FARMERS' BEHAVIOR ON SOIL AND WATER CONSERVATION IN NAKHON PATHOM PROVINCIAL LAND REFORM AREAS

NANTANA APIWATTANAKUL

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N. Apiwattanakul.
Miss Nantana Apiwattanakul
Candidate

B. Kij
Prof. Boontham Kijpredarborisuthi,M.Ed.,
Chair

Wasin Pleumcharoen
Asst.Prof. Wasin Pleumcharoen, M.Ed.,
Member

Nathsuda Pumijumnong.
Assoc. Prof. Nathsuda Pumijumnong, Ph.D.,
Member

W.N—
Mr.Werachai Narkwiboonwong, Ph.D.,
Member

Rassm Hoon
Assoc. Prof. Rassmidara Hoonsawat
Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Suree Kanjanawong
Assoc. Prof. Suree Kanjanawong, Ph.D.
Dean
Faculty of Social Sciences and Humanities
Mahidol University

Thesis
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Miss Nantana Apiwattanakul
Candidate

Prof. Boontham Kijpredarborisuthi, M.Ed.,
Major- Advisor

Asst.Prof. Wasin Pleumcharoen, M.Ed.,
Co - Advisor

Mr.Werachai Narkwiboonwong, Ph.D.,
Co - Advisor

Assoc. Prof. Rassmidara Hoonsawat
Ph.D.
Dean
Faculty of Graduate Studies

Asst.Prof. Wasin Pleumcharoen, M.Ed.,
Chair
Master of Education Programme in
Environmental Education
Faculty of Social Sciences and Humanities

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Nantana Apiwattananakul

FARMERS' BEHAVIOR ON SOIL AND WATER CONSERVATION IN NAKHON PATHOM PROVINCIAL LAND REFORM AREAS

NANTANA APIWATTANAKUL 4237477 SHED/M
M. Ed. (ENVIRONMENTAL EDUCATION)

THESIS ADVISORS: BOONTHAM KIJPREDARBORISUTHI, M.Ed.,
WASIN PLEUMCHAROEN, M.Ed.,WERACHAI NARKWIBOONWONG, Ph.D.

ABSTRACT

This research was to investigate farmers' behavior with regard to soil and water conservation in Nakhon Pathom provincial land reform areas and to investigate the predisposing factors, the enabling factors and the reinforcing factors relating farmers' behavior with regard to soil and water conservation in Nakhon Pathom provincial land reform areas. Also, the study examined related factors to predict farmers' behavior with regard to soil and water conservation in Nakhon Pathom provincial land reform areas in association with investigating problems and limitations of soil and water conservation in Nakhon Pathom provincial land reform areas. The sample was 233 farmers in Nakhon Pathom provincial land reform areas. Percentage, Mean, Standard Deviation, Pearson's Correlation, and Multiple Regression Analysis were statistical applications used in analysis.

It was found out that 55.8 percent of farmers in Nakhon Pathom provincial land reform areas showed negative behavior with regard to soil and water conservation. Variables, which had a statistically significant relationship to soil and water conservation at 0.001,0.01, and 0.05 level were the number of family members, income from cropping, knowledge of soil and water conservation, awareness of soil and water conservation, amount of land holding, duration of land rights, sources of information on soil and water conservation, advice from agricultural neighbors, and advice from state agricultural officers. Variables, which had no statistically significant relationship with behavior with regard to soil and water conservation, were gender, age, education, participation in an agricultural seminar related to soil and water conservation, study tour related to soil and water conservation in agriculture, and advice from private agricultural staff. Variables, which could predict soil and water conservation behavior , were awareness of soil and water conservation, sources of information on soil and water conservation, advice from state agricultural officers, the number of family members, and duration of land rights, all of which were co-predictive of soil and water conservation behavior at 47.5 percent, and statistically significant at the 0.001 level. Further, the problems and limitations of soil and water conservation in Nakhon Pathom provincial land reform areas were 94.9 percent arthropod epidemic and plant attackers, and low products, 87.5 percent were soil problem such as acid soil, and 85.4 percent were low soil fertility.

KEY WORDS : BEHAVIOR/ SOIL AND WATER CONSERVATION/ FARMER/ LAND REFORM AREAS

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พฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม (Farmers' behavior on soil and water conservation in Nakhon Pathom Provincial Land Reform Areas)

นันทนา อภิวัฒน์ธนกุล 4237477 SHED / M
ศษ.ม. (สิ่งแวดล้อมศึกษา)

คณะกรรมการควบคุมวิทยานิพนธ์ : บุญธรรม กิจปรีดาบริสุทธิ์, ค.ม., วศิน ปลื้มเจริญ, ศษ.ม.,
วีระชัย นาควิบูลย์วงศ์, Ph.D.

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกรในเขตปฏิรูป ที่ดินจังหวัดนครปฐม ศึกษาปัจจัยนำ ปัจจัยเอื้อ และปัจจัยเสริมที่มีความสัมพันธ์กับพฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม และเพื่อใช้ปัจจัยที่สัมพันธ์ไปทำนายพฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม รวมทั้งศึกษาปัญหาอุปสรรคในการอนุรักษ์ของเกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม กลุ่มตัวอย่างได้แก่ เกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม จำนวน 233 ราย สถิติที่ใช้วิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่ามัชฌิมเลขคณิต ค่าเบี่ยงเบนมาตรฐาน สัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน การวิเคราะห์พหุคูณแบบขั้นตอน

ผลการวิจัย พบว่า เกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม มีพฤติกรรมการอนุรักษ์ดินและน้ำไม่ดี คิดเป็นร้อยละ 55.8 ตัวแปรที่มีความสัมพันธ์กับพฤติกรรมการอนุรักษ์ดินและน้ำ อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.001 0.01 และ 0.05 คือ จำนวนสมาชิกในครอบครัว รายได้จากการเพาะปลูก ความรู้ในการอนุรักษ์ดินและน้ำ ความตระหนักในการอนุรักษ์ดินและน้ำ จำนวนพื้นที่ถือครอง ระยะเวลาการถือครองที่ดิน แหล่งข้อมูลข่าวสารเกี่ยวกับการอนุรักษ์ดินและน้ำ คำแนะนำจากเพื่อนบ้านที่ประกอบอาชีพทางการเกษตร และคำแนะนำจากเจ้าหน้าที่ด้านการเกษตรจากหน่วยงานรัฐบาล ตัวแปรที่ไม่มีความสัมพันธ์กับพฤติกรรมการอนุรักษ์ดินและน้ำ ได้แก่ เพศ อายุ การศึกษา การเข้ารับการอบรมสัมมนาการเกษตรที่เกี่ยวข้องกับการอนุรักษ์ดินและน้ำ การดูงานการเกษตรที่เกี่ยวข้องกับการอนุรักษ์ดินและน้ำ คำแนะนำจากพนักงานด้านการเกษตรจากหน่วยงานเอกชน ตัวแปรที่สามารถพยากรณ์พฤติกรรมการอนุรักษ์ดินและน้ำ ได้แก่ ความตระหนักในการอนุรักษ์ดินและน้ำ แหล่งข้อมูลข่าวสารเกี่ยวกับการอนุรักษ์ดินและน้ำ คำแนะนำจากเจ้าหน้าที่ด้านการเกษตรจากหน่วยงานรัฐบาล จำนวนสมาชิกในครอบครัว และระยะเวลาการถือครองที่ดิน โดยสามารถร่วมกันพยากรณ์พฤติกรรมพฤติกรรมการอนุรักษ์ดินและน้ำได้ร้อยละ 47.5 อย่างมีนัยสำคัญทางสถิติที่ 0.001 นอกจากนี้ปัญหาอุปสรรคในการอนุรักษ์ดินและน้ำของเกษตรกรในเขตปฏิรูปที่ดินจังหวัดนครปฐม ได้แก่ ปัญหาโรคแมลงและศัตรูพืช ผลผลิตตกต่ำ ร้อยละ 94.9 และปัญหาเกี่ยวกับดิน เช่น ดินเปรี้ยว ร้อยละ 87.5 ปัญหาดินมีความอุดมสมบูรณ์ต่ำ ร้อยละ 85.4

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CHAPTER I
INTRODUCTION

1. Background and Significance of Problem

Thailand is an agricultural country. Most population is farmers. Still, at present Thai farmers are facing different problems such as flood, drought, epidemic and insects. These affect income and their living. However, a key problem is the fundamental factor of production, i.e. soil and in particular, the use of soil. Rationally, land is the valued resources and valuable asset if being developed. Also, land is the agricultural factor that a farmer can produces and earns income. But it is restricted and witnessed by the 321 million rais of the country. All lands used in agriculture are approximately 133 million rais or 41.47 percent (Agricultural Land Reform Office: 2543:62). It cannot be sufficiently increased or added to meet the need of population.

By the need of farmers in additional using of land with contradictory to the agricultural areas, it leads to many problems such as farmers without land for living, or insufficient piece of land for earning, unfairness in land lease and selling products. There are conflicts of land rights, intrusion and deforest for land of living, ineffective uses of land and inadequate maintenance resulting economic, social, administrative, and political dilemmas in the nation. It strongly requires the government to urgently handle the problems. Land reform is a method to help farmers owning lands for living and its most advantageous uses with the production management as well as agricultural distribution to gain fairness to farmers. (Agricultural Land Reform Office: 2541:29)

Therefore, in 2518, the Agricultural Land Reform Acts 2518 has been enforced on 5th March 2518. (Agricultural Land Reform Office (ALRO): 2543:9) Agricultural Land Reform Office has been authorized in land reforms to help farmers possessing land for living to meet the government policy reducing the Imbalance State of individual both economically, and socially.

At present, the ALRO reforms land covering areas of 69 provinces and announces the areas as land reform since 2518 till fiscal year end of 2545 for 51.72 million rais being the state land of 51.24 million rais and the private land of 484,047 rais. (Agricultural Land Reform Office:2545). Nakhon Pathom is the province encompassing private land reform and the start of the land reform since the beginning (2520). When land reforms has been resumed, it could solve problems of land rent during those days.

The Nakhon Pathom provincial land reform has reform land in private land since 2520 and organized the development of infrastructure and agricultural career but still been unlikely successful. Since 2531, it has been unable to additionally buy private lands based on the price was higher than the estimated price of ALRO for 10-20 times. It is still unsolved. Besides, there are operations of agricultural career development for improving resources and production factors so that farmers having the allocated land will be able to use it lucratively. However, the previous operations were met with problems and limitations particularly the areas of earning caused by 1) low quality land, 2) farmers popularly overuse chemical substances, and 3) farmers are not well-informed on proper uses of land. Critically, farmers lack using measures of soil and water conservation as well as method of proper improving fertile soil in the land. The fertility of soil is deteriorating and affecting low agricultural products. (Panasak Sudadej,2540:3). The soil and water conservation requires control to balance both quantity and quality and to instill the capability of production in land.

Therefore, PRECEDE Framework of Lawrence W. Green has been applied with the investigation of farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. This theory is the process using the factors of predisposing, enabling and reinforcing for discernment and evaluates behavior. The Predisposing factors are the fundamentals motivating human behavior or individual preferences gaining from education experiences. They result in supporting or deterring behavior. In this investigation, the researcher has applied knowledge, awareness about soil and water conservation, and social status of farmers, i.e. number of family members, gender, age, income of cropping , education, enabling factors as necessary resources for individual behavioral expression including skills assisting individual capable of behaving. The researcher has also applied information sources, duration of land rights holding, amount of land holding, participation in agricultural seminar, study tour, and membership of agricultural group. In part of reinforcing factors received by individual or expected from other individual affecting oneself, this investigation has exploited the authority, staff and neighbors. All proposed would allow realizing what is farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. And, how different factors proposed relate to behavior on soil and water conservation in association with problems and limitations in operations of soil and water conservation for the purpose of seeking remedial approach driving to the benefits of further land reform.

2. Objectives of the study

1. To investigate farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

2. To investigate the predisposing factors, the enabling factors and the reinforcing factors relating farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

3. To exploit related factors predicting farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

4. To investigate problems and limitations of soil and water conservation in Nakhon Pathom provincial land reform areas.

3. Scope of Study and Conceptual Framework

This investigation is the Analytical Studies in terms of Cross – sectional Study using farmers in Nakhon Pathom as population with the independent variables and dependent variable as follows

Conceptual Framework

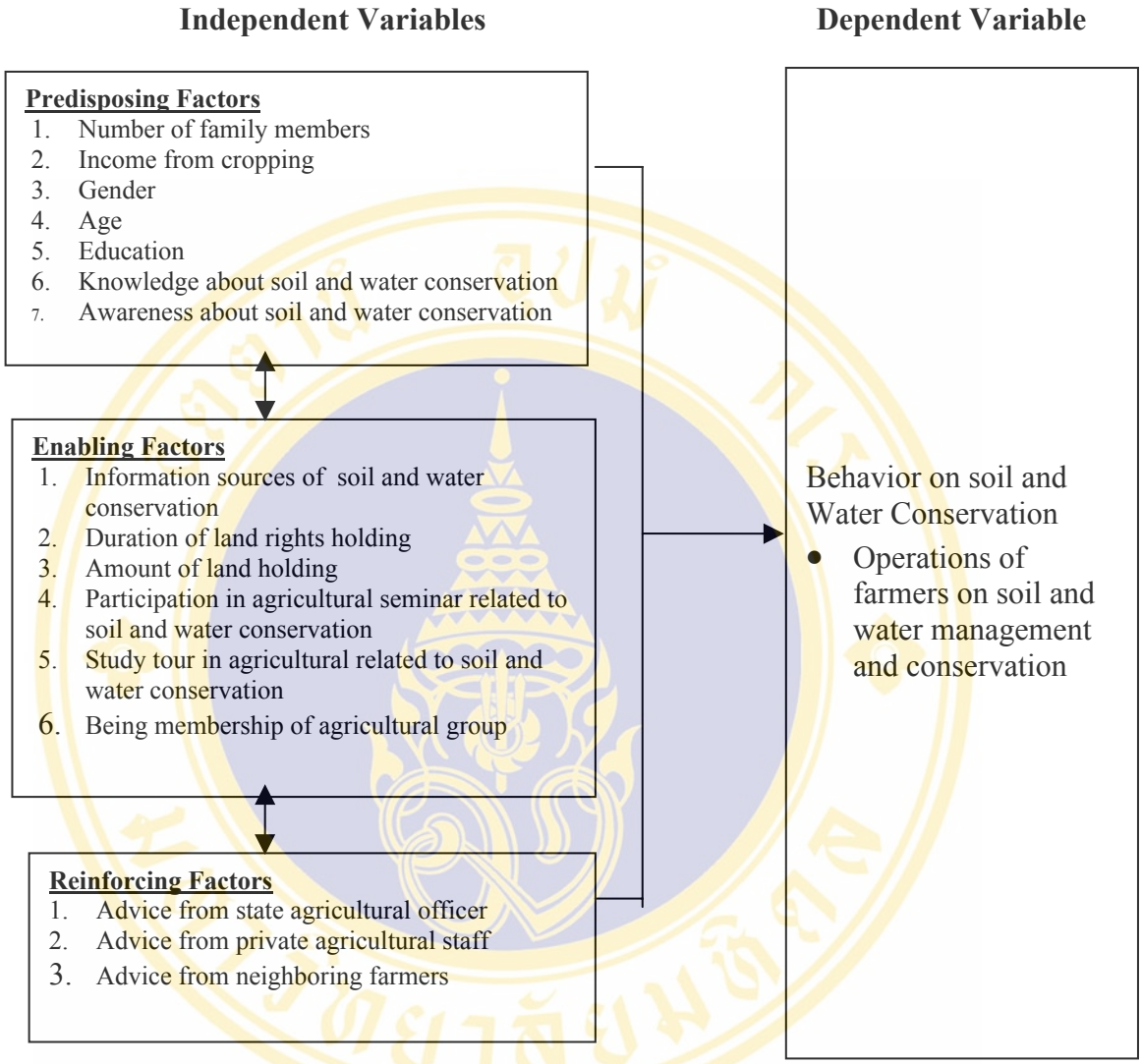


Figure 1: Conceptual Framework of Farmers' Behavior on Soil and Water Conservation in Nakhon Pathom Provincial Land Reform Areas

4. Hypotheses

1. The predisposing factors, i.e. number of family members, income from cropping, gender, age, education, knowledge about soil and water conservation, and awareness of soil and water conservation have relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

2. The enabling factors, i.e. information sources of soil and water conservation, duration of land rights holding, amount of land holding, participation in agricultural seminar related to soil and water conservation, study tour in agricultural related to soil and water conservation, and being membership of agricultural group have relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

3. The reinforcing factors, i.e. advice from state agricultural officer, advice from private agricultural staff, and advice from neighboring farmers have relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

4. All factors can predict farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

5. Definition of Terms

1. Behavior is referred to expression and performance of farmers containing from using, and effective management of soil and water for the highest benefit as well as having preventive and maintenance method to instill fertility as long as possible.

2.Predisposing Factors are referred to fundamental things born in an individual to generate motivation or preferences in behaving, which may affect the support or deterrence behaving, i.e. number of family members, income from cropping, gender, age, education, knowledge of soil and water conservation, and awareness of soil and water conservation.

3. Knowledge is referred to knowledge, understanding, and applying of criteria and methods in managing, preventing and maintaining soil and water to instill the fertility and capability to most advantageously use and for long-term period.

4. Awareness is referred to sentiment, opinion, and awareness of benefit and significance in managing and conserving soil and water as well as forecasting affliction and impacts borne from deteriorating soil and water resources.

5. Member is referred to residing in the same house with relation, i.e. father, mother, children and relatives excluding employees.

6. Enabling factors are referred to the vital resources of behavioral expression of an individual and skills to assist individual in behaving including the accessibility of vital things for easier behaving or help behaving. They are the information sources of soil and water conservation, duration of land right holding, amount of land holding, participation in agricultural seminar related to soil and water conservation, study tour in agricultural related soil and water conservation, and being membership of agricultural group.

7. The information sources are referred to receiving data related to farming with contents connected with soil and water conservation. Sources are television, radio, newspaper, leaflet, individual as well as frequency of receiving the information

8. Participation in agricultural seminar is referred to receiving advantageous information on farming of the farmers as well as following the procedures from persons of well informed and acceptable or academicians from the government and private workplaces.

9. Study tour is referred to beneficial information gained for farming from actual place by allowing successful farmers or from the government and private workplaces such as demonstrated areas of the exemplar farmers, or from the government workplaces so that farmers gain different information for implementation or application.

10. Being membership is referred to having name listed in the agricultural group of either government or private workplace.

11. Reinforcing factors is referred to what expresses that the behavior is promoted and supported reflecting what an individual will receive or expect from the behaving. An individual will receive feedback from others influencing one. Influences of individual are differed to individual behavior and situation. They are advice from state agricultural officer, advice from private agricultural staff, and advice from neighboring farmers

12. Officer is referred to the civil servant working in the Ministry of Agriculture and Cooperatives and is responsible for agricultural promotion and development

13. Staff is an employee working in a company, office, shop or NGO's volunteer who campaigns agricultural information as well as its promotion and development

14. Neighbor is referred to farmers farming inside and outside areas of land reform.

15. Farmer is referred to an agriculturist and is responsible for local farming within Nakhon Pathom provincial land reform areas.

16. Soil and water conservation is referred to the effective uses or the management of soil and water resources for the highest benefits as well as preventing and maintaining its fertility as long as possible.

6. Expectations

1. To know farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

2 To know factors relating farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

3. The Agricultural Land Reform Office and workplaces involved will apply findings to seek proper measures of soil and water conservation for farmers in order to reach achievement of application

4. Information gained from research will be as guidelines for the Agricultural Land Reform Office in planning to improve the uses of land.

CHAPTER II
LITERATURE REVIEW

Many issues and related researches have been reviewed in the study of farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. They contain as follows:

1. The Agricultural Land Reform
2. Soil and Water Conservation
3. Behavior on Soil and Water Conservation
4. Concepts of PRECEDE Framework
5. Previous Study

1. The Agricultural Land Reform

Land reforms in Thailand are meant for agriculture. It definition is coded in the Agricultural Land Reform Acts 2518 Article 4 (Agricultural Land Reform Office (ALRO): 2544:11) stipulating that:

The agricultural land reform is defined as the improvements of rights and land rights holding for agriculture including organizing residence in the agricultural land. The government will use the government land or bought by the government or by expropriation where they are not made lucrative in their land or excess of rights under the this Acts. They will be reorganized for farmers owning no land or farmers with small area insufficient for earning the living, and the rented land by the agricultural institution, or leasing, or settlement for best gains by the support of the state in developing farmer career, improving resources, and means for productions as well as better products and distribution.

The definition of Thai land reforms defined in laws is likely general. It is decentralizing the proprietary rights, improving means of production and the farmer institution for farmers under the following duty.

1. The decentralization of proprietary rights is divided into 2 natures, as follows

1.1 Procuring or expropriating lands from excess landlords but inlucrative by themselves to be allocated to farmers without land for living or renting land and be able to own their farmer land. The right distribution coded in the laws is determining ceiling of land proprietary rights and authorize ALRO procures or expropriates the remaining to be allocated to farmers.

1.2 Allocating state lands for farmers is the arrangement of the state or governmental lands illegally trespassed by people so much that the state couldn't make use of them under the previous intention. For example, the national reserved deteriorated forests, and the public lands lapsed to be for common will be allocated and legalized for farmers to stay under the key principles of land reform, i.e. the distribution of the proprietary right with fairness.

