

( ) married and couple

( ) married but seperate

( ) divorced or widow

1.5 Farming activities (can mark more than one item):

( ) rice field

( ) gardening (vegetables, fruits, etc.)

( ) livestock (cow, fish pond, chicken, etc.)

( ) cash crops i.e corn, sugarcane, casava, etc.

1.6 Total farm area:----------rais. (1 = 1,600 m2)

1.7 Other occupations (can mark more than one item):

( ) merchant

( ) government or private service

( ) labour

( ) farmhand

( ) others

( ) none

1.8 Income:

i.crop production sale

rice/yr.----------kg. --------- price/kg:--------

sugarcane/yr.-----ton. --------- price/ton:-------

others----------

---

ii. livestock sale:

chicken:---------- ---------- price/unit:---

fish:---------- ---------- price/kg:-----

cow:---------- ---------- price/unit:---

others:----------

Part 2. Occupational Barriers.

	serious	not ser.	none
2.1 Soil quality (sandy, clay, hard, etc.).	2	1	0
2.2 Land ownership (family sharing, tenant, etc.).	2	1	0
2.3 Sufficiency of water.	2	1	0
2.4 Deforestation.	2	1	0
2.5 Capital i.e lack of pool, high interest	2	1	0
2.6 Labour i.e not enough, lack of pool, high rate for employment.	2	1	0
2.7 Agricultur technologies i.e negative impact on environment or user, expensive, unaffordable to maintain.	2	1	0
2.8 Marketing i.e low price, priority contact.	2	1	0

Part 3. Information and Supportable Sources.

	often	seldom	none
3.1 Benefit of physical environment	2	1	0
3.2 Negative impact from physical environmental degradation.	2	1	0
3.3 crisis sistuation.	2	1	0
3.4 Conservation and upgrading campaign.	2	1	0
3.5 Addressing about alternative agriculture.	2	1	0
3.6 Native opion leader as information pigeon.	2	1	0
3.7 Government organization as information pigeon.	2	1	0
3.8 Non government organization as information pigeon.	2	1	0
3.9 Mass media as information pigeon.	2	1	0

Part 4. Ideology.

	agree	no decision	disagree
4.1 Need to overwhelm occupational barriers as soon as possible.	2	1	0
4.2 Self-confidence to release occupational barriers.	2	1	0
4.3 Need to solve occupational barriers	2	1	0

4.4 Belief in feasibilities of alternative agriculture to release occupational barriers.	2	1	0
4.5 To utilized alternative agriculture techniques.	2	1	0

Part 5. People's Orgnization, People's Participation and Supportable Sources.

	agree	no decision	disagree
5.1 Many appearance groups in village.	2	1	0
5.2 Fellowship of many groups.	2	1	0

	often	seldom	none
5.3 Meeting discussion.			
5.4 Votting.	2	1	0
5.5 Instrumental supportat for groups activities i.e, labour, fund, tool, etc.	2	1	0
5.6 Feasibility of group activities to release occupational barriers	2	1	0
5.7 Feasibility of such activities to release emergency need.	2	1	0
5.8 Native opinion leaders as instrumental pool	2	1	0
5.9 Government organization as instrumental pool.	2	1	0

5.10 Non government organization as instrumental pool	2	1	0
5.11 Mass media as instrumental pool	2	1	0

Part 6. Technological Inventions.

	often	seldom	none
6.1 Extensive farming.	2	1	0
6.2 Family labour used.	2	1	0
6.3 Reverse to grow native breed.	2	1	0
6.4 Natural growth rate e.g unstimulated by inorganic or chemical substances.	2	1	0
6.5 Mulching by living or non-living mulch.	2	1	0
6.6 Minimum tillage.	2	1	0
6.7 Biological control	2	1	0
6.8 Organic compost.	2	1	0
6.9 Causes of usage			

6.10 Difficulties that you found

6.11 Suggessions

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