No. 2 1

THE KINGDOM OF THAILAND
MINISTRY OF INTERIOR
DEPARTMENT OF TOWN AND COUNTRY PLANNING

CITY PLANNING MANUAL

VOLUME III SOCIO-ECONOMIC ANALYSIS

THE STUDY ON APPLIED TECHNOLOGY FOR MAKING CITY PLAN

JANUARY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

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SOCIO-ECONOMIC ANALYSIS

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ANALYSIS METHOD

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CONTENTS AND OBJECTIVES OF SOCIO-ECONOMIC ANALYSIS

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c. Age-Sex structure
d. Labor force
e. Household characteristics
f. Other special matters

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c. Labor force
d. Other special aspects

1.2.2 Economic Activity

a. Employment by sector
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c. Special economic activity

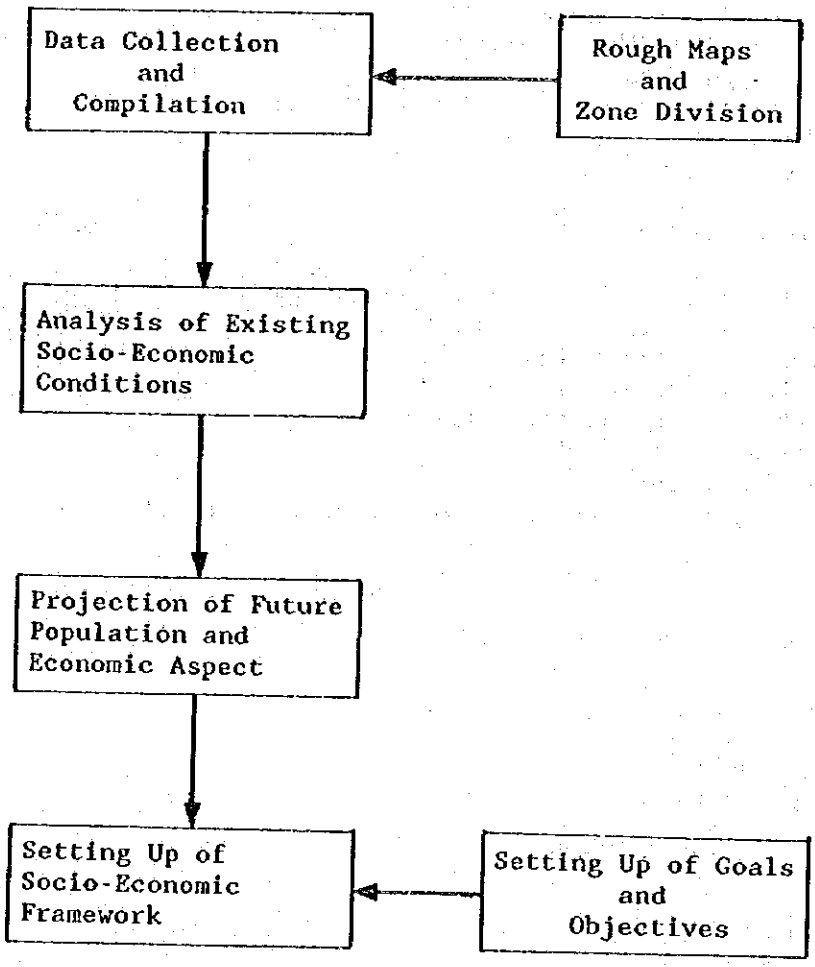
The objectives of socio-economic analysis are: 1) to clarify the social and economic conditions which are the bases of the existing physical environment of the area; 2) to show the prospect of future changes of these conditions; and 3) to give the bases for setting up of the planning framework in the target year.

The results of analysis is handed over to the land use, transport and urban facility planners.

CHAPTER 2

ANALYSIS PROCEDURES

The socio-economic analysis is made according to the following flow chart:



CHAPTER 3

DATA COLLECTION AND COMPILATION

3.1 Populations

3.1.1 Data to be Collected

The basic data needed to obtain a comprehensive demographic profile of a study area and its position in a wider area (e.g. province, region or nation) are enumerated below:

a. Data to be Collected by Field Survey

   a-1 Current Population by Sex and Age Group
   a-2 Current Population by Zone

b. Data Available at the Municipal Sanitary District, Amphoe and Provincial Offices

   b-1 Historical Growth of Registered Population

c. Data Available at the National Statistical Office

   c-1 Population by Sex and Age Group, 1960, 1970, 1980 (province, region, nation)

3.1.2 Compilation Format

The suggested format for the presentation of basic data are enumerated below:

Table 1 CURRENT POPULATION BY SEX AND AGE GROUP
GENERAL PLAN AREA OF_____
YEAR_____

Age Group	Both Sexes	Male	Female
0 - 4			
5 - 9			
etc. up to 65 and over			
Total			

Table 2 CURRENT POPULATION AND DENSITY BY ZONE
GENERAL PLAN AREA OF_____
YEAR_____

Zone	Area (Hectares)	Population	Gross Density (Persons/Hectare)
Urban Sub-Total			
Rural Sub-Total			
Total			

* A zone can be a grid cell, a small administrative unit or a specially divided zone for the purpose of the study.

Table 3 HISTORICAL GROWTH OF REGISTERED POPULATION, GROWTH RATE
GENERAL PLAN AREA OF_____

Year	Actual Population	Increase or Decrease	Average Growth Rate
Oldest year available			
Survey year			

Table 3' HISTORICAL GROWTH OF CENSUS POPULATION, GROWTH RATE
PROVINCE, REGION, NATION

Year	Actual Population			Average Growth Rate		
	Nation	Region	Province	Nation	Region	Province
1960						
1970						
1980						

3.2 Economic Activity

3.2.1 Data to be Collected

The basic data for understanding the economic situation of a study area and its position in a wider area (e.g. province, region nation) are enumerated below:

a. Data to be Collected by Field Survey
   - a-1 Current Employed Population by Sector, Sex and Age Group
   - a-2 Current Employed Population by Sector by Zone (Living Place)
   - a-3 Current Employed Population by Sector by Zone (Working Place)
   - a-4 Current Number of Persons Engaged in Commercial Business by Zone
   - a-5 Current Number of Establishment of Commercial Business by Zone
   - a-6 Current Number of Persons Engaged in Industry by Zone
   - a-7 Current Number of Establishments of Industry by Zone
   - a-8 Current Number of Persons Engaged in Social Service
   - a-9 Monthly Salary Paid by Commercial and Industrial Establishments
   - a-10 Site Area Used by Commercial, Industrial and Social Services Activities
   - a-11 Monthly Income Received by Household Members

b. Data Available at the Local Office
   - b-1 Collected Amount of Tax from Establishments

c. Data Available at the Office of the National Economic and Social Development Board
   - c-1 Gross Provincial and REgional Product

3.2.2 Compilation Format

The suggested formats for the presentation of basic data are enumerated below:

Table 4 CURRENT EMPLOYED POPULATION BY SECTOR, SEX AND AGE GROUP
GENERAL PLAN AREA OF_____
YEAR_____

Age Group	All Sector			Primary Sector			Secondary Sector			Tertiary Sector		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
10 - 14												
15 - 19												
etc. up to 65 and over												
Total												

If necessary, each sector is divided into more detailed calssification (ex. miming, manufacturing industry, construction for the secondary sector).

Table 5 CURRENT EMPLOYED POPULATION BY SECTOR BY ZONE
(LIVING PLACE)
GENERAL PLAN AREA OF_____
YEAR_____

Zone	All Sector	Primary Sector	Secondary Sector	Tertiary Sector
Urban				
Sub-Total				
Rural				
Sub-Total				
Total				

Table 6 CURRENT EMPLOYED POPULATION BY SECTOR BY ZONE
(WORKING PLACE)
GENERAL PLAN AREA OF_____
YEAR_____

Zone	All Sector	Primary Sector	Secondary Sector	Tertiary Sector
Urban				
Sub-Total				
Rural				
Sub-Total				
G.P. Area				
Total				
Outside				
G.P. Area				
Total				

Table 7 CURRENT EMPLOYED POPULATION BY LIVING AND WORKING PLACE
GENERAL PLAN AREA OF _____
YEAR _____

Living Place	Working Place				
	Urban Sub-Total	Rural Sub-Total	G.P. Area Total	Outside G.P. Area	Total
Urban Sub-Total					
Rural Sub-Total					
Total					

Table 8 CURRENT NUMBER OF ESTABLISHMENT, PERSONS ENGAGED AND MONTHLY SALARY PAID BY TYPE OF ACTIVITY
GENERAL PLAN AREA OF_____
YEAR_____

Type of Activity	Number of Establishment	Persons Engaged						Monthly Salary Paid
		Family			Employee			
		Male	Female	Total	Male	Female	Total	
Total								

* Type of activity is classified based on the standard classification table used for commercial and industrial activity.

Table 9 NUMBER OF EMPLOYEE BY RESIDENCE
GENERAL PLAN AREA OF_____
YEAR_____

Residence	Both Sexes	Male	Female
In G. P. Area			
Outside G. P. Area			
Amphoe			
Changwat			
Other			
Total			

This format is used for the Tabulation of Commercial Survey and Industrial Survey.

Table 10 NUMBER OF ESTABLISHMENT BY TYPE OF ACTIVITY BY ZONE
GENERAL PLAN AREA OF_____
YEAR_____

Zone	Type of Activity	
		Total
Urban		
Sub-Total		
Rural		
Sub-Total		
Total		

This format is used for the tabulation of Commercial Survey and Industrial Survey.

Table 11 PERSONS ENGAGED BY TYPE OF EMPLOYMENT BY ZONE
GENERAL PLAN AREA OF_____
YEAR_____

Zone	Family			Empolyee			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Urban Sub-Total									
Rural Sub-Total									
Total									

This format is used for the tabulation of Commercial Survey and Industrial Survey.

Table 12 SITE AREA USED BY ECONOMIC AND SOCIAL ACTIVITIES
BY ZONE
GENERAL PLAN AREA OF_____
YEAR_____

Zone	Commercial	Industrial	Educational	Health	Institutional	Total
Urban						
Sub-Total						
Rural						
Sub-Total						
Total						

Table 13 GROSS PROVINCIAL PRODUCT AT CURRENT MARKET PRICES AND CONSTANT 1972 PRICES
PROVINCE

Industrial Origin	Current Market Prices 1975	1976 -----	1987	Constand 1972 Prices 1975	1976 -----	1987
Agriculture						
Mining & quarrying						
Manufacturing						
Construction						
Electricity and Water Supply						
Transportation and Communication						
Wholesale and Retail Trade						
Banking, Insurance and Real Estate						
Ownership of Dwellings						
Public Administration and Defence						
Services						
Total						
Per Capita GPP						

4.1 Population

4.1.1 Population Growth Trend

Establish a trend presented in a graphical form and determine the percentage increase or decrease which affected the area. Compare the percentage increase or decrease to that of the province or the region and determine the causes for such increase/decrease. Point out how trends affected the local development.

4.1.2 Population Distribution/Density

Compare the urban and rural population distribution in the study area. Discuss the present urbanization level. Mention which are the most populated zones in the study area and account for this by tracing to such factors as proximity to town center, accessibility to transportation lines, etc. Analyze gross density of urban areas. Examine also the population density of each zone and determine which zones have high densities and low densities. Cite possible reasons for the difference in the densities among the zones.

4.1.3 Age-Sex Structure

Present the comparative age composition of the study area. Elaborate on the ratio or percentage composition of the following over the total population:

a. Child age population
b. Working age population
c. Old age population

Indicate the age dependency ratio in the study area.

Compare the above figures to those of the province, the region or the nation.

Point out the percentage distribution of males and females over the total population. Determine the sex ratio which is the number of males for every 100 females.

Identify possible reasons for the imbalance of sex composition in working age population and marriageable age population, if it exists.

4.1.4 Labor Force

The term "labor force" is a general term covering "employed" and "unemployed" persons, in other words, "economically active population".

In Thailand, population of ages 11 years and over is considered to be working age population. However, recently there is a proposal for raising the minimum age to 13 years. Anyway, the labor force is obtained by deducting "not economically active population" from the working age population. The "not economically active population" includes students and pupils, housewives and persons who cannot or do not want to engage in work.

Labor force participation rate (refined activity rate) *1 and crude activity rate *2 are to be calculated.

Compare these ratios with those of similar cities, the province, the region or the whole kingdom.

Age/sex-specific participation rates are also to be calculated and compared.

Based on these ratios and the results of comparisons, point out the characteristics of the survey area about labor force participation, especially focused on those of child, youth and old age population and females.

4.1.5 Household Characteristics

Compare the average household size of the study area with those of similar cities, the province, the region or the whole kingdom. If possible, its changing trend is desirably grasped.

Zonal differences are to be examined.

The type of household, for example, residential, commercial and industrial, is to be analyzed. Agricultural households are to be identified by regarding a household of which head is engaged in agricultural activity as an agricultural household.

Percentage distribution of the types and its zonal difference are to be presented.

4.1.6 Other Special Matters

School attendance rate by type of school shows an aspect of the educational level of the study area.

Calculate the school attendance rate by sex and age-group and compare it with those of similar cities, the province, the region or the whole kingdom.

A living place/schooling place matrix shows the inter-relationship among zones.

Other aspects, for example literacy, religion or race, are examined if the need arises, according to the characteristic of the study area.

*1 The ratio of economically active population of ages 11 years and over to the population of the same ages expressed in percentage.

*2 The ratio of economically active population of ages 11 years and over to the total population.

4.2 Economic Activity

4.2.1 Age-Sex Structure of Employed Population

Present the number and percentage of employed population by age group and sex. Mention the characteristics of employment by age and sex.

4.2.2 Employment by Sector

Comparing the results of Household Survey, Commercial Survey, Industrial Survey and other surveys of social service facilities, point out the characteristics of structure in relation to the economic activity of the area.

4.2.3 Employment Distribution

Compare the sectorial employment distribution (working place) and discuss the urban structure in relation to land use. Mention which zones are specialized to commercial, industrial or service sector.

Preparing a living/working place matrix, discuss the commuting structure of the area.

4.2.4 Situation of Commercial Activities

Assess the commercial activities within the study area in terms of:

a. Type of commercial area present
b. Number and type of commercial establishments present
c. Major types of business or trade

Plot all commercial establishments/commercial areas on map.

If possible, assess the growth of commercial activity in terms of rate of increase in number of establishments. Evaluate the relationship between the commercial areas in terms of area coverage and other functional uses such as residential, institutional, etc.

4.2.5 Situation of Industrial Activities

Identify the existing industrial establishments by type of activity.

Plot all industrial establishments/industrial areas on map.

If possible, assess the growth of industrial activity in terms of rate of increase in number of establishments. Evaluate the relationship between the industrial areas in terms of area coverage.

4.2.6 Special Economic Activity

It is necessary to analyze the existing situation and the past changes of the key industries of the study area.

A key industry is such economic activity as forms part of the basic sector for the area. For example, a type of manufacturing industry, tourism, mining or agriculture which supports the local economy is regarded as key industry.

Even if an analysis in terms of money is difficult because of a lack of data, it is important to make efforts to grasp the situation by using such data as number of employed persons, number of establishments, number of visitors, volume of products, etc.

4.2.7 Household Income

Prepare a table showing income brackets (e.g. 5 brackets), calculate the average household income and compare these data with those of similar cities, the province, the region or the whole kingdom.

Using the income data by sector or occupation, describe the important income source for the households within the study area.

4.2.8 Economic Position and Role of the Area in a Wider Area

Roughly estimate the sectoral amount of value added of the area and compare it to that of a wider area (e.g. province), or compare sectoral number of employment of the area to that of a wider area.

Determine the ratio of sectoral economic index (value added, number of establishments or number of employment) to that of the wider area.

Firstly make a future projection based on the past trend, considering existing plans and projects. Identify future problems if no new measures are taken. Taking into account the measures corresponding to the existing and future problems and the future desirable image of the city, set up a planning framework for land use, transportation and urban facility plans. The method used in future projection depends on the type of the planning area and the data available.

5.1 Population

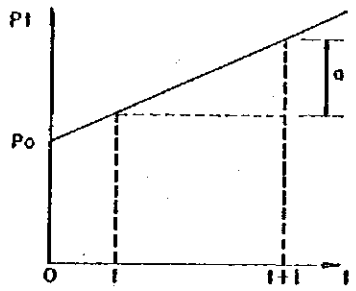
5.1.1 Total Population

There are basically three methods in projecting the future level of population namely: mathematical methods, economic methods and component methods.

In the case that the past population growth of a study area is not remarkable and this trend is expected to continue in future, simple mathematical methods can be applied. For example:

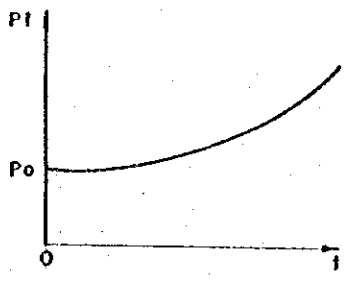
Arithmetic growth model

$$Pt = Po + at$$



Geometric growth model

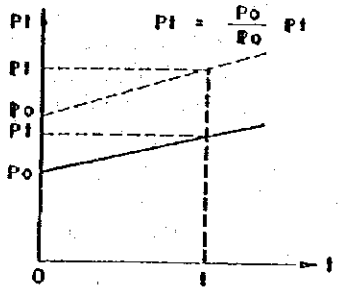
$$Pt = Po\ (1+r)^t$$



$$r = \frac{Pt+1-Pt}{Pt}$$

Ratio method

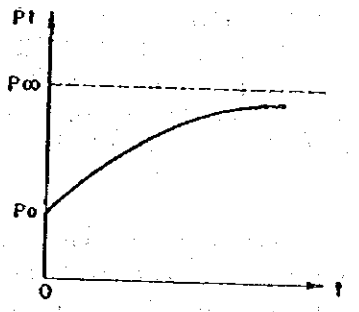
In the case that a wider area (ex. province) including the study area has a projected or planned population and it is considered that the future population of the study area can be determined proportionally to that of the wider area, the ratio method is used.



$$\frac{Po}{Ro} = \frac{Pt}{Rt}$$

When some limits of population growth should be taken into account, more elaborate mathematical formulae such as the Gamperz curve and the Logistic curve.
Considering that population growth is closely related to changing economic circumstances, the future population can also be projected in terms of future economic conditions using the economic method. This method depends on a projection of the future employment opportunities or job-population ratios in the future.

Gamperz curve model

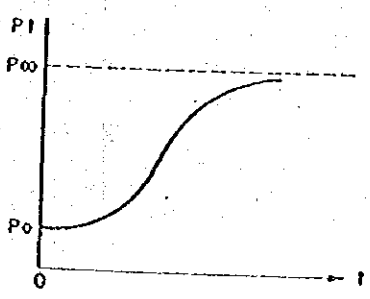


$$Pt = P\omega\, a^{b^t}$$

$$\left(a = \frac{Po}{P\omega} \qquad b < 1 \right)$$

Logistic curve model

$$Pt = 1/\left(\left(\frac{1}{Po} - \frac{b}{a} \right) \bar{e}^{at} + \frac{b}{a} \right)$$



The key point of the above shown two methods is how to decide the upper limit of population (P). The land use constraints might be the most important factor for this. Decide the available land for urbanization and assume a limit of population density of the existing and future urban area. Then calculate a reasonable level of the upper limit of population.

Simple economic method

$$P_t = \frac{\alpha}{1-\alpha\beta} E_{bt} \quad (\alpha > 1,\ 0 < \beta < 1)$$

$$E_{st} = \frac{\alpha\beta}{1-\alpha\beta} E_{bt}$$

$$\begin{bmatrix} P_t = \alpha E_t \\ E_{st} = \beta P_t \\ E_t = E_{bt} + E_{st} \end{bmatrix}$$

where

E_t : Total employment in year t
E_{bt} : Employment in basic sector in year t
E_{st} : Employment in local service sector in year t
$\alpha\left[=\frac{P_t}{E_t}\right]$: Population fed by one employed person
β : Employment in local service sector generated by one person

In a closed planning area where some kind of basic industries play an important role in future level of population, this method can be applied. Basic industries are economic activities which produce goods or supply services not for the local market but for a wider (ex. regional, national or foreign) market. They include, for example, agriculture, large scale manufacturing industry, tourism related industry, etc.

Based on the future prospect of agriculture, industrial development plan and/or tourism development plan, firstly forecast the future employment in basic sector. Then calculate the employment in local sector and population using the above shown formulae.

And also the component method which is described below is used.

5.1.2 Age-Sex Structure

The methods explained above treat total population in projection. However, the population of an area increases or decreases depending on the number of births and deaths and in-and-out migration. For projecting demand of some social service facilities like schools and facilities for the old, and for projecting labor force by age and sex group, the future population should be projected as a sex-age structure. For this purpose the cohort-survival ratio method or the component method is adopted.

This method requires information on:

a. the base population, age and sex composition, and sex ratio at birth;
b. the level and age patterns of fertility and its future trends;
c. the level and age patterns of mortality and its future trends; and
d. level and trend of migration by age and sex.