2. Improving the production means and the farmer institution to help and improve different means related to farmer production and their living in the land reform areas, such as the construction of infrastructure, water resources, communication routes, development of farmer career and others, development the farmer institution, and development of credit for marketing

With the stated duty, it is concluded that the policy of the agricultural land reform is actually focused on helping poor farmers without owning any lands for living and the most lucrative uses of the lands. (Kawila Patta, 2542:13)

1. Objectives of Land Reform

1.1 To revise rights and proprietary rights of farmer land allowing farmers who rent, landless person, and farmers by intent the opportunity to lasting own land for agriculture

1.2 To improve the farmer career and to effectively use soil resources by improving production means, providing credit services and marketing to raise farmers' income higher.

1.3 To encourage the establishment of the farmer institution, to promote and develop career outside agriculture, to provide education, public health services, to leverage welfare and to build growth in locality so that farmers are better living.

2. Policy of ALRO Operations: It significantly emphasizes to respond to the government policy so that the land reform will expeditiously achieve the goal. Policy of ALRO Operations in general is as follows:

2.1 Accelerating allocation of land reform for farmers especially the state land under the problems of invasion and problems of land for living.

2.2 Procuring private lands to help people in need of land for living and being farmers by intent.

2.3 Accelerating of issuing proprietary rights for farmers of both the state lands and the procured private lands.

2.4 Consistently supervising and follow-up viability of farmer lands allocated to prevent illegal exchanges and to allow farmers uses the land to its fullest benefit.

2.5 Improving structures and farmer production system in order to improve farmers' income as well as coordinating with government units related to improving living conditions and environment for their best gains in land reform areas.

2.6 Developing necessary infrastructure such as main communication routes, production routes, water resources for agriculture, and water resources for consumption.

The ALRO is an official unit at the level of Department under the Ministry of Agriculture and Cooperatives chaired by the Secretary of ALRO and fully authorized on land reform coded by laws.

The provincial ALRO is a regional official unit under ALRO chaired by the Director of provincial land reform Office and is established when the Royal Decree zones the areas of land reform has been enforced in the provinces. The office is authorized to follow project and plans of land reform to achieve the goal.

At present (April 2546), 69 provinces have established ALRO and the 69 provinces announced to be the land reform areas are

17 provinces of the North , which are Khamphaeng Petch, Chiangmai. Chiangrai, Tak, Nakhon Sawan, Nan, Payao, Pitsanulok, Petchabun, Prae, Mae Hong Son, Lamphun, Lampang, Sukhothai, Uttaradit, and Uthai thani.

15 provinces of the Central Region, which are Kanchanaburi, Chachoengsao, Chainat, Nahon Nayok, Nakhon Pathom, Pathum Thani, Prachuab Kirikhan, Prachinburi, Pra Nakhon Sri Ayudhya, Petchburi, Ratchaburi, Lopburi, Suphanburi, Sra Kaew, and Saraburi.

19 provinces of the Northeast, which are Kalasin, Khon Khaen, chaiyaphum, Nakhon Phanom, Nakhonratchasima, Buriram, Mahasarakham, Mukdahan, Yasothon, Roi-et, Loei, Sri Sa Ket, Sakhon Nakhon, Surin, Nongkhai, Nong Bualamphoo, Udonthani, Ubonratchathani, and Amnatcharoen.

4 provinces of the East, which are Chanthaburi, Cholburi, Trad and Rayong.

14 provinces of the South, which are Krabi, Pattaloong, Chumpon, Phuket, Trang, Yala, Nakhon Sithammarat, Ranong, Narathiwat, Songkla, Pattani, Suratthani, Satun, and Phang-nga.

3. Procedures of Land Reform-there are 3 stages in the land reform, i.e.

3.1 *The Preparatory Stage*, which is collecting and analyzing data, selection of area, and announcement of being the zone of land reform. Meaning, inside the state lands, it requires to study primary appropriateness examining from survey the social and economic status of farmers, land size, number of farmers invading to reserve the land, land size of being invaded and physical appropriateness including private lands for rent, number of renters and farmer products.

3.2 *The Land Allocation Stage* – within the state land, it requires Cadastral survey and right investigation where the people invaded and possess. Negotiation is made for right distribution, reducing and dividing areas (in case of land over rights by laws) and organizing farmers for rent or leasing or cultivating as petition filed. Farmers own the rights under the land reform laws and will be receiving land certificate (ALRO 4-28) and permit for personal gain in the land reform (ALRO 4-01) and chances to further own the land.

3.3 The Developing Stage – it is divided into the development of the infrastructure such as road construction, water resources for farming, water resources for consumption, and the development for farmers' increasing income such as promotion and development of farmer career and outside framing, establishment of Farmers' Institution, provide credit, and production means, public health service, public utility, education and so on. The ALRO will coordinate with units involved to develop farmers' living responding to the needs and necessity of the locality.

In every land reform area, ALRO focuses n increasing income for farmer family by developing and promoting farmers' career to effectively use the lands as well as developing the infrastructure, water resources and communication routes including living, and promoting different careers as follows (ALRO, 2543: 8)

1. Development and Promotion of Agriculture – it encompasses the improvements of farmer products, planning of land uses and projecting farming in every area, establishing regional fruit tree expansion, operation of soil and water conservation and fertilizing soil including special agricultural promotion for lucrative spot to be sample study for further applications in other areas.

2. Coordination between Private Sector and Farmers – contemplating the proper remuneration- based for every party so those farmers will earn stable and increasing income. Farmers will learn how to improve products to the required quality and worth investment.

4. The Land Reform in Nakhon Pathom Province

4.1 *Nakhon Pathom in General* - It is located on the bank of Ta Chin River, which is the basin of the central part of Thailand housing areas of 2,168,327 square kilometers or 1,355,204 rais by approximation. Geographically, it is a basin plain with no mountains and forests. Some northern and southwest areas are high lands with the slope plain from Ratchaburi, Kanchanaburi and Suphanburi. They are used for cultivating paddy. The central of the province houses a basin plain with some highlands continuing from western highland stretching out to Ta chin River. It turns the central areas are spread with water resources. The key river- Ta Chin of Nakhon Phantom flows through 3 districts; Banglen, Nakhon Chaisi, and Sampran.

The usefulness of Ta Chin basin is mostly for paddy fields and other farming. The second is community and industrial factories.

Nakhon Pathom divides its jurisdiction into 7 districts, i.e. Muang, Nakhon Chaisi, Sampran, Khampaeng Sean, Banglen, Don Toom, and Buddhamonthon with 784,358 population. (Office of Provincial Public Health of Nakhon Pathom, 2542). Geographically being a basin plain, the economy of Nakhon Pathom rely on agriculture. Most population is farmers. The farming areas are 794,494 rais or 56.41 percent of the province. The paddy fields are 427,688 rais followed by farm crops of 135,400 rais, and fruit trees of 76,028 rais (ALRO, 2544:78). The rest are spared for cultivating vegetables, flower and decoration plants and other farming. Major farming products are rice, sugar cane, grape, coconut, lotus, pomelo, orange, rose apple, mango, and orchid garden. Animal raising is leading by pig, duck, chicken, goose, cattle and buffalo. At present, the growth of industry has rapidly extended to Nakhon Pathom and tended more expansion in future. (Department of Land Development, 2539:34)

4.2 *Backgrounds of Nakhon Pathom provincial Land Reform Office*

the royal decree had specified it as the land reform area coded in Article 25 of Agricultural Lad Reform Acts 2518 specifying the areas of Banglen, Nakhon Chaisi, and Don Toom of Nakhon Pathom Province to be the area of land reform announced in the Royal Gazette Vol. 94, Sect. 24 dated 25th March 2520 and in Vol. 102 Sect. 112 dated 28th August 2528 respectively. Areas are 228,594.90 rais distinguished into each district as follows:

District of Banglen	98,544.20 rais by approximate
District of Nakhon Chaisi (Buddhamonthon)	26,001.70 rais by approximate
District of Don Toom	104,049.00 rais by approximate

The land reform in Nakhon Pathom emphasizes procurement and expropriation from private who do not cultivate the land by themselves or owns land more than allowed by proprietary rights on count of being the area of many land ownership. Other types of lands are few or none such as, few pieces of land from royal

donation. The state land cannot be found for proper reform. Therefore major duty is the land procurement or expropriation and small land reform from the royal donations.

Results of purchase or expropriation of Nakhon Pathom provincial Land Reform Office without expropriation, it is found out that purchase can be fulfilled bits by years since 2522 till 2531. Later land cannot be ever purchased. Summary of purchasing since 2522 till 2543 is distinguished as below

Table 1: Space (Rais) and Farmers (Families) Receiving Different Types of Land since Proceedings till Fiscal Year of 2544 Distributed by District

Districts	Types of Land			Total
	Private	Royal	Donation	
Banglen	8,794-3-48.6 rais	-	27-1-22 rais	8,822-70.6 rais
	470 families	-	2 families	472 families
Buddhamonthon	320-2-40 rais	1,009-3-25 rais	-	1,330-1-63 rais
	18 families	61 families	-	79 families
Don Toom	18-1-09 rais	-	-	18-1-09 rais
	3 families	-	-	3 families
Total	**9,133-2-97.6 rais**	**31,009-3-25 rais**	**27-1-22 rais**	**10,170-3-44.6 rais**
	491 families	**61 families**	**2 families**	**554 families**

Sources: *Nakhon Pathom Provincial Land Reform Office, April 2545*

4.3 Geography of Land Reform in Districts of Banglen, Don Toom, and Buddhamonthon – most areas are slope plain the property of soil is fat clay to very fat clay the top is gray colored soil with likely negative drainage, moderately fertile, and moderate capacity to reserve water. Some areas such as Banglen, the soil is likely acid in fertile for plants such as nitrogen and phosphorus, the irrigation and communication in the land reform areas are likely positive.

This province, the land reform areas concentrate on paddy fields followed by plantation, tree and fruit trees such as sugar cane, scent coconut, pomelo, rose apple, banana, betel palm, mango, jack fruit, guava, and vegetation, which are citron, morning glory, water mimosa and flowers such as lotus besides most farmers will cultivate paddy field with vegetable gardening.

4.4 *Performances of Nakhon Pathom provincial Land Reform Office fiscal year 2544* most are concentrated on development in different projects such as

Project of infrastructure development, Project of procurement of water for consumption in land reform areas, promotion and development of Farmers' Institution and career outside farming. They are added to respond to the objective and goal as specified in Planning. Major problem and limitation are allocation of land where Nakhon Pathom provincial Land Reform Office is unable to purchase/ to seek land to be allocated for farmers since 2531, which are the problems and limitation for land reform jobs.

2. Soil and Water Conservation

Manu Omakupt (2525) states that the soil and water conservation is defined as effectively using or managing the soil and water resources based on technical prevention and maintenance. It should best gain per unit of area and able to maintain fertility as long as possible, contemplating the prevention of soil surface erosion, maintaining soil potentiality of production, and proper uses of soil. These are to prolong the field conditions for farming.

Santi Siripakdi (2536) states that the soil and water conservation is referred to methods of effectively using soil and water for the highest gain. At the meantime, there should be attempt to less damage soil water resources, It helps prevention of soil erosions as well as improving richness and better capacity on soil potentiality for production.

Department of Land Development (2544) states that the soil and water conservation is referred to the proper uses of soil and water with intelligent method, worthiness, highest gain and lasting.

In this research, the soil and water conservation is referred to the effective uses or management of soil and water resources for the highest gain as well as preventing and maintaining their fertility as much as possible.

2.1 Objectives of Soil and Water Conservation

Using soil in an area is likely with multiple uses at the same time. Objectives of soil and water conservation are set as follows:

2.1.1 To reduce the rate of soil erosion balancing the natural forming of soil by proper planting

2.1.2 To satisfactorily level plant mineral preventing damaging them from soil and to increase them for soil which lost plant mineral.

2.1.3 To properly level organic materials in soil

2.1.4 To maintain physical property of soil suited the growth of plants for the best gain of water used from soil

2.2 Soil Conservation – it is vital to do to maintain the potentiality of production in common soil even it is difficult to accomplish. Fertility of soil or production potentiality depends mainly on its surface. If it were eroded, it could not maintain the same fertility. Soil conservation by improving the eroded surface may increase its production potentiality . At the meantime, if the similar method used with the normal surface, it would drastically increase production potentiality. Therefore soil conservation is vital to maintain its potentiality and also its production per areas.

Soil erosion is a process affected by water, wind and gravity. It happens in 2 ways, i.e.

1) The detachment – it is caused by rain drops pounding soil atom and split into parts.

2) The transportation – it is a process continuing from the No. 1 that when soil atom has been split; water or wind will transport them away from previous place.

Soil erosion is divided into 2 types, i.e.

1) *Geologic Erosion* - it is the natural destruction in the environmental situation and the soil cover which human does not yet involve. This erosion is observable from present topography such as mountains, slopes and plains, the forming of steep cliffs and valleys, rivers, soils, and their dissemination. In general, factors causing this erosion are water, wind, gravity and gracier.

2) *Accelerated Erosion* – it is hared by humans or animals to accelerate the erosion. Generally, it happens from the cover of the soil and the change of the uses of soil.

2 key factors causing erosion are water and wind

Intense or light erosion caused by water depends on climate, nature of soil, mulching plants and topography, kinds of plants. Human can control something about soil. However, climate and topography (excluding the length of the slope) are beyond human control.

The erosion caused by wind is different from by water. Factors of volatility depend on climate, nature of soil, mulching plants. The topography least affects the erosion process.

Intention of soil and water conservation is to use land as endurable as possible. Meaning, it is useable year round while also increasing production. Such uses may be by farming, livestock, forestry, wildlife reserves, water resources, and resorts with different conservation and activities.

2.3 Soil conservation in General

2.3.1 Properly reduce the rate of geologic erosion as well as attempt to maintain its production potentiality.

2.3.2 Properly increase mineral level in soil and attempt preventing the unnecessary destruction of minerals in soil and frequently increase them to keep the level of soil fertility.

2.3.3 Attempt to keep the quantity of organic material wit h proper ratio

2.3.4 Properly maintain or improve the soil structure, i.e. endurable against erosion and its water absorption.

2.3.5 Able to use water economically with highest gain.

Rationally, the target is to improve soil endurable to erosion and well absorption of water, reducing the tide on soil surface and maintaining the production potentiality for lasting usefulness.

2.4 Water Conservation - it is similar to soil, which is vital to human and living things. It can be said that water is indispensable to all living things. However, water both harms and helps particularly living things on land. If it were either too much or too least water, it would immediately affect living., either for farming or others or for living. Excess of water brings flood and wipes away shelters and plantations. If over excess, it will cause life to human, plants and animals. Similarly, scarcity of water brings drought and also destroys plantations, animals and human beings. Besides, water is key in erosion of soil, stone and others. It is observed that the balance of water and soil with proper climate lead perfect living. Therefore, water conservation is indispensable to pair with water conservation to bring balance in both quantity and quality in order to maintain the production potentiality of soil. (Rationally, it also meant other matching factors such as climate, and so on)

Major origin of water and consistent supplies for industrial farming and for consumption is “rain”. It is not only referred to the natural raindrops seen in Thailand but also included snow, snow rains, and hailstone. Some raindrops will be evaporated before reaching earth. Some will be absorbed by trees and some flow over the ground. Some percolate into the ground and some evaporate into the air from the ground, water and plants

There are 3 forms of water, i.e. solid, liquid and gas. Each form contains different quantity in the air, on the ground, or in living thing or in the dead bodies. Water resources needed to be studied and indispensable for planning are water and humidity in the air, water on ground, and underground water. It is likely concluded that water resources developable is developing water on ground by building reservoirs of different sizes whereas underground water can be dig or found by artesian wells

Principles of water conservation are similar to soil conservation, i.e.

1) Reduce or prevent the loss of water such as evaporation from soil surface, especially from reservoirs, lakes and draining canals.

2) Increase reservoirs to freshen the soil as long as possible, particularly underground water or in artesian wells.

3) Economically use of water for the highest gains.

2.5 Methods of Soil and Water Conservation

It is inseparable in either way. It is always connected. There are 2 major methods in soil and water conservation - Agronomic Methods and Mechanical Methods

2.5.1 Agronomic Methods

1) Agronomic Methods are allowing crops to impede energy from raindrops to touch the soil and to reduce the speed of flows and power of erosion of water. It also helps soil absorbent. Debility control of soil by crop-based are:

2) Cover Cropping – it is to plant crops with thick leaves, many roots and deep to cover the soil. It holds and prevents the collision of raindrops. Normally, plants in farm are in row and the soil between row is uncovered, which is easily eroded. The crops can hold minerals food to be absorbed into the deep ground. It increases organic materials and fertility to soil to gain dampness in order to improve physical property of the soil.

3) Crop Rotation – it is planting of two crops or more than two in the same soil with different time. The repetition destroys some minerals. The crop rotation should be viable.

4) Strip Cropping – it is cut-across cropping to the slope, which is appropriate to unlikely slope grounds and it is most effective with 2-12% slope with not more than 120 meter in distance. The strip cropping helps erosion and it is most effective when it is used with crop rotation by rotatedly stripped with the contour line and vertically or crossing the direction of the slope.

5) Mulching- it is covering soil with different materials for the purpose of soil and water conservation. The coverage may be organic materials such as grass or hay, sawdust, animal dung or synthetic materials such as plastics, papers and so on. It is popular with the tillage and cannot take contour tillage or by terracing such as sideways, construction area, canal bank or irrigation waterway.

6) Agroforestry – it is the relevant process of using soil to maintain production activities during tree planting, animal raising and cropping. It supports the ecological system of the local forest where tree planting and cropping can be organized in the same land. Besides, key factors in agro forestry are divided into 2 models, i.e. 1) the factor of trees, which may be a perennial, a shrubbery, or bamboo.

2) The factor of non-tree , which are crops, plants, grass for animal feed and so on. Agro forestry can be divided into 3 models. 1.) a system of trees and agricultural crop, 2) a system of trees and plants for animal feed and domestic animals, 3) a system of trees and agricultural crops and domestic animals. The agro forestry will be diversified with social conditions and the local ecology.

2.5.2 Mechanical Methods

It is referred to moving soil and constructions to prevent and control the erosion. It is the modification of the topology of the soil in different forms to reduce energy, which will cause erosion. Mechanical methods require high expenditures. Lucrative designs are required as well as being used with cropping to prevent erosion. There are 6 mechanical methods for soil and water conservation.

1) Contour Cultivation – it can be tillage, sowing or planting and harvesting the crop with the contour line crossing the slope of the untilled land. Or, cultivating plants from high to low level to reduce the flows and erosion. It is popular with the level slope. This method is most effective with 3-8% slope. Soil proper for tillage and contour cultivation must be deep and moderately absorbent. Such tillage can reduce 50 percent of wastage of soil comparing to tillage along the slopewise. Underground water can be reserved for 4-400 millimeter a year.

2) Diversion Ditches – they are construct to bar the slope land to interfere water-flows on ground and save the water. Normally, they are constructed on the top or the height of the slope. The water will be diverted along the ditches. They are constructed to prevent erosion in the areas of farming.

3) Waterways and Outlets – they are either built by nature or constructed to lead water-flows on ground in the farms or from diversion ditches or the terracing to the secured reservoir. Waterways constructed should be mulched in the them and their banks to prevent erosion. Plants should be connectedly growing and endurable to prolong inundating such as Johnson grass and Bermuda grass and so on.

4) Terracing – it is building a soil or stone dike to get waterway and built or develop a new land in the stair-shape. Terracing helps soil and water conservation and very prolong popular in the Philippines and Indonesia.

5) Conservation Tillage- it is the furrow that saves more soil and water than the natural furrowing. There are many kinds of conservation tillage, i.e. 1)

Non-Till System, which is plating without furrowing but using weed killer. Popular cultivation is corn and soybean. 2) Contour Tillage ,which is furrowing and use contour cultivation across the slop. 3) Tillage by leaving wastage of plants on ground and underground to considerably prevent erosion 4) Minimum Tillage is least furrowing in preparing soil for cultivation to avoid damaging soil as much as one can such as tillage , planting and fertilizer drops at the same time.

6) Soil conservation by other mechanical methods to prevent erosion but unpopular in many countries because the inadequacy construction material or inadequacy of knowledge and experiences in many areas. Some countries may use lower dike to cross the slope, some construct ditches similar to diversion ditches by interval by dividing the waterways into small parts. It is popular in Taiwan where there are orchards.

Soil and water conservation cannot be separated. Either ways always connected by results. Therefore, soil and water conservation relies on 4 following principles.

1) Adjust the condition of soil endurable to erosion or transported by water force.

2) Mulching soil from the collision of raindrops and wind force

3) Lessen the draught and flows on ground

4) Seek secured methods to diverse water-flows to the reservoir to prevent erosion.

3. Behavior on Soil and Water Conservation

3.1 Definition of Behavior - human behavior has been studies and defined in different definitions as follows:

Aree Phanmanee (2534: 15) defines that it is an activity or organic deeds those an individual can observe, realize or using different instrument to test and examine.

Longman Dictionary defines that it is the deed or the psychological responses of each individual and the interaction to the internal and external stimuli as well as being the different activities purposively and observably performing. Or, it is different activities with reflections or unconscientiously. (Goldensor , 1984 : 90)

Supatta Pinthapaet (2542:2) defines that all actions of human from birth to dead are physical expression such as walking, eating, gestures and speaking. Also, psychological behaviors happens such as thinking, attitudes and emotions and so on.

From the definition above, the researcher could conclude that behavior is the human actions expressed in every type to show sensation and thought caused by perception, learning and decision making or stimuli which may be expressed after reflection or unconscientiously, which are observable and testable with instruments including things unobservable. In this research – **Behavior on Soil and Water Conservation is referred to expressed action and practices of farmers counting from effective and highest gains of uses and management of soil and water in association with preventive methods and maintenance to instill fertility as long as possible.**

3.2 Behavioral Process

Wimolsit Horrayangkul (2526:7-9) states that behavior has 3 process, which are

3.2.1 Perception – the reception of information from environment through senses. The process also includes sensations.

3.2.2 Cognition – the psychological process, which involves learning, memory, and thinking. It also includes development. Learning process is therefore the cognitive process.

