



Block

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DATA COLLECTION

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BLOCK 4 DATA COLLECTION

Block 4 on '**Data Collection**' with three units gives an overview of various tools and techniques of data collection and various sources of secondary data needed for conducting development research.

Unit 1 on '**Quantitative Data Collection Methods and Devices**' discusses the meaning and concept of quantitative data. The unit also gives a detailed account of different methods and devices of quantitative data collection.

Unit 2 on '**Qualitative Data Collection Methods and Devices**' discusses the meaning and concept of qualitative data. This unit also discusses different methods and devices of qualitative data collection.

Unit 3 on '**Data Sources**' provides information about various sources of secondary data that will be useful for development research.

UNIT 1 QUANTITATIVE DATA COLLECTION METHODS AND DEVICES

Structure

- 1.1 Introduction
- 1.2 Primary Data Collection: Meaning and Methods
- 1.3 Questionnaire Methods of Data Collection
- 1.4 Interview Schedule
- 1.5 Secondary Data Methods
- 1.6 Let Us Sum Up
- 1.7 References and Selected Readings
- 1.8 Check Your Progress - Possible Answers

1.1 INTRODUCTION

There are two types of primary research: one is done through quantitative data collection and the other, through qualitative data collection. Customarily, quantitative data collection means using numbers to assess information. As you are aware, some kinds of information are numerical in nature, for example, a person's age, or annual income. The answers to these questions are in numbers.

Quantitative data is used for testing of a hypothesis and drawing inferences. Quantitative data is collected by using the following two set of data resources:

- i. Primary data
- ii. Secondary data.

In this unit, we will discuss in detail, methods of collecting primary and secondary data, along with the advantages and disadvantages of the methods.

After reading this unit, you should be able to

- explain the primary data collection methods
- discuss the questionnaire and interview methods of data collection
- describe secondary methods of data collection

1.2 PRIMARY DATA COLLECTION: MEANING AND METHODS

Data which are originally collected by the investigators are called primary data, while the secondary data are collected through some other sources. For example, information collected by an investigator from a student regarding his class, caste, family background, etc., is called primary data. On the other hand, if the same information is collected about the student from the school record and register, then it is called secondary data.

However, the difference between primary and secondary data is largely of degree, and there is hardly any watertight difference between them. The data collected through primary sources by one investigator may be secondary in the hands of others. For example, field data collected by an investigator for writing his thesis is primary to him, and when the same data is used by another investigator, for reference purposes, then it became secondary data. Let us discuss the methods that are used to collect primary and secondary data.

There are various types of quantitative primary data gathering tools, but the important ones among them are

- The Questionnaire
- The Interview Schedule

1.3 QUESTIONNAIRE METHOD OF DATA COLLECTION

Questionnaires are a popular method of data collection. Although they look easy, it is difficult to design a good questionnaire. Careful design of a questionnaire is vital for the collection of required facts and figures. Any frivolous attempt in framing a questionnaire will lead to either shortage, or, collection of unnecessary information neither of which will be useful to your research. Questionnaire design depends on whom, and, from where information has to be collected; what facts and figures need to be collected; and the calibre of the informants.

The questionnaire can be broadly categorized into two types:

- (i) structured questionnaire
 - (ii) unstructured questionnaire.
- i. **Structured questionnaires** are prepared in advance. They contain definite and concrete questions. The structured questionnaire may contain close ended questions and open ended responses. In the close ended questionnaire, the question setter gives alternative options for which the respondent has to give definite response. The best example of the close ended questionnaire format is the one that leads respondents to the “Yes” or “No”/ “True” or “False” answers.
 - ii. **Unstructured questionnaires** are those that are not structured in advance, and the investigators may adjust questions according to their needs during an interview.

1.3.1 Methods of Data Collection Using Questionnaires

Questionnaire methods are conducted in different ways. A few important methods are outlined here.

i. Personal Interview

In personal interviews, the interviewer or investigator personally approaches the interviewee and administers questions. This method is largely followed in research and studies and the accuracy of data is very high. However, it is an expensive method.

ii. Mail Questionnaire

In this method, the investigator mails the questionnaire to respondents and respondents are requested to fill it up and return it to the investigator. In many cases, a self addressed stamped envelope is sent along with the questionnaire to facilitate the return of the questionnaire mail immediately. This method is usually adopted where the respondents are widespread and the investigator has limited resources to approach them. The success of this method depends of the literacy level of the respondents and the accuracy of the address database. One of the drawbacks of this method is that, sometimes, the respondents do not take the questionnaire seriously, and, as a result the answer may not be accurate.