Since the future size and structure of the population depend on the specific assumptions made on the level and trend of fertility, mortality and migration, any error in one of these assumptions will affect the results. Therefore, there are always certain degrees of uncertainties regarding the future course of population owing to the changes in socio-economic, cultural and other factors which influence the birth, death and migration rates.

5.1.3 Labor Force

It is necessary to make future projection or assumption of labor force participation rate by sex and age-group. The factors which affect the labor force participation are: 1) school attendance rate; 2) participation rate of household wives; and 3) participation rate of the aged.

In future, the school attendance rate is expected to rise, which will lower the participation rate of child and youth age population. In a rural community most housewives are engaged in agricultural activity. And small-scale shops are run by family members. As urbanization proceeds and many medium- and large-scale establishments appear, housewives who do not work will increase, which will lower the participation rate of females.

As the level of public health and medical treatment rises, the proportion of old persons who want to work will be enlarged, which will raise the participation rate of the aged.

All those factors should be taken into account and finally determined referring to the national, regional or provincial trends or to some targets.

Using the determined labor force participation rate by sex and age group, future labor force can be calculated.

5.1.4 Other Special Aspect

The main forecasting items of other social aspects related to population are: 1) number of household; and 2) number of students and pupils.

The number of household is a basic item for housing demand projection.

For determining the number of households it is necessary to forecast the average number of household members in future. Generally speaking the household size shows a tendency to reduce. One reason for that is the decline of birth rate and the other is the progress of household

separation. If changes of the study area are not available, the past trends or future projections of the national, regional or provincial level should be applied by taking into consideration the differences between the study area and the other level of areas.

The number of students and pupils depends on the school attendance rate. The future rate by type of school should be determined referring to the national, regional or provincial tendency, or to the local target.

Applying the determined future attendance rate by type of school and by sex and age-group to the school age population, the number of students and pupils by type of school is obtained.

5.2 Economic Activity

5.2.1 Employment by Sector

The main purpose of future projection of economic activity of a planning area is to get information about number of employment and transfer this to land use and transportation planning groups.

Generally it is difficult to obtain past trends of employment growth in a study area. Therefore, trend methods cannot be applied. Total number of employment could be estimated applying a ratio of employed population to the total population to a projected future population. This ratio cannot help being the same as the existing one unless a special reason to change is found based on an information about the regional employment rate.

$$E_t = \alpha P_t \quad \left(\alpha = \frac{E_0}{P_0}\right)$$

As for the sectoral distribution, an estimation using the following assumption can be made at most:

$$E_{1t} = q_t L_{1t} \quad \left(q_t = \frac{E_1(0)}{L_1(0)}\right)$$

$$E_{2t} = E_{2t}^{p} + \frac{E_2(0)}{E_2(0)+E_3(0)}\left[E_t - (E_{1t} + E_{2t}^{p})\right]$$

$$E_{3t} = \frac{E_3(0)}{E_2(0)+E_3(0)}\left[E_t - (E_{1t} + E_{2t}^{p})\right]$$

where

E_{1t} : Employment in primary sector in year t
L_{1t} : Area of agricultural land in year t
q_t : Agricultural employment per land
E_{2t} : Employment in secondary sector in year t
E_{2t}^{p} : Employment generated by industrial development projects
E_{3t} : Employment in tertiary sector

A more orthodox method is as follows:

Employment is decided as a balance between demand and supply of labor force of an area. The labor force supply is projected using the conhort-survival ratio method. The labor force demand is projected based on the prospect of future sectoral production. When the sectoral value added is estimated, the sectoral labor force demand can be calculated applying the estimated sectoral labor productivity to each value added.

Comparing the demand and supply of labor force and setting a reasonable level of unemployment rate, the sectoral employment is decided.

$$L_{it}^{(d)} = \frac{V_{it}}{\nu_{it}}$$

$$L_t^{(d)} = \sum_{i=1}^{3} L_{it}^{(d)}$$

$$L_t^{(s)} = \sum_{k} \gamma_{kt} P_{kt}$$

$$E_{it}^{(I)} = L_{it}^{(d)}$$

$$E_t^{(I)} = \sum_{i=1}^{3} E_{it}^{(I)} = (1-U_t) L_t^{(s)} - E_t^{(G)} + E_t^{(C)}$$

where

$L_{it}^{(d)}$: Labor force demand in i sector in year t

V_{it} : Value added in i sector in year t

ν_{it} : Labor force productivity in i sector in year t

$L_t^{(s)}$: Labor force supply in the study area in year t

γ_{kt} : Labor force participation rate of age group k in year t

P_{kt} : Population of age group k in year t

$E_{it}^{(I)}$: Employment in i sector in the study area in year t

U_t : Unemployment rate in year t

$E_t^{(G)}$: Employed population commuting to outside of the study area in year t

$E_t^{(C)}$: Employed population commuting from outside of the study area

5.2.2 GRP by Sector

At present Gross Provincial Products (GPP) is publicized annually by NESDB. For the estimation of value added in each sector of the study area's economic activity, it is necessary to examine and evaluate the share of local production in the provincial one. When some economic activities in the study area are identified as prominent in the province and data about the number of employed persons, the number of establishments or the area used for those activities are available for comparison between the study area and the province, the estimation could be possible with a certain degree of accuracy. Another way is to use the informations about salary and wages. The ratio of labor costs to value added is considerably stable according to the type of industry and to the scale of establishments. Accumulating a knowledge of these relationships and gathering the appropriate salary data paid by the establishments in the study area, the estimation of value added would become possible.

5.2.3 Special Economic Activity

If there are some key industries in the study area as described in 4.2.6, the future prospect of the industries is needed for establishing the planning objectives. In the case of new development based on some leading industries, the situation is the same.

For the future projection it is necessary to gather data related to those economic activities, for example 1) national, regional or provincial trends; 2) development targets of regional or provincial plan; and 3) related investment plan by private sectors.

Using these data, finally the employment generated by the key industries are to be forecast. In this process, labor productivity or land/employment ratio is to be examined according to the characteristic of the industry.

CHAPTER 6

SETTING UP OF SOCIO-ECONOMIC FRAMEWORK

Taking the goals and objectives into consideration and revising the results of future projections, the main socio-economic indices in the target years are settled as a planning framework.

In other words, the framework is a quantitative expression of the goals and objectives.

6.1 Contents of Framework

The contents of the planning framework depend on the characteristics of the planning area and the planning methodology.

From the standpoint of land use planning, transport planning and urban facility planning, total population and employment by sector are the most basic data.

If the space requirement for residential area is forecast based on the housing demand, number of households is a fundamental factor.

If the social service facilities like schools and old-people's homes are important subjects to plan, population by sex and age group should be set up as an item of the framework.

Value added or some economic index of key industry might be required in cases as shown below:

(1) Future employment should be calculated in close connection with the target GRP of an upper level (e.g. provincial, regional etc.) economic development plan.

(2) Industrial or tourism development is the main planning object of the city.

(3) Cargo movement is an important factor for transport plan.

6.2 Items to be Considered

For determining the socio-economic framework, the following aspects, for example, should be studied and determined as quantitative target levels:

For total population

a. Land use constraints (upper limit population)
b. Possibility of urban infrastructure provision (sustainable population in accordance with the investment pace for urban infrastructure)

c. City size which makes possible to realize a target function of the city (e.g. a multi-functioned regional center might require a population of 200,000 and over)

For employment by sector

a. Labor force participation
b. Level of unemployment rate
c. Attracting force from the outside of the planning area (the ratio of employment generated in the planning area to the employed population living in the area)
d. Production scale or employment of key industry (e.g. target employment of a planned industrial estate)
e. Trends or policy for agricultural activity

For number of households

a. Average number of household members
b. Housing projects (planned or assumed number of households in the projects)

For population by sex and age group

a. Level of net migration of youth age population
b. Target of family planning (birth rate)
c. Level of social welfare and safety (death rate, survival rate)

PART II

MANUAL OF DATABASE SYSTEM IN INCEPTION STAGE

CHAPTER 1

INTRODUCTION

This manual is written for Research and Analysis System made by dBASE III PLUS Language.

dBASE III PLUS is the third major version of the classic dBASE database management system for micro-computers.

dBASE III is a powerful and flexible system for storing, organizing, analyzing, and retrieving information on a micro-computer.

This manual consists of three Chapters.

The first Chapter explains the concept of the system.

Chapter 3 explains the system design that includes Definition of System Function, Data Items, Code Design, Input and Output format and details of software.

Chapter 4 explains the operation manual that shows how to operate this system from starting dBASE III PLUS to running tabulation programmes.

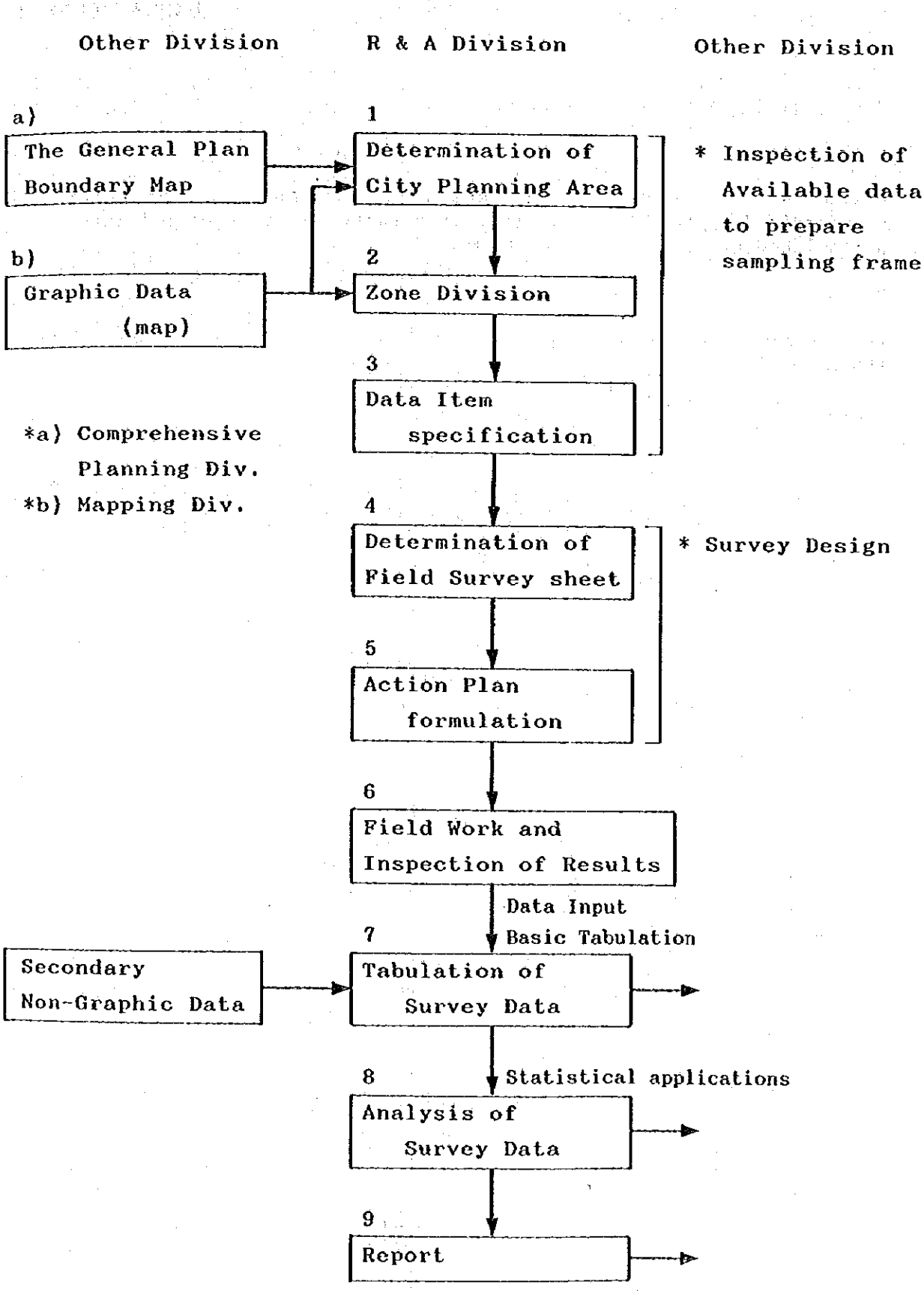
2.1 Purpose of System

From a technical point of view, a computer system is concerned to promote a proper Data Processing System for DTCP to guide, supervise and assist city planning and development. Under normal conditions, Data Processing for making a city plan has various kinds of problems identified in such fields as data availability, accuracy/efficiency of Data Processing and therefore, this system should be made for improvement of Data Processing in Research and Analysis Division.

2.2 Concept of System

Based on a review of current Data Processing activity in Research and Analysis Division, standardized/applicable Data Processing System shall be synchronized into one streamlined procedure as shown Fig. 1. The concept of this system should be most instrumental for formalizing of Research and Analysis Division. Therefore, the concept of Data Processing System should be defined as follows:

Fig. 1 RESEARCH & ANALYSIS PROCEDURE FLOW CHART



3.1 Definition of System Function

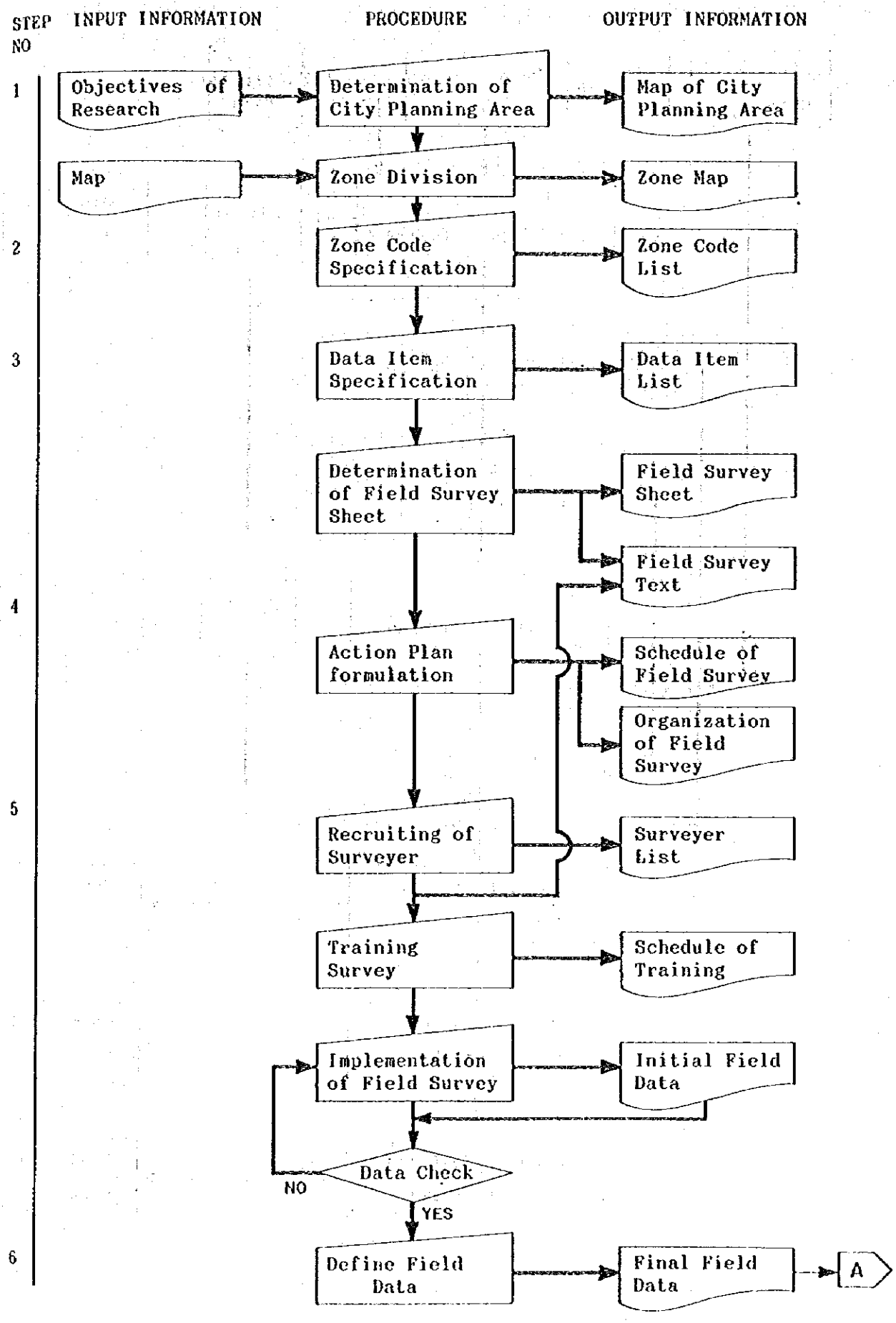
Formulation of Standardized/Applicable Data Processing

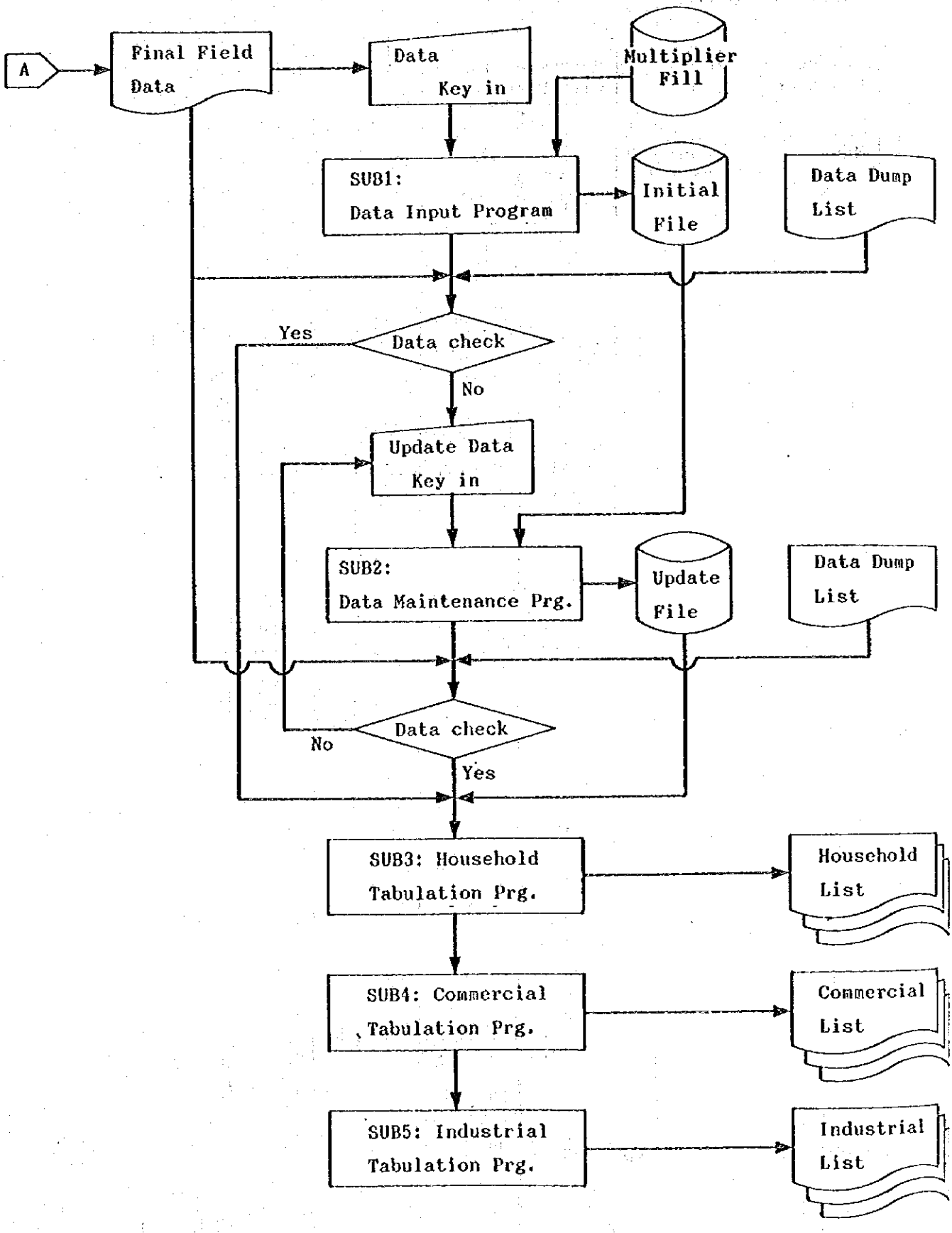
Based on review of current Research and Analysis activities, standardized/applicable Data Processing shall be synchronized into one streamlined procedure as shown in Fig. 1.

Definition of System Function

From a technical point of view, system function should be defined as shown in Fig. 2.