3.3 Spatial Behavior – it is the behavioral process happened and related to an environment through external observations, which is the external behavior

3.4 Factors of Behavior

Cronbach divides human behavior into 7 factors (referred in Pakit Prommayon, 2530 : 29)

3.4.1 Goal – it is the need or objective to create activity. Human must act to respond the needs. Some activities give satisfaction or immediately respond needs. However, some needs or objectives require time to achieve. Human has different needs at the same time and usually choose priority and respond the rest later.

3.4.2 Readiness is referred to level of maturity or capacity necessary to act to respond the needs. Human cannot respond every need. Some are beyond the ability.

3.4.3 Situation is opportunity opened to choose activity responding to needs.

3.4.4 Interpretation – before a human acts, it must reflect situation and decide the most probably satisfactory method.

3.4.5 Response is the activity to meet needs selected from the stage of interpretation.

3.4.6 Consequence is the result of activity, which might confirm or contradict the expectations.

3.4.7 Reaction to Thwarting – if needs cannot re responded, it is the thwarting. In this case human will return tore-interpret the situation and re-select the response.

Prabhaphen Suwan (2526:15-17) says that psychologists believe that behavior are gained from human reactions or organic and environment. Also, Behavioral Theory of Benjamin S. Bloom has been discussed, which encompasses following factors.

1) Cognitive Domain – it involves perception and memory of facts in association with development of capability and intellectual skills, the uses of discretion for decision making. This behavior contains many levels of capability, i.e. knowledge and understanding for application or implementation of knowledge, analysis, synthesis and evaluation.

2) Affective Domain – it is referred to interest, opinion, sensation, gesture, preference, dislikes, valuation, reception, change or improvement of attached values. It is the behavior happened inside an individual mind. It is divided into 5 steps, i.e. reception or interest, response, valuation, grouping and preference expression.

3) Psychomotor Domain – a behavior used physical capacity to express as well as behaving and it is observable in a situation or likely an inert behavior. Meaning, a person of non-immediate reacting becomes target of study and it requires different levels of stated behaviors to be component (Cognitive domain, and attitudes). This behavior is easy to evaluate if being expressed but the process to

behave requires time and multi-level of decision. Theorists believe that education processes help generate Psychomotor Domain.

3.5 Determiners of Human Behavior **-** some mention about determiners of human behavior from different definitions and factors driving human to behave as follows:

Chuda Jitphitak (2526:58-77) says there are 2 determiners of human behavior, which are

3.5.1 Personal Habit, i.e.

3.5.1.1 Ability to think of any facts, which are not necessary to be right or wrong. Belief can be gained by seeing, narrating, reading, and personal thinking.

3.5.1.2 Values, which is referred to thing of preference or attachment for decision or selection

3.5.1.3 Attitudes, which involve with human behavior, i.e. attitudes are trends or readiness of behavior and they are counted vital in determining behaviors.

3.5.1.4 Personality is the determiner to specify what an individual must do if one falls into a situation. It indicates what an individual must behave in a situation.

3.5.2 Other Social Processes, which are

3.5.2.1 Stimulus Object and the density of the behavioral stimuli and individual habit, i.e. belief, values, attitudes, and personality, which actually influence behavior. But behavior cannot be happened if there is no behavioral stimuli, which is the personal factor.

3.5.2.2 Situation is referred to environments, which are personal and impersonal those are states that an individual is on the point to behave.

Pat Sujamnong (2522:21) says about factors influencing human behavior (referred in Juthabhon Sakulsakdi ;2537:21), which are

1) Social Group, which contains the neighboring group, the school peer group, and the institutional peer group, and so on.

2) Identification Figure, which contains father, mother, sibling, teacher, social recognized person and so on.

3) Status, which is likely determined by society such as gender, age, religion and so on. Or which does oneself acquire such as rank, position and etc. An individual with different status also behaves differently.

4) Technological advancement, for example, at present, laborsaving devices are popularly used in replacing workforce unlike the past. It alters human behavior.

5) Laws – some human behaviors are governed by laws. For example in Bangkok, smoking in the bus is counted violations. It is therefore then lessened.

6) Religion – each religion has different norms and restrictions. Similarly, persons with different beliefs may differently behave. Actually, it comes from religious influences.

7) Customs, Traditions, and beliefs are definitely influencing human practices. For example, the tradition of child raising, it differs to the beliefs.

8) Environment – persons living in different environment differently behave such as a rural and an urban.

9) Attitudes influence human expressions. For example, students with negative attitudes toward teachers are weirdly behaving such as being inattentive or being absent during the class of the teachers.

10) Learning – in psychology, it counts that most behaviors are gained from learning; and an unending process since young to adult. For example, children learn to behave from adult modeling.

3.6 Behavioral Measurement

Somjit Suphannatas (2526:131-136) says there are 2 ways to study behaviors. They are:

1 Direct Studies, which can be done by

1.1 *Direct Observation* – it is the behavioral observation. This method allows the observed testify the observer. Such approach, some do not genuinely behave. For example, a manager observes behaviors of staff by informing them who do what during working.

1.2 *Naturalistic Observation,* an approach conducted unknown to the observed an d it is possible to behave without disturbing the observed. Such

method gains much authentically behaviors. Its limitations are time consuming and many consistent conducting..

2. Indirect Studies, which can be done by

2.1 Interviews – it is the questioning an individual or individual groups to know their behaviors. It can be done by face-to-face questioning or through an interpreter in case of different dialect. This can be divided into 2 types, i.e. the direct interview is conducted by an interviewer interviews an interviewee in each topic by objective. Another one is the indirect or informal interview when the interviewee unrealized what the interviewer wants. The interviewer continues conversing while intervening with topic of interview if chance opens. Such method gains much information. However, some limitations are some personal confidential affairs impede knowing authentic behaviors of the interviewee.

2.2 Questionnaire – it is proper to study mass behavior among literate persons. It advantages are accountable to study individuals with dispersal stay. Besides respondents can provide confidential behavioral data or unknown behaviors inexpressive to others by otherwise. Further, questionnaire can at any time optionally be conducted.

2.3 Experiment – it is behavioral study that the sample is conditionally controlled and actually it is conducted in the laboratory, whereas studying community behavior can be unlikely controlled. Laboratorial experiment gains restricted data which sometimes are likely impractical.

2.4 Recording - it helps knowing individual behaviors by asking individuals to write diary or to study each type of behaviors such as consumption behavior, working behavior, health behavior, and environmental behavior and so on.

In this investigation, the researcher uses an interviews as instrument to test farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas .

Relationships between Knowledge, Attitudes and Behavior/Practices

Nipha Manoonpiju (2528:827) says about the relationship between knowledge, attitudes and behavior/practices as follows:

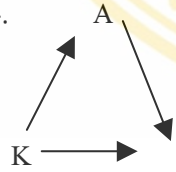
1. K → A → P means knowledge K) generates attitudes (A) which Generates practices (P)

2. 

means knowledge (K) attitudes (A) which relate each other generate practice (P)

3. 

means both knowledge (K) and attitudes (A) generates practices (P) while knowledge and attitudes are not necessarily related

4. 

means knowledge (K) affects practices (P) directly and indirectly having attitudes as an advocator to generate practices

From the model of behavioral relationship of learning, it is found that each dimension of behavior generates practices finally, which is the action of the being where it is measurable or observable.

***3.7 Behavior on Soil and Water Conservation*:** key operation on soil and water conservation is the uses of land, tillage, managing mineral nutrient of plants in soil, water management, and managing organic matter under fertile soil. The effective farming approaches are just counted the soil and water conservation.

3.7.1 Land Uses - Each land use differently affects potential the soil productivity and erosion. Rationally, each area of land has its own different property and capacity of production as well as differently topological location. All these factors determine production capacity and viability of land uses. The effective uses of land with highest gains require using land lucratively to its appropriateness and potentiality.

Suitable uses of land are not only not eroding qualities and capacities of soil productivity but also improving it by increasing its potentialities. Viable uses of land by planning significantly require the Land Evaluation. The land survey provides data for land evaluation for the purposes of best exploiting different uses of land, its impacts, the environment, and the community economy around the area. Consequently, it is viable to group for the lucrative uses of land. Encountering problems of erosion worldwide at present, is caused by the improper uses of land.

3.7.2 Tillage- it is becoming the soil potent environment fit the growth of plants. It turns the soil more absorbent. Nevertheless, over necessary tillage causes impact, i.e. not only expensive and wasting time but also deteriorating the soil , causing erosion and its dampness.

Tillage methods of soil conservation are

1) Contour tillage encompassing Contour line across the slope direction

2) Tillage by leaving surface and subsoil plant remains

3) Minimum tillage i.e. the immediate planting, which respectively is plowing, breaking up, planting, and fertilizing. This is the most popular method comparing to other conservation.

4) Subsoiling the hard pan, which impede the slow water absorption and restrict the root growth. It gives effective perforation to subsoil reducing the surface tide and help the root burrowing deeper. This causes the subsoil more perforation. The subsoiling turns less fertile and hard soil more productive.

3.7.3 Mineral management for plants – highly fertile soil provides less erosion on the basis that the cover pants effectively grow and cover. The highly fertile soil is physically more potential for the growth and covering of plants than the infertile soil. Meaning, the fertile soil contains high perforation and less erosion.

3.7.4 The water management for the viability of farming is to control the erosion with the following methods.

1) Reducing soil surface tiding

2) Reducing the velocity of soil surface tiding

3) Adjusting soil dampness to the level that soil atom is least being carried away by wind and water

4) Adjusting the dampness of soil that roots and microorganism best growth

5) Turning the existing dampness highest gains.

The water management for soil and water conservation is determined to allow the moderate damped soil becoming the highest damped soil for the best growth of crops as well as maximizing activity of soil microorganism. High growth of roots and microorganisms turn soil physically better quality. Also, such level of dampness makes effective perforation and endurance to the collision and transportation. High water absorption comes from being absorbent with water stable aggregation and endurance to the tide because of having thick cover cropping, which reduce the quantity and velocity of tide.

3.7.5 The Organic Matter Management. Organic matters in soil have different functions. Significantly, they are the source of energy and carbon for soil microbes to increase grains of soil, particularly, the water stable aggregation. Therefore, it increase perforation and ventilation in soil making better water absorption and reducing the quality of tide and erosion. Organic matters on the soil surface also cover the soil help reducing collision of raindrops or surface wind. Further, the dissolving of organic matters turn minerals more advantageous to plants. It is like fertilizing in itself. Areas of having high organic matters are forest and meadow soils where least tide are found on the surface and unlikely having erosion.

4. Concepts of PRECEDE Framework

The researcher has applied PRECEDE Framework based on Green et. al (1980) by analyzing human behaviors of their causes or what factors influence behaviors. 3 main groups are conceptualized for analyses, i.e.

Group 1: *Intra Individual Causal Assumption* – This group conceptualizes that causes of behavior or factors influencing behaviors come from inside of a person, i.e. knowledge, attitudes, belief, values, motivation or attentiveness to activity.

Group 2: *Extra Individual Causal Assumption* – This group conceptualizes that causes of behavior or factors influencing behaviors come from outside of a person, encompassing environments and social structure, i.e. political systems, economy, education, religion, population factors, and geographical natures.

Group 3: *Multiple Causal Assumption* – this group conceptualizes that individual behaviors are caused from both internal and external.

These 3 groups apply theories of learning psychology, socio-psychology, social psychology, population sciences and other disciples to analyze causes of behaviors and attempt to solve problems by interdisciplinary approach. (Boonyiam Trakulsuwan, referred in Suwan Chadjen, 2533:17-18)

PRECEDE is abbreviated from Predisposing, Enabling and Reinforcing Cause in Educational Diagnosis and Evaluation.

Predisposing Factors are referred to fundamental factors motivating the behaving or in other side these factors are preference gained from education experience, which either support or deter behaving. They depend on each individual. Predisposing Factors are knowledge, attitudes, belief, values, and perception. They also include social status, economy, age, gender, and family size. In this research, Predisposing Factors are gender, age, education, number of family member, knowledge and awareness of soil and water conservation.

Enabling Factors are referred to the indispensable resources in behaving and skills helps in behaving, i.e. remuneration, family income, and family expenses. In this research, they are information resources of soil and water conservation, conservation, duration of land rights, amount of land holding, Participation in

agricultural seminar related to soil and water conservation, Study tour related to soil and water conservation in agriculture and being membership of agricultural group

Reinforcing Factors are referred to things those an individual gains or expects to gain from others caused by one's performance. The receiving things might be rewards, praise, acceptance, punishment, rejection of behaving, or the regulating to control others to follow. Receiving things from others influencing oneself are such as relatives, peers, interpersonal among family individuals and situations, which might support or deter behaving. In this study, they are advice from state agricultural officers, advice from private agricultural staffs, and advice from neighboring farmers

5. Previous Study

Previous Study of farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas are as follows:

Boriphan Chaiwongkaew (2527:92) studies behaviors related to forest conservation of community development authority. It is found that most authority perform well on forest conservation. Findings of relationship between roles and duty of the authority with factors of socio- population are position, education level, duration of working as community developer have relationship with behavior of roles and duty of the authority by statistical significance at 0.001 level. Whereas, gender, age, number of sources apart from educational institution differentiate the behavior of roles and duty of the authority by statistical significance at 0.001 level. Work experiences differentiate the behavior of roles and duty of the authority by statistical significance at 0.05 level.

Ampha Tuay-ngarm (2528:154-157) studies knowledge and attitudes in soil and water conservation of farmers in Chonburi Province. It is found that most farmers have moderate knowledge and attitudes in soil and water conservation by statistical significance at 0.05 level. The factor generating variance is the reception of agricultural information.

Dhanet Srisook. (2528) studies farmers' uses of land in Khok Chaoren, Lopburi Province. It is found that farmer possessing 42.50 rais a family by average are 0.99 rai is spent for residence, and 40.99 rais have not been managed and soil

conserved. Pertaining the proper uses of land, it is found that most farmers follow the advice of the Land Development Department. Most need of assistance is the water resource for agriculture.

Mallee Watcharanont (2529) studies results of land reforming for agriculture in farming within area of land reform, Amphoe Nong Suia, Pathumthani Province. Most farmers satisfy with land received from the land reforms and find that the most advantage received is the assistance from the government on marketing, soil improving, and funding resources.

Wichan Manichote (2535) studies students' behaviors of environmental conservation of Junior secondary level 3 in Songkhla Province. It is found that gender affects students' behaviors of environmental conservation by statistical significance at 0.05 level. Receiving external information affects students' expected and actual behaviors of environmental conservation by statistical significance at 0.05 level. Different Gender, learning achievements, father occupation, mother occupation, receiving information from radio, television, newspaper, journals, and other have different behaviors of environmental conservation by statistical significance at 0.05 level.

Phongsakorn Maharak (2536:133-135) studies knowledge and farmers' practices of soil and water conservation: a case study of Sa-phue Tai village, Amphoe Phibul Mangsaharn, Ubonratchathani Province. It is found that the relationship between practices and knowledge among farmers planting fast-grow crop promoted by official services for faster advantages depends on farmers' knowledge and the relationship is by statistical significance at 0.05 level. Knowledge, and practices having no socio-relationship are age, educational level, receiving agricultural information, being member of different groups, participation in meeting, agricultural training, witnessing exhibition, agricultural excursion, and nature of land possession.

Judhabhon Sakulsawad (2537) studies factors influencing economizing uses of household water in Bangkok. It is found that samples have moderate economizing uses of household water. Significant variables influencing economizing uses of household water are educational level, reception of information differentiate the economizing uses of household water by statistical significance at 0.05 level.

Duangduan Wanichajiva (2538: 83) studies knowledge, attitudes, and practices in soil and water conservation in vocational students of Agriculture Program of Education Region 5. It is found that students have moderate knowledge, positive attitudes but fewest practices.

Taklaew Damrongdej (2538) studies behavior of River Klong conservation by municipality people of Muang Kanchanburi , Kanchanburi Province. It is found that factors influencing behavior of River Klong conservation are belief in water conservation and water resources, duration of stay, reception of information, and knowledge of water conservation and water resources differentiate behavior of River Klong conservation by statistical significance at 0.01 level. Experiences related to environment differentiate behavior of River Klong conservation by statistical significance at 0.001 level respectively. It is also found that the average monthly income and numbers of household member have positive relationship with behavior of River Klong conservation.

Thawan Yimyaem (2540) studies behaviors of River Petchburi conservation: a case study of Public Health Zone of Tayang, Amphoe Tayang, Petchburi Province. It is found that people have moderate behaviors of River Petchburi conservation in Public Health Zone of Tayang. The personal factor affecting behaviors of River Petchburi conservation in Public Health Zone of Tayang is age by statistical significance at 0.05 level. . The marital status, duration of stay, and monthly income have statistical significance at 0.01 level. The educational level, and occupation have statistical significance at 0.001 level. The motivated factors are having ever been received information on River Petchburi conservation, different information resources, and knowledge of River Petchburi conservation affect behaviors of River Petchburi conservation in Public Health Zone of Tayang is age by statistical significance at 0.001 level.

Phanasak Sudadej (2540) studies farmers' conditions of land uses in land reform area of Amphoe Ban Dung, Udonthani Province. It is found that pertaining land uses, farmers use land for agriculture of 24.09 rais by average or 85.64% by ratio of being allocated. Likely most farmers have no management and soil conservation. Major problem in land uses are, 1) inadequacy of fund, 2) permanent disease and insect epidemic, and 3) inadequacy of agro-water resources.

Songphol Saengprakai (2544:135-136) studies local people's behaviors of natural resource and environmental conservation: a case study of Swamp Borrapet, Nakhon Sawan Province. It is found that there are low, moderate and high level in exploitation of , Swamp Borrapet, reception of information on natural resource conservation, which differentiate local people's behaviors of natural resource and environmental conservation of Swamp Borrapet by statistical significance at 0.05 level. Knowledge of natural resource and environmental conservation an d valuation of Swamp Borrapet which are low, moderate and high differentiate local people's behaviors of natural resource and environmental conservation of Swamp Borrapet by statistical significance at 0.001 level.

Chamnan Wongwinitsorn (2545:139) studies knowledge, attitudes and participation of Tambol Administration members in conserving environment of sandstone mountain: a case study of Amphoe Noen Maprang, Pitsanulok Province. It is found that factors of knowledge, and attitudes in conserving sandstone mountains have no relationship with the participation of Tambol Administration members by statistical significance at 0.05 level.

Further, there are some related researches reviewed deserving to support this study by dividing studied variables as follows:

1) Gender: Cherdsakdi Chaleosilp (2541: 98) studies farmers' behaviors of using insect protective chemicals in Amphoe Sampran, Nakhon Pathom. It is found that male farmers have more behaviors of using insect protective chemicals than females. Whereas, the study of Sumna Yuadying (2544:77) on people behavior in prevention and solution of waterway pollution in River Chao Praya: a case study of Tambol Khor Kled, Amphoe Pak Kled, Pathumthani Province, it is found that male and female samples have no difference in behavior of prevention and solution of waterway pollution in River Chao Praya by statistical significance at 0.05 level.

2) Age: Phongsakorn Maharak (2536:133-135) studies knowledge and farmers' practices of soil and water conservation: a case study of Sa-hue Tai village, Amphoe Phibul Mangsaharn, Ubonratchathani Province. It is found that age has no relationship with knowledge and practices. Whereas, the study of Suchada Boonprasob (2529:156) on people's behavior of solving River Tachin pollution: a case study of Amphoe Sampran, Nakhon Pathom Province., it is found that people of different ages

have different behaviors of solving Rive Tachin pollution by statistical significance at 0.05 level.

3) Number of Family Member : Walaiporn Dowsuwan (2533: 95) studies local people participation in conserving environments of Swamp Khun Talae . It is found that different numbers of family members have difference in participation in conserving environments of Swamp Khun Talae by statistical significance at 0.01 level. Whereas, the study of Sanchai Soodhiphanwiharn (2539:144) on people participation on problems of waterway pollution from community: a case study of Phuket Municipality, and it is found that number of family member has no relationship with all activity participation by statistical significance at 0.05 level. Also, number of family member has negative impact or contradicts with participation in practices and common needs.

4) Income from Cropping: Cholthicha Tang – ont (2534:147) studies knowledge, belief and housewife practices in rid of litters and excretion of the household: a case study of Canal Saen Saeb banks. It is found that housewives with different monthly income differently get rid of litters and excretion by statistical significance at 0.05 level. Whereas, Sanchai Soodhiphanwiharn (2539:142) on people participation on problems of waterway pollution from community: a case study of Phuket Municipality, it is found that income has no relation with people participation on problems of waterway pollution from community by statistical significance at 0.05 level.

5) Education: Phongsakorn Maharak (2536:133-135) studies knowledge and farmers' practices of soil and water conservation: a case study of Sa-phue Tai village, Amphoe Phibul Mangsaharn, Ubonratchathani Province. It is found that education level has no relationship with the knowledge and farmers' practices. Nittaaya Suriyacharoen (2533:86) studies farmers' behavior of using insecticide chemicals in Ban Paew, Samutsakhon Province. It is found that different education causes no difference in farmers' behavior of using insecticide chemicals by statistical significance.

6) Knowledge of Soil and Water Conservation: Ampha Tuay-ngarm (2528:154-157) studies knowledge and attitudes in soil and water conservation of farmers in Chonburi Province. It is found that most farmers have moderate or 68.3

percent of knowledge and attitudes in soil and water conservation by statistical significance at 0.05 level. Duangduan Wanichajiva (2538:83) studies knowledge, attitudes, and practices in soil and water conservation in vocational students of Agriculture Program of Education Region 5. It is found that students have moderate knowledge. Nittaya Suriyacharoen (2533:86) studies farmers' behavior of using insecticide chemicals in Ban Paew, Samutsakhon Province. It is found that farmers with strong knowledge of insecticide chemicals correctly use it. The second is farmers with moderate and less knowledge of insecticide chemicals, respectively. It is found with the statistical test that differences in knowledge of insecticide chemicals differentiate farmers' behavior of using insecticide chemicals by statistical significance at 0.05 level.