Implementing a Mail Survey

- Design a written questionnaire with identification number.
- Pretest questionnaire to assure validity and reliability.
- Select sample population.
- Two weeks before mailing the survey, send an advance letter
- Mail the questionnaire including a cover letter and a stamped, self-addressed envelope
- Send a postcard a week or so later, thanking those who responded and reminding those who did not return the questionnaires
- Three weeks after mailing the first questionnaire, send a follow-up letter stating that a response has not been received, including a replacement questionnaire and a stamped, self-addressed envelope.
- In developing the mailing schedule avoid holidays.
- For most purposes, a 60 to 90 percent return rate is considered satisfactory.

Source : *Suvedi et.al., 2008*

iii. Telephone

In this method, the investigator administers a questionnaire by seeking responses from the respondent over the telephone. It is largely administered to the urban respondents where telephone facilities are widely available. However, the success of this method depends on the availability of telephone with the respondents. It is also an expensive method of administering a questionnaire.

Implementing a Telephone Survey

- Arrange the facilities for survey.
- Identify the sample and their telephone numbers.
- Send an advance letter if addresses are available with information on when you will be likely to contact respondents, during working or non-working hours and how much time you need.
- Prepare well on the background information about the survey to answer respondents questions, if any.
- Develop an interview schedule.

- Decide on the number of calls to make to each number. In local surveys six to seven calls are customary.
- Decide how to handle refusals.
- Stick to the time schedule

Sample Call Sheet for Telephone Interviews

A call-sheet is used for each number chosen from the sampling frame. The interviewer records information that allows the supervisor to decide what to do with each number that has been processed. Call sheets are attached to questionnaires after an interview is completed.

Telephone Interview Call Sheet

Survey title : _____

Questionnaire identification number _____

Area code & number () _____ & _____

Contact attempts	Date	Time	Result code & comments	Interviewer I.D.
1				
2				
3				
4				
5				
6				
Additional comments				
Code	Result Codes			
	No answer after seven rings			
	Busy, after one immediate redial			
	Answering machine (residence)			
	Household language barrier			
	Answered by nonresident			
	Household refusal			
	Disconnected or other non-working number			
	Temporarily disconnected			
	Business or other non-residence			
	No one meeting eligibility requirement			
	Contact only			
	Selected respondent temporarily unavailable			
	Selected respondent unavailable during field period			
	Selected respondent unavailable because of physical/ mental handicap			

	Language barrier with selected respondent
	Refusal by selected respondent
	Partial interview
	Respondent contacted - completed interview
	Other
Sample Help Sheet for Interviewers	
Name of sponsoring agency:	
Purpose of study:	
Contact person for survey:	
Size of survey:	
Identity of interviewer:	
How respondents name was obtained:	
Issues of confidentiality:	
How to get a copy of results:	
How will results be used:	
(Source : Suvedi et.al., 2008)	

iv. E-Mail

With the IT revolution, nowadays, questionnaires are attached to the e-mails and sent to respondents who send an answer through return e-mail. The success of this method depends on the availability of internet facilities.

1.3.2 Qualities of a Good Questionnaire

Questionnaire framing is the most arduous task in social science research. Careful framing of questionnaires is essential to obtain reliable data. Some of the principles that need to be taken into consideration while framing a questionnaire are as follows:

- i. **It must be simple:** the questions must be simple and straightforward. They must also be short, which could be easily answered.
- ii. **Begin with a covering letter:** the front page of the questionnaire must contain an introduction to investigator or institution collecting data, and the purpose of the quest. If the questionnaires are to be returned by mail, then, the address to which they are to be sent must be clearly mentioned.
- iii. **The number of questions must be kept to a minimum:** the questions asked in the questionnaire must be kept to a minimum and restricted to the subject and topic of the study. Any questions which do not have direct bearing on the problem must be avoided.
- iv. **Minimum use of Technical Terms:** try to avoid the technical terms as far as possible. If abbreviations are used, they need to be explained with illustrations, either separately or in the questionnaire itself. However, the investigator should be conversant about those technical terms.

- v. **Questions must be logically arranged:** here lies the acumen of the investigator or question setter. He, or, she must arrange the questions in such a way that such questions should flow naturally from the answer to the previous question.
- vi. **Avoid asking controversial questions:** do not include questions which are controversial in nature, or, are too personal or specific to community sentiments. Hypothetical questions, too, need to be avoided.
- vii. **Pre testing of questionnaire:** before final administration, questionnaire need to be pre tested among a small number of respondents. This will give an opportunity to the investigator to rectify the problems, and, if required, any addition and deletion of questions.

