

E&ID Research Programme: Energy and Low-income Tropical Housing

ELITH Working Paper

HOUSEHOLD SURVEY PLAN FOR LOW-INCOME HOUSING STUDY

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1. Introduction

ELITH-Thailand planned to do the household survey in low-income housing to collect the data of electric appliances, building configurations and energy uses in household, and establish the baseline for each household type in low-income housing in Thailand. Thermal and visual comforts of each household type, building enveloped materials, and energy uses during building construction process will be surveyed also.

This survey will be done from August 2014 with the collaboration of National Housing Authority (NHA), Thailand. Questionnaire and instrumental monitoring will be carried out during the survey.

2. Information from Survey

Table 1 shows information that will be collected and measured during the survey. Data of residents and houses, energy uses, changing trends in energy use, house configuration, and material types and quantities will be obtained from questionnaire.

Table 1. Information to be surveyed and monitored

Required data	Detail	Questionnaire	Measurement
<i>General information</i>	<i>General information of residents and houses</i>	✓	
<i>Energy uses</i>	<i>History of energy uses and energy uses for lighting, cooking, entertainment, convenient, small business or industry, and transportation</i>	✓	
<i>Changing trends in energy use</i>	<i>Changing trends in energy uses</i>	✓	
<i>House configuration</i>	<i>Configurations, size and material of roof, wall, glazing and interior walls</i>	✓	
<i>Material types and quantities</i>	<i>Types and materials of construction materials</i>	✓	
<i>Thermal and visual comforts</i>	<i>Thermal and visual comfort levels</i>	✓	✓

For two comforts in the house, thermal and visual comforts, questionnaire and mobile measurements will be used to obtain the data.

3. Survey Questionnaire

A survey questionnaire was developed in order to answer all requirements in the survey. The designed questionnaire is attached with this working paper. The items listed in the questionnaire are according to information needed from the survey.

The survey staffs will be the persons who ask questions to the low-income household owners, the household owners will not fill the form by themselves. In some case, the answers cannot obtain directly from the questions. The staffs should estimate the information by experience without bias.

4. Survey Equipment

For thermal comfort, a number of parameters will be used to evaluate the comfort level. Therefore, mobile measurements will be carried out in the survey site. In the survey, hot wire anemometers (Lutron AM-4224SD) will be used to measure dry-bulb (DB) temperature, relative humidity (RH), and air velocity, while black globe temperature will be measured by wet-bulb globe temperature (WBGT) meters (Lutron WBGT-2010SD).

Illuminance for visual comfort evaluation will be measured by lux meters (Lutron LX- 1128SD). Moreover, for the condition of environment in houses, CO₂ will also be measured by an air quality meter (AQ-9901SD). All measuring data and equipment, and also quantity of equipment that we have are shown in Table 2.

Table 2. Measuring data and equipment

Measuring data	Equipment model	Accuracy	Quantity
1. DB Temperature	AM-4224SD	±0.8°C	2
2. %RH	AM-4224SD	±3%	
3. Air velocity	AM-4224SD	±5%	
4. Black globe temperature	WBGT-2010SD	±0.6°C	2
5. Illuminance	LX-1128SD	±4%	2
6. CO ₂	AQ-9901SD	±5%	1

5. Survey Plan

The survey will be carried out with collaboration with NHA. The main target households of survey are the low-income houses those were built under the projects of NHA. Four types of housing will be surveyed, i.e. detached house, twin house, townhouse, and condominium.

The survey of NHA houses was divided to be 3 trips, according to the area of sites. The NHA houses in central, north, and east parts of Thailand will be surveyed. NHA staffs will be the persons who firstly contact to each house or juristic persons in the housing projects. Two trips of additional survey will be done in the low-income houses those are not in the NHA projects.

In each trip of surveys, 3-4 persons will be in the team. One or two persons in the team will ask questions in the questionnaire and take notes. At least 1 person will take care for mobile equipment during the survey. NHA staffs will also accompany to the surveys. One trip will be 2 days and 1 night.