Fig. 2 IMPROVEMENT OF R & A SYSTEM BY USING A COMPUTER




A
Final Field Data
Data Key in
Multiplier Fill
SUB1: Data Input Program
Initial File
Data Dump List
Yes
Data check
No
Update Data Key in
SUB2: Data Maintenance Prg.
Update File
Data Dump List
No
Data check
Yes
SUB3: Household Tabulation Prg.
Household List
SUB4: Commercial Tabulation Prg.
Commercial List
SUB5: Industrial Tabulation Prg.
Industrial List

3.2 Data Item

In current field survey of Research and Analysis Division, detailed specification for each data item shall be defined as Table 1-3.

And data item specification is shown in Table 4.

Table 1 HOUSE HOLD DATA FORM

Municipality/Sanitary District..... [ ] Residential Household

Changwat.....Year.....House No..... [ ] Commercial Household

Moo.....Tanon.....Tambon.....Survey Area..... [ ] Industrial Household

Name of the Household Head.....Region..... Surveyor.....

No.	Relationship to the Household Head	Sex	Age	Race	Nationality	Place of Birth		Literacy		Level of Education				Occupation	Status of work	Income/Month
						Native Born	Other Changwat	Literacy	Illiteracy	No Education	School Grade Attended	Province	Year of School Complete			

Table 1.1 MIGRATION DATA FORM (RESEARCH & ANALYSIS DIVISION)

House No.....Tanon.....Survey Area.....

No.	Move In									Move Out								
	Reason for Moving In						Move from			Reason for Moving Out						Move to		
	To study	To change marital status	Enroll transfer job	To look for work	Following person in household	Others	Tambon	Amphoe	Changwat	To study	To change marital status	Enroll transfer job	To look for work	Following person in household	Others	Tambon	Amphoe	Changwat

Table 2 COMMERCIAL SURVEY

Survey area.....

Name of business..... Duration of Business.....year
House No. .....Moo.....Road.....Subdistrict.....District.....
(Tambon) (Amphoe)

☐ Municipal area
☐ Non-Municipal area Surveyor.....

1. Race ☐ Thai ☐ Chinese ☐ Indian ☐ Others
Nationality ☐ Thai ☐ Chinese ☐ Indian ☐ Others
Religion ☐ Buddhism ☐ Christianity ☐ Indian ☐ Others

2. Type of Business
☐ Wholesale ☐ Wholesale - Service
☐ Retail ☐ Retail - Service
☐ Service ☐ Wholesale-Retail-Service
☐ Wholesale-Retail

3. Major goods or Service

Item 1. .....
Item 2. .....
Item 3. .....

4. Number of Persons Engaged in Business

- Family member Male.....Female.....
- Employees Male.....Female.....
- Total Salary per month.....Baht
(Highest Salary.....Baht per month,
Lowest Salary.....Baht per month)

Table 2.1 EMPLOYEE SURVEY

	Total	No. of Person Engaged
	Male	
	Female	
	11 - 24	Age Group
	25 - 44	
	45 - 60	
	60 and over	
	No Education	Education Level
	Primary Level	
	Secondary Level	
	Vocational/ Teacher	
	University	
	Municipal Area	Residence
	Non-Municipal Area (In General Plan Area)	
	Changwat	
	Other Changwat	
	Municipal Area	Place of Birth
	Non-Municipal Area (In General Plan Area)	
	Changwat	
	Other Changwat (Some Region)	
	Other Region	
	Foreign Country	

Table 3 INDUSTRIAL SURVEY

Municipality.....Changwat.....Surveryor.....

House No....Road.....Survey area....

Industrial Name.....

Owner Name.....

Location ☐ Municipal area
☐ Non-Municipal area

Characteristic ☐ Isolated
☐ Shared space

Duration of Industry.....year

Type of industry ☐ Service industry
☐ Manufacturing industry
☐ Handicraft industry

Major products 1. .....
2. .....
3. .....

No. of persons engaged in business

1. Family member Male.....Female.....
2. Employee Male.....Female.....
3. Total Salary per month.....Baht
(Highest Salary.....Baht, Lowest Salary.....Baht)

Table 3.1 EMPLOYER SURVEY

	Total	No. of Person Engaged
	Male	
	Female	
	11 - 24	Age Group
	25 - 44	
	45 - 60	
	60 and over	
	No Education	Education Level
	Primary Level	
	Secondary Level	
	Vocational/ Teacher	
	University	
	Municipal Area	Residence
	Non-Municipal Area (In General Plan Area)	
	Changwat	
	Other Changwat	
	Municipal Area	Place of Birth
	Non-Municipal Area (In General Plan Area)	
	Changwat	
	Other Changwat (Some Region)	
	Other Region	
	Foreign Country	

Table 4 ITEM SPECIFICATION

	POPULATION		COMMERCIAL	INDUSTRIAL	LAND USE	
	R & A	ENG	R & A	R & A	MAP	LAND USE
Zone Code	Area Data No. Location L Code	Address	Area Data No. Location L Code	Area Data No. Location L Code		
Item	Type of Household		Duration of Business	Duration of Business	Residential Area	Preservation Area for Residential Purposes
		Number of People	Type of Commercial	Type of Industry		Low Density Residential Area
		Number of Children Aged under 5 Years Old	Major Products	Major Products		Medium Density Residential Area
		Number of Vehicles Owned	No. of Person: Family Male	No. of Person: Family Male		High Density Residential Area
		Average Monthly Income of Family	Family Female	Family Female	Commercial Area	Commercial and High Density Residential Area
	Sex	Sex	Employee Male	Employee Male	Industrial Area	Industrial and Warehouse Area
	Age	Age	Employee Female	Employee Female		Specific Industrial Area
	Race		Age Group	Age Group	Religious Institution	Religious Institution Area
	Nationality				Educational Institution	Educational Institution Area
	Place of Birth		Place of Birth	Place of Birth	Recreation Area	Open Space for Recreation and Conservation of Environmental Quality
	Literacy				Warehouse Area	Warehouse Area
	School Grade Attending		Educational Level	Educational Level	Agriculture Forest, Vacant Livestocks	Rural and Agricultural Area
	Occupation	Occupation				Preservation Area for Rural and Agricultural Purposes
	Place of School	Place of Work or School				Agricultural Land Reformed Area
	Place of Work					Conservation of the Thai Identity, Art and Culture Area
	Monthly Salary		Total Salary Paid per Month	Total Salary Paid per Month	River, Canal	Open Space for Conservation of Environmental Quality and Fishery
	Move In				Government Area Institution Utility	Governmental Institution, Public Utility and Facility Area
	Move Out					
			Residence	Residence	Roads, Soys	
			Area	Area		

3.3 Code Design

Codes are often used in Data Processing System because:

1. Data is simplified and standardized, and the number of mistakes is reduced.

2. Classifying, verifying, and totalling operations are easier.

3. Data is more easily understood.

4. Processing is more efficient.

and there are various kinds of code type such as follows:

1. Classifiability
   - Code make it easier to classify (group) the data.

2. Identifiability
   - The meaning of codes should be easily deduced from codes themselves.

3. Commonality
   - Codes should be defined so that they can be used in many different applications. All applications of each system function should be able to use the same codes for the same things.

4. Expandability
   - Code structures should be designed to be able to grow and change.

Codes of this system are shown in Table 5.

Table 5 CODE TABLE FOR HOUSEHOLD

CODE	ITEM
Identification:	Type of Household
1	Residential household
2	Commercial household
3	Industrial household
	Number of Family Number
1. 2, 3...n	No.
	Sex
1	Male
2	Female
	Age
1, 2, 3...n	real age
	Race
1	Thai
2	Chinese
3	Indian
4	Others
	Nationality
1	Thai
2	Chinese
3	Indian
4	Other
	Place of Birth
1	Native born
2	Born outside general plan or other Changwat
	Literacy
1	Literacy = (Yes)
2	Illiteracy = (No)
	Status of Education
1	Learning
2	Finish
3	No education

Table 5

CODE	ITEM
	Level of Education
1	Kindergarten and pre-primary
2	Elementary (Primary Level)
3	Secondary Level
4	Vocational, Cert in ed. and Dip in ed.
5	Bachelor's degree and higher
6	Other education
7	None education
	Place of school
	Code No. of grid cell
	Occupation
1	Professional, Technical and Related Workers
2	Administrative, Executive, Managerial Workers and Government Officials
3	Clerical and Related Workers
4	Sales Workers
5	Agricultural, Animal Husbandry and Forest Workers, Fisherman and Hunters
6	Miners, Quarrymen, Well Drillers and Related Workers
7	Transport Equipment Operators and Related Workers
8	Craftsmen, Production Workers and Laborers
9	Service Workers
10	Workers not classifiable by Occupation
11	Unemployed Persons
12	Housewife
13	Student
14	Unable to work
15	Unknown
16	No education
	Place of Work
	Code No. of grid cell
	Monthly salary
(1, 2, 3...n)	real income
	Reasons for Migration (Move in/Move out)
1	To study
2	To change marital status
3	To work, to look for work
4	Following persons in household
5	Others

Table 6 CODE TABLE FOR IDENTIFICATION
(LOCATION AND SURVEY AREA)

Code	Item
Identification	
	Survey Area
1	General Plan of Tha-Rua
	Data Number
1, 2, 3....n	Data No.
	Location for Area
1	In Tambon Tha-Rua Municipality
2	In Tha-Luang Sanitary District
3	In Tha-Lan Sanitary District
4	Rural in Amphoe Tha-Rua, changwat Phra Nakhpon Si Ayuthaya
5	Rural in Amphoe Tha-Luang, changwat Saraburi
6	Outside General Plan of Tha-Rua
	Location for Grid Cell
A113 ------ A774 B111 ------ B774 C111 ------ C774 D111 ------ D774 E111 ------ E774 F111 ------ F774 G111 ------ G774 H111 ------ H774 I111 ------ I774 J111 ------ J774 K111 ------ K774	
	Number of family number
1, 2, 3....n	No.
	Code of Changwat
1	Krabi
2	Kanchanaburi
3	Kalasin
4	Kamphang Phet
5	Khon Kaen
6	Chanthaburi

Table 6

CODE	ITEM
7	Chachoengasao
8	Chonburi
9	Chainarth
10	Chaiyaphum
11	Chumphon
12	Chiang Rai
13	Chiang Mai
14	Trang
15	Trad
16	Tak
17	Nakhon Nayok
18	Nakhon Pathom
19	Nakhon Panom
20	Nakhon Ratchasima
21	Nakhon Srithammarat
22	Nakhon Sawan
23	Nonthaburi
24	Narathiwat
25	Nan
26	Buri Rum
27	Pathum Thani
28	Prachaup Kirikhan
29	Prachin Buri
30	Pattani
31	Phra Nakhon Si Ayuthaya
32	Payoa
33	Pang Nga
34	Pattaluang
35	Pichit
36	Pitsanulok
37	Petchaburi
38	Petchabun
39	Prae
40	Phuket
41	Mahasarakham
42	Maehongson
43	Yasothon
44	Yala
45	Roi-Et
46	Ranong
47	Rayong
48	Ratchaburi
49	Lop Buri
50	Lampang
51	Lampoon
52	Loei
53	Sri Sa Ket
54	Sakon Nakhon
55	Songkhla
56	Satun

Table 6

CODE	ITEM
57	Samut Prakarn
58	Samut Sonkhram
59	Samut Sakhon
60	Saraburi
61	Singburi
62	Sukhothai
63	Surat Thani
64	Surat Thani
65	Surin
66	Nhongkai
67	Ang Thong
68	Udon Thani
69	Uthai Thani
70	Uttaradit
71	Ubon Ratchathani
72	Bangkok Metropolis
73	Mukdahan

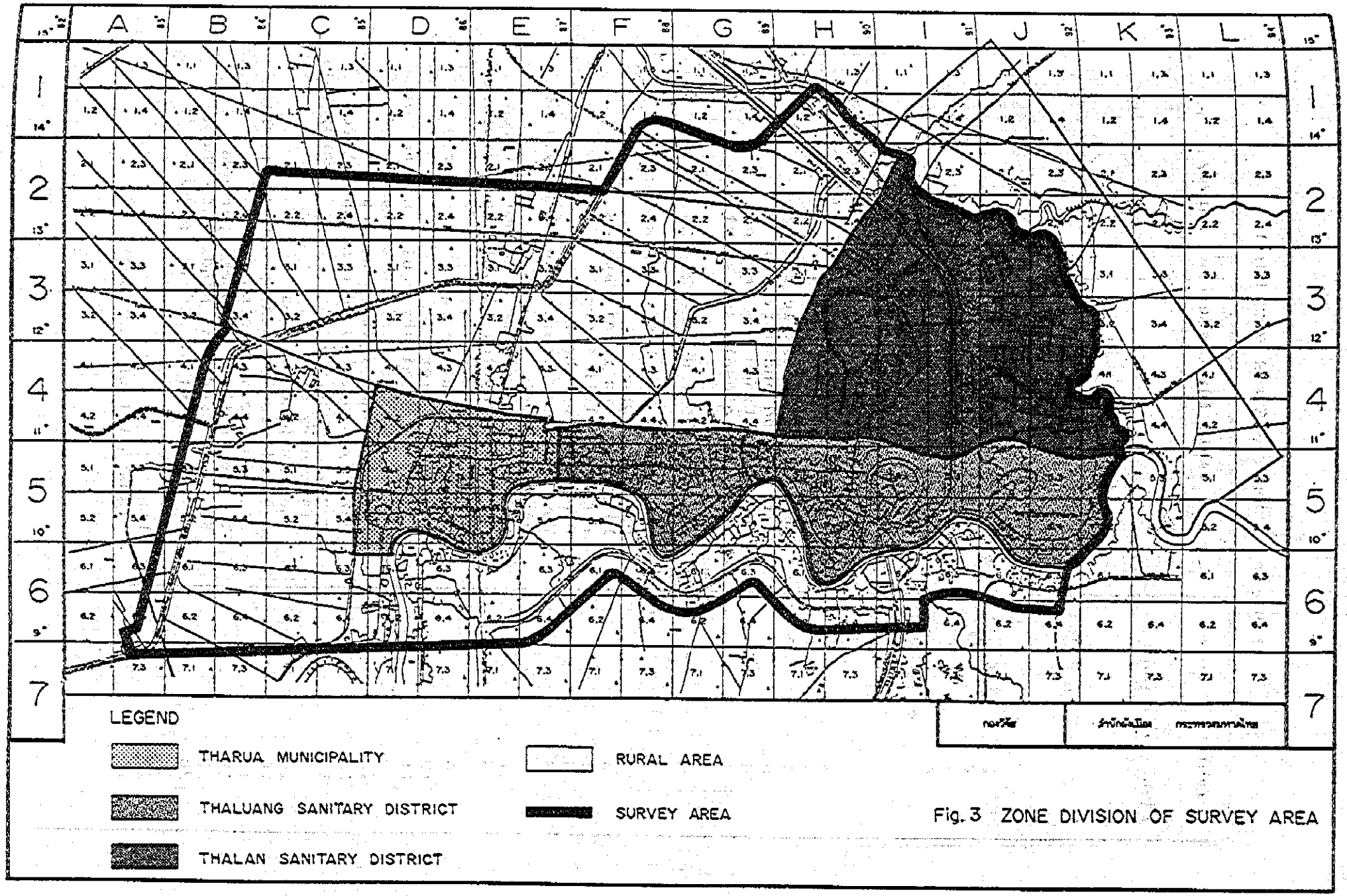


Fig. 3 ZONE DIVISION OF SURVEY AREA

Table 7 CODE TABLE FOR COMMERCIAL

Table Code	Table for Commercial Survey
Identification:	
	Duration of Business
1, 2, 3....n	No. of years
	Religion
1	Buddhism
2	Christianity
3	Islam
4	Others
	Type of business
1	Retail trade
2	Wholesale trade
3	Services
4	Retail and Wholesale trade
5	Retail trad and services
6	Wholesale trade and services
7	Retail, wholesale and services
	Kind of goods and services
1	Other food and beverages stores
2	Grocery stores
3	Miscellaneous retail stores
4	Finished cloth stores
5	Cloth making shops
6	Women's hairdressing and beauty, Men's barber shops
7	Wearing apparel and accessory stores
8	Car, motorcycle, bicycle and accessory stores
9	Electric lighting equipment stores
10	Pharmacy stores
11	Plumbing, sanitary equipment and other construction materials stores
12	Furniture and fixture stores
13	Jewelry stores (Gold ornament stores)
14	Book, periodical and newspaper, stationery stores
15	Photographic studios
16	Agricultural machinery and equipment
17	Gasoline service stations
18	Turkish bath and massage parlors
19	Souvenirs and Thai handicraft shops
20	Hotels and other lodging places
21	Theatre
22	Bank
23	Transportation services

Table 7

CODE	ITEM
24	Other personal services not elsewhere classified
25	Pawn shops
26	Watches, clocks, glasses stores and repair
27	Offerings
28	Advertising place
29	Laundries, laundry services and cleaning
30	Movie and V.D.O. for rent
31	Others
	<u>Persons Engaged in the business</u>
1, 2, 3....n	Family member - male
1, 2, 3....n	Family member - female
1, 2, 3....n	Employee - male
1, 2, 3....n	Employee - female

Table 8 CODE TABLE FOR INDUSTRIAL

Table Code	Table for Industrial Survey
Identification:	
	Duration of Business
1, 2, 3....n	
	Characteristic of Building
1	Isolated
2	Share space
	Type of Industry
1	Service industry
2	Manufacturing industry
3	Handicraft industry
	Major Product
1	Manufacture of foods, drinks and products
2	Manufacture of made-up textile goods wearing apparel and leather products
3	Manufacture of wooden
4	Manufacture of pulp and paper, print and printing services
5	Manufacture of basic industrial chemical rubber, plastic
6	Manufacture of non-metallic mineral products
7	Manufacture of metal product
8	Manufacture, repairing of machinery, tools electric lamps and transportation equipment
9	Other industries
	Persons engaged in industry
1, 2, 3....n	Family member - male
1, 2, 3....n	Family member - female
1, 2, 3....n	Employee - male
1, 2, 3....n	Employee - female
Observation:	1. Lacking of time for preparation before starting the Tharua field survey, we used the old survey sheets which were difficult for coding
	2. The statistical officers have to spend a lot of time for coding because they have never been Trained to do this process before.

3.4 Input/Output Format

Use the process flow diagram as stated in Chapter 3.5 to find which programmes output data to screen or printer. For each programmes, start by listing all the output data items. Then, build a cross-reference table to show which of the data items output by the programme are also input to the programme.

Input coding sheet

The Table 9-11 shows the design of input coding sheet.

Output list

The Table 1-1 ~ 3-4 shows the design of output list.

(1) INPUT

Table 9 CODING SHEET OF HOUSEHOLD SURVEY

Page.....

IDENTIFICATION					FAMILY MEMBER														
		LOCATION										EDUCATION							
SURVEY AREA	DATA NO.	AREA	GRID CELL NO.	TYPE OF HOUSEHOLD	NO.	SEX	AGE	RACE	NATIONALITY	PLACE OF BIRTH	LITERACY	STATUS	LEVEL	PLACE OF SCHOOL	OCCUPATION	PLACE OF WORK	MONTHLY SALARY	MOVE IN	MOVE OUT

Table 10 CODING SHEET OF COMMERCIAL SURVEY

Page.....

IDENTIFICATION																															
		Location						No of Persons Engaged in Business				Employees																			
												Age Group				Educational level					Residence				Place of Birth						
Survey Area	Data No.	Area	Grid Cell	Duration of Business	Religion	Type of Business	Major Products	Family Male	Family Female	Employee Male	Employee Female	11 - 24	25 - 44	45 - 60	Over 60	No Education	Primary Level	Secondary Level	Vocational Teacher	University	In Municipality	Outside Municipality	In Changwat	Others	In Municipality	Outside Municipality	In Changwat	Other Changwat	Other Region	Foreign Country	Total Salary Paid Per Month

Table 11 CODING SHEET OF INDUSTRIAL SURVEY

Page.....

