APPENDIX

The 2010 Population and Housing Census (Final Report)
Method of Estimation

The estimation for the final report provided the results at the district (Amphoe) level. The method of estimation was composed of two parts, those for presenting characteristics of persons and characteristics of households.

Let $h = 1,2,3,4,5$ region

            $i = 1,2,3,...,A_h$ province

            $j = 1,2,3,...,B_i$ district

            $k = 1,2$ administrative district

            $l = 1,2$ sex

Part 1 : Characteristics of Persons

Estimation of Total

1.1   The formula for the estimate of the total number of characteristic Y of persons for sex l administrative district k district j province i region h was

$$\hat{Y}_{1hijkl} = \frac{y_{1hijkl}}{x_{1hijkl}} X_{1hijkl} = r_{1hijkl} X_{1hijkl} \qquad\qquad .... (1)$$

where y_{1hijkl} was the characteristic Y of persons enumerated for sex l administrative district k district j province i region h

     x_{1hijkl} was the total number of persons enumerated for sex l administrative district k district j province i region h

     X_{1hijkl} was the total number of listing persons for sex l administrative district k district j province i region h

     r_{1hijkl} was the ratio of the characteristic Y of persons to the total number of persons enumerated for sex l administrative district k district j province i region h, where

$$r_{1hijkl} = \frac{y_{1hijkl}}{x_{1hijkl}} \qquad\qquad .... (2)$$

1.2 The formula for the estimate of the total number of characteristic Y of persons for administrative district k district j province i region h was

$$\hat{Y}_{1hijk} = \sum_{l=1}^{2} \hat{Y}_{1hijkl} \qquad \text{............ (3)}$$

1.3 The formula for the estimate of the total number of characteristic Y of persons for sex l district j province i region h was

$$\hat{Y}_{1hijl} = \sum_{k=1}^{2} \hat{Y}_{1hijkl} \qquad \text{............ (4)}$$

1.4 The formula for the estimate of the total number of characteristic Y of persons for district j province i region h was

$$\hat{Y}_{1hij} = \sum_{k=1}^{2} \hat{Y}_{1hijk} = \sum_{l=1}^{2} \hat{Y}_{1hijl} \qquad \text{............ (5)}$$

1.5 The formula for the estimate of the total number of characteristic Y of persons for sex l administrative district k province i region h was

$$\hat{Y}_{1hikl} = \sum_{j=1}^{B_i} \hat{Y}_{1hijkl} \qquad \text{............ (6)}$$

1.6 The formula for the estimate of the total number of characteristic Y of persons for administrative district k province i region h was

$$\hat{Y}_{1hik} = \sum_{j=1}^{B_i} \hat{Y}_{1hijk} = \sum_{l=1}^{2} \hat{Y}_{1hikl} \qquad \text{............ (7)}$$

1.7 The formula for the estimate of the total number of characteristic Y of persons for sex l province i region h was

$$\hat{Y}_{1hil} = \sum_{j=1}^{B_i} \hat{Y}_{1hijl} = \sum_{k=1}^{2} \hat{Y}_{1hikl} \qquad \text{............ (8)}$$

1.8 The formula for the estimate of the total number of characteristic Y of persons for province i region h was

$$\hat{Y}_{1hi} = \sum_{j=1}^{B_i} \hat{Y}_{1hij} = \sum_{k=1}^{2} \hat{Y}_{1hik} = \sum_{l=1}^{2} \hat{Y}_{1hil} \qquad \text{............ (9)}$$

1.9   The formula for the estimate of the total number of characteristic Y of persons for sex l administrative district k region h was

$$\hat{Y}_{1hkl} = \sum_{i=1}^{A_h} \hat{Y}_{1hikl} \qquad \ldots\ldots\ldots (10)$$

1.10   The formula for the estimate of the total number of characteristic Y of persons for administrative district k region h was

$$\hat{Y}_{1hk} = \sum_{i=1}^{A_h} \hat{Y}_{1hik} = \sum_{l=1}^{2} \hat{Y}_{1hkl} \qquad \ldots\ldots\ldots (11)$$