1.3.3 Physical form of Questionnaire

While designing the questionnaire, the physical form of the questionnaire may be meticulously prepared. The following factors need to be taken into consideration.

- i. **Size:** the size of the questionnaire depends on the scope of the study. Adequate space should be provided for recording the comments and suggestions of the respondents. However, a single space is needed for recording the response. The Coding of questionnaire will reduced the need for space. Taking all these factors into consideration, the size of the questionnaire can be fixed, accordingly.
- ii. **Quality of the paper:** good quality paper should be used in the question so that it lasts for a longer period. Except for the front page, white papers may be used in other pages.
- iii. **Covering Letter:** Every questionnaire must have a covering letter. The purpose of the questionnaire must be clearly mentioned. Assurance should be given that the information gathered will be used only for research purpose, and be given confidential treatment.

1.3.4 Advantages of Questionnaires

The advantages of questionnaires are:

- i. they are less expensive compared to the interview schedule and can be administered over a large number of respondents.
- ii. they are less time consuming.
- iii. since the interviewer is not present during the administration of a questionnaire, respondents may feel more free and have greater confidence in answering questions
- iv. one of the advantages of the questionnaire method is that once it is standardized, then, the information collected from the respondents becomes more uniform.

1.3.5 Disadvantages of Questionnaires

Some disadvantages of questionnaires are:

- i. In a questionnaire, there is no personal contact between the investigator and the respondents because of which clarifications on responses, if needed, cannot be sought.

- ii. a questionnaire is not a suitable mode when a spontaneous answer is required through probing
- iii. it is possible that the investigator may not get a response for all questions. Sometimes the responses may be vague or incorrect information may be provided
- iv. there is the chance that information may be manipulated.

Sample Questionnaire

Indira Gandhi National Open University
School of Extension and Development Studies
MA in Development Studies

Title: Functioning of Primary School in Bhilwara village

1. Name of the State
2. Name of the District
3. Name of the Block.....
4. Name of the Village.....
5. Name of the Teacher (Respondent)
6. Sex: Male/Female.....
7. Age
8. Educational Qualification.....
9. Caste.....
- 10 Marital Status
11. Years of Teaching
12. Training received, if any.....
13. If yes, write the subjects taught in the training programme ...
14. Subject you are teaching
 - Mathematics
 - Science
 - Literature
 - Any other; specify
15. Medium in which you are teaching
 - English.....
 - Hindi.....
 - Any other, specify.....
16. In your opinion, which students were performing better in the class:
 - General Caste
 - SC
 - ST
 - Girls
 - Boys

17. Your interaction with the	Categories	Frequent	Occasional	Not at all
Parents				
Father				
Mother				
18. The role of Panchayat in your school management				
Good				
Average				
Poor				
19. Functioning of the Village Education Committee				
Good				
Average				
Poor				
Areas of their involvement				
20. In your opinion, who are the real beneficiaries of rural education?				
Economically Poor				
Girl Children				
Socially backward				
All				
21. Write the main problems of your School				
1				
2				
3				
22. What are your suggestions for improvement of the school conditions?				
1				
2				
3				

In this section, you studied about quantitative data collection and the questionnaire method of data collection. Now, answer the questions given in *Check Your Progress-1*.

Check Your Progress 1

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What is primary data?

.....

.....

.....

2. What are the advantages of a questionnaire?

.....

.....

.....

1.4 INTERVIEW SCHEDULE

Interview schedule is a common practice in research. The schedule puts the whole thing in a structured form, so that the tabulation and analysis of data becomes easier. The basic difference between the schedule and the questionnaire is that in case of former, the presence of a field investigator or interviewer is a must, while the same may not be mandatory in the latter case. In other words, in the case of the interview schedule, the field investigator is an essential component. In other aspects, there is not much difference between the interview schedule and the questionnaire.

Some important aspects need to be taken into consideration in the preparation and execution of interview schedule.