IDENTIFICATION																Employees															
		Location						No of Persons Engaged in Business				Age Group				Educational level					Residence				Place of Birth						
Survey Area	Data No.	Area	Grid Cell	Duration of Business	Characteristic of Building	Type of Industry	Major Products	Family Male	Family Female	Employee Male	Employee Female	11 - 24	25 - 44	45 - 60	Over 60	No Education	Primary Level	Secondary Level	Vocational Teacher	University	In Municipality	Outside Municipality	In Changwat	Others	In Municipality	Outside Municipality	In Changwat	Other Changwat	Other Region	Foreign Country	Total Salary Paid Per Month

(2) OUTPUT LIST

Table 1-1

Population by Sex and Age groups

AGE GROUP	Male	Percent (%)	Female	Percent (%)	Total	Percent (%)
0 - 4	1450	8.44	1236	6.52	2686	7.43
5 - 9	1716	9.98	1902	10.03	3618	10.01
10 - 14	1574	9.16	1681	8.87	3255	9.01
15 - 19	1719	10.00	1780	9.39	3499	9.68
20 - 24	1668	9.71	1996	10.53	3664	10.14
25 - 29	1510	8.79	1606	8.47	3116	8.62
30 - 34	1159	6.74	1638	8.64	2797	7.74
35 - 39	1157	6.73	1343	7.09	2500	6.92
40 - 44	910	5.29	1066	5.62	1976	5.47
45 - 49	1019	5.93	1074	5.67	2093	5.79
50 - 54	1104	6.42	996	5.25	2100	5.81
55 - 59	664	3.86	899	4.74	1563	4.32
60 - 64	644	3.75	588	3.10	1232	3.41
65 and over	893	5.20	1149	6.06	2042	5.65
Grand Total	17187	100.00	18954	100.00	36141	100.00

Table 1-1.1 POPULATION BY SEX AND AGE GROUPS

AGE GROUP	Southern Area							Northern Area							Grand Total	Percent (%)
	Male	Percent (%)	Female	Percent (%)	Total	Percent (%)	III	Male	Percent (%)	Female	Percent (%)	Total	Percent (%)	III		
0 - 4	1124	9.04	853	6.18	1977	7.54		326	6.85	383	7.43	709	7.15		2686	7.43
5 - 9	1342	10.80	1306	9.47	2648	10.10		374	7.86	596	11.55	970	9.78		3618	10.01
10 - 14	1168	9.40	1131	8.20	2299	8.77		406	8.53	550	10.66	956	9.64		3255	9.01
15 - 19	1205	9.70	1324	9.60	2529	9.64		514	10.80	456	8.84	970	9.78		3499	9.68
20 - 24	1165	9.37	1491	10.81	2656	10.13		503	10.57	505	9.79	1008	10.17		3664	10.14
25 - 29	1123	9.04	1273	9.23	2396	9.14		387	8.13	333	6.46	720	7.26		3116	8.62
30 - 34	831	6.69	1154	8.36	1985	7.57		328	6.89	484	9.38	812	8.19		2797	7.74
35 - 39	770	6.20	898	6.51	1668	6.36		387	8.13	445	8.63	832	8.39		2500	6.92
40 - 44	492	3.96	747	5.41	1239	4.72		418	8.79	319	6.18	737	7.43		1976	5.47
45 - 49	842	6.77	856	6.20	1698	6.47		177	3.72	218	4.23	395	3.98		2093	5.79
50 - 54	712	5.73	735	5.33	1447	5.52		392	8.24	261	5.06	653	6.59		2100	5.81
55 - 59	540	4.34	698	5.06	1238	4.72		124	2.61	201	3.90	325	3.28		1563	4.32
60 - 64	466	3.75	417	3.02	883	3.37		178	3.74	171	3.32	349	3.52		1232	3.41
65 and over	649	5.22	913	6.62	1562	5.96		244	5.13	236	4.58	480	4.84		2042	5.65
Grand Total	12429	100.00	13796	100.00	26225	100.00		4758	100.00	5158	100.00	9916	100.00		36141	100.00

Table 1-2 POPULATION BY AGE GROUPS BY OCCUPATION CODE (EMPLOYED)

AGE GROUP	Occupation Code 1			Occupation Code 2			Occupation Code 3			Occupation Code 4			Occupation Code 5			Occupation Code 6		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Femal	Total
11 - 14	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0
15 - 19	0	0	0	0	0	0	0	14	14	87	30	117	26	18	44	0	0	0
20 - 24	8	23	31	0	0	0	104	109	213	75	159	234	56	43	99	0	0	0
25 - 29	100	90	190	76	2	78	109	112	221	105	162	267	56	67	123	0	0	0
30 - 34	58	157	215	25	0	25	78	72	150	60	212	272	33	44	77	0	0	0
35 - 39	111	127	238	37	2	39	67	14	81	82	193	275	32	72	104	0	0	0
40 - 44	61	9	70	23	0	23	61	31	92	40	180	220	91	66	157	0	0	0
45 - 49	44	23	67	17	2	19	90	0	90	85	160	245	117	97	214	0	0	0
50 - 54	30	0	30	5	1	6	71	0	71	86	228	314	130	87	217	0	0	0
55 - 59	32	0	32	35	0	35	0	0	0	55	152	207	64	73	137	0	0	0
60 - 64	10	0	10	2	0	2	0	0	0	75	110	185	200	46	246	0	0	0
65 and over	0	0	0	0	0	0	0	0	0	83	75	158	90	24	114	0	0	0
Grand Total	454	429	883	220	7	227	580	352	932	833	1661	2494	903	637	1540	0	0	0

Table 1-2.1 POPULATION BY AGE GROUPS BY OCCUPATION CODE (EMPLOYED)

AGE GROUP	Occupation Code 7			Occupation Code 8			Occupation Code 9			Occupation Code10			Sub total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
11 - 14	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
15 - 19	8	0	8	138	139	277	21	0	21	9	0	9	289	201	490
20 - 24	49	11	60	523	321	844	53	48	101	0	8	8	868	722	1590
25 - 29	77	0	77	661	305	966	74	81	155	14	44	58	1272	863	2135
30 - 34	106	0	106	614	265	879	56	103	159	14	9	23	1044	862	1906
35 - 39	113	8	121	606	134	740	67	94	161	0	38	38	1115	682	1797
40 - 44	131	0	131	465	94	559	7	73	80	8	26	34	887	479	1366
45 - 49	45	0	45	546	55	601	31	38	69	0	16	16	975	391	1366
50 - 54	116	0	116	476	39	515	94	8	102	34	45	79	1042	408	1450
55 - 59	45	0	45	275	88	363	47	16	63	51	82	133	604	411	1015
60 - 64	0	0	0	90	15	105	25	8	33	73	24	97	475	203	678
65 and over	8	0	8	36	0	36	0	24	24	89	22	111	306	145	451
Grand Total	698	19	717	4430	1455	5885	475	493	968	292	314	606	8885	5367	14252

Table 1-2.2 POPULATION BY AGE GROUPS BY OCCUPATION CODE (LABOR FORCE)

AGE	Unemployed total			Labor force total		
GROUP	Male	Female	Total	Male	Female	Total
11 - 14	14	30	44	22	30	52
15 - 19	199	367	566	488	568	1056
20 - 24	515	449	964	1383	1171	2554
25 - 29	156	159	315	1428	1022	2450
30 - 34	85	67	152	1129	929	2058
35 - 39	8	42	50	1123	724	1847
40 - 44	17	0	17	904	479	1383
45 - 49	25	0	25	1000	391	1391
50 - 54	10	10	20	1052	418	1470
55 - 59	14	0	14	618	411	1029
60 - 64	0	0	0	475	203	678
65 and over	8	0	8	314	145	459
Grand Total	1051	1124	2175	9936	6491	16427

Table 1-2.3 POPULATION BY AGE GROUPS BY OCCUPATION CODE (NONE LABOR FORCE)

AGE	Occupation Code12			Occupation Code13			Occupation Code14			Occupation Code15			Occupation Code16			Subtotal		
GROUP	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
11 - 14	0	0	0	1182	1280	2462	8	0	8	0	0	0	0	0	0	1190	1280	2470
15 - 19	3	102	110	1200	1087	2287	11	0	11	0	0	0	0	0	0	1219	1189	2408
20 - 24	22	484	506	243	318	561	8	0	8	0	0	0	0	0	0	273	802	1075
25 - 29	0	524	524	34	40	74	32	0	32	0	0	0	0	0	0	66	564	630
30 - 34	9	666	675	0	0	0	6	22	28	0	0	0	0	0	0	15	688	703
35 - 39	0	581	581	0	8	8	16	8	24	0	0	0	0	0	0	16	597	613
40 - 44	0	575	575	0	0	0	0	0	0	0	0	0	0	0	0	0	575	575
45 - 49	0	671	671	0	0	0	9	0	9	0	0	0	0	0	0	9	671	680
50 - 54	6	550	556	0	0	0	32	17	49	0	0	0	0	0	0	38	567	605
55 - 59	14	464	478	0	0	0	23	11	34	0	0	0	0	0	0	37	475	512
60 - 64	0	279	279	0	0	0	164	96	260	0	0	0	0	0	0	164	375	539
65 and over	0	97	97	0	0	0	560	882	1442	0	0	0	0	0	0	560	979	1539
Grand Total	59	4993	5052	2659	2733	5392	869	1036	1905	0	0	0	0	0	0	2587	8762	12349

Table 1-2.4 POPULATION BY AGE GROUPS BY OCCUPATION CODE (TOTAL)

AGE GROUP	LABOR FORCE									NONE LABOR FORCE			GRAND TOTAL		
	Employed			Unemployed			Total								
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
11 - 14	8	0	8	14	30	44	22	30	52	1190	1280	2470	1212	1310	2522
15 - 19	289	201	490	199	367	566	488	568	1056	1219	1189	2408	1707	1757	3464
20 - 24	868	727	1595	515	449	964	1383	1171	2554	273	802	1075	1656	1973	3629
25 - 29	1272	863	2135	156	159	315	1428	1022	2450	66	564	630	1494	1586	3080
30 - 34	1044	862	1906	85	67	152	1129	929	2058	15	688	703	1144	1617	2761
35 - 39	1115	682	1797	8	42	50	1123	724	1847	16	597	613	1139	1321	2460
40 - 44	887	479	1366	17	0	17	904	479	1383	0	575	575	904	1054	1958
45 - 49	975	391	1366	25	0	25	1000	391	1391	9	671	680	1009	1062	2071
50 - 54	1042	408	1450	10	10	20	1052	418	1470	38	567	605	1090	985	2075
55 - 59	604	411	1015	14	0	14	618	411	1029	37	475	512	655	886	1541
60 - 64	475	203	678	0	0	0	475	203	678	164	375	539	639	578	1217
65 and over	306	145	451	8	0	8	314	145	459	560	979	1539	874	1124	1998
Grand Total	8885	5367	14252	1051	1124	2175	9936	6491	16427	3587	8762	12349	13523	15253	28776

Table 1-3 NUMBER OF HOUSEHOLDS AND POPULATION BY LIVING PLACE

GRID CODE	Number of Households	Population
D4421	36	243
D4441	27	126
D5511	81	405
D5521	249	1298
D5531	209	994
D5541	509	2534
E4421	46	160
E4441	54	279
E5511	97	423
E5521	153	787
E5531	106	624
subtotal 1	1567	7873
E5532	28	154
F4422	14	168
F4442	14	70
F5512	72	328
F5532	98	518
F5542	56	210
F6632	28	224
G4422	70	392
G4442	28	168
G5512	224	1106
G5522	56	308
G5532	130	652
H4442	266	1204
H5512	284	1340
H5522	126	602
H5532	337	1614
H5542	126	532
H6612	70	350
H6632	70	378
I5512	154	882
I5522	225	1067
I5542	28	126
I6632	14	70
J5522	56	280
J5542	14	56
J6612	14	98
J6632	28	154
K5512	14	70

Table 1-4 A. WORKING POPULATION BY OCCUPATION CODE BY LIVING PLACE

GRID CODE	Occupation Code										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Total
D4421	0	0	18	27	36	0	0	9	27	0	117
D4441	9	9	0	0	0	0	9	36	0	0	63
D5511	18	0	0	0	45	0	9	108	45	0	225
D5521	0	9	24	88	208	0	24	193	72	0	618
D5531	48	24	24	176	16	0	48	58	8	24	426
D5541	96	20	57	387	112	0	97	149	88	48	1054
E4421	10	1	3	18	0	0	0	27	0	9	68
E4441	0	0	9	9	36	0	18	18	9	9	108
E5511	0	9	17	32	8	0	0	80	0	16	162
E5521	48	9	16	152	0	0	8	48	32	24	337
E5531	16	3	18	32	24	0	48	56	16	8	221
subtotal 1	245	84	186	921	485	0	261	782	297	138	3399
E5532	0	0	0	28	0	0	0	42	0	0	70
F4422	0	0	0	0	0	0	0	70	0	0	70
F4442	0	0	0	0	0	0	0	28	0	0	28
F5512	14	2	0	70	0	0	14	14	0	43	157
F5532	0	0	14	14	0	0	14	140	0	14	196
F5542	0	14	14	0	14	0	14	28	14	0	98
F6632	0	0	0	0	0	0	0	70	0	0	70
G4422	0	0	14	0	42	0	0	126	14	42	238
G4442	0	0	0	14	28	0	0	70	14	0	126
G5512	0	14	56	140	0	0	0	280	0	14	504
G5522	0	14	42	42	0	0	0	0	0	0	98
G5532	1	5	1	42	0	0	1	143	28	0	221
H4442	28	0	0	112	0	0	28	252	28	28	476
H5512	30	22	70	84	0	0	14	173	14	56	463
H5522	14	0	14	56	0	0	14	42	14	14	168
H5532	44	14	56	238	0	0	14	365	56	14	801
H5542	14	0	14	28	0	0	0	112	14	14	196
H6612	14	0	28	14	0	0	0	42	14	0	112
H6632	0	0	14	0	0	0	0	140	0	0	154
I5512	14	0	0	14	42	0	14	168	42	0	294
I5522	1	0	42	98	28	0	0	196	28	0	393
I5542	0	0	0	0	14	0	0	28	0	0	42
I6632	0	0	0	14	0	0	14	0	0	0	28
J5522	14	0	14	28	28	0	0	0	0	14	98
J5542	0	0	0	0	0	0	0	28	0	0	28

Table 1-4 B. NON-WORKING POPULATION BY OCCUPATION CODE BY LIVING PLACE

GRID CODE	Occupation Code						
	(11)	(12)	(13)	(14)	(15)	(16)	Total
D4421	9	27	72	9	0	9	126
D4441	0	9	27	0	0	27	63
D5511	18	27	72	36	0	27	180
D5521	64	136	312	88	0	80	680
D5531	96	144	208	24	0	96	568
D5541	112	260	755	104	0	249	1480
E4421	9	19	45	9	0	10	92
E4441	18	72	36	18	0	27	171
E5511	16	65	148	16	0	16	261
E5521	80	64	146	88	0	72	450
E5531	56	97	145	48	0	57	403
subtotal 1	478	920	1966	440	0	670	4474
E5532	14	28	42	0	0	0	84
F4422	28	28	28	0	0	14	98
F4442	28	0	14	0	0	0	42
F5512	28	29	86	14	0	14	171
F5532	42	84	112	28	0	56	322
F5542	28	70	0	14	0	0	112
F6632	14	56	28	0	0	56	154
G4422	14	42	42	0	0	56	154
G4442	0	14	0	28	0	0	42
G5512	42	154	280	0	0	126	602
G5522	0	84	84	28	0	14	210
G5532	43	87	173	42	0	86	431
H4442	84	196	364	56	0	28	728
H5512	56	213	454	70	0	84	877
H5522	28	56	224	84	0	42	434
H5532	56	224	351	28	0	154	813
H5542	28	70	126	42	0	70	336
H6612	0	56	168	14	0	0	238
H6632	42	56	98	0	0	28	224
I5512	70	154	294	14	0	56	588
I5522	56	155	337	42	0	84	674
I5542	0	14	56	14	0	0	84
I6632	0	0	42	0	0	0	42
J5522	0	56	56	28	0	42	182
J5542	0	0	14	14	0	0	28

Table 1-5 A. WORKING POPULATION BY OCCUPATION CODE BY WORKING PLACE

GRID CODE	Occupation Code (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Total
D4411	0	0	14	0	0	0	0	0	0	0	14
D4421	0	0	0	0	18	0	0	0	0	0	18
D4441	82	0	0	0	18	0	0	0	0	0	100
D5511	0	1	0	0	45	0	0	10	18	0	74
D5521	0	0	1	48	208	0	0	16	24	0	297
D5531	73	0	32	64	32	0	8	10	8	0	227
D5541	32	53	70	372	112	0	0	37	159	32	867
D6611	0	0	0	0	0	0	0	9	0	0	9
D6631	0	0	0	0	0	0	0	0	0	9	9
E4421	0	1	0	18	0	0	0	133	0	0	152
E4441	0	0	0	9	36	0	0	9	0	9	63
E5511	57	1	48	32	0	0	0	67	9	8	222
E5521	0	15	36	383	9	0	267	22	41	8	781
E5531	8	2	20	16	8	0	0	97	33	0	184
I4431	0	0	14	0	0	0	0	0	0	0	14
Z0001	0	0	9	72	8	0	35	444	16	0	584
subtotal 1	252	73	244	1014	494	0	310	854	308	66	3615
E5522	0	0	0	9	0	0	0	0	0	0	9
E5532	0	0	0	28	0	0	0	19	0	0	47
F5512	0	2	17	70	0	0	14	126	37	29	295
F5532	0	0	0	14	0	0	0	0	0	14	28
G4422	0	0	0	0	28	0	0	0	0	0	28
G4442	0	0	0	0	28	0	0	0	0	0	28
G5512	0	0	0	84	0	0	0	14	0	0	98
G5532	0	4	1	28	0	0	9	60	26	0	128
H4422	0	1	28	0	0	0	0	40	0	0	69
H4442	0	0	0	112	0	0	0	0	0	0	112
H5512	8	8	0	28	0	0	0	10	28	0	82
H5522	0	0	0	0	0	0	0	28	0	0	28
H5532	27	0	0	322	0	0	0	70	40	14	473
H5542	0	0	0	14	0	0	0	0	0	0	14
H6612	0	0	0	14	0	0	0	0	0	0	14
H6632	28	0	0	42	0	0	0	28	0	0	98
I4422	0	0	0	10	0	0	0	0	0	0	10
I5512	0	0	0	14	0	0	0	70	0	0	84
I5522	22	0	0	84	0	0	0	14	0	14	134
I5542	8	0	0	0	28	0	0	0	0	0	36

Table 1-6 WORKING POPULATION BY LIVING AND WORKING PLACE (GRID)

	B551	D442	D444	D551	D552	D553	D554	D661	D662	D663	D664	E223	E331	E333	E441	E442	E444	E551
B551	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D442	0	18	18	0	0	0	9	0	0	0	0	0	0	0	0	0	0	18
D444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D551	0	0	0	72	0	18	18	9	0	0	0	0	0	0	0	0	0	18
D552	0	0	0	16	288	0	64	0	0	0	0	0	0	0	0	40	0	24
D553	0	0	24	0	0	112	64	8	0	0	0	0	0	0	0	0	0	8
D554	0	0	32	0	8	16	656	0	0	0	0	0	0	0	0	0	0	8
D661	0	0	0	0	0	0	0	72	0	0	0	0	0	0	0	0	0	0
D662	0	0	0	0	0	0	0	16	64	0	0	0	0	0	0	16	0	0
D663	0	0	0	0	0	0	0	0	0	72	18	0	0	0	0	0	0	0
D664	0	0	0	0	0	0	9	0	0	0	81	0	0	0	0	0	0	0
E223	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0
E331	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0
E333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
E442	0	0	9	0	9	0	9	0	0	0	0	0	0	0	0	54	0	9
E444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	0
E551	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	72
E552	0	0	0	0	0	8	50	0	0	0	0	0	0	0	0	8	0	16
E553	0	0	0	0	0	41	8	0	0	0	0	0	0	0	0	0	0	26
E661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F551	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F553	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0
G551	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G552	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G553	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
G661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1-7 NUMBER OF PUPILS AND STUDENTS BY SEX AND AGE GROUPS

AGE GROUP	Kindergarten			Primary			Secondary			Vocational			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
3 - 4	94	107	201	0	0	0	0	0	0	0	0	0	0	0	0	94	107	201
5 - 9	384	354	738	1103	1311	2414	0	0	0	0	0	0	0	0	0	1487	1665	3152
10 - 14	0	0	0	1038	1140	2178	506	510	1016	0	0	0	0	0	0	1544	1650	3194
15 - 19	0	0	0	21	8	29	821	795	1616	366	277	643	0	14	14	1208	1094	2302
20 - 24	0	0	0	0	0	0	32	8	40	195	233	428	26	94	120	253	335	588
25 - 29	0	0	0	0	0	0	0	0	0	0	18	18	25	16	41	25	34	59
Grand Total	478	461	3319	2162	2459	13537	1359	1313	7926	561	528	3378	51	124	472	4611	4885	9496

Table 1-8 NUMBER OF PUPILS AND STUDENTS BY LIVING PLACE

GRID CODE	Number of Pupils and Students
D4421	72
D4441	27
D5511	64
D5521	312
D5531	208
D5541	755
E4421	43
E4441	34
E5511	148
E5521	146
E5532	145
subtotal 1	1954
E5532	42
F4422	28
F4442	14
F5512	86
F5532	112
F6632	28
G4422	42
G5512	280
G5522	84
G5532	173
H4442	364
H5512	454
H5522	224
H5532	351
H5542	126
H6612	168
H6632	98
I5512	294
I5522	337
I5542	56
I6632	42
J5522	56

Table 1-9 NUMBER OF PUPILS AND STUDENTS BY PLACE OF SCHOOL

G R I D C O D E	Number of Pupils and Students
1D441	10
1D443	42
1D444	1911
1D552	622
1D554	479
1E551	490
1E553	188
1F663	8
1G553	14
1H553	40
1H663	16
subtotal 1	3820
2D553	14
2G553	186
2H552	52
2H553	1185
2H554	10
2H555	10
2H663	395
2I552	253
2I554	98
2K552	129
subtotal 2	2332
3H553	14
3H663	9
3J331	9
3J333	62
3J443	257
3J444	180
subtotal 3	531
4F663	141