7) Awareness of Soil and Water Conservation : Chorthip Tanthavee (2532:101) studies perceptions and awareness of preventive insecticide in residence of Elementary 6, Amphoe Muang, Nakhon Pathom Province. It is found that Perceptions have positive relationship with awareness of preventive insecticide in residence of Elementary 6 by statistical significance at 0.01 level. Somsak Suriyajaroen (2533:114) studies the awareness of the permanent secretary of district pertaining forest conservation. It is found that the permanent secretary of district have high level of awareness in forest preservation with the scores of 157 out of total of 190 or 82.63%. Findings of Suchada Boonprasob (2529:156) on people's behavior of solving River Tachin pollution: a case study of Amphoe Sampan, Nakhon Pathom Province., it is found that people with high level of awareness on water pollution actually more correct behave to solve River Tachin pollution than the group of lower awaresness.

8) Amount of Land Holding : Ampha Tuay-ngarm (2528:154-157) studies knowledge and attitudes in soil and water conservation of farmers in Chonburi Province. It is found that most farmers with more land have better knowledge and attitude than farmers with less lands. Chairot Dhanasanti (2535:97) studies the participation of Tambol Council Board in conserving the natural resources: a case study of Unbonratchthani Province. It is found that different land possession differentiates the participation of Tambol Council Board in conserving the natural resources the participation of Tambol Council Board in conserving the natural resources by statistical significance at 0.01 level. Saiyood Kongyarit (2527:34) studies

the farmers' acceptance of farming by using soil and water conservation in the Project of Mae Sae Basin Management, Amphoe Mae Rim, Chiangmai Province. It is found that people of more land size possession have more accuracy in soil and water conservation, acceptance of promoted breeds, insecticide uses, and farming practices.

9) Sources of Information Reception of Soil and Water Conservation: Ampha Tuay-ngarm (2528:154-155) studies knowledge and attitudes in soil and water conservation of farmers in Chonburi Province. It is found that most farmers permanently receiving information have best knowledge and attitude in soil and water conservation. Taklaew Damrongdej (2538:78) studies behavior of River Klong conservation by municipality people of Muang Kanchanburi , Kanchanburi Province. It is found that different reception of information and knowledge of water conservation and water resources differentiate behavior of River Klong conservation by statistical significance at 0.01 level.

10) Being Membership in Agricultural Group: Ampha Tuay-ngarm (2528:154-155) studies knowledge and attitudes in soil and water conservation of farmers in Chonburi Province. Chamnan Wongwinitsorn (2545:139) studies knowledge, attitudes and participation of Tambol Administration members in conserving environment of sandstone mountain: a case study of Amphoe Noen Maprang, Pitsanulok Province. It is found that being members of the group have no impact to the level of knowledge, attitudes and participation of Tambol Administration members in conserving environment of sandstone mountains.

11) Participation in Agricultural Seminar Related Soil and Water Conservation: Cholthicha Prakobsap (2540:108)studies associating in conserving River Tha Chin of Tambol Council Members in Suphanburi Province. It is found that different training have no difference in opinions of conserving River Tha Chin. Whereas the study of Wilaiporn Somboonchai (2534:83) on participation of community development volunteer in conserving the natural resources of Lampang Province, it is found that different participation of community development volunteer in training of conserving soil, water, and forest have different in participation in conserving the natural resources by statistical significance at 0.05 level.

12) Advice from Neighbor, State Agricultural Officers and Agricultural Private: Walaiporn Dowsuwan (2533:95) studies local people participation in conserving environments of Swamp Khun Talae . It is found that sample contacting more than twice a month with the government units participate more in conserving environments of Swamp Khun Talae than samples contacting once a month by statistical significance at 0.001 level. Somsak Phoomchuay (2544:58-59) studies knowledge, opinions and practices of farmers relating to preventive chemicals and weed killer in rubber plantations: a case study of Nongkhai Province. It was found that most farmers have low advice on preventive chemicals and weed killer i.e. 39.4 percent of farmers from neighbors, 41.9 percent of them from chief of tambol, 31.5 percent of them from chief of village, 26.6 percent of them from suppliers and 75.5 percent of them from agricultural authority.

Therefore, the research of farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas is intended to study these factors to explicably show the behavior of soil and water conservation, relationship of behaviors on soil and water conservation, and predicting behavior of soil and water conservation, as well as problems and limitations in the areas of land reforms.

CHAPTER III
RESEARCH METHODOLOGY

This is the Analytical Studies in an Cross-Sectional Method having farmers in Nakhon Pathom provincial land reform area as population. The research methodology is as follows

1. Population and Samples
2. Instrumentation
3. Instrument Reliability
4. Data Collection
5. Data Analysis

1. Population and Sample

1.1 Population: they are farmers and responsible mostly on farming in Nakhon Pathom provincial land reform area within 3 districts, i.e. Banglen, Buddhamonthon, and Don Toom. However, this study concentrates on 2 districts , i.e. Banglen, and Buddhamonthon. Rationally, Don Toom houses only 3 families, which is not counted to represent the population. 554 families have been conducted with the area of 10,152,rais, 2 ngarns, and 43.7 square was.

1.2 Sample: a random sampling has been employed as follows

1.2.1 Sample size is based on Taro Yamane (1973, referred in Boontham Kijpredaborisuthi,2542:14) with the following formula

$$n = \frac{N}{1 + Ne^2}$$

Whereas e = error of sampling

N = population size

n = sample size

Solution

$$n = \frac{554}{1 + (554)(0.05)^2}$$

$$= 232.2$$

233 families are sample size

1.2.2 Sampling

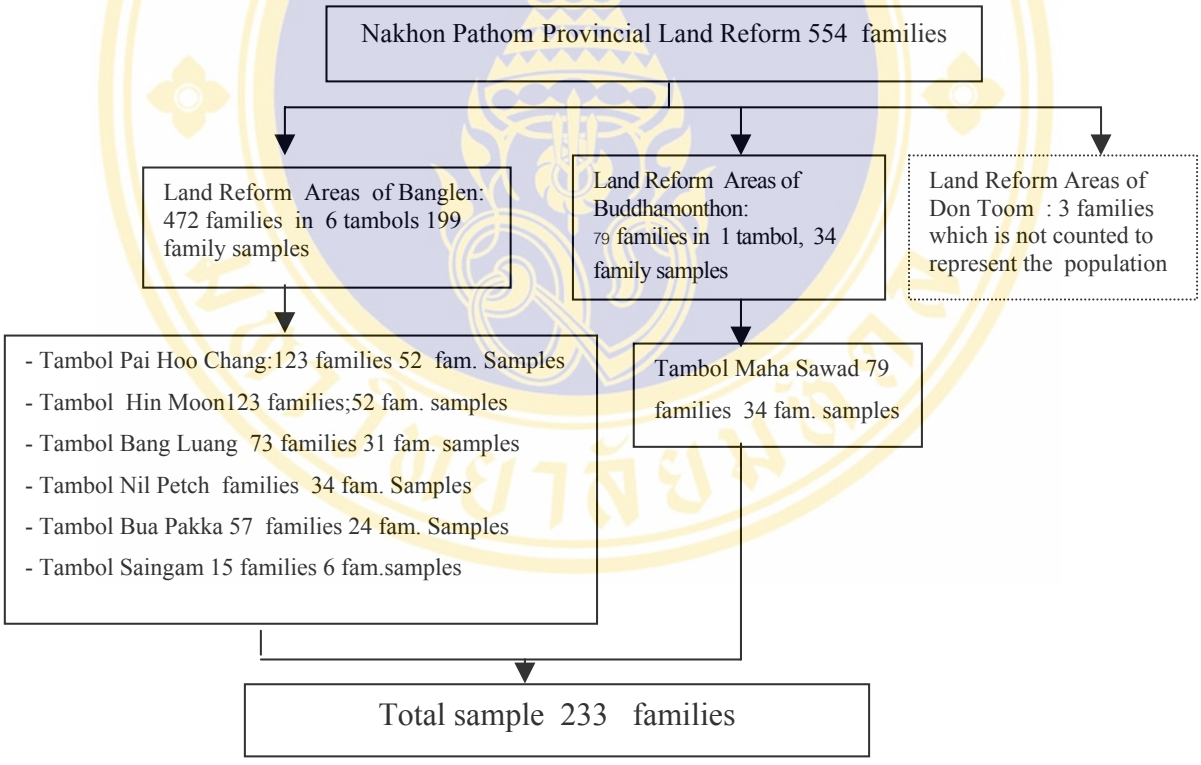


Figure 2 Sampling- Title: Behavior about soil and Water Conservation in Nakhon Pathom Provincial Land Reform Area

Table 2 Population and Samples Distributed by Nakhon Pathom Provincial Land Reform Area

Districts	Pop. (families)	Samples (families)
Banglen	472	199
Buddhamonthon	79	34
Don Toom *	3	-
Total	**554**	**233**

* Don Toom have only 3 family which is not counted to represent the population.

2. Instrumentation

Interview questions has been used in data collection. The researcher reviewed scope of content from textbooks documents theories and related researches.

2.1 Nature of Interview Questions has been divided into 7 parts

Part1 General Backgrounds encompassing number of family members, age, income from cropping, education, duration of land right holding, amount of land holding, participation in agricultural seminar related to soil and water conservation, study tour in agricultural related on soil and water conservation, being membership of agricultural group including 10 close –ended and open-ended questions.

Part2 Knowledge of Soil and Water Conservation encompassing advantages of soil and water, management of soil and water, soil and water conservation with 15 choused questions of 4 itemized answers.

Part 3 Awareness of Soil and Water Conservation encompassing gains from soil and water conservation, needs in soil and water conservation, sentiment towards environmental problems in the area with 14 questions of 5 choices of rating scale , i.e. strongly agree, agree, uncertain, disagree, and strongly disagree

Part 4 Information Resource Related to Soil and Water Conservation encompassing reception resources i.e., television, radio, newspaper, and leaflets with contents related to soil and water conservation, including frequency of receiving, also, it is the open-ended questions.

Part 5 Recommendations from Different Sources on Soil and Water Conservation encompassing advice from neighboring farmers, state agricultural officer , and private agricultural staff. It is the close-ended questionnaire with choices

Part6 Farmers' Behavior on Soil And Water Conservation encompassing management practices of farmers on soil and water conservation, a 12 rating scale questions, i.e. permanently , occasionally, never.

Part 7 Problems and Limitations in soil and water conservation within Nakhon Pathom provincial land reform area. there are 10 open-ended questions with choices.

2.2 Formulation of Interview Questions: Textbooks, journals, researches, and theses related have been reviewed and drafted. The prepared questionnaire has been submitted to thesis advisors for examining the clarity and linguistic validity, content validity as well as comments, recommendations and justification of the questionnaire whether any contents are either positive or negative in testing the awareness and behavior. Later the questionnaire has been returned for further improvements for the Try-out.

3. Instrument Reliability

3.1 Validity has been tested by Face-Validity. The researcher has submitted the questionnaire to the thesis advisors to examine and check the clarity of linguistics, content validity as well as comments and justification of the most accurate items in the interview questions of knowledge, awareness, and behavior. It has later again been improved.

3.2 Checking the Didificullty Index and Discrimination Power by try-out with 30 farmers in areas of land reform , who are not the representative of the sample group. The score and coefficient has later been analyzed.

3.3 Score of Part 2; the knowledge of soil and water conservation has been counted to see probability and values of distribution techniques at 27 percent of choice with the difficulties rating of 0.2-0.8 and distributing the value from 0.2 and over for the actual uses. This calculation is based on following formula (Boontham Kijpredaborisuthi, 2542:91)

$$\text{Didificullty Index (p)} = \frac{P_H + P_L}{2n}$$

$$\text{Discrimination Power (r)} = \frac{P_H + P_L}{n}$$

Whereas n = represents all respondents either the high group or lower group

P_H = represents the high group

P_L = represents the low group

Reliability was tested by formula of KR 20 (Kuder – Richardson (Boontham Kijpredaborisuthi, 2542: 208)

$$r_{tt} = \frac{k}{k-1}\left[1 - \frac{\sum pq}{S_t^2}\right]$$

whereas k = represents itemized number of knowledge interviews

p = represents ratio of correct answers

q = represents of ration wrong answer = $1 - p$

S_t^2 = represents variance of scores.

Reliability of 0.82 has been found with the interview questionnaire

3.4 In Part 3 and Part 6 related to awareness and behavior on soil and water conservation; they have been scored by distribution of values with techniques of 25 percent of the high and low groups. Likert's rating scale has been employed (Boontham Kijpreedaborisuth, 2542:226)

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{S_H^2 + S_L^2}{n}}}$$

Whereas $\bar{X}_H$ = represents average scores of the high group

$\bar{X}_L$ = represents average scores of the low group

S_H^2 = represents variance scores of the high group

S_L^2 = represents variance scores of the low group

n = represents total respondents

Coefficient Alpha of Cronbach has been employed in the test (Boontham Kijpredaborisuthi, 2542:212)

$$r_{tt} = \frac{k}{k-1}\left[1 - \frac{\sum S_i^2}{S_t^2}\right]$$

Whereas k = represents number of item

$\sum S_i^2$ = represents the sum of variance score in each item

S_t^2 = represents variance of sum of score

Coefficient Alpha score are 0.88 and 0.93 when tested awareness and behavior on soil and water conservation in Nakhon Pathom provincial land reform area.

4. Data Collection

Data collection in this research is as follows

4.1 The researcher and the research assistants have conducted a face-to-face interview with farmers.

4.2 8 research assistants are graduate students from Program of Environment, Mahidol University. The researcher has called for meeting to explain the details of data collection. Also, each has pre-experienced the actual data collection with 2 samples to cognize the problems and to seek solution in order that least deviation in data collection would be found.

4.3 In interviewing sample, farmers responsible with mostly area of farming were interviewed. If the farmer did not stay at home, researcher interviewed a farmer who stayed in the same house and was responsible in farming the same area with the same interview questionnaire. Farmers provided additional details or comments related, researcher would be recorded for further benefits.

5. Data Analysis

The researcher checked and scored the interview questionnaire. SPSS (Statistic Package for the Social) was employed as detail follows:

5.1 *The General Background* has been analyzed by percentage.

5.2 *Knowledge of Soil and Water Conservation* has been scored by rating. Meaning, the correct answer gained 1 mark and the wrong gained 0. Then scores are distributed for the score of knowledge. The researcher grouped the level of score based on the Evaluation Criteria of the Ministry of Education as follows:

Percentages	**Scores**	**Interpretation**
80-100	12-15	Good knowledge
60-79	9-11	Moderate knowledge
Less than 60	0-8	Poor knowledge

Find number and percentage of each item and find the standard deviation, mean, highest value and lowest value

5.3 *Awareness of Soil and Water Conservation* has been scored under the following criteria

Choices	**Positive Scores**	**Negative Scores**
Strongly agree	5	1
Agree	4	2
Uncertain	3	3
Disagree	2	4
Strongly disagree	1	5

Then, sum the scores to represent Awareness level, the researcher grouped the level of score based on the Evaluation Criteria of the Ministry of Education as follows:

Percentages	**Scores**	**Interpretation**
80-100	59-70	Good Awareness
60-79	48-58	Moderate Awareness
Less than 60	0-47	Poor Awareness

Find number and percentage of each item and find the standard deviation, mean, highest value and lowest value

5.4 *Information Resource Related to Soil and Water Conservation* has been using number and percentage of each item based on the following criteria.

Frequency	**Scores**
Everyday	4
1-4 times/week	3
1-2 times/month	2
1-2 times/year	1
Never	0

5.5 *Recommendations from Different Sources on Soil and Water Conservation* has been using number and percentage of each item based on the following criteria.

Frequency	**Scores**
1-4 times/week	4
1-2 times/month	3
Every month	2
1-2 times/year	1
Never	0

5.6 *Farmers' Behavior on Soil and Water Conservation* has been scored on each item based on the following criteria.

Choices	**Positive Scores**	**Negative Scores**
Habitual practice	2	0
Occasional practice	1	1
Never practice	0	2

Then, sum the scores to represent ness level, the researcher grouped the level of score based on the Evaluation Criteria of the Ministry of Education as follows:

Percentages	**Scores**	**Interpretation**
80-100	59-70	Habitual practice
60-79	48-58	Occasional practice
Less than 60	0-47	Never practice

Find number and percentage of each item and find the standard deviation, mean, highest value and lowest value.

5.7 *Problems and Limitations* are analyzed by percentage.

5.8 *Pearson's Product Moment Correlation Coefficient* has been used in analyses of relationship among factors related to behavior on soil and water conservation.

5.9 *Stepwise Multiple Regression Analysis* has been used to predict and to prioritize behaviors from variables studied.

CHAPTER IV
RESULTS

This study was to investigate farmers' behavior on soil and water conservation in Nakhon Pathom Provincial Land Reform Areas, the relationship of predisposing, enabling and reinforcing factors affecting farmers' behavior on soil and water conservation. It was to study the capacity in predicting behavior on soil and water conservation, and to study problems, and limitations of behavior on soil and water conservation in Nakhon Pathom Provincial Land Reform Areas, The researcher and her assistants had collected data by using farmers' interview questionnaire. Duration of collection was between 11-19th May 2002. 233 farmers are samples living in Nakhon Pathom Provincial Land Reform Areas. Analyses have been presented combining with Tables as follows

1. General Background
2. Farming Occupation
3. Reception of Information on Soil and Water Conservation
4. Knowledge of Soil and Water Conservation
5. Awareness of Soil and Water Conservation
6. Behavior on Soil and Water Conservation
7. Factors Related Behavior on Soil and Water Conservation
8. Problems and Limitations of Soil and water Conservation in Nakhon Pathom Provincial Land Reform Areas

1. General Background

1.1 Gender:it was found that genders of samples are relative, 50.6 percent of farmers were female farmers, and 49.4 percent of them were male farmers in Table 3

Table 3 Number and Percentage of Farmers Distributed by Gender

Gender	Number	Percentage
Female	118	50.6
Male	115	49.4
Total	233	100.0

1.2 Age: 56.6 percent of farmers were 30-49 years, 15.9 percent of them were less than 30 years, 15.5 percent of them were 50-59 years and 12.0 percent of them were more than 60 years as in Table 4.

Table 4 Number and Percentage of Farmers Distributed by Age

Age	Number	Percentage
Less than 30 years	37	15.9
30 - 39 years	75	32.2
40 - 49 years	58	24.9
50 - 59 years	35	15.0
More than 60 years	28	12.0
Total	233	100.0

1.3 Education: it was found that the most farmers of 38.6 percent finished Primary Grade 4. 34.3 percent of them finished Primary Grade 6, 15.9 percent of them finished Secondary Grade 3, 6.4 percent of them finished secondary Grad 6 or Vocational Certificate or Diploma, 3.4 percent of them were uneducated. The least farmers of 1.3 percent finished bachelor degree and also as in Table 5.

Table 5 Number and Percentage of Farmers Distributed by Education

Education	Number	Percentage
Uneducated	8	3.4
Primary Grade 4	90	38.7
Primary Grade 4	80	34.3
Secondary Grade 3	37	15.9
Secondary Grade 3/Voc. Cert./Dip.	15	6.4
Bachelor degree	3	1.3
Total	**233**	**100.0**

1.4 Number of Family Member: it was found that there were unlikely difference, i.e. 2-4 members and over as in Table 6

Table 6 Number and Percentage of Farmers Distributed by Family Members

Number of Family Members	Number	Percentage
2 persons	66	28.3
3 persons	57	24.5
4 persons	61	26.2
More than 4 persons	49	21.0
Total	233	100.0

2. Farming Occupation

2.1 Income from Cropping before expenses, it was found that the most farmers of 30.4 percent earned 60,000 - 90,000 Baht /year. 27.0 percent of farmers earned 90,000 - 140,000 Baht/year. followed by 13.8 percent of them earned 140,001 - 190,000 Bath/ year, 19.3 percent of them earned more than190, 000 Baht/ year. The least farmers of 9.4 percent earned 60,000 Baht/ year as shown in Table 7

Table 7 Number and Percentage of Farmers Distributed by Income from cropping

Income from Cropping	Number	Percentage
Less than 60,000 Baht	22	9.4
60,000 - 90,000 Baht	71	30.5
90,001 - 140,000 Baht	63	27.0
140,001 - 190,000 Baht	32	13.7
More than 190,000 Baht	45	19.3
Total	233	100.0

2.2 Duration of Land Rights : it was found that the most farmers of 26.6 percent held land 20-24 years, 23.6 percent of them held land 15-19 years, 17.6 percent of them held land more than 30 years, 16.3 percent of them held land less than 15 years and the least farmers of 15.9 percent held land 25-29 years as shown in Table 8

Table 8 Number and Percentage of Farmers Distributed by Duration of Land Rights

Duration of Land Rights Holding	Number	Percentage
Less than 15 years	38	16.3
15 – 19 years	55	23.6
20 – 24 years	62	26.6
25 – 29 years	37	15.9
More than 30 years	41	17.6
Total	233	100.0

2.3 Amount of Land Holding : 37.3 percent of farmers possessed 15-24 rais of lands, 26.6 percent of farmers possessed 25-34 rais, 18.9 percent of farmers were less than 15 rais, and the least farmers of 17.2 percent possessed more than 35 rais as shown in Table 9

Table 9 Number and Percentage of Farmers Distributed by Amount of Land Holding

Amount of Land Holding	Number	Percentage
Less than 15 rais	44	18.9
15 – 24 rais	87	37.3
25 – 34 rais	62	26.6
More than 35 rais	40	17.2
Total	233	100.0

3. Reception of Information on Soil and Water Conservation

3.1 Information Resources on Soil and Water Conservation: 53.2 percent of farmers received information from radio, and 18.5 percent of them never received, 58.4 percent of them received from television and 11.6 percent of them never received, 12.9 percent of them received from newspaper, and 69.5 percent of them never received, 42.9 percent of them received from leaflets and 41.6 percent of them never received, 44.6 percent of them received from different document, and 40.3 percent of them never received as shown in Table 10.