- i. **Selection of Respondents:** the selection of respondents is the key to interview schedule administration. The respondents are selected through various sampling methods and their names and addresses are noted down. The field investigator approaches them for data collection by filling up the interview schedule.
- ii. **Training of the Field Staff:** before sending field investigators for data collection, try to give them proper training on the interview schedule. If possible, some orientation on various aspects of the problem may be given. It will enable the field investigator to effectively interact with the respondents. Nowadays, the NFHS (National Family Health Survey), RCH (Reproductive and Child Health) surveys and many base line surveys conducted by various agencies spend a lot of money in training of the field investigators before sending them for data collection.
- iii. **Method of Conducting an Interview:** the field investigators must be practiced in conducting interviews; otherwise, respondents sometimes may not allow them to take the interviews. He must approach the respondents politely, introduce himself/herself and tell them the purpose of interview and the confidentiality involved in it. The respondents must be approached by the field investigator according to their convenience. Getting correct information from the informants depends on the skill of the field investigator.
- iv. **Editing of the Interview Schedule:** editing of the interview schedule is a must before sending it for tabulation and analysis. While checking the schedule, one must notice the number of cases allotted, number of cases contacted, and number of cases lost due to refusal. The field supervisor must check the schedule filled up by the field investigator. If information is missing from any schedule then the field investigators could be sent again for data collection. If the schedules have codes for different alternative responses, these should also be checked, and, if any contradiction exists must be shared before sending it for final data entry and tabulation.

Sample Interview Schedule

Title: Socio-Economic study of Households Lines in Jadupur Village

(To be filled by the Head of the Household Or Any Adult Member of the family)

Name of the Respondent:

I) Identification of Village

1. Name of the Village

II) Identification of Household:

1. Household Survey No.....

(marked by the survey team)

2. Name of the Head of the Household

3. Religion

4. Caste/Sub Caste, Specify... ..

III. Housing Condition:

1. Type of House;

(i) Kacha (.....)

(ii) Pacca (.....)

(iii) Semi Pacca (.....)

(iv) Any other (.....)

2. Main source of drinking water;

(i) Government/own hand pump (.....)

(ii) Tap/pipe (.....)

(iii) Canal/river (.....)

(iv) River/well/pond (.....)

(v) Any others, specify..... ..

3. Toilet facilities;

(i) Flush (.....)

(ii) Pit (.....)

(iii) Open field (.....)

(iv) Any other (.....)

4 A. Main source of light;

(i) Electricity (.....)

(ii) Kerosene/Oil (.....)

(iii) Gas (.....)

(iv) Any other (.....)

4 B. Main source of cooking;

(i) Traditional *chulha* (.....)

(ii) Bio-gas/gas (.....)

(iii) Kerosene/electric stove (.....)

(iv) Any other (.....)

5. Communication Media;

- (i) Radio/transistor/tape recorder (.....)
- (ii) Television (.....)
- (iii) Newspaper/magazine (.....)
- (iv) Any other (.....)

6. Agricultural land owned by the household;

- (i) 1-10 Bigha (.....)
- (ii) 11-20 Bigha (.....)
- (iii) 21-30 Bigha (.....)
- (iv) 31-40 Bigha (.....)
- (v) 41 Bigha and above (.....)

(Note : One hectare is equivalent to approximately 12 *Bigha*)

7. Average monthly income of household (Rs. per month);

- (i) Rs.1-1000 (.....)
- (ii) Rs.1001-2000 (.....)
- (iii) Rs.2001-3000 (.....)
- (iv) Rs.3001-4000 (.....)
- (v) Rs.4001-5000 (.....)
- (vi) Rs.5001 and above (.....)

(Kindly mention actual income of the household.....)

IV. Household Profile

S. No.	No.Members of the house hold (start from Head of the house hold)	Relationship	Sex	Age	Marital Status	Education	Occupation	Diseases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Note: 1. If there are more than 15 members in a household, use another household schedule to fill the relevant data of the household profile.

2. If age of any member, under (Col.5) is below 5 years then Col. 6, Col. 7 and Col. 8 are not to be filled.

Col. (3) Relationship:

(i) Head of household-01; (ii) Spouse (wife/husband)-02; (iii) Son-03; (iv) Daughter-04 (v) Grandson-05; (vi) Granddaughter-06; (vii) Father-07; (viii) Mother-08; (ix) Grandfather-09; (x) Grandmother-10; (xi) Son in law-11; (xii) Daughter in law-12; (xiii) Brother-13; (xiv) Sister-14; (xv) Brother in law-15; (xvi) Sister in law-16; (xvii) Uncle-17; (xviii) Auntie-18; (xix) Nephew-19; (xx) Niece-20; (xxi) Servant-21; (xxii) Other household member specify.....-22. (It should be clear that persons sharing their meals in a single kitchen, are considered as family members)

Col. (6) Marital Status:

(i) Currently married-01; (ii) Separated-02; (iii) Widow-03; (iv) Widower-04; (v) Divorced-05; (vi) Never married-06

Col. (7) Education:

(i) Illiterate-01; (ii) Literate (non-formal)-02; (iii) Primary-03; (iv) Middle-04; (v) High School-05; (vi) Higher Secondary or Intermediate-06; (vii) Graduate-07; (viii) Post Graduate and above-08; (ix) Professional or Technical Education-09; (x) Any other, specify.....-10.