Table 2-1 NUMBER OF ESTABLISHMENT, PERSONS AND MONTHLY SALARY PAID BY TYPE OF BUSINESS

Type of Business	Number of Establishment	Number of Persons Engaged						Monthly Salary Paid (Bath)	Average Salary Paid (Bath)
		Owner Family			Employee				
		Male	Female	Total	Male	Female	Total		
1) Retail	225	261	390	651	24	61	85	0	0.00
2) Wholesale	7	9	10	19	0	0	0	0	0.00
3) Service	114	160	171	331	37	28	65	0	0.00
4) Retail/Wholesale	16	31	29	60	5	9	14	0	0.00
5) Retail/Service	25	25	37	62	14	13	27	0	0.00
6) Wholesale/Service	5	10	8	18	5	0	5	0	0.00
7) Retail/Wholesale /Service	3	1	3	4	2	0	2	0	0.00
Total	395	497	648	1145	87	111	198	0	0.00

Table 2-2 NUMBER OF EMPLOYEES BY LIVING PLACE

Living Place	Number of Empolyees
In G.P. area	0
Amphoe	0
Changwat	0
Others	0
Total	0

Table 2-3 NUMBER OF ESTABLISHMENTS BY TYPE OF BUSINESS BY GRID

GRID CODE	Type of Business							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Total
D444	1	0	1	0	0	0	0	2
D552	6	0	1	0	0	0	0	7
D553	7	0	1	2	0	0	0	10
D554	54	4	22	3	0	2	1	86
E442	6	2	6	3	1	1	0	19
E444	1	0	2	0	0	0	0	3
E552	29	0	7	3	1	0	1	41
Tharua Municipality subtotal	104	6	40	11	2	3	2	168
F551	8	0	0	0	0	0	0	8
F553	5	0	4	0	0	0	0	9
G551	5	0	1	0	1	0	0	7
G552	5	0	0	0	0	0	0	5
H551	3	0	6	0	2	0	0	11
H552	37	0	0	0	0	0	0	37
H553	33	0	23	4	1	1	0	62
I552	15	0	8	0	0	0	0	23
I663	8	0	2	0	0	0	0	10
Thaluang Sanitary District Subtotal	78	0	44	4	4	1	0	131
H333	0	0	0	0	2	0	0	2
H443	3	0	2	0	1	0	0	6
I331	1	0	1	0	0	0	0	2
I332	1	0	1	0	0	0	0	2
I334	6	0	4	0	5	0	0	15
I443	17	1	14	1	8	0	1	42
J331	0	0	1	0	0	0	0	1
J333	1	0	0	0	0	0	0	1
J334	0	0	3	0	0	0	0	3
J441	5	0	1	0	2	0	0	8
J443	3	0	1	0	1	0	0	5
Thalan Sanitary District Subtotal	37	1	28	1	19	0	1	87

Table 2-4 NUMBER OF PERSONS ENGAGED TYPE OF BUSINESS BY GRID

GRID CODE	Type of Business							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Total
D444	2	0	1	0	0	0	0	3
D552	12	0	1	0	0	0	0	13
D553	18	0	2	15	0	0	0	35
D554	192	16	74	13	0	11	1	307
E442	18	2	68	18	1	4	0	111
E444	2	0	5	0	0	0	0	7
E552	94	0	25	9	2	0	4	134
Tharua Municipality subtotal	338	18	176	55	3	15	5	610
F551	16	0	0	0	0	0	0	16
F553	24	0	22	0	0	0	0	46
G551	22	0	6	0	1	0	0	29
G552	7	0	0	0	0	0	0	7
H551	13	0	12	0	13	0	0	38
H552	10	0	0	0	0	0	0	10
H553	124	0	66	17	4	2	0	213
I552	47	0	12	0	0	0	0	59
I663	23	0	2	0	0	0	0	25
Thaluang Sanitary District Subtotal	286	0	120	17	18	2	0	443
H333	0	0	0	0	2	0	0	2
H443	12	0	15	0	1	0	0	28
I331	1	0	3	0	0	0	0	4
I332	2	0	3	0	0	0	0	5
I334	8	0	5	0	14	0	0	27
I443	45	1	53	2	38	0	1	140
J331	0	0	1	0	0	0	0	1
J333	2	0	0	0	0	0	0	2
J334	0	0	6	0	0	0	0	6
J441	10	0	1	0	6	0	0	17
J443	12	0	2	0	7	0	0	21
Thalan Sanitary District Subtotal	92	1	89	2	68	0	1	253

Table 3-1 NUMBER OF ESTABLISHMENT, PERSONS AND MONTHLY SALARY PAID BY TYPE OF INDUSTRY

Type of Industry	Number of Establishment	Number of Persons Engaged						Monthly Salary Paid (Bath)	Average Salary Paid (Bath)
		Owner Family			Employee				
		Male	Female	Total	Male	Female	Total		
1) Service Industry	6	11	6	17	48	0	48	239500	3684.62
2) Manufacturing	30	39	51	90	3081	259	3340	15387293	4486.09
3) Handicraft	8	15	16	31	10	5	15	45000	978.26
4) Others	6	5	4	9	147	66	213	1064875	4796.73
Total	50	70	77	147	3286	330	3616	16736668	4447.69

Table 3-2 NUMBER OF EMPLOYEES BY LIVING PLACE

Living Place	Number of Empolyees
In G.P. area	405
Amphoe	120
Changwat	165
Others	5
Total	695

Table 3-3 NUMBER OF ESTABLISHMENTS BY TYPE OF INDUSTRY BY GRID

GRID CODE	Type of Industry				
	(1)	(2)	(3)	(4)	Total
D553	2	0	0	0	2
D554	1	3	1	0	5
E442	0	1	0	0	1
E551	0	0	0	1	1
E552	0	1	0	1	2
E553	1	0	0	2	3
F551	0	4	0	1	5
Tharua Municipality subtotal	3	5	1	4	13
F551	0	4	0	0	4
G553	0	3	1	2	6
H551	0	3	0	0	3
H553	0	2	0	0	2
I552	0	1	0	0	1
Thaluang Sanitary District Subtotal	0	7	1	2	10
H442	0	1	0	0	1
I334	0	0	1	0	1
I441	0	1	1	0	2
I442	0	3	0	0	3
I443	0	2	1	0	3
J333	2	0	0	0	2
J441	1	4	0	0	5
J443	0	1	1	0	2
Thalan Sanitary District Subtotal	2	9	4	0	15
H551	0	1	0	0	1
D661	1	3	0	0	4
H551	0	2	1	0	3
Rural Area of Amphoe Tharua Subtotal	1	4	1	0	6

Table 3-4 NUMBER OF PERSONS ENGAGED TYPE OF INDUSTRY BY GRID

GRID CODE	Type of Industry				
	(1)	(2)	(3)	(4)	Total
D553	2	0	0	0	2
D554	4	18	3	0	25
E442	0	2	0	0	2
E551	0	0	0	65	65
E552	0	103	0	33	136
E553	3	0	0	56	59
F551	0	29	0	18	47
Tharua Municipality subtotal	9	123	3	172	307
F551	0	29	0	0	29
G553	0	73	6	50	129
H551	0	17	0	0	17
H553	0	5	0	0	5
I552	0	6	0	0	6
Thaluang Sanitary District Subtotal	0	130	6	50	186
H442	0	1214	0	0	1214
I334	0	0	15	0	15
I441	0	521	1	0	522
I442	0	204	0	0	204
I443	0	933	8	0	941
J333	44	0	0	0	44
J441	9	86	0	0	94
J443	0	5	2	0	7
Thalan Sanitary District Subtotal	53	2962	26	0	3041
E551	0	4	0	0	4
D661	3	100	0	0	103
E551	0	35	5	0	40
Rural Area of Amphoe Tharua Subtotal	3	139	5	0	147

3.5 Details of Software

Define a processing outline for each programme.

This becomes the basis of the detailed programme specification which is shown in programme list table.

The outline includes as follows:

1. a description of the input data items.
2. a description of the processing flow, including editing rules and error handling.
3. a description of the output data items and files.

The Fig. 4-6 shows the outline of software.

Fig. 4 STRUCTURE OF R & A DATA PROCESSING SYSTEM

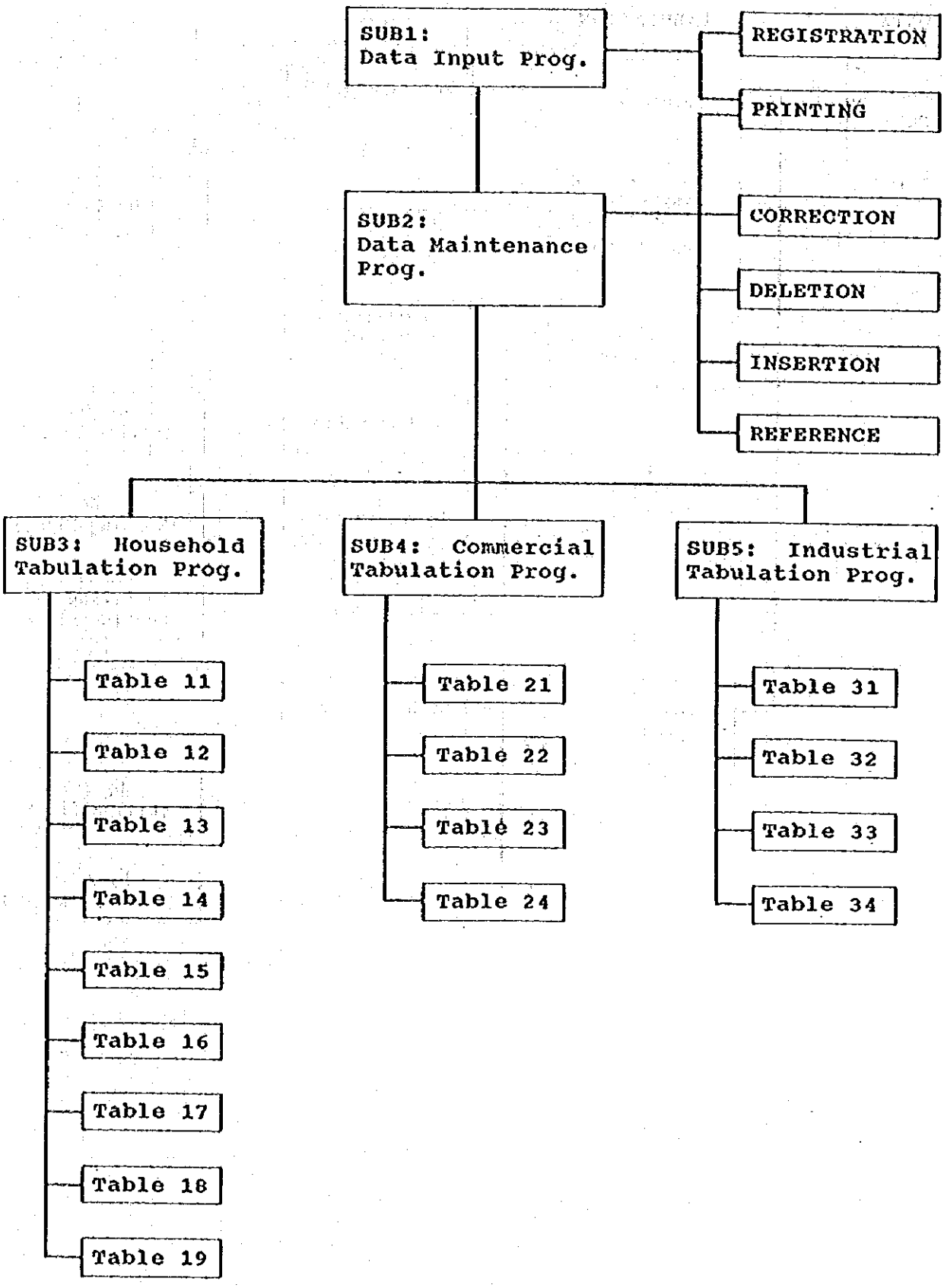


Fig. 5 BASIC TABULATION FOR POPULATION

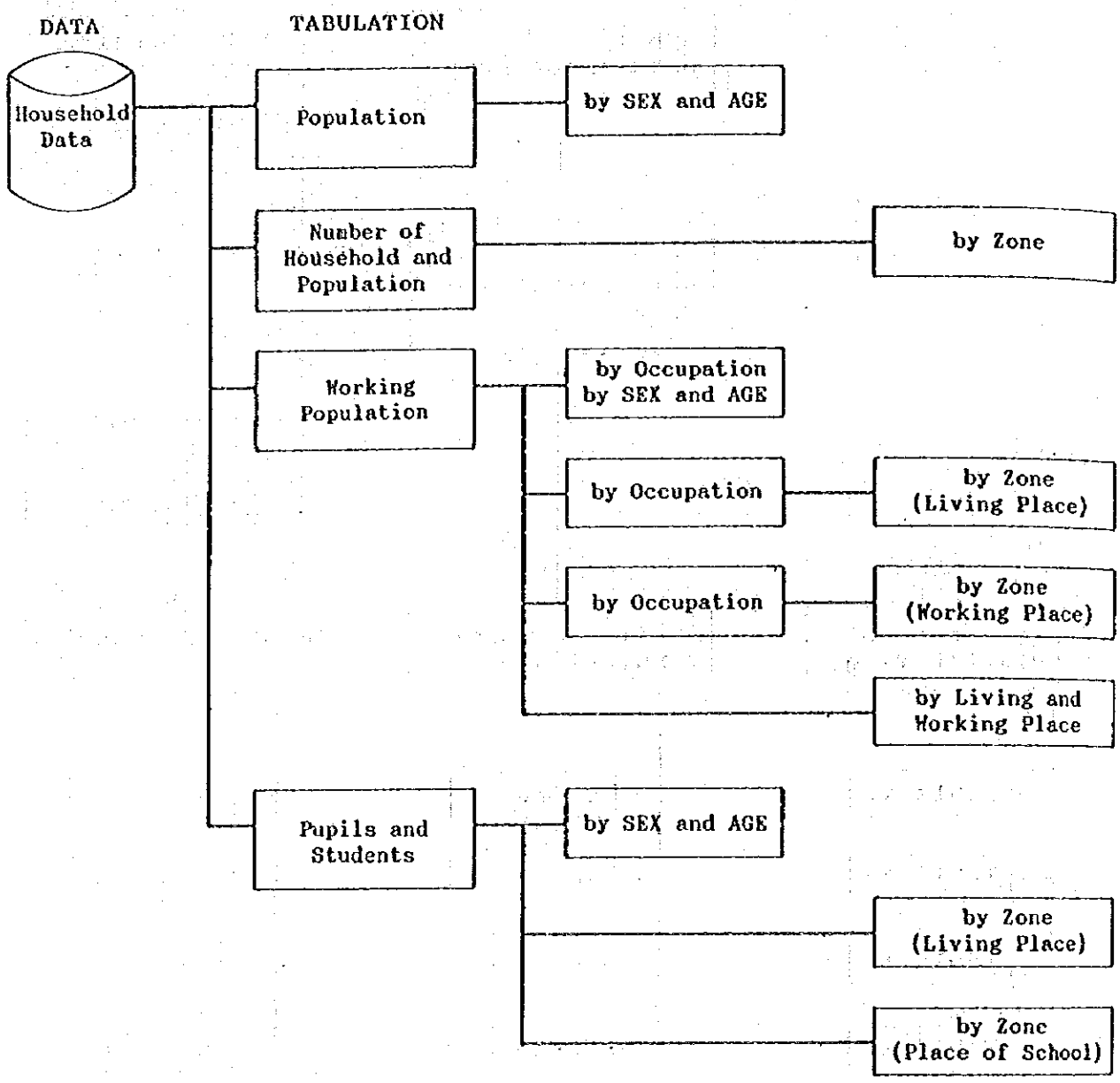
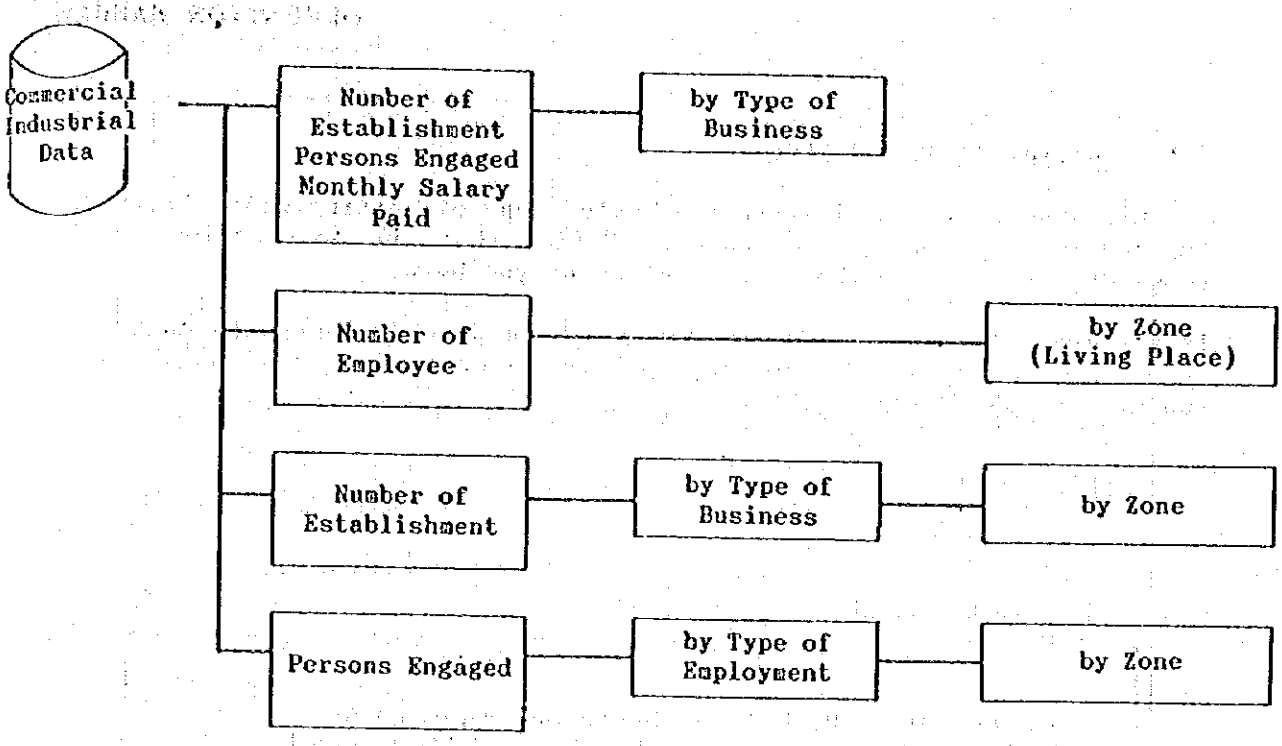


Fig. 6 BASIC TABULATION FOR COMMERCIAL AND INDUSTRIAL



4.1 Starting dBASE III PLUS

In this Chapter you will learn the basic steps of getting dBASE III PLUS "up-and-running" on your computer. Notice that the instructions vary somewhat depending on the type of computer you have.

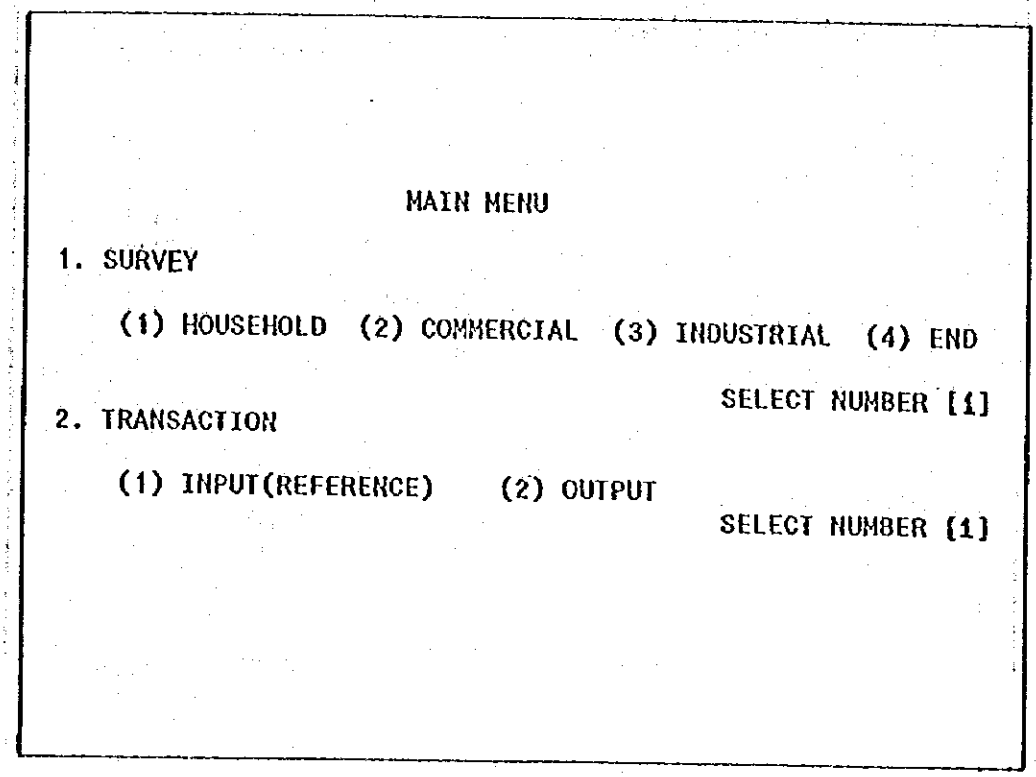
If you are using a hard disk system and have already installed dBASE II PLUS, simply log on to the appropriate directory on your hard disk (using the DOS CHDIR).

```
SpeedStor(TM) II  Hard Disk Device Driver  Version 1.06
Copyright(C) Hexis Design 1985, 1986.  All rights reserved

<D> Drive unit 1, Partition 2, DOS-Compatible,   22,238,720 Bytes

     2,655 bytes reserved by device driver.

Current date is Fri  7-08-1988
Enter new date (mm-dd-yy):  [↵]
Current time is 16:59:37.22
Enter new time:  [↵]


The IBM Personal Computer DOS
Version 3.10 (C)Copyright International Business Machines Corp 1981
             (C)Copyright Microsoft Corp 1981, 1985

C>cd dbase3p  [↵]

C>dbase  [↵]
```

When the copyright notice appears, press Return to move into the dBASE III PLUS menu screen.