Table 10 Number and Percentage of Farmers Distributed by Information Resources of Soil and Water Conservation

Types	Never		everyday		1 – 4 times / wk		Every month		1 – 2 times / yr	
	n	%	n	%	n	%	n	%	n	%
Newspaper	162	69.5	7	3.0	21	9	30	12.9	13	5.6
Radio	43	18.5	124	53.2	23	9.9	26	11.2	17	7.3
Television	27	11.6	136	58.4	38	16.3	18	7.7	14	6.0
Leaflets	97	41.6	2	0.9	6	2.6	28	12	100	42.9
Different documents	94	40.3	3	1.3	13	5.6	19	8.2	104	44.6

n = 233 samples

3.2 Participation in Agricultural Seminar Related to Soil and Water Conservation :since 2540-2544 seminar organized on farming, new farming, improving soil, acid soil, deteriorated soil, expansion of products, insecticide, aggregated agriculture, and aggregated plantations. It was found that 69.5 percent of them had never attended, 17.6 percent of them had once attended, and 12.9 percent of them had twice attended as shown in Table 11

Table 11 Number and Percentage of Farmers Distributed by Participation in Agricultural Seminar Related to Soil and Water conservation

Participation in Agricultural Seminar Related to Soil and Water Conservation:	Number	Percentage
Never	162	69.5
Once	41	17.6
Twice	30	12.9
Total	233	100.0

3.3 Study Tour Related to Soil and Water Conservation in Agriculture: since2540-2544 study tour had been organized on paddy cultivation, soil improving, plant insecticide, nurturing plants, acidified fertilizing, manure, estate crops and garden crops. 70.8 percent of farmers never joined, 9.4 percent of them once joined, and 19.7 percent of them twice joined as shown in Table 12.

Table 12 Number and Percentage of Farmers Distributed by Study Tour Related to Soil and Water Conservation in Agriculture

Study Tour Related to Soil and Water Conservation in Agriculture	Number	Percentage
Never	165	70.8
Once	22	9.4
Twice	46	19.7
Total	233	100.0

3.4 Being Membership of Agricultural Group : Agricultural and Cooperative Bank, Cooperative of Banglen Land Reform, and Buddhamonthon Land Reform- it was found that 33.9 percent of farmers were members for more than 20 years, 24.0 percent of them were not members, 22.8 percent of them were members for 15-18 years, 9.87 percent of them were member for less than 10 years, and the least farmers of 9.44 percent were for 10-14 years, as shown in Table.

Table 13 Number and Percentage of Farmers Distributed by Being Membership of Agricultural Group

Being Membership of Agricultural Group	Number	Percentage
Never	56	24.0
Less than 10 years	23	9.9
10 – 14 years	22	9.4
15 – 19 years	53	22.8
More than 20 years	79	33.9
Total	233	100.0

3.5 Advice from Neighboring Farmers: i.e. Soil Experts, and Model Farmer – it was found that 18 percent of farmers received 1-2 time from Soil Experts and 80.3 percent of them never received, 34.3 percent of them received 1-2 time from Model Farmers and 59.2 percent of them never received as shown in Table 14

Table 14 Number and Percentage of Farmers Distributed by Advice from Neighboring Farmers

Advisors	Never		1-4 times / week		1-2 times / month		Every month		1-2 times/year	
	n	%	n	%	n	%	n	%	n	%
Soil Experts	187	80.3	-	-	3	1.3	1	0.4	42	18
Model Farmers	138	59.6	6	2.6	6	2.6	3	1.3	80	27.5

n = 233 samples

3.6 Advice from State Agricultural Officers : i.e. Tambol/District Agricultural officers, Land Reform officers, Irrigation officers, Land Development officers, Agricultural College/University officers, and Fishery officers It was found that 27.5 percent of farmers were advised 1-2 times from Tambol/District Agricultural officers and 40.3 percent of them were not advised , 28.8 percent of them were advised every month from Land reform officers and 48.5 percent of them were not advice, 11.6 percent of them were advised 1-2 times from Irrigation officers and 86.3 percent of them were not advised, 11.6 percent of them were advised 1-2 times from Land Development officers and 7.3 percent of them were advised 1-2 times from Agricultural College/University officers and 91.8 percent of them were not advised, 5.6 percent of them were advised 1-2 times from Fishery officers and 94 percent of them were not advised as shown in Table 15.

Table 15 Number and Percentage of Farmers Distributed by Advice from Advice from State Agricultural Officers

Advisors	Never		1-4 times / week		1-2 times / month		Every month		1-2 times/year	
	n	%	n	%	n	%	n	%	n	%
Tambol/District Agricultural officers	94	40.3	5	2.1	9	3.9	61	26.2	64	27.5
Land Reform officers	113	48.5	-	-	15	6.4	67	28.8	38	16.3
Irrigation officers	201	86.3	-	-	5	2.1	-	-	27	11.6
Land Development officers	203	87.1	2	0.9	1	0.4	-	-	27	11.6
Agricultural College/University officers	214	91.8	1	0.4	1	0.4	-	-	17	7.3
Fishery officers	219	94.0	-	-	1	0.4	-	-	13	5.6

n = 233 samples

3.7 Advice from Private Agricultural Staff: NGOs or Volunteers, Fertilizer and Insecticide Substance Salesman, and Foundation or Framing Association. It was found that 4.3 percent of farmers were advised 1-2 times from NGOs or Volunteers and 94.0 percent of them were not advised. 54.5 percent of them were advised 1-2 times from Fertilizer and Insecticide Substance Salesman and 29.6 percent of them

were not advised, 3.0 percent of them were advised 1-2 times from Foundation or Framing Association and 94.0 percent of them were not advised as shown in Table 16

Table 16 Number and Percentage of Farmers Distributed by Advice from Private Agricultural Staff

Advisors	Never		1-4 times / week		1-2 times / month		Every month		1-2 times/year	
	n	%	n	%	n	%	n	%	n	%
NGOs or Volunteers	219	94.0	1	0.4	3	1.3	-	-	10	4.3
Fertilizer and Insecticide Substance Salesman	69	29.6	5	2.1	19	8.2	13	5.6	127	54.5
Foundation or Framing Association	219	94.0	3	1.3	4	1.7	-	-	7	3.0

n = 233 samples

4. Knowledge of Soil and Water Conservation

4.1 The Itemized Knowledge of Soil and Water Conservation, it was found from the study that 73.4 percent of farmers knew that after harvest comes tillage of rice stalks and weeds (No. 9). 68.7 percent of them knew that cropping the same kind of plant deteriorate rich soil (No.2). 63.1 percent of them knew that parched by sun on surface cause faster evaporation (No. 8). 54.1 and 54.9 percent of them knew that rain and wind cause erosion and cover cropping was the preventive method or reduce erosion (No. 3 and 4). 39.9 percent of farmers correctly answer that multi-cropping rotation in the same land enriches the soil (No.5). Soil around erosion by water shallows the water sources, as shown in Table 17

Table 17 Number and Percentage of Farmers Correctly Answer the Knowledge of Soil and Water Conservation

Knowledge of Soil and Water Conservation	Number	Percentage
1. Cause of soil deterioration (B. plant the same crop)	160	68.7
2. Cause of erosion (C. rain and wind)	128	54.9
3. Preventive method for Erosion(C. cover cropping)	126	54.1
4. What measure to keep rich soil (A. multi cropping rotation in the same land)	93	39.9
5. Cause of shallow water resources (C. Soil at water resources erodes)	93	39.9
6.Cause of faster evaporation (C. sunlight parch the s oil surface)	147	63.1
7. Which is correct (A. after harvest come tillage of rice stalk and weeds)	171	73.4
8. Results of negligence to take correctly care the soil (A. Faster de-enrichment of the soil)	109	46.8
9. Results of not preserving water (D. Directly disastrous to soil and crops)	115	49.4
10. Which choice does not directly impact soil and water condition for framing (D. Industrial development)	111	47.6
11. Which choice is incorrect? (B. Using Natural fertilizer (manure, acid fertilizing or bio fertilized) makes crop slowly grow and heavily disturbed by insects.)	115	49.4
12. Nature of acid soil (A. sever acidified soil)	130	55.8

And farmers group of misunderstood - 35.6 percent of farmers misunderstood that soil and water conservation must at all time maintain the same condition, 41.6 percent of them misunderstood that soil with no weeds is deteriorated soil, 51.6 percent of them misunderstood that to prevent plant epidemic was buying chemicals to treat early as sown in Table 18.

Table 18 Number and Percentage of Farmers Answering Wrongly on Knowledge of Soil and Water Conservation

Knowledge of Soil and Water Conservation	Number	Percentage
1. What is the meaning of soil and water conservation?		
. Maintaining soil and water in the same condition at all time (wrong)	83	31.3
. Using soil and water for the highest gains and lasting (correct)	73	35.3
2. What method can farmers prevent plant epidemic/		
. Prepare to buy chemical to kill early (wrong)	119	51.6
. Rotated cropping (correct)	77	33.0
3. How do one know de-enrich soil?		
. Parched surface soil (wrong)	78	33.5
. Unabsorbent surface soil(correct)	42	18.0
. No weeds on surface soil (wrong)	97	41.6

4.2 Scored classifying farmers by knowledge level, it was found that 48.1 percent of them had moderate knowledge, 32.6 percent of them had low knowledge, and 19.3 percent of them had high knowledge the average score of knowledge is 8.2, the standard deviation is 2.9. The lowest score is 1 mark, and the highest score is 15 marks as shown in Table 19.

Table 19 Number and Percentage of Farmers Distributed by Knowledge Level of Soil and Water Conservation

Knowledge Level of Soil and Water Conservation	Number	Percentage
High (12 –15 scores)	45	19.3
Moderate (9 – 11 scores)	112	48.1
Low (1 – 8 scores)	76	32.6
Total	233	100.0

Mean = 8.2. SD = 2.9 lowest = 1, highest = 15

5. Awareness of Soil and Water Conservation

5.1 The itemized awareness of soil and water conservation – it was found that 87.9 percent of farmers agreed with planting beans to nourish soil (No.1). 83.2 percent of them agreed that erosion must be solved and friable and perforate soil was advantageous for cropping (No.2 and 3). 81.9 percent of them agreed that rotated multiple cropping was advantageous for soil conservation (No. 4). 80.2 percent of them agreed that problems of acid soil are required solution (No. 5). 73.8 percent of them agreed that covering soil with straw, and grass was important (No. 6). 68.7 percent of them disagreed that using irrigated water for farming requires no saving of water (No. 7). 57.5 percent of them disagreed that using organic fertilizer do not worth production (No. 8). 54.1 percent of them disagreed that tillage and crop as well as aggregated cropping are not worth (No. 9 and 10). 50.6 percent of them disagreed using bio-fertilizer or insecticide substances extracted from natural substance such as margosa substance to replace chemical is complicated (No.11). At the meantime, farmers who have negative awareness are 47.6 percent of them agreed that it was necessary to set fire straw and plant wastes remaining in the paddy field after harvest (No.13). 52.4 percent of them agreed chemical fertilizer is necessary (No.14) as shown in Table 20

Table 20 Number and Percentage of Farmers Distributed by Awareness of Soil and Water Conservation

Awareness of Soil and Water Conservation	SA		A		U		D		SD	
	n	%	n	%	n	%	n	%	n	%
1. Cropping bean help nourishing soil	63	27.0	142	60.9	20	8.6	5	2.1	3	1.3
2. Erosion requires solution	73	31.3	121	51.9	21	9.0	15	6.4	3	1.3
3. Friable and perforate soil is advantageous for cropping	97	41.6	97	41.6	36	15.5	2	0.9	1	0.4
4. Rotated multiple cropping in land is advantageous of soil conservation	77	33.0	114	48.9	21	9.0	11	4.7	10	4.3
5.Problems of acid soil requires solution	87	37.3	100	42.9	31	13.3	10	4.3	5	2.1
6.Covering soil with straw and grass is important	102	43.8	70	30.0	31	13.3	26	11.2	4	1.7
7* Using irrigated water needs no saving water	25	10.7	32	13.7	16	6.9	134	57.5	26	11.2
8*Using organic fertilizer is not worth	15	6.4	49	21.0	35	15.0	48	20.6	86	36.9

Table 20 (Cont.)

Awareness of Soil and Water Conservation	SA		A		U		D		SD	
	n	%	n	%	n	%	n	%	n	%
9*Tillage and crop is not worth	34	14.6	41	17.6	32	13.7	58	24.9	68	29.2
10*Aggregated farming is not worth	28	12.0	39	16.7	40	17.2	108	46.4	18	7.7
11*Bio-fertilizer or insecticide substance can be extracted from natural substance such margosa substance to replace using chemicals is complicated.	23	9.9	52	22.3	40	17.2	48	20.6	70	30.0
12*Continuing cropping in the same land worth production	22	9.4	46	19.7	57	24.5	52	22.3	56	24.0
13*Set fir straw and plant wastes remains in the field after harvest is necessary.	63	27.0	48	20.6	21	9.0	89	38.2	12	5.2
14*Using chemical fertilizer is necessary for farming	68	29.2	54	23.2	39	16.7	64	27.5	8	3.4

n = 233 samples

SA= strongly agree, A = agree, U = Uncertain, D = disagree, SD = Strongly disagree

* = negative question

5.2 Score levels of awareness about soil and water conservation - it was found that most farmers had moderate awareness or 46.8 percent. The second was less awareness or 28.7 percent and good awareness was 24.5 percent. The average score is 50.1, the standard deviation is 7.1, the lowest score is 36 and the highest score is 63 as shown in Table 21.

Table 21 Number and Percentage of Farmers Distributed by Awareness Scoring about Soil and Water Conservation

Score Level of Awareness	Number	Percentage
High awareness (59 – 70 scores)	57	24.5
Moderate awareness (48 - 58 scores)	109	46.8
Less awareness (0 –47 scores)	67	28.7
Total	233	100.0

Average score = 50.1, SD = 7.1, Lowest score = 36, highest score = 63

6. Behavior on Soil and Water Conservation

6.1 the itemized behavior of soil and water conservation, it was found that 90.6 percent of farmers would tillage and leaved before cropping. (No.2), 79.4 percent of them checked and maintained the bed first before cropping (No.1), 64.8 percent of them covered the soil with crop wastes, straw and sawdust (No.7), 57.1 percent of them used manure only to enrich the soil (No.4), and 52.8 percent of them cultivated paddy field with fruit tree or vegetables (No.10). Sample group who does not behave in soil and water conservation in the following areas. 93.1 percent of farmers cropped the same plant year round (No.8). 87.2 percent of them used the same fertilizer to enrich the soil (No.3), 70.4 percent of them set fire on straw and cropped waste after harvest (No.11). 66. percent of them was tillage and continued cropping after harvest (No.12). 48.9 percent of them cultivated no rotated cropping in the same land (No.8). 48.5 percent of them did not cultivate cover cropping on the land (No.6) as shown in Table 22

Table 22 Number and Percentage of Farmers Distributed by Itemized Behavior on Soil and Water Conservation

Behavior on Soil And Water Conservation	Habitual		Occasional		Never	
	n	%	n	%	n	%
1. Farmers nourish and maintain beds before cropping	129	55.4	56	24	48	20.6
2. Tillage and leave before cropping	170	73.0	41	17.6	22	9.4
3.* Use chemical fertilizer to enrich the soil	122	52.4	81	34.8	30	12.9
4. Use the same chemical fertilizer to enrich the soil	33	14.2	100	42.9	100	42.9
5. Farmers cultivate cover cropping in the land	11	4.7	102	43.8	120	51.5
6. Farmers cultivate rotated crops in the land	11	4.7	103	44.2	119	51.1
7. Farmers cover soil with crop wastes, straw, and sawdust in the land	26	11.2	125	53.6	82	35.2
8.* Farmers cultivate the same crop year round in the land	123	52.8	94	40.3	16	6.9
9. Farmers raise fishes in the paddy field	19	8.2	71	30.5	143	61.4
10. Farmers cultivate paddy with fruit trees and vegetables	32	13.7	91	39.1	110	47.2
11.*After harvest, farmers set fire the straw or crop wastes in the land	108	46.4	56	24.0	69	29.6
12.* After harvest farmers tillage and continue cropping	114	48.9	41	17.6	78	33.5

** = negative question , n = 233 samples*

6.2 Levels of farmers' behavior on soil and water conservation - it are found that the most farmers had negative behavioral scoring level or 55.8 percent. The second is moderate or 44.2 percent and the positive had not score. The average scores are 9.4, the standard deviation is 5.9, the lowest scare is 0 and the highest scores are 18 as shown in Table 23.

Table 23 Number and Percentage of Farmers Distributed by Behavioral Scoring Level of Soil and Water Conservation

Behavioral Scoring Level of Soil and Water Conservation	Number	Percentage
Positive (19 – 24 scores)	0	0
Moderate (14 – 18 scores)	103	44.2
Negative (0 – 13 scores)	130	55.8
Total	233	100.0

Average scores = 9.4, the standard deviation = 5.2, the lowest score = 0 and the highest scores = 18

7. Factors Related Behavior on Soil and Water Conservation

Factors Related Behavior on Soil and Water Conservation, Analysis of correlation between variables and the soil and water conservation has been determined as follows:

Independent Variables

X1 Gender
X2 Age
X3 Number of family members
X4 Income from cropping
X5 Amount of land holding
X6 Duration of land rights
X7 Education
X8 Knowledge of soil and water conservation
X9 Awareness of soil and water conservation
X10 Information resources of soil and water conservation
X11 Advice from neighboring farmers
X12 Advice from state agricultural officer

X13 Advice form private agricultural staff

X14 Being membership of agricultural group

X15 Participation in agricultural seminars related to soil and water conservation

X16 Study tour related to soil and water conservation in agriculture

Dependent Variable

Y Behavior on soil and water conservation

Table 24 Correlation Between Variables and Behavior on Soil and Water Conservation

Variables	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	Y
X1	1.000	-.189**	-.182**	-.096	-.111*	-.002	.203	-.038	-.080	.019	-.149*	-.007	.203	.036	-.050	.056	-.034
X2		1.000	.137	.111	.144*	.057	.543***	-.442***	-.202**	-.145*	-.054	-.168**	-.112*	077	-.053	.068	-.075
X3			1.000	.048	.111*	.006	.011	-.053	.077	.080	.052	.132*	.038	.037	.165*	-.109	.199**
X4				1.000	.845***	.254***	.099	-.097	-.234***	-.125*	-.076	-.170**	-.027	.071	-.151*	-.080	-.194**
X5					1.000	.254***	.136*	-.097	-.258***	-.011	-.098	-.174**	-.016	.083	-.116	-.097	-.164*
X6						1.000	.126*	.001	-.094	-.078	-.012	-.089	.008	-.127	-.007	-.070	-.185**
X7							1.000	-.154*	-.286*	-.180*	-.086	-.116*	-.042	-.084	-.025	-.000	-.190
X8								1.000	.197**	.159**	-.004	.104	-.154**	.013	.055	.011	.180**
X9									1.000	.347***	.225***	.223***	-.068	.090	.045	-.042	.620***
X10										1.000	.265***	.384***	.248***	.232***	.133*	.096	.432***
X11											1.000	.421***	.426***	-.069	.051	-.035	.255***
X12												1.000	.370***	.109	.087	-.002	.345***
X13													1.000	.082	.050	.061	.056
X14														1.000	.175**	.452**	.201**
X15															1.000	.449***	.066
X16																1.000	-.001

* *statistical significant at 0.05 level* ** *statistical significant at 0.01 level* *** *statistical significant at 0.001*

From Table 24, it was found that independent variables pertaining each pair of predisposing factors, enabling factors, and reinforcing factors has statistically related with behavior on direction and relationship as follows

Positive Relationship

1. Number of family members had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

2. Knowledge of soil and water conservation had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

3. Awareness of soil and water conservation had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.001 level.

4. Information resources of soil and water conservation had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

5. Being membership of agricultural group had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

6. Advice from neighboring farmers had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.001 level.

7. Advice from state agricultural officer had positive correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.001 level.

Negative Relationship

1. Amount of land holding had negative correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.05 level.

2. Duration of land rights had negative correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

3. Income from cropping had negative correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level.

No Relationship

1. Gender had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

2. Age had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

3. Education had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas.

4. Participation in agricultural seminars related to soil and water conservation had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

5. Study tour in agricultural related to soil and water conservation had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

6. Advice from private agricultural staff had no correlation with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas

With Stepwise Multiple Regression Analysis to know which independent variables have relationship with behavior on soil and water conservation as shown in Table 25.