Col. (8) Occupation:

(i) Cultivator-01; (ii) Agricultural/casual labourer-02; (iii) Self-employed -03; (iv) Private service-04; (v) Government service-05; (vi) Household/ domestic activities-06; (vii) Student-07; (viii) Unemployed-08; (ix) Any other, specify.....-09.

Col. (9) Diseases:

(i) Tuberculosis (T.B.)-01; (ii) Asthma-02; (iii) Cataract/Blindness-03; (iv) Leprosy-04; (v) Physical impairment-05; (vi) Malaria during last 3 months-06; (vii) Diabetes-07; (viii) Hypertension-08; (ix) Heart Problem-09; (x) Any other specify.....-10.

1.4.1 Advantages of Interview Schedule

- (i) the interview probes the problem in detail which gives scope to gather detailed information
- (ii) there is a personal touch between the investigator and the respondents and, therefore, detailed and exhaustive information can be collected
- (iii) there is greater accuracy in getting the information
- (iv) the interview method is particularly suitable for illiterate respondents.

1.4.2 Disadvantages of Interview

Some disadvantages of the interview schedule method are

- (i) it is a time consuming and expensive method, compared to the questionnaire method
- (ii) lack of objectivity is a common lacuna of the interview method
- (iii) the interview method sometimes leaves investigators at the mercy of respondents.

Now that you have read about interview schedule, try and answer the following questions in *Check Your Progress-2*.

Check Your Progress 2

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What are the advantages of the interview schedule method?

.....

.....

.....

.....

2. What aspects need to be taken into consideration while preparing an interview schedule?

.....

.....

.....

.....

1.5 SECONDARY DATA METHODS

Secondary data are collected by investigators from sources other than primary respondents. Secondary data are collected from both, published and unpublished sources. The main resources of secondary data are given below.

- i. Official publication of the Central Government such as Census, NSSO Report, Human Development Report, SRS report, etc.
- ii. Research and study reports of bilateral and multilateral organizations such as WHO, World Bank, IMF, UNESCO, UNICEF, etc. A few of them include, the World Development Report, World Development Indicators, Human Development Report, etc.
- iii. Reports brought out by committees and commissions such as the Mandal Commission Report, the National Planning Commission Report, the Human Rights Commission Report, the Population Commission Report, etc.
- iv. Policy documents of the Central and State Government such as National Population Policies, National Education Policies, National Health Policies, etc.
- v. Publications brought out by the research institutes, universities and organizations.
- vi. Publications of data sources on different national and international journals such as Economic and Political Weekly, Indian Economic Journal, etc.
- vii. Books and articles published on various subjects.
- viii. Official publications of the Reserve Bank of India, State Bank of India, Association of Indian Banking, etc.

- ix. Information available in year books and encyclopaedias.
- x. Statistical abstracts published both by the Central and State Governments.
- xi. Information published in the directories and bulletins of various institutions such as the Indian Council of Social Sciences Research, the Indian Council of Agricultural Research, etc.
- xii. Abstracts and index of reports and articles published by various research, teaching, and related organizations.

1.5.1 Precautions in the use of Secondary Data

While using secondary data for the study, users have to be careful. Sometimes, the data published by an individual researcher may be full of errors and even drawn from an inadequate sample. Some factors to keep in mind while using the data from secondary sources are listed below.

Adequacy –sometimes data available from the secondary, sources are not adequate for the investigation. Data may either be from a different time period, or partially fulfil the requirement of the study. Therefore, adequacy of the data must be ensured before conducting the study.

Reliability – before using secondary data, its reliability must be taken into consideration. For example, the reliability on sample size and the sampling method used in the collection of data may be taken into consideration. Besides, the investigator has also to know the degree of bias in collection of data.

Suitability –the investigator has to check whether the data is suitable for the purpose of the research study. Sometimes, the secondary data may be suitable for tabular presentation, but, unsuitable for statistical analysis.

The investigator has to take all these factors into consideration before using the secondary data.

In this section you read about the secondary data methods. Now try and answer the questions in *Check Your Progress-3*.

Check Your Progress 3

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What are a few sources of secondary data?

.....

.....

.....

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2. What precautions have to be taken care of while using secondary data?

.....