4.2 Operation of Data Input

(1) Household



SELECT DATA FILE

```
Input filename? NSD\THARUA

Is this file [O]ld or [N]ew? O
```

HOUSEHOLD DATA INPUT MENU

```
                    H O U S E H O L D   S U R V E Y

      AREA          DATA NO.          LOCATION      GRID NO.
      TYPE OF HOUSEHOLD               ITEM NO.

      SEX
      AGE
      RACE
      NATION
      BIRTH
      LITERACY
      STATUS                EDUCATION
      SCHOOL                GRID NO.
      OCCUPATION
      WORK                  GRID NO.
      INCOME
      MOVE IN
      MOVE OUT

                    PLEASE SELECT NUMBER OF WORK      ( )

1:INPUT  2:EDIT  3:INSERT  4:DELETE  5:REFERENCE  6:PRINT  7:REINDEX  0:END
```

(REGISTRATION)

```
          H O U S E H O L D   S U R V E Y      [REGISTRATION]

AREA [1   ]    DATA NO.[1     ]  LOCATION [1]  GRID NO.[D551 ]
TYPE OF HOUSEHOLD [3]            ITEM NO. [1 ]

SEX
AGE
RACE
NATION
BIRTH
LITERACY
STATUS                EDUCATION
SCHOOL                GRID NO.
OCCUPATION
WORK                  GRID NO.
INCOME
MOVE IN
MOVE OUT


          PLEASE KEY IN ITEM NO.

           IF RETURN THEN END!
```

```
          H O U S E H O L D   S U R V E Y      [REGISTRATION]

AREA [1   ]    DATA NO.[1     ]  LOCATION [1]  GRID NO.[D551 ]
TYPE OF HOUSEHOLD [3]            ITEM NO. [1 ]
                                                    REC.3648
SEX        [0]
AGE        [  0]
RACE       [0]
NATION     [0]
BIRTH      [0]
LITERACY   [0]
STATUS     [0]        EDUCATION [0]
SCHOOL     [0]        GRID NO.  [      ]
OCCUPATION[ 0]
WORK       [0]        GRID NO.  [      ]
INCOME     [      0]
MOVE IN    [0]
MOVE OUT   [0]
```

(CORRECTION)

```
          H O U S E H O L D   S U R V E Y     [CORRECTION]

AREA          DATA NO.[1     ]  LOCATION      GRID NO.
TYPE OF HOUSEHOLD               ITEM NO. [1 ]

SEX
AGE
RACE
NATION
BIRTH
LITERACY
STATUS                EDUCATION
SCHOOL                GRID NO.
OCCUPATION
WORK                  GRID NO.
INCOME
MOVE IN
MOVE OUT

          PLEASE KEY IN THE ITEM NO.
```

```
          H O U S E H O L D   S U R V E Y     [CORRECTION]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]           ITEM NO. [ 1]
                                                    REC.1
SEX       [2]
AGE       [ 68]
RACE      [1]
NATION    [1]
BIRTH     [1]
LITERACY  [1]
STATUS    [2]         EDUCATION [2]
SCHOOL    [0]         GRID NO.  [0    ]
OCCUPATION[04]
WORK      [1]         GRID NO.  [E552 ]
INCOME    [  2000]
MOVE IN   [0]
MOVE OUT  [0]

          Do you want to edit this record(y/n)?  [Y]
```

```
                HOUSEHOLD SURVEY      [CORRECTION]

AREA [1  ]    DATA NO.[     1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]           ITEM NO. [ 1]

                                                        REC.1
SEX         [2]
AGE         [ 68]
RACE        [1]
NATION      [1]
BIRTH       [1]
LITERACY    [1]
STATUS      [2]         EDUCATION [2]
SCHOOL      [0]         GRID NO.  [0     ]
OCCUPATION[ 4]
WORK        [1]         GRID NO.  [E552  ]
INCOME      [  2000]
MOVE IN     [0]
MOVE OUT    [0]


            PLEASE KEY IN DATA
```

(INSERTION)

```
          H O U S E H O L D   S U R V E Y     ( INSERTION )

AREA          DATA NO.[1     ]  LOCATION      GRID NO.
TYPE OF HOUSEHOLD                ITEM NO. [1 ]

SEX
AGE
RACE
NATION
BIRTH
LITERACY
STATUS                EDUCATION
SCHOOL                GRID NO.
OCCUPATION
WORK                  GRID NO.
INCOME
MOVE IN
MOVE OUT

          PLEASE KEY IN THE ITEM NO.
```

```
          H O U S E H O L D   S U R V E Y     ( INSERTION )

AREA [1  ]    DATA NO.[     1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]            ITEM NO. [ 1]
                                                    REC.1
SEX        [2]
AGE        [ 68]
RACE       [1]
NATION     [1]
BIRTH      [1]
LITERACY   [1]
STATUS     [2]          EDUCATION [2]
SCHOOL     [0]          GRID NO.  [0     ]
OCCUPATION[04]
WORK       [1]          GRID NO.  [E552 ]
INCOME     [  2000]
MOVE IN    [0]
MOVE OUT   [0]

          Are you sure to insert after this record(y/n)?  [Y]
```

```
        H O U S E H O L D   S U R V E Y      [ DELETE ]

AREA              DATA NO.[1     ]  LOCATION       GRID NO.
TYPE OF HOUSEHOLD                   ITEM NO. [2 ]

SEX
AGE
RACE
NATION
BIRTH
LITERACY
STATUS                EDUCATION
SCHOOL                GRID NO.
OCCUPATION
WORK                  GRID NO.
INCOME
MOVE IN
MOVE OUT

           PLEASE KEY IN THE ITEM NO.
```

↓

```
        H O U S E H O L D   S U R V E Y      [ DELETE ]

AREA [1  ]   DATA NO.[    1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]         ITEM NO. [ 1]
                                                REC.2
SEX         [2]
AGE         [ 68]
RACE        [1]
NATION      [1]
BIRTH       [1]
LITERACY    [1]
STATUS      [2]       EDUCATION [2]
SCHOOL      [0]       GRID NO.  [0    ]
OCCUPATION[04]
WORK        [1]       GRID NO.  [E552 ]
INCOME      [  2000]
MOVE IN     [0]
MOVE OUT    [0]

        ARE YOU SURE TO DELETE THESE DATA ? ....[1]

              0 : DELETE    1 : NOT DELETE
```

(REFERENCY)

```
          H O U S E H O L D   S U R V E Y      [ REFERENCY ]

AREA          DATA NO.[1     ]  LOCATION      GRID NO.
TYPE OF HOUSEHOLD                ITEM NO. [1 ]

SEX
AGE
RACE
NATION
BIRTH
LITERACY
STATUS                EDUCATION
SCHOOL                GRID NO.
OCCUPATION
WORK                  GRID NO.
INCOME
MOVE IN
MOVE OUT

          PLEASE KEY IN THE ITEM NO.
```

```
          H O U S E H O L D   S U R V E Y      [ REFERENCY]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]           ITEM NO. [ 1]
                                                    REC.1
SEX        [2]
AGE        [ 68]
RACE       [1]
NATION     [1]
BIRTH      [1]
LITERACY   [1]
STATUS     [2]        EDUCATION [2]
SCHOOL     [0]        GRID NO.  [0    ]
OCCUPATION[04]
WORK       [1]        GRID NO.  [E552 ]
INCOME     [  2000]
MOVE IN    [0]
MOVE OUT   [0]

          CONTINUE THE REFERENCY ? ..... [+]

     + : NEXT KEY   - : BEFORE KEY   [ENTRY]  :  END
```

```
          H O U S E H O L D  S U R V E Y      [ REFERENCY ]

AREA [1   ]    DATA NO.[     1]  LOCATION [1]  GRID NO.[D4421]
TYPE OF HOUSEHOLD [1]             ITEM NO. [ 1]
                                                      REC.2
SEX         [2]
AGE         [ 68]
RACE        [1]
NATION      [1]
BIRTH       [1]
LITERACY    [1]
STATUS      [2]         EDUCATION [2]
SCHOOL      [0]         GRID NO.  [0     ]
OCCUPATION[04]
WORK        [1]         GRID NO.  [E552  ]
INCOME      [  2000]
MOVE IN     [0]
MOVE OUT    [0]


          CONTINUE THE REFERENCY ? ..... [ ]

     + : NEXT KEY    - : BEFORE KEY    [ENTRY] :  END
```

(PRINTING)

```
        H O U S E H O L D  S U R V E Y     [ PRINTING ]

START : DATA NO.  [1     ]          ITEM NO.       [1 ]

  END : DATA NO.                    ITEM NO.



                PLEASE KEY IN THE STARTING ITEM NO.
```

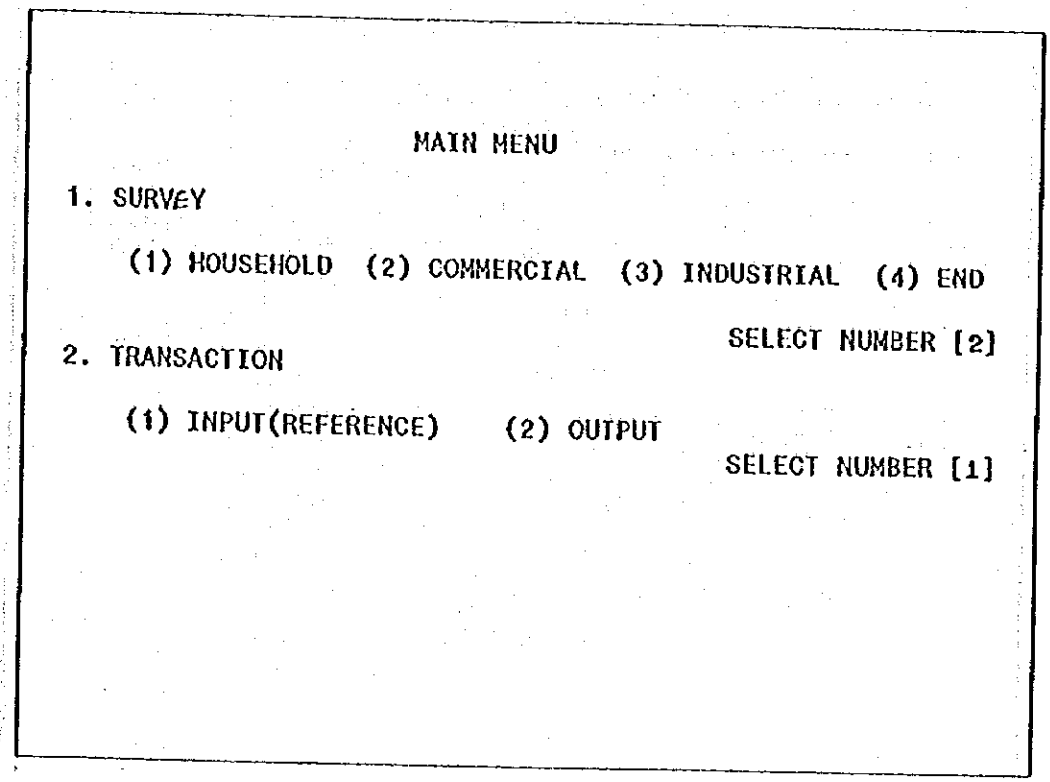
```
        H O U S E H O L D  S U R V E Y     [ PRINTING ]

START : DATA NO.  [1     ]          ITEM NO.       REC. NO.  1

  END : DATA NO.  [      ]          ITEM NO.



                PLEASE KEY IN THE ENDING DATA NO.
```

```
        H O U S E H O L D  S U R V E Y    [ PRINTING ]

START : DATA NO.  [1    ]        ITEM NO.        REC. NO.  1

  END : DATA NO.  [3    ]        ITEM NO.        REC. NO.  18



                          NOW PRINTING!
```

(Sample)

Record#	AREA	DATANO	LOCATION	SCHOOL	HOUSEHOLD	ITEM	SEX	AGE	RACE	NATION	BIRTH	LITERACY	STATUS	EDUCAT	SCHOOL	SCHOOL	OCCUPA	WORK	WORK	SALARY	MOVEIN	MOVEOUT	CRIMNO	MULTIPL
1	1	1	1	D4421	1	1	2	26	1	1	1	1	2	2	0	0	09	1	K551	1200	0	0	D4421	9.00
2	1	1	1	D4421	1	1	2	68	1	1	1	1	2	2	0	0	04	1	K552	2000	0	0	D4421	9.00
3	1	1	1	D4421	1	8	2	21	1	1	1	1	2	3	0	0	12	0	0		0 0	0	D4421	9.00
4	1	1	1	D4421	1	3	1	33	1	1	1	1	2	2	0	0	12	0	0		0 0	0	D4421	9.00
5	1	1	1	D4421	1	5	1	28	1	1	2	1	2	1	0	00	03	2	W551	2000	0	0	D4421	9.00
6	1	1	1	D4421	1	6	1	27	1	1	1	1	2	2	0	0	08	1	K551	1500	0	0	D4421	9.00
7	1	1	1	D4421	1	2	2	60	1	1	1	1	2	2	0	0	04	1	K552	2000	0	0	D4421	9.00
8	1	1	1	D4421	1	4	2	29	1	1	1	1	2	2	0	0	09	2	W551	1400	0	0	D4421	9.00
9	1	1	1	D4421	1	9	2	19	1	1	1	1	1	2	1	D444	12	0	0		0 0	0	D4421	9.00
10	1	1	1	D4421	1	10	1	3	1	1	1	2	3	7	0	00	16	0	0		0 0	0	D4421	9.00
11	1	2	1	D4421	1	1	1	40	1	1	1	1	2	2	0	0	05	1	D442	4000	0	0	D4421	9.00
12	1	2	1	D4421	1	2	2	42	1	1	1	1	2	2	0	0	05	1	D442	4000	0	0	D4421	9.00
13	1	2	1	D4421	1	3	1	12	1	1	1	1	1	3	1	D444	13	0	0		0 0	0	D4421	9.00
14	1	2	1	D4421	1	4	2	10	1	1	1	1	1	2	1	K551	13	0	0		0 0	0	D4421	9.00
15	1	3	1	D4441	1	7	1	11	1	1	1	1	1	2	1	K551	13	0	0		0 0	0	D4441	9.00
16	1	3	1	D4441	1	1	1	68	1	1	1	1	2	2	0	0	05	1	D444	16000	0	0	D4441	9.00
17	1	3	1	D4441	1	8	2	9	1	1	1	1	1	2	1	K551	13	0	0		0 0	0	D4441	9.00
18	1	3	1	D4441	1	3	2	29	1	1	1	1	2	2	0	0	04	1	K552	12000	0	0	D4441	9.00
19	1	3	1	D4441	1	5	1	14	1	1	1	1	1	3	1	D444	13	0	0		0 0	0	D4441	9.00
20	1	3	1	D4441	1	6	2	12	1	1	1	1	1	3	1	D444	13	0	0		0 0	0	D4441	9.00
21	1	3	1	D4441	1	2	2	70	1	1	1	1	2	2	0	0	05	1	D444	16000	0	0	D4441	9.00
22	1	3	1	D4441	1	4	1	44	1	1	1	1	2	3	0	0	03	6	21	3900	0	0	D4441	9.00
23	1	4	1	D4441	1	1	2	68	1	1	1	2	3	7	0	0	14	0	0		0 0	0	D4441	9.00
24	1	4	1	D4441	1	2	2	41	1	1	1	1	2	2	0	0	12	0	0		0 0	0	D4441	9.00
25	1	4	1	D4441	1	3	1	46	1	1	1	1	2	3	0	0	09	1	D554	4155	0	0	D4441	9.00
26	1	4	1	D4441	1	4	1	21	1	1	1	1	2	3	0	0	11	0	0		0 0	0	D4441	9.00
27	1	4	1	D4441	1	5	2	20	1	1	1	1	1	4	6	21	13	0	0		0 0	0	D4441	9.00
28	1	5	1	D4441	1	1	1	21	1	1	2	1	2	2	0	0	07	1	K552	2000	0	0	D4441	9.00
29	1	5	1	D4441	1	2	2	22	1	1	2	1	2	4	0	0	12	0	0		0 0	0	D4441	9.00
30	1	5	1	D4441	1	3	2	17	1	1	2	1	1	4	6	21	12	0	0		0 0	0	D4441	9.00
31	1	5	1	D4441	1	4	1	1	1	1	1	2	3	7	0	0	16	0	0		0 0	0	D4441	9.00
32	1	6	1	D4441	1	1	2	38	1	1	1	1	1	2	0	0	08	1	2000	1000	0	0	D4441	9.00
33	1	6	1	D4441	1	2	1	43	1	1	1	1	1	2	0	0	08	1	2000	2200	0	0	D4441	9.00
34	1	6	1	D4441	1	3	2	19	1	1	1	1	2	3	0	0	08	1	2000	1500	0	0	D4441	9.00
35	1	6	1	D4441	1	4	1	27	1	1	1	1	2	3	0	0	08	1	2000	3500	0	0	D4441	9.00
36	1	6	1	D4441	1	5	2	16	1	1	1	1	1	3	1	D444	13	0	0		0 0	0	D4441	9.00
37	1	6	1	D4441	1	6	2	5	1	1	1	2	3	7	0	0	16	0	0		0 0	0	D4441	9.00
38	1	7	1	D4441	1	1	2	37	1	1	1	1	2	5	0	0	01	1	K551	5000	0	0	D4441	9.00
39	1	7	1	D4441	1	2	1	39	1	1	2	1	2	3	6	72	02	0	0	4000	0	0	D4441	9.00
40	1	7	1	D4441	1	3	2	11	1	1	1	1	1	2	1	K551	13	0	0		0 0	0	D4441	9.00
41	1	7	1	D4441	1	4	2	3	1	1	1	2	3	7	0	0	16	0	0		0 0	0	D4441	9.00
42	1	8	1	D5511	1	1	2	32	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
43	1	8	1	D5511	1	8	1	4	1	1	1	2	3	7	0	0	16	0	0		0 0	0	D5511	8.00
44	1	8	1	D5511	1	3	2	29	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
45	1	8	1	D5511	1	4	1	26	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
46	1	8	1	D5511	1	5	2	22	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
47	1	8	1	D5511	1	6	1	65	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
48	1	8	1	D5511	1	7	2	9	1	1	1	1	1	2	1	D552	13	0			0 0	0	D5511	8.00
49	1	8	1	D5511	1	2	1	30	1	1	1	1	2	2	0	0	08	1	2000	1200	0	0	D5511	8.00
50	1	9	1	D5511	1	1	2	73	1	1	1	2	3	7	0	0	14	0	0		0 0	0	D5511	8.00

(3) COMMERCIAL



(SELECT DATA FILE)

```
Input filename? NSD\THARUA_C

Is this file [O]ld or [N]ew? O
```

(COMMERCIAL DATA INPUT MENU)

```
                    C O M M E R C I A L   S U R V E Y

AREA              DATA NO.          LOCATION        GRID NO.
DURATION          RELIGIOUS         COMMERCIAL TYPE     MAJOR

FAMILY    :     MALE              FEMALE
EMPLOYEE  :     MALE              FEMALE
AGE       :    11 - 24            25 - 44
               45 - 60             > 60
EDUCATION : NO                    PRIMARY
            SECON.                VOCATION
            UNIV.
RESIDENT  : INSIDE                OUT(AMP)
            OUT(CH)               OTHERS
BIRTHPLACE: INSIDE                OUT(AMP)
            OUT(CH)               OTH CHAN
            OTH REG               FOREIGN
TOTAL SALARY

                PLEASE SELECT NUMBER OF WORK      [ ]

1:INPUT  2:EDIT  3:INSERT  4:DELETE  5:REFERENCY  6:PRINT  0:END
```

