TECHNICAL NOTES

1. *Introduction*

    1.1 *The statistics published in this report is based on Labour Force Survey (LFS) conducted by Department of Statistics, Malaysia. The implementation of LFS is based on guidelines and recommendations of the **International Labour Organization (ILO)** with reference to the **Surveys of Economically Active Population, Employment, Unemployment and Underemployment: An ILO Manual on Concepts and Methods**.*

    1.2 *The survey which is carried out every month provided statistics of labour force, employment and unemployment at the national and state levels as well as urban and rural areas. The comprehensive and systematic approach in data collection and processing has been maintained over a period of time in order to obtain comparable time series statistics.*

    1.3 *The information obtained from LFS is gathered under the provisions of the **Statistics Act 1965 (Revised 1989)**. **Section 6** of this Act requires any individuals to provide actual information or best estimates to DOSM. Meanwhile, **Section 7** of this Act allows respondents whom refuse to cooperate in the undertaking of the survey to be penalized. The Act stipulated that the detailed information gathered is confidential and only aggregated figures are published.*

    1.4 *This technical note comprises of detailed explanation on concepts, definition and methodology used to conduct LFS to assist users to better understand labour market information obtained via household approach.*

2. *Objectives of the survey*

    2.1 *The main objectives of LFS are:*
        i.   *to collect information on the structure and distribution of labour force, employment and unemployment; and*
        ii. *to provide the latest statistics in relation to labour market situation from the perspective of labour supply.*

    2.2 *The statistics from this survey is utilised especially by the Government as input in planning national developments strategies; as well as by economists, academicians, private sector and individuals for the purpose of research and analysis.*

3. Method of data collection

3.1 *LFS uses the personal interview method. During the survey period, trained interviewers visit households in selected living quarters (LQs) to collect demographic information on all household members and labour force particulars of household members aged 15 years and over.*

3.2 *Field checks are undertaken to identify and correct any possibility of errors or omissions at the time when the survey is conducted. In addition to this, selected households are interviewed again to check the quality of data collection operation.*

3.3 *25 per cent repeated panels were interviewed via Computer-Assisted Telephone Interviewing (CATI)[1].*

4. Questionnaire

4.1 *The survey questionnaire is designed to collect the relevant information on social and demographic characteristics of the survey population and detailed information on economic characteristics of the labour force.*

4.2 *All household members will be asked the following information:*
   i. *relationship to the head of household;*
   ii. *sex;*
   iii. *age;*
   iv. *ethnic and citizenship;*
   v. *marital status; and*
   vi. *educational attainment.*

4.3 *For those aged 15 years and over, their **activity status** either employed, unemployed or outside labour force will be determined.*

   4.3.1 *Information collected from those who are employed include whether they had been working or not during the reference week, the number of hours worked, occupation, industry and status in employment. If they have worked less than 30 hours per week, reasons and willingness to accept additional work is also obtained. If they have not been working during the reference week but have a job to return to, the reasons for not working will be asked.*

   4.3.2 *The following questions will be asked to household members who are unemployed:*
      i. *action taken to look for work;*

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[1] *Computer-Assisted Telephone Interviewing (CATI) is a modern method of data collection through telephone interview equipped with interactive computer system.*

ii. *work experience; and*

iii. *duration of unemployment.*

4.3.3 Household members who are classified as outside labour force will be asked to state the reasons for not seeking work and whether or not they have any working experience.

5. Reference period

The reference period of the survey refers to **seven days (week)** *preceding the commencement date of the interviews which are 1–7, 8–14 and 15–21 of the respective month.*

6. Scope and coverage

6.1 The LFS covers both urban and rural areas for all administrative districts within all states in Malaysia.

6.2 The survey population is defined to cover persons who live in private LQs; hence excludes persons residing in institutional LQs such as hotels, hostels, hospitals, prisons, boarding houses, and workers residing in construction work site.

6.3 Although the LFS did not cover the institutional population, no attempt was made to adjust for the exclusion of the population living in institutional LQs from the independent mid-year post census population estimates. Based on the 2010 Population and Housing Census, those living in institutional LQs was less than four per cent of the total population. This percentage was small and did not affect the estimates of labour force statistics.

6.4 This survey comprises the economically active and inactive population between the age of **15 to 64 years**[2]. *The economically active population are those who are either employed or unemployed while those who are inactive are classified as outside labour force.*

7. Sampling frame

7.1 The frame used for the selection of sample for LFS 2016 is based on the Household Sampling Frame which is made up of enumeration blocks (EBs) created for the 2010 Population and Housing Census and was updated from time to time.