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1.6 LET US SUM UP

This unit describes in detail the various sources and methods of collection of quantitative data. It also deals with the methods of collection of primary data and secondary data. The advantages and disadvantages of various methods of data collection have also been discussed in the unit. The unit also narrates the precautions one has to take while collecting the primary and secondary data.

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1.8 CHECK YOUR PROGRESS-POSSIBLE ANSWERS

Check Your Progress 1

1. Primary data are those data which are originally collected by the investigators, while the secondary data are used by investigator collected through some other sources. For example, information collected by an investigator from a student regarding his class, caste, family background, etc., is called primary data. On the other hand, if the same information is collected about the student from the school record and register, then it is called secondary data.
2. The advantages of a questionnaire are
 - a. it is less expensive compared to interview schedule and can be administered over a large number of sample
 - b. it is less time consuming.

Data Collection

- c. the interviewer is not present during the administration of questionnaire, the respondents have greater freedom and confidence in answering questions
- d. one of the advantages of the questionnaire is that once it is standardized, then there is greater uniformity in getting responses.

Check Your Progress 2

1. The advantages of the interview method are as follows:
 - a. the interview probes the problem in detail which gives scope to gathering detailed information
 - b. there is a personal touch between the investigator and the respondents, and, therefore, detailed and exhaustive information can be collected
 - c. there is greater accuracy in getting the information
 - d. the interview method is particularly suitable for illiterate respondents.
2. Some aspects need to be taken into consideration while preparing an interview schedule:
 - Selection of Respondents: this is the key to interview schedule administration.
 - Training of the Field Staff: before sending the field investigator for data collection, try to give them proper training on the interview schedule.
 - Method of Conducting an Interview: the field investigator must be apt in conducting the interview, otherwise respondents sometimes may not allow them to take interview
 - Editing of the Interview Schedule: the investigator has to do proper editing of the interview schedule before sending it for tabulation and analysis.

Check Your Progress 3

1.
 1. Official publication of the Central Government such as Census, NSSO Report, Human Development Report, SRS report, etc.
 2. Research and Study Reports of bilateral and multilateral organizations such as WHO, World Bank, IMF, UNESCO, UNICEF, etc. A few of them like World Development Report, World Development Indicators, Human Development Report, etc.
 3. Reports brought out by Committees and Commissions such as Mandal Commission Report, National Planning Commission Report, Human Rights Commission Report, Population Commission Report etc.
2. Some of the factors to be kept in mind while using the data from secondary sources are:

Adequacy –sometimes data that is available from secondary sources are not adequate for the research project. Data may either be from a different time period or partially fulfil the requirement of the study.

Reliability – before using the secondary data, its reliability must be taken into consideration. The investigator has also to know the degree of bias in the collection of data.

Suitability –the investigator has to see whether the data is suitable to his or her study. Sometimes, the secondary data available may be suitable for tabular presentation, but unsuitable for statistical analysis.

UNIT 2 QUALITATIVE DATA COLLECTION METHODS AND DEVICES

Structure

- 2.1 Introduction
- 2.2 Qualitative Data - Meaning and Concept
- 2.3 Methods and Techniques of Qualitative Data Collection
- 2.4 Features of Qualitative and Quantitative Research
- 2.5 Let Us Sum Up
- 2.6 Key Words
- 2.7 References and Selected Readings
- 2.8 Check Your Progress – Possible Answers

2.1 INTRODUCTION

Data Collection is an important aspect of any type of research study. Data collection techniques allow us to systematically collect information about the subject of our study (people, objects, phenomena), and about the environment. In the collection of data we have to be systematic. If data are collected haphazardly, it will be difficult to answer our research questions in a conclusive way. Inaccurate data collection can impact the results of a study and ultimately lead to invalid results.

After studying this unit, you should be able to

- discuss the meaning and concept of qualitative data;
- describe the features of various methods and devices used for qualitative data collection; and
- state the uses and limitations of various qualitative data collection methods.

2.2 QUALITATIVE DATA - MEANING AND CONCEPT

Qualitative research is grounded in the assumption that individuals construct social reality in the form of meanings and interpretations, and that these constructions tend to be transitory and situational. Qualitative research typically involves qualitative data, i.e., data obtained through methods such as interviews, on-site observations, and focus groups that is in narrative rather than numerical form. Such data are analyzed by looking for themes and patterns. It involves reading, re-reading, and exploring the data. How the data are gathered will greatly affect the ease of analysis and utility of findings.