The survey target is about 20 households a trip. Figures 1-3 show the possible households for survey in central, north, and east parts of Thailand, respectively.

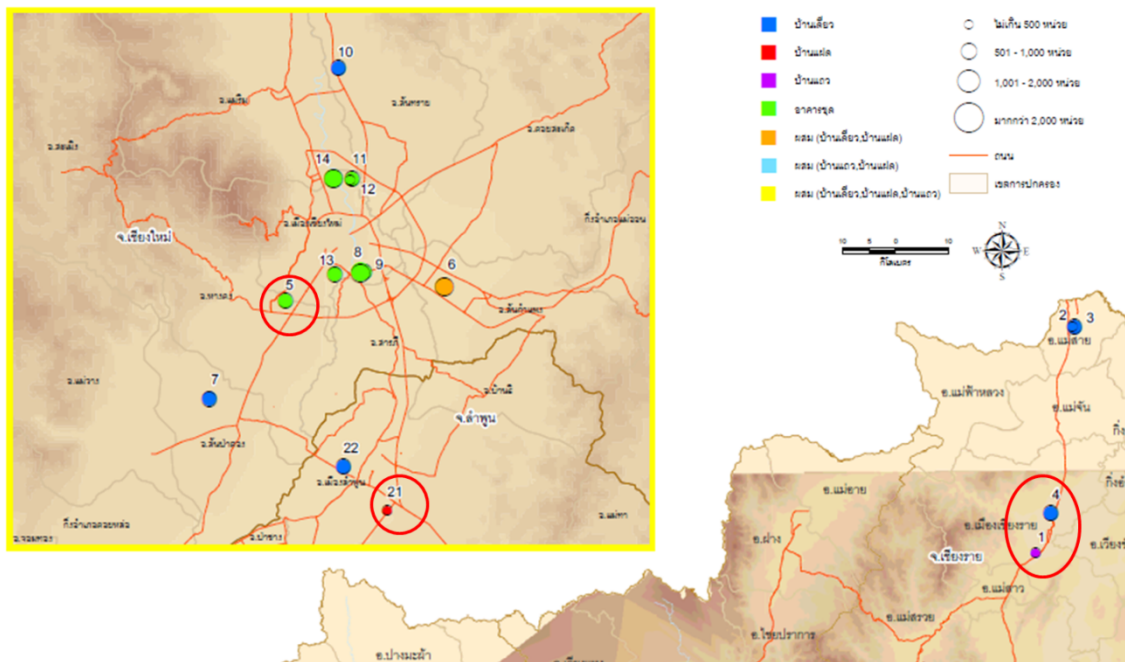


Fig. 1 Possible households for survey in central part of Thailand.