Table 25 Multiple Regression Analysis of Factors Relating Farmer's Behavior on and Water Conservation in Nakhon Pathom Provincial Land Reform Areas

Variable	R	R^2	R^2 adj	B	Beta	t	Sig
Model 1. Stable value	.620	.384	.381	-13.236		-6.950	.000
X9				.451	.620	12.003	.000
Model 2. Stable value	.662	.438	.433	-13.001		-7.133	.000
X9				.389	.534	10.131	.000
X10				.359	.247	4.686	.000
Model 3. Stable value	.677	.458	.451	-12.603		-7.001	.000
X9				.378	.518	9.939	.000
X10				.281	.193	3.504	.001
X12				.295	.155	2.925	.004
Model 4 Stable value	.688	.473	.456	-13.977		-7.531	.000
X9				.373	.513	9.944	.000
X10				.277	.190	3.498	.000
X12				.268	.141	2.674	.008
X3				.479	.126	2.587	.010
Model 5 Stable value	.697	.486	.475	-12.099		-6.034	.000
X9				.368	.505	9.863	.000
X10				.272	.187	3.467	.001
X12				.254	.133	2.557	.011
X3				.489	.128	2.665	.008
X6				-.076	-.112	-2.342	.020

From Table 25, it was interpreted as follows studying 16 independent variables which were predisposing factors, enabling factors, and reinforcing factors by applying Stepwise Multiple Regression Analysis, they predicted behavior on soil and water conservation in 5 models as follows:

Model 1 $Y = 0.451X9 - 13.23$

$R^2 = 38.4$ R^2 adj = 46.4 Sig .000

Applying Stepwise Multiple Regression Analysis, it was found that awareness of soil and water conservation has highest value at 38.4 percent by statistical significance at 0.001 level and co-predict behavior on soil and water conservation at 46.4 percent.

Model 2 $Y = 0.389X9 + 0.359X10 - 13.23$

$R^2 = 43.8$ R^2 adj = 43.3 Sig .000

Applying Stepwise Multiple Regression Analysis, it was found that awareness of soil and water conservation has highest value and the second is information resources of soil and water conservation at 43.8 percent by statistical significance at 0.001 level and co-predict behavior of soil and water conservation at 43.3 percent.

Model 3 $Y = 0.378X9 + 0.281X10 + 0.268X12 - 12.603$

$R^2 = 45.8$ R^2 adj = 45.1 Sig .000

Applying Stepwise Multiple Regression Analysis, it is found that awareness of soil and water conservation has highest value and the second is information resources of soil and water conservation and advice from state agricultural officers at 45.8 percent by statistical significance at 0.001 level and co-predict behavior of soil and water conservation at 45.1 percent

Model 4 $Y = 0.373X9 + 0.277X10 + 0.268X12 + 0.479X3 - 13.977$

$R^2 = 47.3$ R^2 adj = 46.4 Sig .000

Applying Stepwise Multiple Regression Analysis, it was found that awareness of soil and water conservation has highest value and the second was information resources of soil and water conservation, advice from state agricultural officers and number of family members, respectively at 47.3 percent by statistical significance at 0.001 level and co-predict behavior of soil and water conservation at 46.4 percent

Model 5 $Y = 0.368X9 + 0.272X10 + 0.254X12 + 0.489X3 - 0.076X6 - 12.099$

$R^2 = 48.6$ R^2 adj = 47.5 Sig .000

Applying Stepwise Multiple Regression Analysis, it was found that awareness of soil and water conservation had highest value and the second was information resources of soil and water conservation, advice from state agricultural officers, number of family members, and duration of land rights respectively at 48.6 percent by statistical significance at 0.001 level and co-predict behavior of soil and water conservation at 47.5 percent

8. Problems, Limitations of Soil and water Conservation in Nakhon Pathom Provincial Land Reform Areas

Farmers in Nakhon Pathom Provincial Land Reform Areas meet problems and limitations of soil and water conservation that more than 80 percent of farmers meet with insect diseases and low production, and soil such as acid soil, low enrich soil, and inadequacy of fund and problems of using chemicals for prevention and insecticide. More than 50 percent of farmers meet with problems of enriching soil, inadequacy of good breed, and inadequacy of farming water resources. 70.8 percent of farmers had no problems with inadequacy of workforce as shown in Table 26.

Table 26 Number and Percentage of Farmers Distributed by Problems and Limitations of Soil and Water Conservation

Problems	Problem		No Problem	
	n	%	n	%
1 Insect disease and plant enemy	221	94.9	12	5.2
2. low production	220	94.4	13	5.6
3. Soil problem such as acid soil	204	87.5	29	12.4
4. low enrich soil	199	85.4	34	14.6
5. inadequacy of fund	199	85.4	34	14.6
6.Problems arisen from chemicals for insect prevention and insecticide	188	80.7	45	19.3
7. Problem of enriching soil	183	78.6	50	21.5
8. Inadequacy of crop breed	158	67.8	75	32.2
9. Inadequacy of farming water resources	137	58.8	96	41.2
10. Problems of inadequacy of workforce	68	29.2	165	70.8

n = 233 samples

CHAPTER V
DISCUSSION

This study tells farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas and factors of predisposing, enabling and reinforcing related to soil and water conservation as well to realize the nature of problems and limitations of soil and water conservation in Nakhon Pathom provincial land reform areas. Discussions are as follows.

1. Factors Related to Behavior on Soil and Water Conservation

1.1 Gender: it is found that there is no statistical relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas. It is likely that at present the male and female genders have no different responsibility toward the family. Also, the family must help each other in farming beds. Rationally, farming occupation in Thai society is counted as family occupation that collaborations are required. It is corresponded with the study of Sumna Yuadying (2544:93) on people behavior in prevention and solution of waterway pollution in River Chao Praya: a case study of Tambol Khor Kled, Amphoe Pak Kled, Pathumthani Province, it is found that male and female samples have no difference in behavior of prevention and solution of waterway pollution in River Chao Praya. It is also corresponded with the study of Preecha Majaroen (2540:116) on people behavior in conserving River Ma Klong: a case study of Amphoe Pho Tharam, Ratchaburi Province, which is found that gender does not make differences in the behavior of conserving River Ma Klong:

1.2 Age: it is found that there is no statistical relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas. It shows that in this study, the age is irrelevant to relationship with farmers'

behavior on soil and water conservation. Whether young or aged has similar behavior on soil and water conservation. It is corresponded with the study of Phongsakorn Maharak (2536:141) studies knowledge and farmers' practices of soil and water conservation: a case study of Sa-phue Tai village, Amphoe Phibul Mangsaharn, Ubonratchathani Province that age has no relationship with practices on soil and water conservation. It also corresponded with the study of Samruay Saengdara (2541: 80) on factors affecting farmers' behavior of danger prevention from plant killing enemy among the risk group, Khon Khaen Province, which is found that age has no relationship with farmers' behavior on danger prevention from plant killing enemy among the risk group.

1.3 Number of Family Member: it is foundout that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas, by statistical significance at 0.001 level. Rationally, family members share occupation, i.e. assisting the work achievement in farming beds since the beginning till the end. Also, members can advise related to farming rather than only by workforce. Activity participation depends on family members help decision-making and its completion. Had members united, it affected more to the activities. It is corresponded with the study of Songphol Saengprakai (2544:134) studies local people's behaviors of natural resource and environmental conservation: a case study of Swamp Borrapet, Nakhon Sawan Province, which find that different family members have no difference in behavior on conserving the nature and environment of Swamp Borrapet, Nakhon Sawan Province.

1.4 Income from Cropping :it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas, by statistical significance at 0.01 level. Rationally, farmers are still attaching with income rather than practice on soil and water conservation. By reasons, it is likely based on the inadequacy of cost of production, expenses or debt or information reception or public relation. It is corresponded with the study of Songphol Saengprakai (2544:134) studies local people's behaviors of natural resource and environmental conservation: a case study of Swamp Borrapet, Nakhon Sawan

Province, which find that different monthly income have no difference in behavior on conserving the nature and environment. Meaning, samples with average monthly income of 1,500 Baht, and below, have behavior on conserving the nature and environment of Swamp Borrapet, with mean of 80.22. Samples with monthly income of 1,501- 4,900 and higher have means of 78.48 and 77.24 respectively.

1.5 Education: it is found that there is no statistical relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas. Rationally, the soil and water conservation requires experiences of farming and most samples earn Primary level, which turns unlikely different. Further contemplation on duration of possession, i.e. more than 20 years, it is likely support that farmers must have experience in soil and water conservation. It is corresponded with the study of Phongsakorn Maharak (2536:142) studies knowledge and farmers' practices of soil and water conservation: a case study of Sa-phue Tai village, Amphoe Phibul Mangsaharn, Ubonratchathani Province that education has no relationship with practices of soil and water conservation. It also corresponded with the study of Samruay Saengdara (2541: 80) on factors affecting farmers' behavior of danger prevention from plant killing enemy among the risk group, Khon Khaen Province, which is found that education has no relationship with behavior on danger prevention from plant killing enemy among the risk group.

1.6 Knowledge of soil and water conservation: it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas, by statistical significance at 0.01 level. It is corresponded with the study of Praphapen Suwan (referred in Samruay Saengdara,2541:43) says that knowledge principally shares to generate understanding, motivation, and capacity to behave. Rationally, having the precise knowledge will lead to know how to behave. Enchanting knowledge will also leverage behaving either directly or indirectly. Th more precise of knowing in this affairs the more it plays key part to arouse individual behaving. It is corresponded with Green et al. (1980, referred in Samruay Saengdara,2541:84) state that the Predisposing Factors are one of the factors related and drive human behaving. Contemplating testing

knowledge from interview questions, samples have moderate knowledge or 78.06 percent .Further , it is corresponded with the study of Samruay Saengdara (2541: 80) on factors affecting farmers' behavior on danger prevention from plant killing enemy among the risk group, Khon Khaen Province, which find out that knowledge of danger from plant killing enemy has relationship with behavior on danger prevention from plant killing enemy among the risk group by statistical significance at 0.05 level. Also, Somsak Phumchuay (2544:79) studies knowledge, opinions and practices of farmers relating to preventive chemicals and weed killer in rubber plantations: a case study of Nongkhai Province. It is found that knowledge has relationship with practices of farmers relating to preventive chemicals and weed killer in rubber plantations by statistical significance at 0.01 level.

1.7 Awareness of soil and water conservation: it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas by statistical significance at 0.001 level. Good (1973:54) said awareness is referred to behaving of knowledge creation or being responsible for different problems. Awareness therefore happens from duration and frequency of perception or from attentiveness to value the thing. It is corresponded with the study of Chorthip Tanthavee (2532:101) studies perceptions and consciousness of preventive insecticide in residence of Elementary 6, Amphoe Muang, Nakhon Pathom Province. It is found that perceptions and awareness have positive relationship with awareness about preventive insecticide in residence of Elementary 6 by statistical significance at 0.01 level.

1.8 Amount of land holding :it is found out that there is negative relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.05 level. Less amount of land holding has behavior on soil and water conservation of the basis that farmers in land reform areas are allocated the land of not more than 50 rais. However, in Nakhon Pathom provincial land reform areas, most have been allocated not more than 50 rais. More than these are additional leasing for earning or buying. More land needs more investment, more expenses and more debt. Production curtails soil and water

conservation. On the contrary, had there been less areas of land, there would be more time for farmers to more secure exploitation in their land. It is corresponded with the study of Cherdsakdi Chaleosilp (2541: 98) studies farmers' behaviors on using insect protective chemicals in Amphoe Sampran, Nakhon Pathom. It is found that farmers with 5-10 rais have the most precise behaviors on using insect protective chemicals. The second is farmers with less than 5 rais. Testing by the statistical significance, it is found out those different areas of cropping cause different behaviors of using insect protective chemicals by statistical significance at 0.01 level.

1.9 Duration of land rights :it is found out that there is negative relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01 level. Meaning, less duration of land rights holding have behavior on soil and water conservation. Contemplating Nakhon Pathom provincial land reform areas since 2520 for 26 years, which is not less duration for farmers in farming. There are 33.5 percent of farmers possess more than 25 years. Those possess for 1-24 year therefore have behavior on soil and water conservation, which is relevant to amount of land holding .

1.10 Information resources of soil and water conservation: it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.1 level. Rationally, information of environment is widespread as well as by radio, television, newspaper, journals, books, and other printed matters affecting information pursuant acquire knowledge about environment resulted the trails of soil and water conservation. It is corresponded with the study of Somsak Phumchuay (2544: 79) studies knowledge, opinions and practices of farmers relating to preventive chemicals and weed killer in rubber plantations: a case study of Nongkhai Province. It is found out that perception on information resources of using to preventive chemicals and weed killer has positive relationship with practices of farmers relating to preventive chemicals and weed killer in rubber plantations by statistical significance at 0.1level. Also, the study of Sanchai Soodhiphanwiharn (2539:69) on people participation on problems of waterway pollution from community: a case study of Phuket

Municipality, and it is found that receiving information has relationship with all activity participation by statistical significance at 0.05 level.

1.11 Being Membership of Agricultural Group: it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas by statistical significance at 0.01level. Rationally, applying to be members will change behavior to follow influential group and allowing members more sharing in activities. It is corresponded with the study of Anuphong Pianprai-ngarm (2543:134) on factors affecting people participation in reducing problems of environmental public health: a case study of Amphoe Chiangkham, Payao Province. It is found that participation of community activities share reducing problems of environmental public health by statistical significance at 0.001level. Also, Udom Yaemchuenphong (2537:89) studies participation of Tambol Council Board in conserving River Ta Chin: a case study of River Ta Chin, Amphoe Nakhon Chaisri, Nakhon Pathom Province. It is found that being member of village scouts and cooperative members affecting the participation of conserving water resources, River Ta Chin, by statistical significance at 0.001level.

1.12 Participation in agricultural seminars related to soil and water conservation: it is found out that there is no relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. Contemplating research results, it is found that most samples or 69.5 percent do not attend. It is unlikely inadequate of public relation in persuading to attend training or lack of coordination between agricultural officers or workplaces related to farmers or the involved workplaces may have no budget for drawing farmers to attend the training and seminars. Also, the farmers themselves may lack interest unrealizing their benefits. It contradicts with the study of Anuphong Pianprai-ngarm (2543:135) on factors affecting people participation in reducing problems of environmental public health: a case study of Amphoe Chiangkham, Payao Province. It is found that different training has different share in reducing problems of environmental public health by statistical significance at 0.001 level.

1.13 Study tour related to soil and water conservation in agriculture: it is found out that there is no relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. Contemplating research results, is found that most samples or 70.8 percent of farmers never join study tour. It is similar to item 12 by reasons.

1.14 Advice from neighboring farmers, and state agricultural officers: it is found out that there is positive relationship with farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas by statistical significance at 0.01level. Being advised by experts and experienced drive individual faster perception acceptance leading to behaving the thing. It is corresponded with the study of Wilaiporn Somboonchai (2534:97) on participation of community development volunteer in conserving the natural resources of Songkhla Province. It is found that the population supported by officers for more than 4 times a month more participate in conserving the natural resources than the group of supported by officers for 1-3 times/ month by statistical significance at 0.01 level. Walaiporn Dowsuwan (2533:84) studies local people participation in conserving environments of Swamp Khun Talae . It is found that samples contacting officers more than twice a month participate in conserving environments of Swamp Khun Talae more than the samples contacting officers once a month or never by statistical significance at 0.001 level.

1.15 Advice from private agricultural staff: it is found out that there is no relationship with farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas. Rationally, the staff first concerns the company benefits, therefore, it is difficult to fully promote knowledge. Whereas volunteers or foundation have not been found in this land reform area, which might cause no relationship with farmers' behavior.

Therefore, factors relating behavior on soil and water conservation are number of family members, knowledge about soil and water conservation, awareness about soil and water conservation, information resources of soil and water conservation,

being membership of agricultural group, advice from neighboring farmers, advice from state agricultural officers, amount of land holding, duration of land rights holding and income from cropping.

2. Behavior on Soil and Water Conservation in Nakhon Pathom Provincial Land Reform Areas

It was found that most sample or 55.8 percent of farmers have negative behavior on soil and water conservation. Meaning, there is low treatment of soil and water conservation. By study, it is likely come from perception of information on soil and water conservation from different resources, such as resources of information (newspaper, radio, television, leaflets, books, printed matter or different documents). It includes attending training and seminars or study tour related to soil and water conservation. Farmers are least recommended. Rationally, perception information is vital and it is a process to behaving (Wimolsith Harayangkull, 2526:76-77) . It is corresponded with Sumna Yuadying (2544:77) on people behavior in prevention and solution of waterway pollution in River Chao Praya: a case study of Tambol Khor Kled, Amphoe Pak Kled, Pathumthani Province, it is found that samples have low behavior. Also, Duangduan Wanichajiva (2538:83) studies knowledge, attitudes, and practices in soil and water conservation in vocational students of Agriculture Program of Education Region 5. It is found that students have moderate knowledge, positive attitudes but fewest practices.

Therefore, this investigation shows that farmers in Nakhon Pathom Provincial land reform areas have not treated soil and water conservation, which is referred to have no behavior on soil and water conservation.

3. Factors Relating Prediction of farmers' behavior on soil and water conservation in Nakhon Pathom Provincial land reform areas

It is found that there are 5 predictors foreseen behavior on soil and water conservation by statistical significance at 0.001 level. They are, awareness of soil and water conservation, information resources of soil and water conservation, advice from

state agricultural officers, number of family members, and duration of land rights, which co-predict behavior on soil and water conservation at 47.5 percent. Even, income from cropping, knowledge of soil and water conservation, amount of land holding, being membership of agricultural group, and advice form neighboring farmers, have relationship with behavior on soil and water conservation but cannot predict behavior on soil and water conservation behavior. Rationally, those variables have least values of relationship of behavior on soil and water conservation.

This investigation support theory PRECEDE Framework of Lawrence W. Green that the researcher has modified in her research by exploiting predisposing factor, enabling factor and reinforcing factors to discern and assess behavior of soil and water conservation. It is found that the predisposing factors are the foundation driving motivation in behaving by determining them as gender, education, number of family member, knowledge of soil and water conservation, and awareness of soil and water conservation. From the study, it is found that awareness about soil and water conservation and number of family member have highest influence over behavior on soil and water conservation. At the meantime, the enabling factors, which is the vital resources in individual behaving and is skills that can help individual behaving. They are information resources on soil and water conservation, duration of land rights holding, amount of land holding, participation in agricultural seminars related on soil and water conservation, study tour related on soil and water conservation in agriculture, and being membership of agricultural group. It is found that the information resources on soil and water conservation and duration of land rights have the highest influence over the behavior on soil and water conservation. Finally, the reinforcing factors are things that people gain or expect to receive from other caused by one own behaving, which is resulted in supporting or deterring individual behavior. They are advice from state agricultural officers, advice from private agricultural staffs, and advice from neighbor farmers. The advice from state agricultural officers has highest influence over the behavior on soil and water conservation. Therefore, theory of PRECEDE Framework has been applied in discernment and assessment of the behavior on soil and water conservation. It is obvious that factors defined by the researcher affect the behavior on soil and water conservation, which are advantageous to the investigation. It is corresponded with the study of Samruay Saengdara (2541:

100) on factors affecting farmers' behavior on danger prevention from plant killing enemy among the risk group, Khon Khaen Province, which the results have supported the theory of PRECEDE Framework of Lawrence W. Green.

4. Problems and Limitations of Soil and Water Conservation in Nakhon Pathom Provincial Land Reform Area

It is found that most farmers critically face problems and limitations from soil in cropping, low production, inadequacy of fruitful breed, chemical of preventing and kill crop enemy, and inadequacy of fund. These problems not only farmers must help themselves. The land reform authority has key duty in pursuing viability from the land. There should be coordination between workplaces involved to assist and supervise emphasizing promotion of precise knowledge and advantages to be exploited in the land rather than production. It should emphasize environment on account of environment precisely being exploited will be lucrative in all aspects such as soil, water, crop enemy, production, capital, expenses and even debt.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

This investigation is to study farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas. It is to study predisposing factors , enabling factors, and reinforcing factors related behavior on soil and water conservation., and to employ different factors related to predict behavior on soil and water conservation. It also includes the investigation of problems and limitations in soil and water conservation in Nakhon Pathom provincial land reform area.

233 samples are farmers in Nakhon Pathom Provincial land reform area, i.e. Banglen district and Buddhamonthon district. Interview questionnaire is instrument in data collection under the examination of Content Validity by thesis Advisors. Also, the reliability of the questionnaire contains the interview on knowledge, awareness and behavior on soil and water conservation r = 0.82, 0.88 and 0.93 respectively. Data collection has been conducted during 11-19th May 2545 and has been analyzed with computer programme. The investigation is concentrated on general background of samples. Variables are income from cropping, duration of land rights, information resource on soil and water conservation, participation in agricultural seminars, study tour in agricultural related on soil and water conservation, being membership of agricultural group, advice from neighboring farmers, advice form state agricultural officer, and advice from private agricultural staff, as well as knowledge, awareness and behavior on soil and water conservation. Statistical applications are percentage, mean, and standard deviation. Pearson's Product Moment Correlation Coefficient is used in analysis of each variable relationship. Stepwise Multiple Regression Analysis is used to predict and to prioritize behaviors from variables studied.

1. Conclusions

From the investigation of farmers' behavior on soil and water conservation in Nakhon Pathom provincial land reform areas, detail are found as follows:

1.1 General background; 233 farmers were samples, with 115 or 49.4 percent were male and 118 or 50.6 percent were female, 31.3 percent of farmers were 30-39 years old, 38.6 percent or 90 farmers finished primary 4, 28.3 percent of farmers were house family member of 2 persons.

1.2 Farming occupation: annual income before expenses were 30.4 percent of farmers earned 60,000-90,000 Baht, 26.6 percent of farmers held the land holding 20-24 year, 37.3 percent of farmers possessed 15-24 rias

1.3 Reception of information on soil and water conservation: farmers receive information by 58.4percent from television, 53.2 percent from radio, 27.5 percent receiving advice from tambol/ district agricultural officers, 16.3 percent from land reform officers, 54.5 percent from fertilizer and insecticide or weed killers salesman. since 2540-2544, 12.9 percent of farmers have participation in agricultural seminars twice, 19.7 percent of farmers join study tour in agricultural related on soil and water conservation twice. 33.91 percent of farmers are membership of agricultural group such as Bank of Agriculture and Cooperative, cooperative of Banglen and Buddhamonthon for more than 20 years.