(REGISTRATION)

```
          C O M M E R C I A L   S U R V E Y   [REGISTRATION]

AREA [    ]     DATA NO.          LOCATION      GRID NO.
DURATION        RELIGIOUS         COMMERCIAL TYPE    MAJOR

FAMILY    :     MALE              FEMALE
EMPLOYEE  :     MALE              FEMALE
AGE       :     11 - 24           25 - 44
              45 - 60              > 60
EDUCATION : NO                    PRIMARY
              SECON.              VOCATION
              UNIV.
RESIDENT  : INSIDE                OUT(AMP)
            OUT(CH)               OTHERS
BIRTHPLACE: INSIDE                OUT(AMP)
            OUT(CH)               OTH CHAN
            OTH REG               FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE SURVEY AREA
```

```
          C O M M E R C I A L   S U R V E Y   [REGISTRATION]

AREA [1   ]     DATA NO.[1     ]  LOCATION [0]  GRID NO.[      ]
DURATION[ 0]    RELIGIOUS[0]      COMMERCIAL TYPE [0] MAJOR [ 0]

FAMILY    :     MALE    [ 0]      FEMALE     [ 0]
EMPLOYEE  :     MALE    [ 0]      FEMALE     [ 0]
AGE       :     11 - 24 [ 0]      25 - 44    [ 0]
              45 - 60   [ 0]        > 60     [ 0]
EDUCATION : NO          [ 0]      PRIMARY    [ 0]
              SECON.    [ 0]      VOCATION   [ 0]
              UNIV.     [ 0]
RESIDENT  : INSIDE      [ 0]      OUT(AMP)   [ 0]
            OUT(CH)     [ 0]      OTHERS     [ 0]
BIRTHPLACE: INSIDE      [ 0]      OUT(AMP)   [ 0]
            OUT(CH)     [ 0]      OTH CHAN   [ 0]
            OTH REG     [ 0]      FOREIGN    [ 0]
TOTAL SALARY    [      0]

                                                  REC.397

          PLEASE KEY IN THE DATA
```

```
          C O M M E R C I A L   S U R V E Y   [REGISTRATION]

AREA [1  ]    DATA NO.[      ]  LOCATION [0]  GRID NO.[      ]
DURATION[ 0]  RELIGIOUS[0]      COMMERCIAL TYPE [0] MAJOR [ 0]

FAMILY   :    MALE   [ 0]       FEMALE    [ 0]
ENPLOYEE :    MALE   [ 0]       FEMALE    [ 0]
AGE      :   11 - 24  [ 0]      25 - 44   [ 0]
            45 - 60   [ 0]       > 60     [ 0]
EDUCATION : NO        [ 0]      PRIMARY   [ 0]
              SECON.  [ 0]      VOCATION  [ 0]
              UNIV.   [ 0]
RESIDENT : INSIDE     [ 0]      OUT(AMP)  [ 0]
           OUT(CH)    [ 0]      OTHERS    [ 0]
BIRTHPLACE:INSIDE     [ 0]      OUT(AMP)  [ 0]
           OUT(CH)    [ 0]      OTH CHAN  [ 0]
           OTH REG    [ 0]      FOREIGN   [ 0]
TOTAL SALARY    [      0]

                                                  REC.398

          PLEASE KEY IN THE DATA NO.

              IF RETURN THEN END!
```

```
         C O M M E R C I A L   S U R V E Y   (CORRECTION)

AREA            DATA NO.[     ]  LOCATION      GRID NO.
DURATION        RELIGIOUS        COMMERCIAL TYPE     MAJOR

FAMILY    :   MALE                 FEMALE
EMPLOYEE  :   MALE                 FEMALE
AGE   :     11 - 24                25 - 44
            45 - 60                 > 60
EDUCATION : NO                     PRIMARY
             SECON.                VOCATION
             UNIV.
RESIDENT : INSIDE                  OUT(AMP)
           OUT(CH)                 OTHERS
BIRTHPLACE:INSIDE                  OUT(AMP)
           OUT(CH)                 OTH CHAN
           OTH REG                 FOREIGN
TOTAL SALARY


         PLEASE KEY IN THE DATA NO.

          IF RETURN THEN END!
```

↓

```
         C O M M E R C I A L   S U R V E Y   (CORRECTION)

AREA [1  ]   DATA NO.[     1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]  RELIGIOUS[1]     COMMERCIAL TYPE [3] MAJOR [08]

FAMILY    :   MALE    [ 1]     FEMALE    [ 0]
EMPLOYEE  :   MALE    [ 0]     FEMALE    [ 0]
AGE   :     11 - 24   [ 0]     25 - 44   [ 0]
            45 - 60   [ 0]      > 60     [ 0]
EDUCATION : NO        [ 0]     PRIMARY   [ 0]
             SECON.   [ 0]     VOCATION  [ 0]
             UNIV.    [ 0]
RESIDENT : INSIDE     [ 0]     OUT(AMP)  [ 0]
           OUT(CH)    [ 0]     OTHERS    [ 0]
BIRTHPLACE:INSIDE     [ 0]     OUT(AMP)  [ 0]
           OUT(CH)    [ 0]     OTH CHAN  [ 0]
           OTH REG    [ 0]     FOREIGN   [ 0]
TOTAL SALARY     [        0]
                                              REC.1
       Do you want to edit this record(y/n)?  [Y]
```

↓

```
          C O M M E R C I A L   S U R V E Y   [CORRECTION]

AREA [1  ]    DATA NO.[     1] LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4] RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [ 8]

FAMILY   :    MALE    [ 1]     FEMALE    [ 0]
EMPLOYEE :    MALE    [ 0]     FEMALE    [ 0]
AGE      :   11 - 24   [ 0]     25 - 44   [ 0]
             45 - 60   [ 0]      > 60     [ 0]
EDUCATION : NO         [ 0]     PRIMARY   [ 0]
              SECON.   [ 0]     VOCATION  [ 0]
              UNIV.    [ 0]
RESIDENT : INSIDE      [ 0]     OUT(AMP)  [ 0]
           OUT(CH)     [ 0]     OTHERS    [ 0]
BIRTHPLACE:INSIDE      [ 0]     OUT(AMP)  [ 0]
           OUT(CH)     [ 0]     OTH CHAN  [ 0]
           OTH REG     [ 0]     FOREIGN   [ 0]
TOTAL SALARY     [      0]

                                                REC.1

          PLEASE KEY IN THE DATA
```

(INSERTION)

```
                C O M M E R C I A L   S U R V E Y   [INSERTION]

AREA            DATA NO.[      ]  LOCATION       GRID NO.
DURATION        RELIGIOUS         COMMERCIAL TYPE      MAJOR

FAMILY    :     MALE              FEMALE
EMPLOYEE  :     MALE              FEMALE
AGE       :     11 - 24           25 - 44
                45 - 60           > 60
EDUCATION :     NO                PRIMARY
                SECON.            VOCATION
                UNIV.
RESIDENT  :     INSIDE            OUT(AMP)
                OUT(CH)           OTHERS
BIRTHPLACE:     INSIDE            OUT(AMP)
                OUT(CH)           OTH CHAN
                OTH REG           FOREIGN
TOTAL SALARY

PLEASE KEY IN THE DATA NO. OF THE REC. THAT YOU WANT TO INSERT AFTER IT

                IF RETURN THEN END!
```

```
                C O M M E R C I A L   S U R V E Y   [INSERTION]

AREA [1  ]      DATA NO.[     1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]    RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [08]

FAMILY    :     MALE    [ 1]      FEMALE    [ 0]
EMPLOYEE  :     MALE    [ 0]      FEMALE    [ 0]
AGE       :     11 - 24 [ 0]      25 - 44   [ 0]
                45 - 60 [ 0]      > 60      [ 0]
EDUCATION :     NO      [ 0]      PRIMARY   [ 0]
                SECON.  [ 0]      VOCATION  [ 0]
                UNIV.   [ 0]
RESIDENT  :     INSIDE  [ 0]      OUT(AMP)  [ 0]
                OUT(CH) [ 0]      OTHERS    [ 0]
BIRTHPLACE:     INSIDE  [ 0]      OUT(AMP)  [ 0]
                OUT(CH) [ 0]      OTH CHAN  [ 0]
                OTH REG [ 0]      FOREIGN   [ 0]
TOTAL SALARY    [     0]

                                                  REC.1
        Are you sure to insert after this record(y/n)?  [Y].
```

```
          C O M M E R C I A L   S U R V E Y   (INSERTION)

AREA [1  ]    DATA NO.[     1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]  RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [ 8]

FAMILY   :    MALE    [ 1]      FEMALE     [ 0]
EMPLOYEE :    MALE    [ 0]      FEMALE     [ 0]
AGE      :   11 - 24   [ 0]      25 - 44    [ 0]
             45 - 60   [ 0]       > 60      [ 0]
EDUCATION : NO         [ 0]      PRIMARY    [ 0]
              SECON.   [ 0]      VOCATION   [ 0]
              UNIV.    [ 0]
RESIDENT : INSIDE      [ 0]      OUT(AMP)   [ 0]
           OUT(CH)     [ 0]      OTHERS     [ 0]
BIRTHPLACE:INSIDE      [ 0]      OUT(AMP)   [ 0]
           OUT(CH)     [ 0]      OTH CHAN   [ 0]
           OTH REG     [ 0]      FOREIGN    [ 0]
TOTAL SALARY    [      0]

                                                  REC.2

          PLEASE KEY IN THE DATA
```

```
          C O M M E R C I A L   S U R V E Y   (INSERTION)

AREA [1  ]    DATA NO.[     1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]  RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [ 8]

FAMILY   :    MALE    [ 1]      FEMALE     [ 0]
EMPLOYEE :    MALE    [ 0]      FEMALE     [ 0]
AGE      :   11 - 24   [ 0]      25 - 44    [ 0]
             45 - 60   [ 0]       > 60      [ 0]
EDUCATION : NO         [ 0]      PRIMARY    [ 0]
              SECON.   [ 0]      VOCATION   [ 0]
              UNIV.    [ 0]
RESIDENT : INSIDE      [ 0]      OUT(AMP)   [ 0]
           OUT(CH)     [ 0]      OTHERS     [ 0]
BIRTHPLACE:INSIDE      [ 0]      OUT(AMP)   [ 0]
           OUT(CH)     [ 0]      OTH CHAN   [ 0]
           OTH REG     [ 0]      FOREIGN    [ 0]
TOTAL SALARY    [      0]

                                                  REC.2

DO YOU WANT TO INSERT NEXT TO THIS REC.? (Y/N)    [ ]
```

(DELETE)

```
                C O M M E R C I A L   S U R V E Y   [ DELETE ]

AREA            DATA NO.[     ]  LOCATION       GRID NO.
DURATION        RELIGIOUS        COMMERCIAL TYPE      MAJOR

FAMILY    :     MALE             FEMALE
EMPLOYEE  :     MALE             FEMALE
AGE       :    11 - 24           25 - 44
              45 - 60             > 60
EDUCATION :  NO                  PRIMARY
               SECON.            VOCATION
               UNIV.
RESIDENT  :  INSIDE              OUT(AMP)
             OUT(CH)             OTHERS
BIRTHPLACE:INSIDE                OUT(AMP)
             OUT(CH)             OTH CHAN
             OTH REG             FOREIGN
TOTAL SALARY

              PLEASE KEY IN THE DATA NO.

               IF RETURN THEN END!
```

```
                C O M M E R C I A L   S U R V E Y   [ DELETE ]

AREA [1  ]    DATA NO.[  395]  LOCATION [3]  GRID NO.[J441 ]
DURATION[ 2]  RELIGIOUS[1]     COMMERCIAL TYPE [5] MAJOR [01]

FAMILY    :    MALE    [ 1]      FEMALE    [ 3]
EMPLOYEE  :    MALE    [ 0]      FEMALE    [ 0]
AGE       :  11 - 24    [ 0]      25 - 44   [ 0]
             45 - 60     [ 0]       > 60     [ 0]
EDUCATION :  NO          [ 0]      PRIMARY   [ 0]
               SECON.    [ 0]      VOCATION  [ 0]
               UNIV.     [ 0]
RESIDENT  :  INSIDE      [ 0]      OUT(AMP)  [ 0]
             OUT(CH)     [ 0]      OTHERS    [ 0]
BIRTHPLACE:INSIDE        [ 0]      OUT(AMP)  [ 0]
             OUT(CH)     [ 0]      OTH CHAN  [ 0]
             OTH REG     [ 0]      FOREIGN   [ 0]
TOTAL SALARY     [     0]

                                                 REC.395

          ARE YOU SURE TO DELETE THESE DATA ? ....[1]

                0 : DELETE     1 : NOT DELETE
```

```
          C O M M E R C I A L   S U R V E Y   [ REFERENCY ]

AREA           DATA NO.[1    ]  LOCATION      GRID NO.
DURATION       RELIGIOUS         COMMERCIAL TYPE     MAJOR

FAMILY    :    MALE              FEMALE
EMPLOYEE  :    MALE              FEMALE
AGE       :   11 - 24            25 - 44
              45 - 60             > 60
EDUCATION : NO                   PRIMARY
             SECON.              VOCATION
             UNIV.
RESIDENT  : INSIDE               OUT(AMP)
            OUT(CH)              OTHERS
BIRTHPLACE:INSIDE                OUT(AMP)
           OUT(CH)               OTH CHAN
           OTH REG               FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE DATA NO.

           IF RETURN THEN END!
```

```
          C O M M E R C I A L   S U R V E Y   [ REFERENCY ]

AREA           DATA NO.[1    ]  LOCATION      GRID NO.
DURATION       RELIGIOUS         COMMERCIAL TYPE[  ] MAJOR

FAMILY    :    MALE              FEMALE
EMPLOYEE  :    MALE              FEMALE
AGE       :   11 - 24            25 - 44
              45 - 60             > 60
EDUCATION : NO                   PRIMARY
             SECON.              VOCATION
             UNIV.
RESIDENT  : INSIDE               OUT(AMP)
            OUT(CH)              OTHERS
BIRTHPLACE:INSIDE                OUT(AMP)
           OUT(CH)               OTH CHAN
           OTH REG               FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE ITEM NO.
```

```
          C O M M E R C I A L   S U R V E Y   [ REFERENCY ]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]  RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [08]

FAMILY    :   MALE    [ 1]      FEMALE     [ 0]
EMPLOYEE  :   MALE    [ 0]      FEMALE     [ 0]
AGE       :  11 - 24  [ 0]      25 - 44    [ 0]
             45 - 60  [ 0]       > 60      [ 0]
EDUCATION : NO        [ 0]      PRIMARY    [ 0]
              SECON.  [ 0]      VOCATION   [ 0]
              UNIV.   [ 0]
RESIDENT  : INSIDE    [ 0]      OUT(AMP)   [ 0]
            OUT(CH)   [ 0]      OTHERS     [ 0]
BIRTHPLACE:INSIDE     [ 0]      OUT(AMP)   [ 0]
            OUT(CH)   [ 0]      OTH CHAN   [ 0]
            OTH REG   [ 0]      FOREIGN    [ 0]
TOTAL SALARY    [     0]

                                                  REC.1

          CONTINUE THE REFERENCY ? ..... [+]

     + : NEXT KEY    - : BEFORE KEY    [ENTRY]  :  END
```

```
          C O M M E R C I A L   S U R V E Y   [ REFERENCY ]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D444 ]
DURATION[ 4]  RELIGIOUS[1]      COMMERCIAL TYPE [3] MAJOR [08]

FAMILY    :   MALE    [ 1]      FEMALE     [ 0]
EMPLOYEE  :   MALE    [ 0]      FEMALE     [ 0]
AGE       :  11 - 24  [ 0]      25 - 44    [ 0]
             45 - 60  [ 0]       > 60      [ 0]
EDUCATION : NO        [ 0]      PRIMARY    [ 0]
              SECON.  [ 0]      VOCATION   [ 0]
              UNIV.   [ 0]
RESIDENT  : INSIDE    [ 0]      OUT(AMP)   [ 0]
            OUT(CH)   [ 0]      OTHERS     [ 0]
BIRTHPLACE:INSIDE     [ 0]      OUT(AMP)   [ 0]
            OUT(CH)   [ 0]      OTH CHAN   [ 0]
            OTH REG   [ 0]      FOREIGN    [ 0]
TOTAL SALARY    [     0]

                                                  REC.2

          CONTINUE THE REFERENCY ? ..... [ ]

     + : NEXT KEY    - : BEFORE KEY    [ENTRY]  :  END
```

(PRINTING)

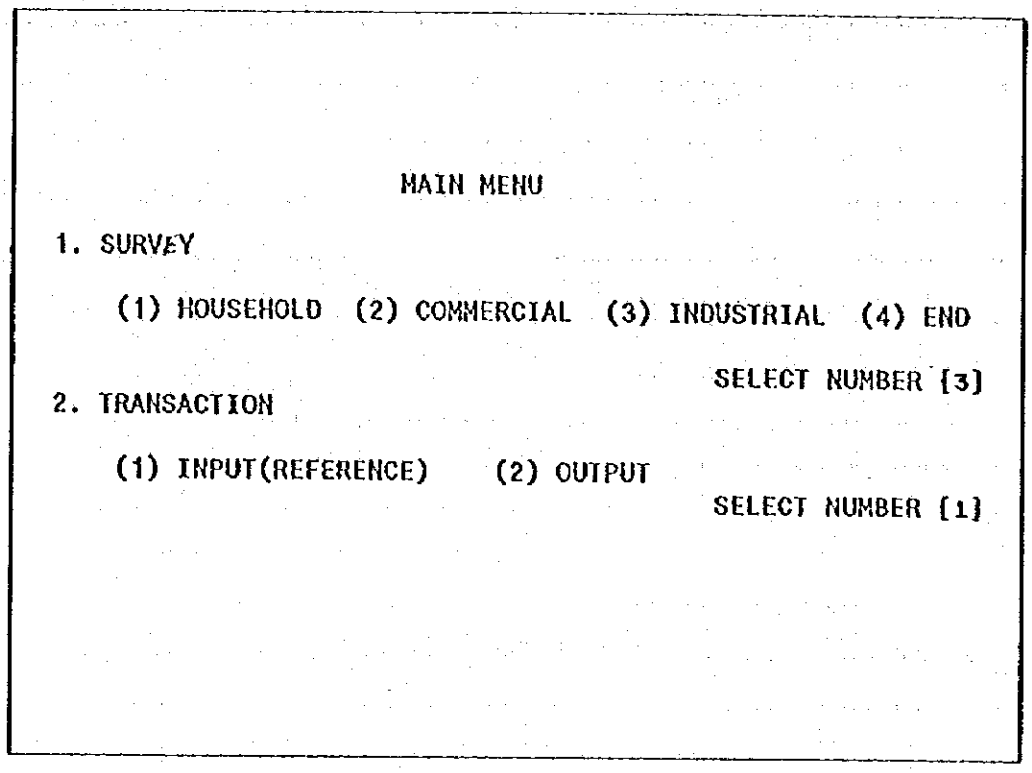
```
        C O M M E R C I A L   S U R V E Y   [ PRINTING ]

START : DATA NO.            [1    ]          REC. NO.  1

  END : DATA NO.            [10   ]

        PLEASE KEY IN THE ENDING DATA NO.
```

```
        C O M M E R C I A L   S U R V E Y   [ PRINTING ]

START : DATA NO.            [1    ]          REC. NO.  1

  END : DATA NO.            [10   ]          REC. NO.  15

        IS PRINTER READY ? .....[1]

  1 : READY   2 : NOT READY   3 : CANCEL
```

(Sample)

Record#	AKKA	DATANO	LOCATION	LCODK	DURATION	KRLIGIOUS	COMMXCIAL	MAJOR	MWALK	MMKWALK	MWALK	KMKWALK	AGK1	AGK2	AGK3	AGK4	KDUCA1	KDUCA2	KDUCA3	KDUCA4	KDUCA5	KKS11	KKS12	KKS13	KKS14	KIKTHP1	KIKTHP2	KIKTHP3	KIKTHP4	KIKTHP5	KIKTHP6	TSALARY
1	1	1 1	0444	4 1	3	08	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	2 1	0444	2 1	1	03	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	3 1	0552	3 1	1	02	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1	4 1	0552	2 1	1	03	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	5 1	0552	5 1	1	02	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	6 1	0552	1 1	1	02	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	7 1	0552	1 1	2	08	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	8 1	0552	8 1	1	02	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	9 1	0552	5 1	1	03	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	10 1	0554	7 1	2	07	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	11 1	0554	2 1	3	09	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	12 1	0554	1 1	3	08	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	13 1	0554	5 1	3	01	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	1	14 1	0554	6 1	1	09	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	15 1	0554	11 1	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	16 1	0554	20 1	1	17	2	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	1	17 1	0554	22 1	1	03	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1	18 1	0554	22 1	1	02	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	1	19 1	0554	10 1	1	02	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	20 1	0554	3 1	2	04	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	1	21 1	0554	20 1	1	01	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	1	22 1	0554	20 1	1	04	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1	23 1	0554	20 1	3	05	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	24 1	0554	1 1	1	04	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	1	25 1	0554	15 1	1	01	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1	26 1	0554	30 1	1	26	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	1	27 1	0554	10 1	1	04	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	28 1	0554	10 1	1	01	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1	29 1	0554	10 1	1	09	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	30 1	0554	5 1	1	02	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1	31 1	0554	5 1	1	09	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	32 1	0554	4 1	1	05	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1	33 1	0554	40 1	1	02	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	34 1	0554	1 1	1	04	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1	35 1	0554	10 1	4	09	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1	36 1	0554	40 1	1	02	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1	37 1	0554	10 1	2	02	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	1	38 1	0554	35 1	2	03	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	1	39 1	0554	1 1	1	03	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	1	40 1	0554	30 1	1	03	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	1	41 1	0554	20 1	1	11	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1	42 1	0554	45 1	1	04	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	1	43 1	0554	1 1	1	03	1	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	1	44 1	0554	20 1	7	03	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	1	45 1	0554	20 1	3	01	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	1	46 1	0554	40 1	1	14	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	1	47 1	0554	6 1	3	06	1	7	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1	48 1	0554	4 1	1	08	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	1	49 1	0554	2 1	1	01	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	1	50 1	0554	1 1	3	06	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(4) INDUSTRIAL