7.2 EBs are geographically contiguous areas of land with identifiable boundaries created for survey operation purposes, which on average contains about 80 to 120 LQs. All EBs are formed within gazetted boundaries, i.e. within mukim or local authority areas.

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[2] *Working age limit for a country is determined based on the age structure of the population of the country.*

7.3   The EBs in the sampling frame are also classified into urban and rural areas[3].

   i.   **Urban areas**
        Gazetted areas with their adjoining built-up areas with combined population of 10,000 or more at the time of the 2010 Population and Housing Census.

        • **Built-up areas**
          Areas contiguous to a gazetted area with at least 60 per cent of the population (aged 15 years and over) engaged in non-agricultural activities.

        The definition of urban areas also takes into account the special development area namely the development area which is not gazetted and can be identified and separated from the gazetted area or built-up area of more than 5 km with population of at least 10,000 persons where 60 per cent of the population (aged 15 years and over) were involved in non-agricultural activities.

   ii. **Rural areas**
        All other gazetted areas with population of less than 10,000 persons and non-gazetted areas.

7.4   Urbanisation is a dynamic process and keeps changing in line with progress and development. Thus, the urban areas for the Population and Housing Census 2000 and 2010 do not necessarily refer to the same areas, as areas fulfilling the criteria of urban continue to increase or grow with time.

8.   **Sample design**

8.1   A stratified two-staged sample design is adopted, that is:

        Primary strata   :   urban and rural strata; and
        Secondary strata   :   states and administrative district within the primary strata.

8.2   Two-stage sample selections are implemented and samples are drawn randomly. The first stage units of sample selection are the EBs while the second stage units are the LQs within the EBs. All households and persons within the selected LQs are canvassed. At every stage of selection, the units are selected systematically with equal probability within each level of the secondary strata.

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[3] *Population Distribution and Basic Demographic Characteristics, 2010 Population and Housing Census.*

9.   Sample size

9.1   *The sample size for this survey is required to represent overall population at the fixed level of analysis. This sample size has accounted for the following elements:*

    i.   *response rates of the previous survey;*
    ii.   *labour force participation rate of the previous survey as the variable of selection;*
    iii.   *level of sampling design; and*
    iv.   *the maximum desired error.*

Factors that are taken into consideration to finalise the sample size are cost, time and human resources.

9.2   *The distribution of sample size for the 2016 LFS are as follows:*

State	Number of selected EBs	Number of selected LQs
Johor	1,080	8,390
Kedah	840	6,662
Kelantan	728	5,732
Melaka	603	4,909
Negeri Sembilan	744	6,000
Pahang	970	7,734
Pulau Pinang	769	5,821
Perak	1,033	7,428
Perlis	384	3,119
Selangor	1,098	7,891
Terengganu	648	5,367
Sabah	1,167	9,313
Sarawak	1,063	7,918
W.P. Kuala Lumpur	531	4,140
W.P. Labuan	145	1,204
W.P. Putrajaya	158	991
Malaysia	**11,961**	**92,619**

10.   Estimation procedures

10.1   Current population estimates by age group, sex, citizenship, ethnicity and state were used as the benchmark to produce labour statistics through **combined ratio estimated method** which are adjusted weight and population factor.

   i.   **Adjusted weight**
   Adjusted weight is used to take into account the non-response cases.

   ii.   **Population factor**
   In multi-stage sampling design, the sample size is a random variable and aggregates directly estimated from the survey can have large sampling errors. External weight is used to minimise sampling error. The external weight used in Labour Force Survey is the population factor. The population factor is obtained through up-to-date estimates of population totals which is used to inflate the various rates and ratios estimated from the survey.

10.2   Two types of population statistics produced by DOSM are:

   i.   **population projection** to indicate the size and structure of the population in the long term based on certain assumption on the trend of fertility, mortality and migration. These statistics are used as input to formulate future plans and policies.

   ii.   **current population estimates** to illlustrate the size of the current population and is prepared annually based on the recent data on birth, death and migration.

10.3   Starting with the 2015 LFS, the labour force statistics were estimated based on the current population estimates compared to the previous approach which used population projection. Therefore, time series for the period of 2011–2014 were also updated based on the population estimates of the respective years.

11.   Concepts and definitions

11.1   The working age limit for a country is determined based on the age structure of the economically active population of the country. Working age for the analysis of LFS in Malaysia refers to household members between the age of **15 to 64 years** during the reference week, who are either in the labour force or outside the labour force[4].

