

# Appendix A

## Methodology

### 1. Sample Design

A Stratified Random Sampling was adopted for the survey. Each province was constituted a stratum. The sampling units were establishments.

#### 1.1 Stratification

Bangkok and each province were constituted a stratum. There were altogether 77 strata. Each stratum was classified by TSIC (Thailand Standard Industrial Classification: TSIC 2009) at class level into 11 sub-stratum and in each sub-stratum was divided into 5 sizes according to number of persons engaged as follows:

Size of establishment	1	2	3	4	5
Number of persons engaged	1 – 5	6 – 10	11 – 15	16 – 20	> 20

#### 1.2 Selection of Sampling Unit

The sample selection of establishments were done by simple random sampling and performed separately and independently in each sub-stratum and size of establishments. The total samples were 12,971 from 33,099 establishments.

The total number of sample establishments selected for enumeration by region and size of establishment was as follows:

Region	Total	Size of establishment				
		1	2	3	4	5
Bangkok	1,412	328	182	132	107	663
Vicinity	1,316	531	315	162	83	225
Central	2,235	1,061	500	268	98	308
North	2,539	1,398	581	276	94	190
Northeast	3,464	2,081	749	336	109	189
South	2,005	1,177	415	177	64	172
<b>Whole kingdom</b>	<b>12,971</b>	<b>6,576</b>	<b>2,742</b>	<b>1,351</b>	<b>555</b>	<b>1,747</b>

## 2. Method of Estimation

The survey results were presented at provincial level and regional level. At the regional level, the results were presented separately for Bangkok, Vicinity (Samut Prakan, Nonthaburi, Pathum Thani, Nakhon Pathom and Samut Sakhon) and the remaining provinces were classified by region. All the establishments were classified by TSIC at class level and divided into 5 sizes according to number of persons engaged as follows:

Size of establishment	1	2	3	4	5
Number of person engaged	1 – 5	6 – 10	11 – 15	16 – 20	>20

Let,

$$q = 1, 2, 3, 4, n_{ilp} \quad (\text{sample establishment})$$

$$p = 1, 2, 3, 4, 5 \quad (\text{size of establishment})$$

$$l = 1, 2, 3, \dots, 11 \quad (\text{class})$$

$$i = 1, 2, 3, \dots, 77 \quad (\text{province})$$

The estimated total number of characteristic  $X$  of the establishments for the  $p^{\text{th}}$  size,  $l^{\text{th}}$  class,  $i^{\text{th}}$  province was based on the formula:

$$\hat{X}_{ilp} = \sum_{q=1}^{n_{ilp}} w_{ilp} x_{ilpq}$$

where

$x_{ilpq}$  is the value of characteristic  $X$  of the establishments for the  $p^{\text{th}}$  size,  $l^{\text{th}}$  class,  $i^{\text{th}}$  province.

$w_{ilp}$  is the weighting factor of the establishments for the  $p^{\text{th}}$  size,  $l^{\text{th}}$  class,  $i^{\text{th}}$  province. Where

$$w_{ilp} = \frac{N_{ilp}}{n_{ilp}}$$

$N_{ilp}$  is the total number of the establishments for the  $p^{\text{th}}$  size,  $l^{\text{th}}$  class,  $i^{\text{th}}$  province.

$n_{ilp}$  is the total number of the sample establishments for the  $p^{\text{th}}$  size,  $l^{\text{th}}$  class,  $i^{\text{th}}$  province.

### 3. Data Collection

The interviewing method was employed in data collection. The enumerators who are permanent and temporary staff of the National Statistical Office were sent out to interview the owners or the entrepreneurs of manufacturing establishments during June 1 to July 31, 2015.

### 4. Data Processing

The information of establishments in provincial areas was processed at the provincial office with the technical supports from the central office, e.g. preparation of the software programs for data entry and tabulation, and drafting form of the report. Those data were aggregated to regions and the whole kingdom, as well as the detailed information of the establishments was processed at the central office.

### 5. In Round Figures

The summation of each amount may not equal to the total due to rounding.

### 6. Errors of the Data

Data presented in this report might be subject to sampling and non-sampling errors. For instance, errors from the imputation for missing values and non-response, intentional misreporting and errors arising at coding and data entry stages. However, the NSO tried its best to minimize such errors, thus the data should be used with appropriate cautions.

### 7. Data Presentation and Reporting

Results of the operational information of construction establishments are presented into 2 levels of publication.

- 1) Preliminary report of the region and the whole kingdom level.
- 2) Regional and Whole Kingdom level report of consists of 7 volumes, i.e. Bangkok, Vicinity, Central region, Northern region, Northeastern region, Southern region and Whole Kingdom.