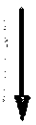
(SELECT DATA FILE)

```
Input filename? NSD\THARUA_I

Is this file [O]ld or [N]ew? O
```

(INDUSTRIAL DATA INPUT MENU)

```
                    I N D U S T R I A L   S U R V E Y

AREA              DATA NO.              LOCATION        GRID NO.
DURATION          BUILDING              INDUSTRY TYPE       MAJOR

FAMILY     :      MALE                  FEMALE
EMPLOYEE   :      MALE                  FEMALE
AGE        :      11 - 24               25 - 44
                  45 - 60                > 60
EDUCATION  : NO                         PRIMARY
             SECON.                     VOCATION
             UNIV.
RESIDENT   : INSIDE                     OUT(AMP)
             OUT(CH)                    OTHERS
BIRTHPLACE:INSIDE                       OUT(AMP)
             OUT(CH)                    OTH CHAN
             OTH REG                    FOREIGN
TOTAL SALARY


                  PLEASE SELECT NUMBER OF WORK      [ ]

1:INPUT  2:EDIT  3:INSERT  4:DELETE  5:REFERENCY  6:PRINT  0:END
```

```
          I N D U S T R I A L   S U R V E Y   (REGISTRATION)

AREA (    )     DATA NO.          LOCATION       GRID NO.
DURATION        BUILDING          INDUSTRY TYPE        MAJOR

FAMILY    :     MALE              FEMALE
EMPLOYEE  :     MALE              FEMALE
AGE       :     11 - 24           25 - 44
                45 - 60            > 60
EDUCATION :  NO                   PRIMARY
             SECON.               VOCATION
             UNIV.
RESIDENT  :  INSIDE               OUT(AMP)
             OUT(CH)              OTHERS
BIRTHPLACE:  INSIDE               OUT(AMP)
             OUT(CH)              OTH CHAN
             OTH REG              FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE SURVEY AREA
```



```
          C O M M E R C I A L   S U R V E Y   (REGISTRATION)

AREA (1   )     DATA NO.(1     )  LOCATION       GRID NO.
DURATION        BUILDING          INDUSTRY TYPE        MAJOR

FAMILY    :     MALE              FEMALE
EMPLOYEE  :     MALE              FEMALE
AGE       :     11 - 24           25 - 44
                45 - 60            > 60
EDUCATION :  NO                   PRIMARY
             SECON.               VOCATION
             UNIV.
RESIDENT  :  INSIDE               OUT(AMP)
             OUT(CH)              OTHERS
BIRTHPLACE:  INSIDE               OUT(AMP)
             OUT(CH)              OTH CHAN
             OTH REG              FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE DATA NO.

             IF RETURN THEN END!
```

```
          I N D U S T R I A L   S U R V E Y   [REGISTRATION]

AREA [1  ]    DATA NO.[1     ]  LOCATION [0]  GRID NO.[      ]
DURATION[ 0]  BUILDING [0]      INDUSTRY TYPE   [0] MAJOR [0]

FAMILY    :    MALE    [ 0]      FEMALE    [ 0]
EMPLOYEE  :    MALE    [   0]    FEMALE    [   0]
AGE       :   11 - 24   [   0]    25 - 44   [   0]
              45 - 60   [   0]     > 60     [   0]
EDUCATION : NO          [   0]    PRIMARY   [   0]
              SECON.    [   0]    VOCATION  [   0]
              UNIV.     [   0]
RESIDENT  : INSIDE      [   0]    OUT(AMP)  [   0]
              OUT(CH)   [   0]    OTHERS    [   0]
BIRTHPLACE: INSIDE      [   0]    OUT(AMP)  [   0]
              OUT(CH)   [   0]    OTH CHAN  [   0]
              OTH REG   [   0]    FOREIGN   [   0]
TOTAL SALARY    [       0]

                                                    REC.53

          PLEASE KEY IN THE DATA
```

(CORRECTION)

```
          I N D U S T R I A L  S U R V E Y  [CORRECTION]

AREA          DATA NO.[1    ]  LOCATION      GRID NO.
DURATION      BUILDING         INDUSTRY TYPE      MAJOR

FAMILY    :   MALE             FEMALE
EMPLOYEE  :   MALE             FEMALE
AGE       :   11 - 24          25 - 44
              45 - 60           > 60
EDUCATION :   NO               PRIMARY
              SECON.           VOCATION
              UNIV.
RESIDENT  :   INSIDE           OUT(AMP)
              OUT(CH)          OTHERS
BIRTHPLACE:   INSIDE           OUT(AMP)
              OUT(CH)          OTH CHAN
              OTH REG          FOREIGN
TOTAL SALARY


          PLEASE KEY IN THE DATA NO.

          IF RETURN THEN END!
```

```
          I N D U S T R I A L  S U R V E Y  [CORRECTION]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D553 ]
DURATION[ 2]  BUILDING [1]      INDUSTRY TYPE  [1] MAJOR [8 ]

FAMILY    :   MALE   [ 0]      FEMALE    [ 1]
EMPLOYEE  :   MALE   [   1]    FEMALE    [   0]
AGE       :   11 - 24[   0]    25 - 44   [   0]
              45 - 60[   0]     > 60     [   0]
EDUCATION :   NO     [   0]    PRIMARY   [   0]
              SECON. [   0]    VOCATION  [   0]
              UNIV.  [   0]
RESIDENT  :   INSIDE [   0]    OUT(AMP)  [   0]
              OUT(CH)[   0]    OTHERS    [   0]
BIRTHPLACE:   INSIDE [   0]    OUT(AMP)  [   0]
              OUT(CH)[   0]    OTH CHAN  [   0]
              OTH REG[   0]    FOREIGN   [   0]
TOTAL SALARY  [      0]

                                                    REC.1
          Do you want to edit this record(y/n)?  [Y]
```

```
          I N D U S T R I A L  S U R V E Y  [CORRECTION]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[0553 ]
DURATION[ 2]  BUILDING [1]     INDUSTRY TYPE   [1] MAJOR [8]]

FAMILY    :   MALE   [ 0]      FEMALE    [ 1]
EMPLOYEE  :   MALE   [   1]    FEMALE    [   0]
AGE       :  11 - 24 [   0]    25 - 44   [   0]
             45 - 60 [   0]     > 60      [   0]
EDUCATION : NO       [   0]    PRIMARY   [   0]
              SECON. [   0]    VOCATION  [   0]
              UNIV.  [   0]
RESIDENT  : INSIDE   [   0]    OUT(AMP)  [   0]
            OUT(CH)  [   0]    OTHERS    [   0]
BIRTHPLACE: INSIDE   [   0]    OUT(AMP)  [   0]
            OUT(CH)  [   0]    OTH CHAN  [   0]
            OTH REG  [   0]    FOREIGN   [   0]
TOTAL SALARY    [        0]

                                                    REC.1

          PLEASE KEY IN THE DATA
```

(INSERTION)

```
          I N D U S T R I A L   S U R V E Y   (INSERTION)

AREA          DATA NO.[1    ]  LOCATION      GRID NO.
DURATION      BUILDING         INDUSTRY TYPE      MAJOR

FAMILY    :   MALE             FEMALE
EMPLOYEE  :   MALE             FEMALE
AGE       :   11 - 24          25 - 44
              45 - 60           > 60
EDUCATION : NO                 PRIMARY
            SECON.             VOCATION
            UNIV.
RESIDENT  : INSIDE             OUT(AMP)
            OUT(CH)            OTHERS
BIRTHPLACE:INSIDE              OUT(AMP)
           OUT(CH)             OTH CHAN
           OTH REG             FOREIGN
TOTAL SALARY

PLEASE KEY IN THE DATA NO. OF THE REC. THAT YOU WANT TO INSERT AFTER IT

                    IF RETURN THEN END!
```

```
          I N D U S T R I A L   S U R V E Y   (INSERTION)

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D553 ]
DURATION[ 2]  BUILDING [1]     INDUSTRY TYPE   [1] MAJOR [8 ]

FAMILY    :   MALE   [ 0]      FEMALE    [ 1]
EMPLOYEE  :   MALE   [   1]    FEMALE    [   0]
AGE       :  11 - 24 [   0]    25 - 44   [   0]
             45 - 60 [   0]     > 60      [   0]
EDUCATION : NO       [   0]    PRIMARY   [   0]
            SECON.   [   0]    VOCATION  [   0]
            UNIV.    [   0]
RESIDENT  : INSIDE   [   0]    OUT(AMP)  [   0]
            OUT(CH)  [   0]    OTHERS    [   0]
BIRTHPLACE:INSIDE    [   0]    OUT(AMP)  [   0]
           OUT(CH)   [   0]    OTH CHAN  [   0]
           OTH REG   [   0]    FOREIGN   [   0]
TOTAL SALARY   [      0]

                                                  REC.1
          Are you sure to insert after this record(y/n)?  [ ]
```

```
          I N D U S T R I A L   S U R V E Y   [INSERTION]

AREA [1  ]     DATA NO.[     1]  LOCATION [1]  GRID NO.[D553 ]
DURATION[ 2]  BUILDING [1]      INDUSTRY TYPE   [1] MAJOR [8]]

FAMILY    :    MALE    [ 0]      FEMALE     [ 1]
EMPLOYEE  :    MALE    [   1]    FEMALE     [   0]
AGE       :   11 - 24   [   0]    25 - 44    [   0]
              45 - 60   [   0]     > 60      [   0]
EDUCATION :   NO        [   0]    PRIMARY    [   0]
               SECON.   [   0]    VOCATION   [   0]
               UNIV.    [   0]
RESIDENT  :   INSIDE    [   0]    OUT(AMP)   [   0]
              OUT(CH)   [   0]    OTHERS     [   0]
BIRTHPLACE:   INSIDE    [   0]    OUT(AMP)   [   0]
              OUT(CH)   [   0]    OTH CHAN   [   0]
              OTH REG   [   0]    FOREIGN    [   0]
TOTAL SALARY    [       0]

                                                    REC.2

          PLEASE KEY IN THE DATA
```

(DELETE)

```
          I N D U S T R I A L   S U R V E Y   [ DELETE ]

AREA          DATA NO.[1    ]  LOCATION      GRID NO.
DURATION      BUILDING         INDUSTRY TYPE      MAJOR

FAMILY    :   MALE             FEMALE
EMPLOYEE  :   MALE             FEMALE
AGE       :   11 - 24          25 - 44
              45 - 60           > 60
EDUCATION :   NO               PRIMARY
              SECON.           VOCATION
              UNIV.
RESIDENT  :   INSIDE           OUT(AMP)
              OUT(CH)          OTHERS
BIRTHPLACE:   INSIDE           OUT(AMP)
              OUT(CH)          OTH CHAN
              OTH REG          FOREIGN
TOTAL SALARY

          PLEASE KEY IN THE DATA NO.

           IF RETURN THEN END!
```

```
          I N D U S T R I A L   S U R V E Y   [ DELETE ]

AREA [1  ]    DATA NO.[    1]  LOCATION [1]  GRID NO.[D553 ]
DURATION[ 2]  BUILDING [1]      INDUSTRY TYPE  [1] MAJOR [8 ]

FAMILY    :   MALE   [ 0]      FEMALE   [ 1]
EMPLOYEE  :   MALE   [   1]     FEMALE   [   0]
AGE       :   11 - 24[   0]     25 - 44  [   0]
              45 - 60[   0]      > 60    [   0]
EDUCATION :   NO     [   0]     PRIMARY  [   0]
              SECON. [   0]     VOCATION [   0]
              UNIV.  [   0]
RESIDENT  :   INSIDE [   0]     OUT(AMP) [   0]
              OUT(CH)[   0]     OTHERS   [   0]
BIRTHPLACE:   INSIDE [   0]     OUT(AMP) [   0]
              OUT(CH)[   0]     OTH CHAN [   0]
              OTH REG[   0]     FOREIGN  [   0]
TOTAL SALARY  [      0]

                                                  REC.1

          ARE YOU SURE TO DELETE THESE DATA ? ....[1]

                0 : DELETE    1 : NOT DELETE
```

(REFERENCY)

```
          I N D U S T R I A L  S U R V E Y   [ REFERENCY ]

AREA           DATA NO.[1    ]  LOCATION       GRID NO.
DURATION       BUILDING         INDUSTRY TYPE       MAJOR

FAMILY    :    MALE             FEMALE
EMPLOYEE  :    MALE             FEMALE
AGE       :   11 - 24           25 - 44
              45 - 60            > 60
EDUCATION : NO                  PRIMARY
            SECON.              VOCATION
            UNIV.
RESIDENT  : INSIDE              OUT(AMP)
            OUT(CH)             OTHERS
BIRTHPLACE:INSIDE               OUT(ANP)
            OUT(CH)             OTH CHAN
            OTH REG             FOREIGN
TOTAL SALARY


          PLEASE KEY IN THE DATA NO.

           IF RETURN THEN END!
```

```
          I N D U S T R I A L  S U R V E Y   [ REFERENCY ]

AREA [1  ]    DATA NO.[    1] LOCATION [1]  GRID NO.[D553 ]
DURATION[ 2]  BUILDING [1]     INDUSTRY TYPE   [1] MAJOR [8 ]

FAMILY    :    MALE    [ 0]     FEMALE    [ 1]
EMPLOYEE  :    MALE    [   1]   FEMALE    [   0]
AGE       :   11 - 24  [   0]   25 - 44   [   0]
              45 - 60   [   0]    > 60     [   0]
EDUCATION : NO         [   0]   PRIMARY   [   0]
            SECON.     [   0]   VOCATION  [   0]
            UNIV.      [   0]
RESIDENT  : INSIDE     [   0]   OUT(AMP)  [   0]
            OUT(CH)    [   0]   OTHERS    [   0]
BIRTHPLACE:INSIDE      [   0]   OUT(AMP)  [   0]
            OUT(CH)    [   0]   OTH CHAN  [   0]
            OTH REG    [   0]   FOREIGN   [   0]
TOTAL SALARY    [      0]

                                                  REC.1

          CONTINUE THE REFERENCY ? ..... [ ]

     + : NEXT KEY   - : BEFORE KEY   [ENTRY]  :  END
```

```
        I N D U S T R I A L   S U R V E Y   [ PRINTING ]
START : DATA NO.            [1    ]
  END : DATA NO.



        PLEASE KEY IN THE STARTING DATA NO.
```

```
        I N D U S T R I A L   S U R V E Y   [ PRINTING ]
START : DATA NO.            [1    ]          REC. NO.  1
  END : DATA NO.            [10   ]          REC. NO.  12



        IS PRINTER READY ? .....[1]
     0 : READY   1 : NOT READY   2 : CANCEL
```

(Sample)

Record#	AREA	DATANO	LOCATION	LCODE	DURATION	BUILDING	INDUSTRY	MAJOR	FWALK	FFXWALK	XWALK	KYXWALK	AGX1	AGX2	AGX3	AGX4	KOUCA1	KOUCA2	KOUCA3	KOUCA4	KOUCA5	XXS11	XXS12	XXS13	XXS14	RIKTHP1	RIKTHP2	RIKTHP3	RIKTHP4	RIKTHP5	RIKTHP6	TSALARY
1	1	1	1	DSS3	2	1	1	8	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0	0
2	1	2	1	DSS4	20	1	3	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	3	1	DSS4	45	1	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1	4	1	DSS4	1	1	2	3	1	0	2	2	2	2	0	0	0	4	0	0	4	0	0	4	0	0	0	0	0	0	0	10200
5	1	5	1	DSS4	2	1	1	8	2	0	2	0	1	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	4000
6	1	6	1	DSS4	30	1	2	1	3	0	7	0	0	7	0	0	0	7	0	0	0	0	7	0	0	0	7	0	0	0	0	9100
7	1	7	1	K442	1	1	2	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
8	1	8	1	K551	25	1	4	1	1	0	40	24	10	[illegible]	14	0	0	0	64	0	0	64	0	0	0	64	0	0	0	0	0	445440
9	1	9	1	K552	6	1	4	1	0	0	10	23	0	33	0	0	0	0	33	0	0	33	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	1	10	1	K552	10	1	2	1	1	0	87	15	0	102	0	0	0	0	102	0	0	0	0	102	0	0	0	0	102	0	0	244800
11	1	11	1	K553	7	1	4	1	0	0	44	12	0	49	7	0	0	21	15	20	0	0	56	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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13	1	13	1	Y551	7	1	4	1	1	0	15	2	0	10	7	0	0	9	5	3	17	0	0	0	0	0	0	0	0	0	C	[illegible]
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15	1	15	2	G553	3	1	4	1	1	0	32	4	4	32	0	0	0	0	0	36	0	36	0	0	0	36	0	0	C	C	0	52200
16	1	16	2	G553	10	1	4	1	2	4	6	1	1	5	0	1	0	0	7	0	0	7	0	0	0	0	0	0	7	0	0	22750
17	1	17	2	G553	5	1	2	8	1	2	13	5	0	18	0	0	0	18	0	0	0	0	0	18	0	0	0	18	0	0	0	38700
18	1	18	2	G552	6	1	2	8	3	1	39	3	0	42	0	0	0	0	39	3	0	42	0	0	0	0	42	0	0	0	0	109200
19	1	19	2	G553	1	1	3	7	1	2	3	0	0	3	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	3	6000
20	1	20	2	G553	9	1	2	1	1	0	5	0	0	5	0	0	0	5	0	0	0	5	0	0	0	0	0	0	5	0	0	13000
21	1	21	4	H551	2	1	2	6	2	3	7	13	0	20	0	0	0	20	0	0	0	20	0	0	0	20	0	0	0	0	0	68000
22	1	22	4	H551	4	1	2	3	1	1	4	4	8	0	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0	0	0	13600
23	1	23	4	H551	3	1	3	1	2	3	0	0	0	5	0	0	0	2	3	0	0	5	0	0	0	5	0	0	0	0	0	0
24	1	24	2	H551	8	1	2	7	1	4	12	0	0	8	4	0	0	3	1	8	0	6	6	0	0	6	6	0	0	0	0	33600
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27	1	27	4	D661	10	1	2	1	0	0	74	26	0	98	2	0	0	98	2	0	0	100	0	0	0	100	0	0	0	0	0	307500
28	1	28	4	D661	14	1	1	1	2	0	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	2000
29	1	29	4	R551	1	1	2	6	0	1	0	3	0	0	3	0	0	3	0	0	0	3	0	0	0	3	0	0	0	0	0	21000
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31	1	31	3	1443	10	1	2	6	1	1	2	0	2	0	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	0	0	1400
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33	1	33	3	J333	2	1	1	8	3	1	40	0	0	40	0	0	0	40	0	0	0	0	40	0	0	0	40	0	0	0	0	202000
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35	1	35	3	J441	4	1	1	8	2	4	3	0	0	3	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3	0	0	30000
36	1	36	3	J441	6	1	2	8	3	3	30	10	40	0	0	0	0	40	0	0	0	0	0	40	0	0	0	0	40	0	0	390000
37	1	37	3	J441	2	1	2	8	1	25	0	0	25	0	0	0	15	10	0	0	25	0	0	0	0	0	25	0	0	0	0	562500
38	1	38	3	J441	10	1	2	6	1	0	7	5	12	0	0	0	0	12	0	0	0	12	0	0	0	12	0	0	0	0	0	25000
39	1	39	3	J443	2	1	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	1	40	5	K223	3	1	2	6	5	5	3	5	3	0	0	0	8	0	0	0	8	0	0	0	0	0	0	8	0	0	0	10800
41	1	41	5	K331	2	1	2	6	1	0	2	4	6	0	0	0	0	6	0	0	0	0	6	0	0	0	6	0	0	0	0	12600
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46	1	46	3	1441	2	1	3	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	1	47	3	1443	49	1	2	6	0	0	881	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4278976
48	1	48	3	H442	21	1	2	6	0	0	1186	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5591684
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