1.11   The formula for the estimate of the total number of characteristic Y of persons for sex l region h was

$$\hat{Y}_{1hl} = \sum_{i=1}^{A_h} \hat{Y}_{1hil} = \sum_{k=1}^{2} \hat{Y}_{1hkl} \qquad \ldots\ldots\ldots (12)$$

1.12   The formula for the estimate of the total number of characteristic Y of persons for region h was

$$\hat{Y}_{1h} = \sum_{i=1}^{A_h} \hat{Y}_{1hi} = \sum_{k=1}^{2} \hat{Y}_{1hk} = \sum_{l=1}^{2} \hat{Y}_{1hl} \qquad \ldots\ldots\ldots (13)$$

1.13   The formula for the estimate of the total number of characteristic Y of persons for administrative district k of the whole kingdom was

$$\hat{Y}_{1k} = \sum_{h=1}^{5} \hat{Y}_{1hk} \qquad \ldots\ldots\ldots (14)$$

1.14   The formula for the estimate of the total number of characteristic Y of persons for sex l of the whole kingdom was

$$\hat{Y}_{1l} = \sum_{l=1}^{2} \hat{Y}_{1hl} \qquad \ldots\ldots\ldots (15)$$

1.15   The formula for the estimate of the total number of characteristic Y of persons for the whole kingdom was

$$\hat{Y}_{1} = \sum_{h=1}^{5} \hat{Y}_{1h} = \sum_{k=1}^{2} \hat{Y}_{1k} = \sum_{l=1}^{2} \hat{Y}_{1l} \qquad \ldots\ldots\ldots (16)$$

Part 2 : Characteristics of Private Households

Estimation of Total

2.1 The formula for the estimate of the total number of characteristic Y of private households for administrative district k district j province i region h was

$$\hat{Y}_{21hijk} = \frac{y_{21hijk}}{n_{1hijk}} N_{1hijk} = r_{21hijk} N_{1hijk} \qquad \text{...........(17)}$$

where y_{21hijk} was the characteristic Y of private households enumerated for administrative district k district j province i region h

n_{1hijk} was the total number of private households enumerated for administrative district k district j province i region h

N_{1hijk} was the total number of listing private households for administrative district k district j province i region h

r_{21hijk} was the ratio of the characteristic Y of private households to the total number of private households enumerated for administrative district k district j province i region h, where

$$r_{21hijk} = \frac{y_{21hijk}}{n_{1hijk}} \qquad \text{...........(18)}$$

2.2 The formula for the estimate of the total number of characteristic Y of private households for district j province i region h was

$$\hat{Y}_{21hij} = \sum_{k=1}^{2} \hat{Y}_{21hijk} \qquad \text{...........(19)}$$

2.3 The formula for the estimate of the total number of characteristic Y of private households for administrative district k province i region h was

$$\hat{Y}_{21hik} = \sum_{j=1}^{B_i} \hat{Y}_{21hijk} \qquad \text{...........(20)}$$

2.4   The formula for the estimate of the total number of characteristic Y of private households for province i region h was

$$\hat{Y}_{21hi} = \sum_{j=1}^{B_i} \hat{Y}_{21hij} = \sum_{k=1}^{2} \hat{Y}_{21hik} \qquad\qquad .... (21)$$

2.5   The formula for the estimate of the total number of characteristic Y of private households for administrative district k region h was

$$\hat{Y}_{21hk} = \sum_{i=1}^{A_h} \hat{Y}_{21hik} \qquad\qquad .... (22)$$

2.6   The formula for the estimate of the total number of characteristic Y of private households for region h was

$$\hat{Y}_{21h} = \sum_{i=1}^{A_h} \hat{Y}_{21hi} = \sum_{k=1}^{2} \hat{Y}_{21hk} \qquad\qquad .... (23)$$

2.7   The formula for the estimate of the total number of characteristic Y of private households for administrative district k of the whole kingdom was

$$\hat{Y}_{21k} = \sum_{h=1}^{5} \hat{Y}_{21hk} \qquad\qquad .... (24)$$

2.8   The formula for the estimate of the total number of characteristic Y of private households for the whole kingdom was

$$\hat{Y}_{21} = \sum_{h=1}^{5} \hat{Y}_{21h} = \sum_{k=1}^{2} \hat{Y}_{21k} \qquad\qquad .... (25)$$

_____