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[4] *Surveys of Economically Active Population, Employment, Unemployment and Underemployment: An ILO Manual on Concepts and Methods.*

11.2   The LFS uses the **actual status** approach, where a person is classified on the basis of labour force activity during the reference week. The activity status is categorised as follows:

i.   **Labour force**
Labour force refers to population in the working age group of 15 to 64 years who are either **employed** or **unemployed**.

ii.   **Employed**
All persons who, at any time during the reference week worked at least one hour for pay, profit or family gain either as an employer, employee, own-account worker or unpaid family worker. They are also considered as employed if they:

a.   did not work during the reference week because of illness, injury, disability, bad weather, leave, labour dispute and social or religious reasons but had a job, farm, enterprise or other family enterprise to return to.

b.   were temporary laid-off with pay and would definitely be called back to work.

c.   were employed less than 30 hours during the reference week because of the nature of their work or due to insufficient work and are able and willing to accept additional hours of work. This group is **underemployed**.

Persons who were employed more than 30 hours during the reference week are considered to be in **full employment**.

iii.   **Unemployed**
The unemployed are those who did not work during the reference week and are classified into two groups that is the actively unemployed and inactively unemployed.

The **actively unemployed** include all persons who were available for work and were actively looking for work during the reference week.

Inactively unemployed persons include those in the following categories:
a.   did not look for work because they believed no work was available or that they were not qualified;
b.   would have looked for work if they had not been temporarily ill or had it not been for weather condition; and
c.   had looked for work prior to the reference week and were waiting for result of job applications.

iv. **Outside labour force**
All persons not classified as employed or unemployed are classified as **outside labour force**. *This category consists of housewives, students (including those going for further studies), retired, disabled persons and those not interested in looking for a job.*

11.3 **Hours worked**
Refers to total number of hours worked during the reference period.

11.4 **Living quarters**
*Living quarters is defined as any **separate** and **independent** structures which is constructed and intended as place of abode.*

i. **Separate**
A structure is considered separate if it is surrounded by walls, fence, etc. and is covered by roof.

ii. **Independent**
A structure is independent if it has direct access via public path, communal passageway or space (that is occupants can come in or go out of their living quarters without passing through others' premises).

11.5 **Household**
A household is defined as a person or group of related or unrelated persons who usually live together and make common provision for food and other living essentials.

11.6 **Ordinary members**
Ordinary members are members who have or will reside in selected residences for a period of at least three months.

11.7 **Ethnic group**
The ethnic group is categorised within Malaysian citizens after separating those who are non-citizens. The classification is as follows:

i. *Malaysian citizens*
   a. *Bumiputera*
   b. *Chinese*
   c. *Indians*
   d. *Others*

ii. *Non-Malaysian citizens*

11.8 Marital status

    i. Never married

    Refers to those who have never been married at the time of interview.

    ii. Married

    Refers to persons who are currently married at the time of interview. The term, 'married' includes those married by law or by religious rites or are living together by mutual agreement.

    iii. Widowed

    Refers to those who have not remarried after the death of the spouses at the time of interview.

    iv. Divorced/permanently separated

    Refers to those whose marriages were annulled through divorce by law or religious arrangement or separated for a long duration without any possibility of reconciliation.

11.9 Educational attainment

Refers to the highest level in which a person has completed schooling or is currently attending school in a public or private educational institution that provides formal education and is categorised as follows:

    i. No formal education

    Refers to persons who have never attended school in any of the educational institutions that provide formal education.

    ii. Primary

    Refers to those whose highest level of education attained is from Standard 1 to 6 or equivalent.

    iii. Secondary

    Refers to those whose highest level of education attained is from Form 1 to 5 (including remove class), General Certificate of Education (GCE) O Level or equivalent. This includes basic skill programmes in specific trades and technical skills institutions with the training period of at least six months.

    iv. Tertiary

    Refers to those whose highest level of education is above Form 5.

11.10 **Highest certificate obtained**
Refers to the highest certificate obtained from public or private educational institution that provides formal education and is adapted from the **International Standard Classification of Education (ISCED–97)** as follows:

i. **UPSR/UPSRA or equivalent**
Refers to "Ujian Penilaian Sekolah Rendah"/"Ujian Penilaian Sekolah Rendah Agama" or equivalent.

ii. **PT3/PMR/SRP/LCE/SRA or equivalent**
Refers to "Pentaksiran Tingkatan 3", "Penilaian Menengah Rendah", "Sijil Rendah Pelajaran", Lower Certificate of Education, "Sijil Rendah Agama" or equivalent.