Qualitative data are descriptive in nature and can be statistically analyzed only after processing and after having them classified into some appropriate categories. Qualitative data can, however, facilitate in-depth analysis of a social situation. There are certain situations where qualitative research alone can provide the researcher with all insights needed to make decisions and take actions; while in some other cases quantitative research might be needed as well.

2.3 METHODS AND TECHNIQUES OF QUALITATIVE DATA COLLECTION

Qualitative methods are ways of collecting data which are concerned with describing meaning, rather than with drawing statistical inferences. They provide in-depth and rich descriptions. In this section, a detailed description and comparison of the most commonly used qualitative methods employed in social science research is given. These include observations, in-depth interviews, and focus groups.

2.3.1 Observation Method

In our daily life we observe many things and events around us, but this sort of observation is not scientific. Observational techniques are methods by which an individual or individuals gather first hand data on programs, processes, or behaviours being studied. They provide evaluators with an opportunity to collect data on a wide range of behaviours, to capture a great variety of interactions, and to openly explore the evaluation topic. By directly observing operations and activities, the evaluator can develop a holistic perspective, i.e., an understanding of the context within which the project operates. This may be especially important where it is not the event that is of interest, but rather how that event may fit into, or be impacted by, a sequence of events.

Scientific observation is a methodical way of recognizing and noting a fact or occurrence, often involving some sort of measurement. Scientific observations should be specific, and recorded immediately. Understanding the culture of the people and the ability to interact with them are essential for good observation. Researches may be based solely on observation, but in most cases observation precedes other methods of data collection.

When to use observations: Observations can be useful during both the formative and summative phases of evaluation. For example, during the formative phase, observations can be useful in determining whether or not the project is being delivered and operated as planned. In the hypothetical project, observations could be used to describe the faculty development sessions, examining the extent to which participants understand the concepts, ask the right questions, and are engaged in appropriate interactions. Such formative observations could also provide valuable insights into the teaching styles of the presenters and how they are covering the material.

Advantages

- (i) Subjective bias may be eliminated, if observation is done accurately
- (ii) Information relates to current state of affairs; and
- (iii) It is independent of respondents' willingness or capability to respond.

Limitations

- (i) A time consuming and expensive method
- (ii) A limited amount of information may be available; and
- (iii) Extraneous factors may interfere with the task of observation.

Types of observation:

Structured and unstructured observation: in case the observation is characterized by a careful definition of the units to be observed, the manner of recording the observed information, standardized conditions of observation, and the selection of pertinent data of observation, then the observation is called as structured observation. But, when the observation is conducted without these features thought out in advance, the same is termed an unstructured observation. Structured observation is considered appropriate in descriptive studies, whereas, in an exploratory study, the observational procedure should be relatively unstructured.

Participant and non-participant observation: this depends on the degree of involvement of the researcher with the situation being observed. In participant observation, the researcher who may be an outsider, while observing the group, also plays the role of a group member. It is necessary to have the observation in an unbiased way, without getting emotionally involved in the affairs of the group or the community. The main advantage of participant observation is that, it helps the observer to get an intimate knowledge of the group or the community being observed, under natural condition. For example, if one wants to study the fishermen community, reliable information may be obtained through the method of participant observation. Participant observation, however, requires longer time, greater resources, and there may be loss of objectivity, if not properly done. In non-participant observation, the researcher observes the group or the community, while maintaining physical and psychological isolation from them. This ensures collection of information in an objective way.

Controlled and uncontrolled observation: when observation takes place according to a definite pre-arranged plan involving experimental procedure, the same is termed as a controlled observation. The aim of a controlled observation is to check any bias due to faulty perception, incomplete information and effect of external stimuli on a specific situation. An uncontrolled observation on the other hand, is one where the researcher observes the behaviour and activities of a group under natural conditions (as they are) without any stimulation from the outside. This method provides a wide range of information and helps in developing an insight about the group or community. Care should, however, be taken against subjective interpretation of observed phenomenon.

Recording Observational Data

Observations are carried out using a carefully developed set of steps and instruments. The observer is more than just an onlooker, but, rather, comes to the scene with a set of target concepts, definitions, and criteria for describing events. While, in some studies, observers may simply record and describe, in the majority of evaluations, their descriptions are, or eventually will be, judged against a continuum of expectations.

Observations usually are guided by a structured protocol. The protocol can take a variety of forms, ranging from the request for a narrative, describing events seen to a checklist or a rating scale of specific behaviours/activities that address the evaluation question of interest. The use of a protocol helps assure that all observers are gathering the pertinent information and, with appropriate training, applying the same criteria in the evaluation. For example, an observational approach is selected to gather data on the faculty training sessions, the instrument developed would explicitly guide the observer to examine the kinds of activities in which participants were interacting, the role(s) of the trainers and the participants, the types of materials provided and used, the opportunity for hands-on interaction, etc.

