THAI-GERMAN HIGHLAND DEVELOPMENT PROGRAMME

SOIL AND WATER CONSERVATION PROGRAM
IMPACT MEASUREMENT SURVEY AND EVALUATION

1988/1989

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CHAPTER 1: INTRODUCTION

PART 1: BACKGROUND

In the hills of northern Thailand, traditional agriculture consisted primarily of various types swidden farming. Areas were cleared of trees and other vegetation and crops planted for a period of one to several years. When soil fertility declined and pressure from weeds increased, the field was abandoned and a new field cleared. After a period of up to twenty years or more, the old field would have naturally regained its fertility and would then again be cleared and farmed.

When the population density was low and land availability relatively high, this system was quite satisfactory. At present, however, a combination of increasing population density and decreasing agricultural land availability have necessitated a shift to settled farming, i.e., cultivating the same field for many years in succession. With this shift to settled farming, problems of soil fertility and topsoil erosion become of paramount importance. It was to help reduce soil degradation while increasing yields that the Thai-German Highland Development Programme (TG-HDP) began introducing a new Soil and Water Conservation Cropping System based on the use of grass strips planted at intervals within a farmer’s field along the contour, zero burning of crop residues, strip cropping, green manuring, rotation of crops, fertilizer application, minimum tillage.

This marks the second consecutive year that this soil and water conservation cropping system first brought to Thailand by TG-HDP has been in operation, and the second year in which the Research and Development Center of Payap University has evaluated the program. To allow easier comparison between the first and second year evaluations, this report follows as closely as possible the format used in the initial evaluation.

The Soil and Water Conservation (SWC) cropping system consists of alternating strips of crops and grass laid out along the contour of the slope of the field. The crop strips laid out during the first year of operation (1987/1988) were to be eight meters wide with the grass strips two meters wide. Width of crop strips in fields converted to the Soil and Water Conservation (SWC) method during the second year of operation (1988/1989) varied according to the slope of the field, with grass strips closer together the steeper the slope. The grass strips act as a barrier to erosion, slowing rain water run-off and retaining additional moisture in the soil and trapping soil particles.

The main crops planted on the SWC fields in 1988/89 were (1) corn followed by kidney beans and (2) upland rice. The two cropping patterns were planted on alternating strips. In addition, farmers were encouraged to rotate crops from year to year, so strips planted to rice in 1987/88 were usually planted to corn/kidney beans in 1988/89. Other crops grown included soy beans and, in a few cases, ginger.

Farmers participating in the SWC program were provided with inputs of improved variety seed and chemical fertilizer from TG-HDP. Pesticides were not provided and their use was not recommended.

In addition to the basic strip method of cropping, farmers were taught to plant crops in contour rows with closer spacing than traditionally in traditional cropping patterns and to spread residues over the fields instead of burning them. This year farmers were also requested to clear a fire break all around the edge of their SWC fields to prevent forest fires or fires in other farmers’ fields from burning their crop residues.

Relatively high levels of inputs (seed and fertilizer) were provided to the farmers as the project is considered a...
"large scope test run" rather than merely extension of proven methods.

The above constitutes a very brief overview of the grass strip method of soil and water conservation cropping promoted by TG-HDP. For more information, readers are referred to more detailed TG-HDP publications.

PART 2. OBJECTIVES

This evaluation is part of the overall monitoring and evaluation of the project which is accomplished at three levels: implementation, adoption and impact. This evaluation of yields of the SWC cropping system are primarily concerned with adoption and impact. Specific objectives include:

- Measuring corn, rice, kidney bean and soybean yields from SWC fields of a random sample of participating farmers.
- Determining the degree to which participating farmers follow TG-HDP crop production guidelines.
- Conduct a socio-economic survey of all SWC farmers.
- Measure the size of SWC fields of participating farmers.
- Obtain soil samples from selected SWC farmers.
- Obtain other information requested by TG-HDP.

PART 3. METHODOLOGY

OVERVIEW. The evaluation was carried out in Tambon Wawi, Amphoe Mae Suai, Chiang Rai Province and in the Nam Lang area, Tambons Pang Ma Pha and Sob Pong, Branch Amphoe Pang Ma Pha, Mae Hong Son Province.

Data used in the evaluation was gathered by three means: interviews with farmers in the TG-HDP project areas; direct measurement of corn, rice, kidney bean and soybean yields; and direct measurement of characteristics of the SWC fields including measurements of spacing and density.

INTERVIEWS. A socio-economic survey was made of all SWC farmers who could be located in both project areas, a total of 487 farmers. The survey instrument used can be found in Appendix A.

YIELD MEASUREMENT. Measurement of yields of corn were made by marking and harvesting yields from three 5 by 5 meter squares in each of the surveyed farmer’s fields. Squares were, to the extent possible, placed in a diamond shape, with one axis straight up and down the field, the second axis along the contour. Three twenty-five square meter plots were marked in each field. Where possible, two squares were marked in one strip, one square in a second strip. All farmers selected for measurement had applied at least some of the fertilizer provided by TG-HDP.

Similar methods were used for rice, kidney beans and soy beans, the only difference being that the squares were 4 by 4 meters. Harvesting of corn and rice was done directly by the survey team; beans were harvested by the owner of the field.

Marking of yield measurement squares in corn fields was done in August and September 1988, followed by harvesting corn and marking rice fields in September and October. Rice was harvested in October and November, at which time measurement squares were marked in kidney bean and soy bean fields. Bean yields were measured in December 1988 and January 1989.

Analysis of yield information from the 1987/88 crop year showed that correction of yield data for moisture content did not appreciably increase accuracy. In that year, samples of crops were sun dried prior to weighing. At the time of weighing, moisture content was noted and actual weights of samples were adjusted to a standard 13% moisture content. As a consequence, it was determined that the expensive and time consuming process of measuring moisture content would not be conducted for the 1988/89 crop year. The samples taken in 1988/89 were sun dried by owner of the samples to the level which the farmer felt was appropriate for use of the crop. The crop was then weighed but moisture content was not recorded. It is estimated that moisture content was in the range of 13%.
A total of 198 SWC corn fields, 191 SWC rice fields, 185 kidney bean fields and 7 soybean fields were included in the survey. Survey instruments used for corn, rice, kidney bean and soybean crops are included in appendices B, C and D.

FIELD MEASUREMENT. During the months of March and April 1989, the SWC fields of participating farmers were measured. The length and average width of each crop strip was determined. The fields of farmers who had used the SWC method the previous year and who had not increased the size of their fields were not measured, as the field size had been determined last year.

DATA ANALYSIS. Data was analyzed by computer using the Statistical Package for Social Scientists (SPSS). Cross-tabulation, Chi Square, mean and standard deviation measurements were computed as appropriate. Due to the relatively small sample size, interpretation of data broken down by tribe or other sub-project area categories must be interpreted with caution.