1.4 Knowledge of soil and water conservation: from full scores of 15, the average was 8.2 scores. When being classified into 3 levels it is found that 19.3 percent of farmers had high knowledge, 48.1 percent of farmers were moderate and 32.6 percent of farmers were less knowledge.

1.5 Awareness of soil and water conservation: from full scores of 70, the average was 50.1 scores. When being classified into 3 levels it is found that 24.5 percent had high awareness, 46.8 percent were moderate and 28.7 percent were less .

1.6 Behavior on soil and water conservation: from full scores of 24, the average was conservation, 9.4 scores. When being classified into 3 levels it was found that 55.8 percent had negative behavior of soil and water and 44.2 percent were moderate

1.7 Factors relating to behavior on soil and water conservation: It was found that the awareness of soil and water conservation, the advice from neighboring farmers and state agricultural officers have positive relationship with behavior on soil and water conservation by statistical significance at 0.001 level. The number of family members, knowledge of soil and water conservation, amount of land holding, information resource, and being membership of agricultural group, have positive correlation with behavior on soil and water conservation by statistical significance at 0.01 level. At the meantime, duration of land rights holding had negative correlation with behavior on soil and water conservation by statistical significance at 0.05 level.

1.8 Analysis on relationship of variables and behavior on soil and water conservation using Stepwise Multiple Regression Analysis to best co- predict behavior on soil and water conservation, and it was found out that there are 5 variables, i.e. Awareness of soil and water conservation, information resource in soil and water conservation, advice from state agricultural officers, number of family members, and duration of land rights can co-predict behavior on soil and water conservation at 47.5 percent by statistical significance at 0.001 level.

1.9 Problems and limitations of farmers in Nakhon Pathom Provincial land reform areas were found that most critical problem faced was : 94.9 percent of farmers were insect and plant killers, 94.4 percent of farmers were the low production, 87.5 percent of farmers claimed acid soil, 85.4 percent of farmers was low rich soil. Also, there was problem of inadequacy of fund, problems of preventive chemicals and insecticide substance, enriching soil, inadequacy of fruitful breed, and inadequacy of water resources for farming.

2. Recommendations from Studied

2.1 It is found that the awareness of soil and water conservation, is the best predictor of behavior on soil and water conservation and the knowledge of soil and water conservation, is moderate. However, contemplating level of practices the behavior on soil and water conservation, it is found wit negative practices. Reasons are likely as follows:

2.1.1 *Income from cropping* is critical to behavior on soil and water conservation on the basis that farmers have burden on expenses from framing, i.e. the each investment. Therefore, overlooking the criticality of farming, which is enrich soil and water is the cost reduction. Therefore, the more income the more are expenses. It is found that income has relationship with behavior on soil and water conservation by statistical significance at 0.01 level. The less income have behavior on soil and water conservation. Publicity is vital particularly if it is media. Publicity by oneself is building credential. If they were authority such as Tambol agriculturist, District agriculturist, Land reform officer or the well-informed person, they could have been key part to drive farmers cultivate better behavior on soil and water conservation.

2.1.2 *Environment in farming*: farming in Nakhon Pathom provincial land reform areas finds no problems of water. Therefore, most farmers with many areas of land (land reform and leasing) need increasing production for income by continuing cultivate land at full fetch. There is no time to correctly enrich the soil. They emphasize improper technology discarding long-term gains to their lands. From interview of non-stop cultivating such as whether 3 times a year on paddy field, which gain more than once or twice a year. the answers of the farmers are “uncertain”. However, reflecting at present, paddy field has been cultivate 3 times a year but the production is equal to 2 times or one time a year. But they still insist because other have also done the same. Environment caused by farming is critical to generate soil and water conservation. As mention above, the publicity is key and other such as training, seminar, and study tour on farming. Rationally, not only gaining advantageous knowledge but allow farmers open their correct worldviews and creativity and usefulness. It exposed them to experiences to properly know the pros

and cons and new approaches. It is found from the study that few farmers only 12.9 percent or 19.7 percent attend training, seminar, and study tour.

2.1.3 *Having supports or promotion* from workplaces of both government and private sectors particularly the Land Reform Office. Not only allocating the land for farmers but also vital to pursue viability of the farmers. Interviewing farmers in some areas and it is found that there is no any officers from any office to promote and to encourage. Whatever, it has been done is similarly done. Many officers visit some areas and they rather emphasize career outside farming or otherwise emphasizing distribution of tree or domestic animals which some farmers do not want and improper to the locality, which turn to be burden. Coordination should therefore be made with involved workplaces in promotion and career development in major career of the locality particularly the appropriateness and practicality. Low cost but high returns should be focused. Using correct technology will not harm environments. Significantly, develop the farmers themselves emphasizing knowledge-creation in order to develop awareness to accurately apply knowledge and substantial to the environment.

3. Recommendations for Further Studies

3.1 There should be investigation of problems and limitations related to knowledge enhancement, public relation on soil and water conservation of the Agricultural Promotion Office or person concerned to seek solutions.

3.2 There should be training course for farmer leader in relation to soil and water conservation communicable for the farmers' usefulness in the locality.

3.3 Training for Land Reform Officer should be organized on soil exploitation emphasizing environment conservation for the purpose of understanding the nature of their performance and local farming

3.4 Factors relating to behavior on soil and water conservation a should be added such as expenses of farming, debt, nature of locality, such as basin and slope and so on including the additional suggestions of farmers.

BIBLIOGRAPHY

Bloom,B.S., et al.(1975). Taxonomy of Educational objectives Textbook I : Cognitive Domain. New York : David Mckay company Inc.

Good,C.V. (1973). Dictionary of Education, 3 rd ed, New York : Mc Graw Hill Book Co.

Green, Lawrence Way, et al.(1980). Health Education Planing : A diagnostic Approach. California : May Field Publishing Company.

Robert M. Golddenson.(1984). London Dictionary of Psychology Psychiatry . New York : Longman Inc.

กรมพัฒนาที่ดิน.(2539). คู่มือการจัดการทรัพยากรที่ดินเบื้องต้นจังหวัดนครปฐม.กองแผนงาน. ม.ป.ท.

กรมพัฒนาที่ดิน.(2544). นิยามและทางเลือกมาตรการการอนุรักษ์ดินและน้ำ. กองอนุรักษ์ดินและน้ำ. ม.ป.ท.

กรมพัฒนาที่ดิน.(ม.ป.ป.). คู่มือเจ้าหน้าที่ของรัฐ งานอนุรักษ์ดินและน้ำ เรื่อง ดินกับการพัฒนาที่ดิน 2530-2534 ฝ่ายเผยแพร่ประชาสัมพันธ์ สำนักงานเลขานุการกรม.

กรรณิการ์ ประกอบทรัพย์.(2540).การมีส่วนร่วมในการอนุรักษ์แม่น้ำท่าจีนของสมาชิกสภาตำบลในจังหวัดสุพรรณบุรี.วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต,สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

กวิละ ปัตถา,จ.ส.อ. (2542).ปัญหาอุปสรรคในการนำนโยบายปฏิรูปที่ดินเพื่อเกษตรกรรมไปปฏิบัติ : ศึกษากรณี สำนักงานปฏิรูปที่ดินจังหวัดน่าน. ภาคนิพนธ์ศิลปศาสตรมหาบัณฑิต, สาขาวิชานโยบายและการวางแผนสังคม บัณฑิตวิทยาลัย มหาวิทยาลัยเกริก.

จุฑาภรณ์ สกุลสวัสดิ์ (2537). ปัจจัยที่มีอิทธิพลต่อพฤติกรรมการใช้น้ำอย่างประหยัดในครัวเรือนของ แม่บ้านในเขตกรุงเทพมหานคร. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ชลธิชา ตั้งอั้น.(2534). ความรู้ ความเชื่อ และการปฏิบัติของแม่บ้านในการกำจัดขยะมูลฝอยและ สิ่งปฏิกูล ศึกษากรณีครัวริมคลองแสนแสบ กรุงเทพมหานคร. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ช่อทิพย์ ตันทวี.(2532). การรับรู้และความตระหนักเกี่ยวกับการใช้สารเคมีป้องกันกำจัดแมลงในเคหสถานของนักเรียนชั้นประถมศึกษาปีที่ 6 อำเภอเมือง จังหวัดนครปฐม. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ชัยโรจน์ ธนสันติ.(2535). การทีส่วนร่วมของคณะกรรมการสภาตำบลในการอนุรักษ์ทรัพยากรธรรมชาติ : กรณีศึกษาจังหวัดอุบลราชธานี. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ชำนาญ วงศ์วินิจศร.(2545). ความรู้ เจตคติ และการมีส่วนร่วมของสมาชิกองค์การบริหารส่วนตำบลในการอนุรักษ์สิ่งแวดล้อมเขาหินปูน : กรณีศึกษาอำเภอเนินมะปราง จังหวัดพิษณุโลก. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาวิชาเทคโนโลยีการบริหารสิ่งแวดล้อม.บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ชุดา จิตพิทักษ์.(2526). พฤติกรรมเบื้องต้น.กรุงเทพมหานคร : ไทยวัฒนาพานิช.

เชิดศักดิ์ เฉลียวศิลป์,พ.ต.ต.(2541). พฤติกรรมการใช้สารเคมีป้องกันและกำจัดศัตรูพืชของเกษตรกรอำเภอสามพราน จังหวัดนครปฐม.วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ดวงเดือน วณิชาชีวะ.(2538). ความรู้ เจตคติ และการปฏิบัติในการอนุรักษ์ดินและน้ำของนักเรียนระดับ ประกาศนียบัตรวิชาชีพประเภทวิชาเกษตรกรรม เขตศึกษา 5. วิทยานิพนธ์ปริญญาศึกษา ศาสตรมหาบัณฑิต,สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ถวัลย์ ยิ้มแย้ม.(2540). พฤติกรรมของประชาชนในการอนุรักษ์แม่น้ำเพชรบุรี : กรณีศึกษาเขตสุขาภิบาลท่ายาง อำเภอท่ายาง จังหวัดเพชรบุรี. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่ง แวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ทแกล้ว ดำรงเดช. (2538). พฤติกรรมการอนุรักษ์แม่น้ำแม่กลองของประชาชนในเขตเทศบาลเมืองกาญจนบุรี จังหวัดกาญจนบุรี. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ทรงพล แสงประกอบ.(2544). พฤติกรมการอนุรักษ์ทรัพยากรธรรมชาติและสิ่งแวดล้อมของประชาชนในท้องถิ่น : กรณีศึกษาบึงบอระเพ็ด จังหวัดนครสวรรค์. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ธเนตร ศรีสุข.(2528). การใช้ที่ดินของเกษตรกรในเขตปฏิรูปที่ดิน อำเภอเมือง จังหวัดลพบุรี. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต,สาขาส่งเสริมการเกษตร บัณฑิตวิทยาลัย มหาวิทยาลัยเกษตรศาสตร์.

นิตยา สุริยะเจริญ.(2533). การศึกษาพฤติกรรมการใช้ยาฆ่าแมลงของเกษตรกร อำเภอบ้านแพ้ว จังหวัด สมุทรสงคราม. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

นิภา มนูญปิจุ.(2528). การวิจัยทางสุขศึกษา. กรุงเทพมหานคร : อักษรบัณฑิต.

บริพันธ์ ไชยวงศ์แก้ว.(2527). การศึกษาพฤติกรรมเกี่ยวกับการอนุรักษ์ป่าไม้ของเจ้าหน้าที่พัฒนาชุมชน. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

บุญธรรม กิจปรีดาบริสุทธิ์.(2542). เทคนิคการสร้างเครื่องมือรวบรวมข้อมูลสำหรับการวิจัย. พิมพ์ครั้งที่3. กรุงเทพมหานคร : เจริญดีการพิมพ์.

ปกิจ พรหมายน.(2530). ความรู้และการปฏิบัติตนในการป้องกันอุบัติภัยจากการจราจรของผู้ขับขี่ส่วนบุคคลในกรุงเทพมหานคร. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ประภาเพ็ญ สุวรรณ.(2526). การสอนสุขศึกษา ทฤษฎี และการประยุกต์. กรุงเทพมหานคร : ไทยวัฒนาพานิช.

ปรีชา มาเจริญ.(2540). พฤติกรรมของประชาชนในการอนุรักษ์แม่น้ำแม่กลอง ศึกษากรณี อำเภอโพธาราม จังหวัดราชบุรี.วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

พงศกร มหารักษ์.(2536). ความรู้และการปฏิบัติในการอนุรักษ์ดินและน้ำของเกษตรกร : ศึกษาเฉพาะกรณีหมู่บ้านสะพือใต้ อำเภอพิบูลมังสาหาร จังหวัดอุบลราชธานี. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต,สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

พณศักดิ์ สุดาเดช.(2540). การศึกษาสภาพการใช้ที่ดินของเกษตรกรในเขตปฏิรูปที่ดิน อำเภอบ้านดุง จังหวัดอุดรราชธานี. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต,สาขาส่งเสริมการเกษตร บัณฑิตวิทยาลัย วิทยาลัยขอนแก่น.

มัลลี วัชรานนท์.(2529). ผลของการปฏิรูปที่ดินเพื่อเกษตรกรรมต่อการเกษตรในเขตปฏิรูปที่ดิน อำเภอหนองเสือ จังหวัดปทุมธานี. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาส่งเสริมการเกษตร บัณฑิตวิทยาลัย มหาวิทยาลัยเกษตรศาสตร์.

วลัยภรณ์ ดาวสุวรรณ.(2533). การมีส่วนร่วมของประชาชนในท้องถิ่นต่อการอนุรักษ์สิ่งแวดล้อมบึงขุนทะเล. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

วิชาญ มณีโชติ.(2533). พฤติกรรมการอนุรักษ์สิ่งแวดล้อมของนักเรียนชั้นมัธยมศึกษาปีที่ 3 ในจังหวัดสงขลา. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต,สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

วิเชียร ฝอยพิกุล,รศ.ดร.(2539). เทคนิคการใช้ดิน – ปุ๋ย – น้ำ เอกสารคำสอน ภาควิชาเกษตรศาสตร์ คณะวิทยาศาสตรและเทคโนโลยี สถาบันราชภัฏสุรินทร์.

วิมลสิทธิ์ หรยางกูล.(2526). พฤติกรรมมนุษย์กับสภาพแวดล้อมมูลฐานทางพฤติกรรมการออกแบบและวางแผน. กรุงเทพมหานคร : จุฬาลงกรณ์มหาวิทยาลัย.

วิไลพร สมบูรณ์ชัย.(2534). การมีส่วนร่วมของผู้นำอาสาพัฒนาชุมชนในการอนุรักษ์ทรัพยากรธรรมชาติ จังหวัดลำปาง. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สมจิตต์ สุพรรณทัศน์.(2526). "ความหมายของพฤติกรรม".เอกสารการสอนชุดวิชาสุขศึกษาหน่วยที่1–7 . มหาวิทยาลัยสุโขทัยธรรมมาธิราช. กรุงเทพมหานคร : อรุณการพิมพ์.

สมศักดิ์ พุ่มช่วย.(2544). ความรู้ ความคิดเห็น และการปฏิบัติของเกษตรกรเกี่ยวกับการใช้สารเคมีและ กำจัดวัชพืชในสวนยางพารา : กรณีศึกษาจังหวัดหนองคาย. วิทยานิพนธ์ปริญญาวิทยา ศาสตร มหาบัณฑิต, สาขาวิชาการวางแผนสิ่งแวดล้อมเพื่อพัฒนาชุมชนและชนบท. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สมศักดิ์ สุริยะเจริญ.(2533). ความตระหนักของปลัดอำเภอเกี่ยวกับการอนุรักษ์ทรัพยากรป่าไม้. วิทยา นิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สัญชัย สูติพันธ์วิหาร.(2539). การมีส่วนร่วมของประชาชนต่อปัญหามลพาทางน้ำจากชุมชน กรณีศึกษา เทศบาลเมืองภูเก็ต. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต,สาขาวิชาเทคโนโลยีการบริหารสิ่งแวดล้อม.บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สันต์ สิริภักดิ์,ผศ.(2536). การอนุรักษ์ดินและน้ำ ตำรา-เอกสารวิชาการ ฉบับที่ 62 ภาคพัฒนาตำราและ เอกสารวิชาการ. หน่วยนิเทศก์.

สายหยุด คงยะฤทธิ์.(2527). การยอมรับการทำไร่นาโดยวิธีการอนุรักษ์ดินและน้ำของเกษตรกรในโครงการจัดการลุ่มน้ำแม่สา อำเภอแม่ริม จังหวัดเชียงใหม่. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาวิทยาศาสตร์สิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2541). พระราชบัญญัติการปฏิรูปที่ดินเพื่อเกษตรกรรม พ.ศ. 2518 แก้ไขเพิ่มเติม (ฉบับที่ 2) พ.ศ. 2519 และ(ฉบับที่ 3) พ.ศ. 2532. เอกสารปฏิรูปที่ดิน ฉบับที่ 214. กรุงเทพมหานคร: สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2543). รายงานประจำปี 2542. จังหวัดนครปฐม : สำนักงานการปฏิรูปที่ดินจังหวัดนครปฐม.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2543). 25 ปีปฏิรูปที่ดิน 6 มี.ค. 43. ม.ป.ท.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2544). วิถีเกษตรในเขตปฏิรูปที่ดิน. เอกสารเผยแพร่ฉบับที่ 293. ม.ป.ท.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2544). สถิติที่สำคัญเกี่ยวกับการเกษตรของประเทศไทย ปี 2542 . ม.ป.ท.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2545). สรุปผลการดำเนินงานปฏิรูปที่ดินของสำนักงานการ ปฏิรูปที่ดินจังหวัดนครปฐม (ผลงานตั้งแต่ต้นถึงปีงบประมาณ 2544). กองวิชาการและแผนงาน : สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.

สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.(2545). รายงานสรุปผลการดำเนินงานการปฏิรูปที่ดินเพื่อเกษตรกรรม (ปีงบประมาณ 2518-2545). เอกสารประกอบการประชุมแลกเปลี่ยนข้อคิดเห็นการดำเนินภารกิจของกระทรวงเกษตรและสหกรณ์ ภายใต้โครงสร้างการแบ่งส่วนราชการใหม่. ฝ่ายติดตามและประเมินผล : สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม.

สำนักงานคณะกรรมการวิจัยแห่งชาติ.(2538). การอนุรักษ์ดินในประเทศกำลังพัฒนา. ผู้แปล ถนอม ณ ป้อมเพชร. พิมพ์ครั้งที่ 2. กรุงเทพมหานคร: โรงพิมพ์คุรุสภาลาดพร้าว.

สำนักงานสาธารณสุขจังหวัดนครปฐม.(2542). สรุปผลงานประจำปี. จังหวัดนครปฐม : งานแผนงานและประเมินผล.

สำรวย แสงดารา.(2541). ปัจจัยที่มีผลต่อพฤติกรรมในการป้องกันอันตรายจากสารกำจัดศัตรูพืชของเกษตรกรกลุ่มเสี่ยง จังหวัดขอนแก่น. วิทยานิพนธ์ปริญญาศิลปศาสตรมหาบัณฑิต. มหาวิทยาลัยขอนแก่น.

สำราญ สมบัติพานิช และเดชา สัมฤทธิ์.(บรรณาธิการ).(2525). การอนุรักษ์ดินและน้ำ 2525. กรุงเทพมหานคร : บริษัทวรวุฒิการพิมพ์.

สุชาดา บุญประสพ.(2539). พฤติกรรมของประชาชนในการแก้ไขปัญหาแม่น้ำท่าจีนเน่าเสีย กรณีศึกษา อำเภอสามพราน จังหวัดนครปฐม.วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สุภัททา ปิณฑะแพทย์,ผศ.(2542)พฤติกรรมมนุษย์และการพัฒนาคน. ภาควิชาจิตวิทยาและการแนะแนว. สถาบันราชภัฏสวนสุนันทา.

สุมนา ยวดยง.(2544). พฤติกรรมของประชาชนในการป้องกันและแก้ไขปัยหามลพาทางน้ำในแม่น้ำเจ้าพระยา : กรณีศึกษา ตำบลเกาะเกร็ด จังหวัดนนทบุรี. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สุวรรณ จัดเจน.(2533). การวิเคราะห์และปรับปรุงพฤติกรรมทางด้านสุขาภิบาลอาหารของผู้ประกอบการค้าอาหารในโรงเรียนระดับมัธยมศึกษาโดยใช้ PRECEDE Framework. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร์)สาขาสุขศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

อนุพงษ์ เพียรไพรงาม.(2543). ปัจจัยที่มีผลต่อการมีส่วนร่วมของประชาชนในการลดปัญหาด้านสุขาภิบาลสิ่งแวดล้อม กรณีศึกษา อำเภอเชียงคำ จังหวัดพะเยา.วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

อัมพา ถ้วยงาม.(2528). ความรู้และเจตคติในการอนุรักษ์ดินและน้ำของเกษตรกร จังหวัดชลบุรี. วิทยา นิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต,สาขาสิ่งแวดล้อมศึกษา. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

อารีย์ พันธ์มณี.(2534). จิตวิทยาการเรียนการสอน. กรุงเทพมหานคร : เลิฟแอนด์ลิฟเพรส.