iii. **SPM or equivalent**
Refers to "Sijil Pelajaran Malaysia" or equivalent (Senior Cambridge Certificate, GCE O Level and Malaysia Certificate of Vocational Education). This includes basic skill certificate obtained from specific trades and technical skills institutions whereby the training period is at least six months such as GIATMARA certificate.

iv. **STPM or equivalent**
Refers to "Sijil Tinggi Persekolahan Malaysia", Higher School Certificate or equivalent ("Sijil Tinggi Agama" and GCE A Level).

v. **Certificate**
Refers to certificate obtained from college, polytechnic or other institutions which offers formal education. Duration of certification should not be less than six months.

vi. **Diploma**
Refers to diploma or equivalent certificate obtained after category iii, iv or v from university, college or polytechnic prior to a degree qualification.

vii. **Degree**
Refers to degree (Bachelor, Masters or Ph.D) obtained from public or private higher institution or equivalent.

viii. **No certificate**
Refers to those who are currently attending school or who have completed schooling without receiving any certificate.

ix. **Not applicable**
Refers to those who have no formal education.

11.11 **Status in employment**
   *Refers to the **position or status** of an employed person within the establishment or organisation for which he/she worked and is adapted based on the **International Classification of Status in Employment (ICSE–93)**. Employed persons are classified according to the following employment status:*

   i. **Employer**
       A person who operates a business, a plantation or other trade and employs one or more workers to help him.

   ii. **Employee**
        A person who works for a public or private employer and receives regular remuneration in wages, salary, commission, tips or payment in kind.

   iii. **Own account worker**
         A person who operates his own farm, business or trade without employing any paid workers in the conduct of his farm, trade or business.

   iv. **Unpaid family worker**
        A person who works without pay or wages on a farm, business or trade operated by another member of the family.

11.12 **Occupation**

   i. *Occupation data of LFS 2011–2015 is classified according to **Malaysia Standard Classification of Occupations (MASCO) 2008** based on the **International Standard Classification of Occupations (ISCO–08)** as follows:*

           1 – Managers
           2 – Professionals
           3 – Technicians and associate professionals
           4 – Clerical support workers
           5 – Service and sales workers
           6 – Skilled agricultural, forestry and fishery workers
           7 – Craft and related trades workers
           8 – Plant and machine-operators and assemblers
           9 – Elementary occupations

ii. *Starting with LFS 2016, occupation is classified according to **MASCO 2013** which was also based on the ISCO–08 but was improved in line with the transformation of work process and areas of specialisation as well as the complexity and dynamics in skills and tasks. The classification of occupation based on MASCO 2013 is as follows:*

       1 – Managers
       2 – Professionals
       3 – Technicians and associate professionals
       4 – Clerical support workers
       5 – Service and sales workers
       6 – Skilled agricultural, forestry, livestock and fishery workers
       7 – Craft and related trades workers
       8 – Plant and machine-operators and assemblers
       9 – Elementary occupations

iii. *For a person having more than one job, only the job at which he worked for the longest number of hours during the reference week is treated as his principal occupation. Should the number of hours worked for each job is the same, then the job with the highest income is the principal occupation. In cases where the number of hours worked and the income earned from each job are the same, the job at which he was working for the longest period of time is considered as the principal occupation.*

11.13 *Industry*

i. *Industry is classified according to the **Malaysia Standard Industrial Classification (MSIC) 2008 version 1.0** based on the **International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4**.*

ii. *A person's industry classification refers to that of his principal occupation.*

iii. *LFS does not classify the subsistence goods-and services-producing activities of households as persons who are economically active. Therefore, the classification of industry by MSIC 2008 for **Activities of households as employers; undifferentiated goods-and services-producing activities of households for own use** only accounted for **Activities of households as employers**.*

iv. *Sectors for the infographic in page 8 and page 28 are the reclassification of industry as follows:*

Sector	MSIC 2008
Agriculture	Agriculture, forestry and fishing
Mining & quarrying	Mining and quarrying
Manufacturing	Manufacturing
Construction	Construction
Services	Electricity, gas, steam and air conditioning supply
	Water supply; sewerage, waste management and remediation activities
	Wholesale and retail trade; repair of motor vehicles and motorcycles
	Transportation and storage
	Accommodation and food and beverage service activities
	Information and communication
	Financial and insurance/takaful activities
	Real estate activities
	Professional, scientific and technical activities
	Administrative and support services activities
	Public administration and defence; compulsory social security
	Education
	Human health and social work activities
	Arts, entertainment and recreation
	Other service activities
	Activities of households as employers
	Activities of extraterritorial organization and bodies

11.14 *Labour force participation rate*

The economic activity of a population depends on the demographic characteristics of that population. Therefore, the proportion of economically active persons differs between sub-groups of that population. These variations are measured by specific activity rates termed **labour force participation rate**.