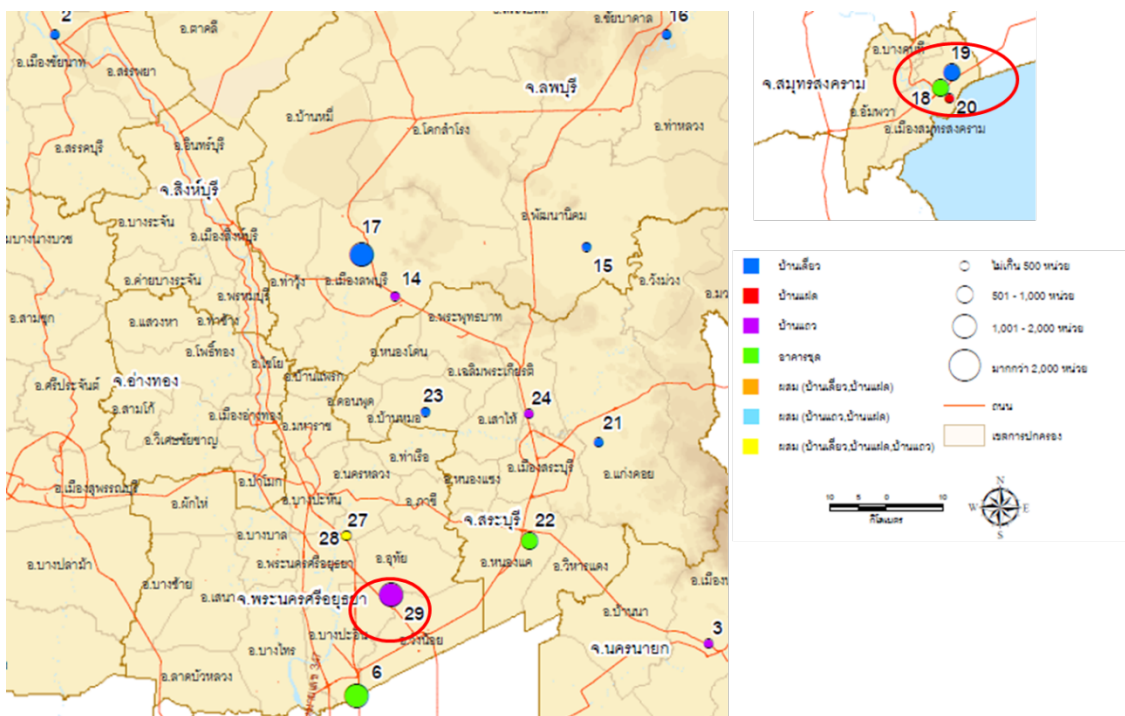


Fig. 2 Possible households for survey in north part of Thailand.

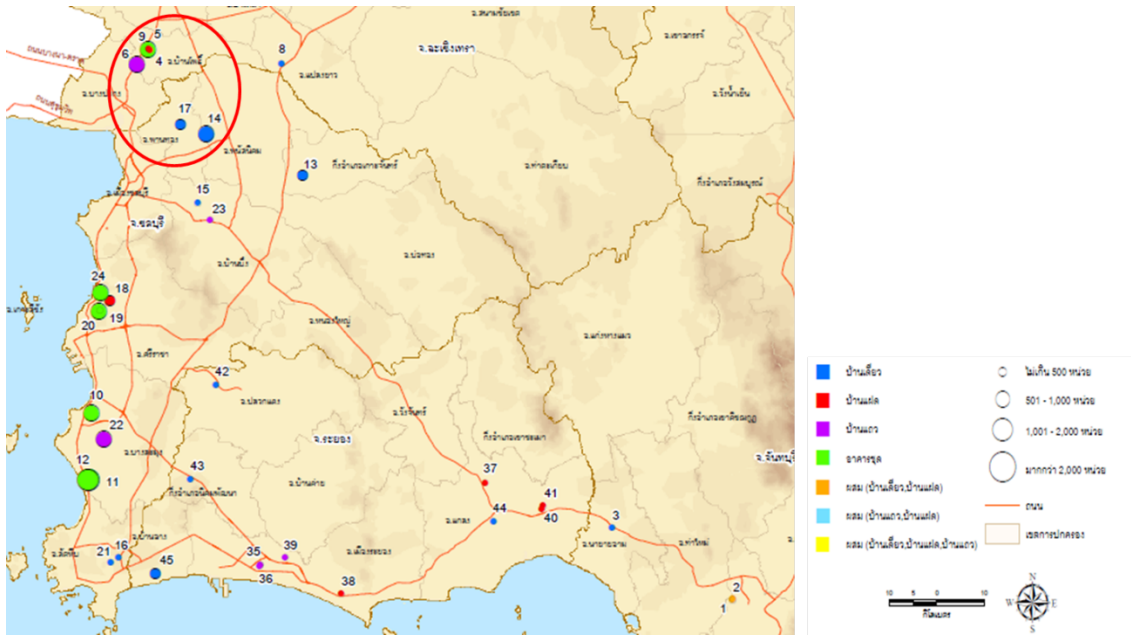


Fig. 3 Possible households for survey in east part of Thailand.