อุดม แย้มชื่นพงศ์.(2537). การมีส่วนร่วมของคณะกรรมการสภาตำบลในการอนุรักษ์แหล่งน้ำแม่น้ำท่าจีน : ศึกษาเฉพาะกรณีแม่น้ำท่าจีน เขตอำเภอนครชัยศรี จังหวัดนครปฐม. วิทยานิพนธ์ปริญญาสังคมศาสตรมหาบัณฑิต, สาขาสิ่งแวดล้อม. บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

APPENDIX

แบบสัมภาษณ์

เรื่อง
พฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกร
ในเขตปฏิรูปที่ดินจังหวัดนครปฐม

ส่วนที่ 1 ข้อมูลทั่วไป

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลซักถามเกษตรกรเกี่ยวกับรายละเอียดต่างๆ ตามหัวข้อที่กำหนดให้ เมื่อซักถามได้รายละเอียดถูกต้องตรงตามความเป็นจริงแล้ว ให้ผู้รวบรวมข้อมูลกา / ลงในช่องที่ตรงกับคำตอบหรือเติมข้อความ รายละเอียดลงในช่องว่างที่เว้นไว้

1. อายุ.....ปี
2. เพศ ( ) ชาย ( ) หญิง
3. การศึกษาสูงสุด
   - ( ) ไม่เคยเรียนในสถานศึกษา
   - ( ) เรียนจบชั้นประถมศึกษาปีที่4
   - ( ) เรียนจบชั้นประถมศึกษาปีที่6
   - ( ) เรียนจบชั้นมัธยมศึกษาปีที่ 3
   - ( ) ปริญญาตรี
   - ( ) อื่นๆระบุ.....
4. จำนวนสมาชิกในครอบครัว (ผู้ที่ช่วยแรงงานทางการเกษตรเป็นประจำ).....คน

ผู้สัมภาษณ์.....
วันที่สัมภาษณ์.....

5. รายได้จากการเพาะปลูก / ฤดูกาล

ชนิดพืช	จำนวน (ไร่)	ผลผลิตรวม (ไร่)	ราคาขาย (บาท / ไร่)	รายได้รวมต่อไร่
1. ข้าว				
2. พืชไร่ (ระบุ)…… ……				
3.พืชสวน (ระบุ)…… …… …				
4.อื่นๆ(ระบุ)…… ……				
รวม				

6. จำนวนพื้นที่ถือครอง……..ไร่
7. ระยะการถือครองที่ดิน……ปี
8. ท่านเป็นสมาชิกของกลุ่มการเกษตรบ้างหรือไม่

( ) ไม่เป็น

( ) เป็น ชื่อกลุ่ม

1……

เป็นมานาน……ปี

ชื่อกลุ่ม

2……

เป็นมานาน……ปี

9. ท่านเคยเข้ารับการอบรมสัมมนาการเกษตรที่เกี่ยวข้องกับการอนุรักษ์ดินและน้ำ

( ) เคย

( ) ไม่เคย

ถ้าเคยไป

ครั้งที่	สถานที่	สัมมนาเรื่อง	เมื่อปี
1.			
2.			
3.			
4.			
5.			

10. ท่านได้ไปศึกษาดูงานการเกษตรที่เกี่ยวข้องกับการอนุรักษ์ดินและน้ำบ้างหรือไม่

( ) เคย ( ) ไม่เคย

ถ้าเคยไป

ครั้งที่	สถานที่	ศึกษาดูงานเกี่ยวกับ	เมื่อปี
1.			
2.			
3.			
4.			
5.			

ส่วนที่ 2 ความรู้ในการอนุรักษ์ดินและน้ำของเกษตรกร

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลบอกเกษตรกรผู้ให้ข้อมูลว่าจะอ่านข้อความให้ฟังทีละข้อ ข้อใดถูกให้บอกว่า “ถูก” เพียงข้อเดียว เมื่อได้คำตอบจากเกษตรกรแล้วให้กาเครื่องหมาย / ลงในหัวข้อ ก , ข , ค หรือ ง ข้อใดข้อหนึ่งเพียงข้อเดียว ถ้าเกษตรกรไม่เข้าใจคำถามหรือฟังไม่ชัดเจนให้อ่านข้อความให้เกษตรกรฟังใหม่

1.การอนุรักษ์ดินและน้ำ หมายถึง อะไร

ก. การรักษาดินและน้ำให้อยู่ในสภาพเดิมอยู่ตลอดเวลา

ข. การใช้ดินและน้ำให้เกิดประโยชน์สูงสุดและใช้ให้ได้นานที่สุด

ค. ใช้แต่ปุ๋ยธรรมชาติเท่านั้นเพื่อให้ดินและน้ำไม่เสื่อมโทรม

ง. ใช้แต่ปุ๋ยเคมีเท่านั้นเพื่อให้ดินและน้ำไม่เสื่อมโทรม

2. สาเหตุที่ทำให้ดินเสื่อมความอุดมสมบูรณ์

ก. ปลูกพืชหลายชนิดหมุนเวียนกัน

ข. ปลูกพืชชนิดเดียวในพื้นที่

ค. ปลูกพืชโดยใช้แต่ปุ๋ยคอกปุ๋ยหมัก

ง. หยุดพักพื้นที่หลังการเพาะปลูก

3. อะไรเป็นสาเหตุให้หน้าดินถูกชะล้างจนทำให้ดินเสื่อมคุณภาพ

ก. เลี้ยงสัตว์ในแปลงเพาะปลูก เช่น เป็ด ไก่ วัว

ข. ใส่ปุ๋ยอินทรีย์ (ปุ๋ยคอก ปุ๋ยหมัก) ลงในแปลง

ค. ฝนและลม

ง. ชนิดของพืชที่ปลูก

4. วิธีการป้องกันหรือลดการชะล้างพังทลายของหน้าดินคือ

ก. กั้นคันดินให้สูงขึ้น

ข. เลี้ยงสัตว์แทนการทำการเกษตร

ค. ปลูกพืชคลุมดิน

ง. ยกร่องให้สูงขึ้น

5. ข้อใดเป็นวิธีการที่จะช่วยรักษาดินให้มีความอุดมสมบูรณ์
   ก. เพาะปลูกพืชหลายชนิดหมุนเวียนกันในที่ดินเดียวกัน
   ข. ก่อนเพาะปลูกไถพรวนดินหลายๆรอบเพื่อให้ดินมีความพรุน
   ค. เผาตอซังและซากพืชที่เหลือในไร่เพื่อกำจัดแมลงและเชื้อโรค
   ง. ใส่ปุ๋ยเคมีเป็นประจำเพื่อปรับปรุงดิน
6. เกษตรกรสามารถที่จะป้องกันการแพร่ระบาดของโรคพืชได้อยู่เสมอ ด้วยวิธีการป้องกันอย่างไร
   ก. เตรียมซื้อยามากำจัดโรคของพืชไว้แต่เนิ่นๆ
   ข. ปลูกพืชสลับกัน
   ค. ปลูกพืชเพียงชนิดเดียวในพื้นที่
   ง. ไถพรวนดินสม่ำเสมอ
7. สาเหตุที่ทำให้แหล่งน้ำตื้นเขินเร็วเกิดจากสาเหตุใด
   ก. เกิดการทับถมของดินในแหล่งน้ำ
   ข. หน้าดินถูกชะล้าง
   ค. ดินข้างๆแหล่งน้ำพังทลายลงมาทับถม
   ง. ไม่มีการขุดลอกคลอง
8. อะไรคือสาเหตุที่ทำให้ดินชั้นบนสูญเสียน้ำเร็วขึ้น
   ก.การหยุดพักพื้นที่ในการเพาะปลูก
   ข.การปลูกพืชแน่นจนเกินไป
   ค.แสงแดดเผาหน้าดินทำให้น้ำระเหยเร็วเกินไป
   ง. พื้นที่ห่างไกลแหล่งน้ำ
9. ข้อใดถูกต้อง
   ก. หลังการเกี่ยวควรไถกลบตอซัง ซากพืชที่เหลือในไร่นา
   ข. ใช้ปุ๋ยเคมีเป็นประจำในการปรับปรุงดิน
   ค. ไม่ควรปลูกพืชหลายชนิดในพื้นที่เพราะทำให้สิ้นเปลืองปุ๋ย
   ง. ไม่ควรนำขี้เลื่อย ฟาง หรือ หญ้ามาคลุมบริเวณโคนต้น ระหว่างแถว เพราะจะทำให้พืชที่ปลูกโตช้า

10. ท่านจะทราบได้อย่างไรว่าดินในพื้นที่เพาะปลูกเริ่มเสื่อมความอุดมสมบูรณ์
    ก. ดินชั้นบนแห้ง
    ข. ดินชั้นบนไม่อุ้มน้ำ
    ค. ดินชั้นบนมีน้ำขังอยู่
    ง. ดินชั้นบนไม่มีวัชพืชขึ้นอยู่เลย
11. ผลของการขาดการเอาใจใส่ดูแลรักษาดินอย่างถูกต้องจะทำให้
    ก. ทำให้ความอุดมสมบูรณ์ของดินลดลงอย่างรวดเร็ว
    ข. ผลผลิตลดลงบ้างเล็กน้อย
    ค. ต้องซื้อปุ๋ยเพิ่มมากขึ้น
    ง. ทำให้พื้นที่ทำการเกษตรลดลง
12. การขาดการเอาใจใส่สงวนรักษาน้ำอย่างถูกต้องจะส่งผลในข้อใด
    ก. พื้นที่การเกษตรจะลดน้อยลง
    ข. ไม่ส่งผลอะไรเพราะมีน้ำจากคลองชลประทาน
    ค. ทำให้พืชที่ปลูกไม่เจริญเติบโต
    ง. ส่งผลเสียหายต่อดินและพืชที่ปลูกโดยตรง
13. ข้อใดต่อไปนี้ไม่มีผลกระทบต่อสภาพดินและน้ำเพื่อการเกษตรโดยตรง
    ก. ตัวเกษตรกรเอง
    ข. การเพิ่มหรือลดผลผลิต
    ค. สภาพพื้นที่เกษตรกรรม
    ง. การพัฒนาอุตสาหกรรม
14. ข้อใดกล่าวไม่ถูกต้อง
    ก. ปลูกพืชเพียงชนิดเดียวทำให้ดินเสียและดินไม่สมบูรณ์
    ข. ใช้ปุ๋ยธรรมชาติ (ปุ๋ยคอก ปุ๋ยหมัก หรือ ปุ๋ยชีวภาพ)ทำให้พืชโตช้ามีแมลงรบกวนมาก
    ค. ปลูกพืชตระกูลถั่วทำให้ดินดีสมบูรณ์
    ง. หลังการเก็บเกี่ยวควรไถกลบตอซัง ซากพืชที่เหลือในไร่นา
15. ลักษณะของดินเปรี้ยว หมายถึงอะไร
    ก. ดินที่เป็นกรดจัด
    ข. ดินที่มีเกลือมาก
    ค. ดินที่มีปูนอยู่มาก
    ง. ดินที่มีทั้งเกลือและปูนอยู่มาก

ส่วนที่ 3 ความตระหนักในการอนุรักษ์ดินและน้ำของเกษตรกร

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลบอกเกษตรกรผู้ให้ข้อมูลว่าจะอ่านข้อความให้ฟังทีละข้อ ข้อใดเป็นความคิดเห็นของเกษตรกรให้กา / ลงในข้อนั้น

ข้อความ	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
1. ท่านคิดว่าการปลูกพืชหมุนเวียนหลายชนิดในพื้นที่เพาะปลูกเป็นสิ่งที่มีประโยชน์ในการอนุรักษ์ดิน					
2. ท่านคิดว่าการใช้ปุ๋ยเคมีในการทำเกษตรเพราะเป็นสิ่งที่จำเป็น					
3. ท่านคิดว่าการไถพรวนดินแล้วปลูกพืชทันทีจะได้รับประโยชน์มาก					
4. ท่านคิดว่าการคลุมดินด้วยฟางหญ้าเป็นสิ่งที่จำเป็น					
5. ท่านคิดว่าการปลูกพืชต่อเนื่องกันตลอดเวลาในพื้นที่จะได้ผลผลิตที่คุ้มค่า					
6. ท่านคิดว่าการเผาตอซังและซากพืชที่เหลือค้างในไร่นาหลังการเก็บเกี่ยวเป็นเรื่องที่จำเป็น					
7.ท่านคิดว่าการทำเกษตรกรผสมผสานในพื้นที่เป็นเรื่องไม่คุ้มค่า					
8. ท่านคิดว่าการปุ๋ยชีวภาพหรือสารกำจัดแมลงจากสารสกัดธรรมชาติเช่น สารจากสะเดาแทนการใช้สารเคมีเป็นเรื่องที่ยุ่งยาก					
9. ท่านคิดว่าการใช้ปุ๋ยอินทรีย์(ปุ๋ยคอก ปุ๋ยหมัก)จะได้ผลผลิตไม่คุ้มค่า					
10. ปัญหาดินเปรี้ยวภายในพื้นที่ของท่านเป็นเรื่องที่ต้องแก้ไข					
11. ท่านคิดว่าการชะล้างพังทลายของดินชั้นบนเป็นเรื่องที่ต้องแก้ไข เพราะทำให้แร่ธาตุในดินน้อยลง					
12. ท่านคิดว่าการใช้น้ำจากชลประทานทำการเกษตรจึงไม่จำเป็นต้องประหยัดน้ำ					
13.ท่านคิดว่าการปลูกพืชตระกูลถั่วในการบำรุงดินเป็นสิ่งที่มีประโยชน์					
14. ท่านคิดว่าดินที่ร่วนซุยและมีความพรุนเป็นดินที่มีประโยชน์ต่อการเพาะปลูก					

ส่วนที่ 4 การรับรู้ข่าวสารเกี่ยวกับการอนุรักษ์ดินและน้ำ

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลซักถามเกษตรกรเกี่ยวกับรายละเอียดต่างๆ ตามหัวข้อที่กำหนดให้ เมื่อซักถามได้รายละเอียดถูกต้องตรงตามความเป็นจริงแล้ว ให้ผู้รวบรวมข้อมูลกา / ลงในช่องที่ตรงกับคำตอบ รายละเอียดลงในช่องว่างที่เว้นไว้

คำอธิบาย ข่าวสารที่ได้รับจากแหล่งข้อมูลข้างล่างนั้นเกี่ยวกับการอนุรักษ์ดินและน้ำ เช่น ที่เกี่ยวกับการเพาะปลูก การบำรุงดินและการใช้น้ำ การใช้ปุ๋ยชีวภาพ การใช้ยาปราบศัตรูพืช การเกษตรผสมผสาน วนเกษตร การให้ผลผลิตสูง การใช้พืชพันธุ์ใหม่

แหล่งรับข้อมูลข่าวสาร	**ไม่เคย**	**เคย**			
		ทุกวัน	**1 – 4 ครั้ง ต่อสัปดาห์**	**1 – 2 ครั้ง ต่อเดือน**	**1- 2 ครั้งต่อ ปี**
หนังสือพิมพ์					
วิทยุ					
โทรทัศน์					
เอกสารเผยแพร่หรือ แผ่นพับ					
หนังสือสิ่งพิมพ์และ เอกสารต่างๆ					

ส่วนที่ 5 การได้รับการสนับสนุนจากแหล่งต่างๆ

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลซักถามเกษตรกรเกี่ยวกับรายละเอียดต่างๆ ตามหัวข้อที่กำหนดให้ เมื่อซักถามได้รายละเอียดถูกต้องตรงตามความเป็นจริงแล้ว ให้ผู้รวบรวมข้อมูลกา / ลงในช่องที่ตรงกับคำตอบ รายละเอียดลงในช่องว่างที่เว้นไว้

คำอธิบาย เกษตรกรเคยสนทนาการเกษตรเกี่ยวกับการอนุรักษ์ดินและน้ำกับผู้สนับสนุนจากแหล่งต่างๆ เช่น ที่เกี่ยวกับการเพาะปลูก การบำรุงดินและการใช้น้ำ การใช้ปุ๋ยชีวภาพ การใช้ยาปราบศัตรูพืช การเกษตรผสมผสาน วนเกษตร การให้ผลผลิตสูง การใช้พืชพันธุ์ใหม่

ผู้ที่สนับสนุน	ไม่เคย	เคย			
		1 –4 ครั้งต่อสัปดาห์	1 – 2 ครั้งต่อเดือน	ทุกเดือน	1 –2 ครั้งต่อ ปี
1. หมอดิน					
2.เกษตรกรตัวอย่าง					
3. เกษตรตำบล หรือ เกษตรกรอำเภอ					
4. เจ้าหน้าที่ ส.ป.ก.					
5. เจ้าหน้าที่จากกรมชลประทาน					
6. เจ้าหน้าที่จากหน่วยหรือศูนย์พัฒนาที่ดิน					
7. วิทยาลัยหรือมหาวิทยาลัยเกษตรกรรม					
8. เจ้าหน้าที่กรมประมง					
9. NGOs หรือ อาสาสมัคร					
10. พนักงานขายปุ๋ยและสารกำจัดศัตรูพืชหรือ วัชพืช					
11. มูลนิธิหรือชมรมการเกษตรต่างๆ					

ส่วนที่ 6 พฤติกรรมการอนุรักษ์ดินและน้ำของเกษตรกร

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลบอกเกษตรกรผู้ให้ข้อมูลว่าจะอ่านข้อความให้ฟังทีละข้อ ข้อใดเป็นความคิดเห็นของเกษตรกรให้กา / ลงในข้อนั้น

1. ก่อนทำการเพาะปลูก ท่านมีการตรวจดูแลและบำรุงรักษาดินในแปลงของท่านก่อนการเพาะปลูกหรือไม่หรือไม่

( ) มีการตรวจดูแลเป็นประจำ ( ) มีการตรวจดูแลเป็นบางครั้ง

( ) ไม่มีการดำเนินการเลย

2. ก่อนปลูกพืชท่านมีการเตรียมดิน โดยการไถพรวนแล้วปล่อยทิ้งไว้แล้วค่อยเพาะปลูกหรือไม่

( ) ปล่อยทิ้งแล้วค่อยปลูกเป็นประจำ ( ) ปล่อยปล่อยทิ้งแล้วค่อยปลูกเป็นบางครั้ง

( ) ไม่มีการดำเนินการเลย

3. ท่านใส่ปุ๋ยเคมีเพียงชนิดเดียวในการปรับปรุงดินหรือไม่

( ) ใส่เป็นประจำ ( ) ใส่เป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

4. ท่านใส่ปุ๋ยคอกในการปรับปรุงดินหรือไม่

( ) ใส่เป็นประจำ ( ) ใส่เป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

5. ท่านมีการปลูกพืชคลุมดินหรือไม่ (พืชคลุมดิน คือ การปลูกพืชที่มีใบหนาหรือระบบรากแน่นสำหรับคลุมและยึดดิน เช่น พืช ตระกูลถั่ว พืชตระกูลหญ้า เป็นต้น)

( ) ปลูกเป็นประจำ ( ) ปลูกเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

6. ท่านมีการปลูกพืชหมุนเวียนหรือไม่ (พืชหมุนเวียน คือ การปลูกพืชต่างชนิดกันบนพื้นที่เดียวกันหมุนเวียนกันไป เช่น การปลูกถั่วตามด้วยข้าวโพด)

( ) ปลูกเป็นประจำ ( ) ปลูกเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

7. ท่านมีการคลุมดินด้วย เศษเหลือของพืช ตอ ซัง ขี้เลื่อย ในพื้นที่เพาะปลูก

( ) ทำเป็นประจำ ( ) ทำเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

8. ท่านปลูกพืชแบบชนิดเดียวในรอบปีบนพื้นที่เพาะปลูกของท่านหรือไม่

( ) ปลูกเป็นประจำ ( ) ปลูกเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

9. ท่านมีการเลี้ยงปลาในนาข้าวหรือไม่

( ) เลี้ยงเป็นประจำ ( ) เลี้ยงเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

10. ท่านมีการปลูกข้าวร่วมกับการปลูกไม้ผลไม้ยืนต้นหรือปลูกผักต่างๆหรือไม่

( ) ปลูกเป็นประจำ ( ) ปลูกเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

11. หลังการเก็บเกี่ยวท่านเผาตอซัง หรือซากพืชที่เหลือค้างในพื้นที่หรือไม่

( ) เผาเป็นประจำ ( ) เผาเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

12. หลังการเก็บเกี่ยวท่านท่านเตรียมไถพรวนแล้วปลูกพืชต่อหรือไม่

( ) ปลูกต่อเป็นประจำ ( ) ปลูกต่อเป็นบางครั้ง ( ) ไม่มีการดำเนินการเลย

ส่วนที่ 7 ปัญหา อุปสรรค ในการอนุรักษ์ดินและน้ำในเขตปฏิรูปที่ดินจังหวัดนครปฐม

คำแนะนำผู้รวบรวมข้อมูล : ให้ผู้รวบรวมข้อมูลบอกเกษตรกรผู้ให้ข้อมูลว่าจะอ่านข้อความให้ฟังทีละข้อ ข้อใดเป็นความคิดเห็นของเกษตรกรให้กา / ลงในข้อนั้น

ปัญหา	ปัญหามาก	ปัญหาน้อย	ไม่มีปัญหา	ข้อเสนอแนะ
1. ปัญหาดินมีความอุดมสมบูรณ์ต่ำ				
2.ดินมีปัญหา เช่น ดินเปรี้ยว				
3. ขาดแหล่งน้ำทางการเกษตร				
4.ขาดแคลนเงินทุน				
5.ขาดพันธุ์พืชที่ดี				
6.ปัญหาการปรับปรุงรักษาดิน				
7.ปัญหาเรื่องโรคแมลงศัตรูพืช				
8.ปัญหาที่เกิดจากการใช้สารเคมีป้องกันกำจัดศัตรูพืช				
9. ปัญหาผลผลิตตกต่ำ				
10. ปัญหาการขาดแคลนแรงงาน				

BIOGRAPHY

NAME	Ms. Nantana Apiwattanakul
DATE OF BIRTH	9th June 2517 (1974)
PLACE OF BIRTH	Bangkok
EDUCATION	Siam University 2536-2540 Bachelor of Arts (English for Business Communication) Mahidol University 2542-2546 Master of Education (Environmental Education)
POSITION AND OFFICE	Agricultural Land Reform Office Foreign Relations Officer 5