Labour force participation rate is defined as the ratio of the labour force to the working age population (15–64 years), expressed as percentage. The formula is as follow:

$$\text{Labour force participation rate} = \frac{\text{Number of persons in the labour force}}{\text{Number of persons in the working age (15–64 years)}} \times 100$$

11.15 Unemployment rate

Unemployment rate is the proportion of unemployed population to the total population in labour force. This rate measures the percentage of unemployed population in labour force. Unemployment rate is computed by using the formula below:

$$\text{Unemployment rate} = \frac{\text{Number of unemployed persons}}{\text{Number of persons in the labour force}} \times 100$$

11.16 Employment to population ratio

The employment to population ratio is defined as the proportion of employed population to working-age population. A high ratio means that a large proportion of the country's population is employed while a low ratio means that a large share of the population is not involved directly in market-related activities due to being unemployed or out of the labour force. The formula is as follow:

$$\text{Employment to population ratio} = \frac{\text{Number of employed persons}}{\text{Number of persons in the working age}} \times 100$$
$$(15–64 \text{ years})$$

12. Reliability of statistics

The statistics generated based on survey conducted with probability sampling are subjected to two types of errors namely sampling error and non-sampling errors.

i. Sampling error

Sampling error is a result of estimating data based on probability sampling survey compared to the population. Such error in statistics is termed as Relative Standard Error (RSE) and is expressed in percentage. This error is an indication to the precision of the parameter under study. In other words, it reflects the extent of variation of sample-based estimates compared to the parameter of population.

Sampling errors of estimates on a few important variables at national and state levels are calculated separately as shown in the Tables S1 to S3. For instance based on LFS 2016, the labour force participation rate for Malaysia was 67.7 per cent with an RSE of 0.24 per cent and Standard Error (SE) of 0.16 per cent. At 95 per cent confidence interval ($\alpha = 0.05$), the labour force participation rate was in the range of 67.41–68.05 per cent.

ii. Non-sampling error

The error may rise through incomplete survey coverage, weaknesses in the frame, response errors, non-response errors and also errors during processing either through editing, coding or data capture. To ensure that data is of high quality, several administrative procedures were taken to minimise non-sampling errors. Intensive training was conducted for the supervisors and enumerators. In addition, close supervision and random checks

were carried out on households covered by the enumerators to ensure the validity of the recorded information.

In order to resolve the case of non-response error due to several reasons such as vacant house, 'no one at home', refusal to co-operate or unqualified LQ, the sample size estimation for this survey has taken into account all those possibilities.

The survey frame is updated regularly to overcome the problem of non-response due to vacant home. Publicity was carried out widely through electronic and printed media to minimise the case of 'no one at home' and refusal to cooperate.

In addition, at the data processing stage, consistency checking and validation process has been systematically implemented for each variable in order to minimise the non-sampling error.

13. **Presentation of statistics**

13.1 *The statistics in this report are presented at the national and state level. National level statistics comprises the following topics:*
   i. labour force participation rate;
   ii. labour force;
   iii. employment to population ratio;
   iv. employed persons;
   v. unemployment rate;
   vi. unemployment; and
   vii. population outside labour force.

   The statistics at state level compiled in this report consists of thirteen states and three federal territories and are presented as follows:
   i. labour force participation rate;
   ii. labour force;
   iii. employment to population ratio; and
   iv. employed persons.

13.2 *The time series for 1982–2016 presented the principal labour force statistics. There is no data for 1991 and 1994 since LFS was not conducted for those years. Meanwhile, time series for 2012–2016 presented statistics on LFPR, labour force and employed persons by selected demographic and socioeconomic characteristics.*

14. **Rounding of estimates**

The sum of each category may not always equal to the totals shown in related tables because of independent rounding to one decimal place. However, the differences are not obvious.

15. Employment statistics

The statistics published in this report are based on LFS 2016. Summary of the monthly statistics are also published in the Monthly Statistical Bulletin. The employment statistics from the demand side is also available from economic surveys. However, the concept, definitions and survey methodology used are different compared to LFS.

16.   Notes and symbols

–	*Nil/no cases*
0.0	*Less than half the smallest unit shown. For example, less than 0.05 per cent.*
n.a	*Not applicable*
W.P.	*Wilayah Persekutuan*
r	*Updated*