Field notes are frequently used to provide more in-depth background or to help the observer remember salient events if some forms are not completed at the time of observation. Field notes contain the description of what has been observed. The descriptions must be factual, accurate, and thorough without being judgmental and cluttered by trivia. The date and time of the observation should be recorded, and everything that the observer believes to be worth noting should be included. No information should be trusted to future recall.

Technological tools, such as a battery-operated tape recorder or a Dictaphone, laptop computer, camera, and video camera, can make the collection of field notes more efficient and the notes themselves more comprehensive. Informed consent must be obtained from participants before any observational data are gathered.

2.3.2 Interview/Questionnaire Method

In these methods, the data are collected by presenting stimuli to the respondents in the form of questions for eliciting appropriate responses from them. The questions may be presented to the respondents in a face-to-face situation as oral-verbal stimuli, and the researcher or personnel trained for the purpose (interviewers, enumerators) note down their oral-verbal responses. This method is known as the interview method, and the set of questions is known as the interview schedule. In another method, the questions are delivered (generally mailed) to the respondents, who note down their responses on it and send it back to the researcher. This method is known as the questionnaire method, and the set of questions is known as a questionnaire.

In both, answers to some systematically organised questions, relevant to the objectives of the study are sought. The questions should be accurate and clearly understood by the respondents, so that the responses are accurate. Both the methods have some advantages and limitations. The success of the questionnaire method depends more on the quality of the questionnaire itself, but in case of interview method much depends upon the honesty and competency of the enumerators.

Types of interview

Interviews may be of different types according to the needs of the situation.

Structured interview: For this purpose an interview schedule is used which is well structured with specific questions to be asked. The questions are precisely worded and systematically organised, and are prepared in advance

after requisite pre-testing. The interviewer is not expected to make any change while interviewing the respondents. The data received are comparable and are more amenable to statistical analyses. The structured interview is also known as standardized, controlled or guided interview.

Unstructured interview: Here the interviewer proceeds with some well thought out themes or guidelines to be inquired into, and brings out the required information from the respondents through the process of conversation. The situation is free and informal and no interview schedule is used. This provides more flexibility and freedom, but at the same time demands deep knowledge and greater skill on the part of the interviewer. The process may yield good amount of information, but the data lack comparability and are less amenable to statistical analysis. Unstructured interview is suitable for exploratory or formulative research studies.

Focused interview: In focused interviews, some specific issue, occurrence, experience, or event is taken into consideration instead of general aspects of a situation. The interviewer has the freedom to decide the manner and sequence in which the questions would be asked, and, has also the freedom to explore reasons and motives. The main task of the interviewer, however, is to confine the discussion to the specific issue under investigation. Such interviews are convenient for development of hypotheses, action research etc. and constitute a major type of unstructured interviews.

In-depth interview: An in-depth interview is a dialogue between a skilled interviewer and an interviewee. Its goal is to elicit rich, detailed material that can be used in analysis. These interviews are designed to discover motives and desires, and, are often used in motivational research. Such interviews are held to explore needs, desires, and feelings of respondents. Such interviews are best conducted face to face, although in some situations telephonic interviewing can be successful.

In-depth interviews are characterized by extensive probing and open-ended questions. Typically, the researcher prepares an interview guide that includes a list of questions or issues that are to be explored and suggested probes for follow up on key topics. The guide helps the interviewer pace the interview and makes interviewing more systematic and comprehensive.

The dynamics of interviewing are similar to a guided conversation. The interviewer becomes an attentive listener who shapes the process into a familiar and comfortable form of social engagement - a conversation - and the quality of the information obtained is largely dependent on the interviewer's skills and personality. In contrast to a good conversation, however, an in-depth interview is not intended to be a two-way form of communication and sharing. The key to being a good interviewer is being a good listener and questioner. Tempting as it may be, it is not the role of the interviewer to put forth his or her opinions, perceptions, or feelings. Interviewers should be trained individuals who are sensitive, empathetic, and able to establish a non-threatening environment in which participants feel comfortable. They should be selected during a process that weighs personal characteristics that will make them acceptable to the individuals being interviewed; clearly, age, sex, profession, race/ethnicity, and appearance may be key characteristics. Thorough training, including familiarization with the research problem and its goals, is important.

Specific circumstances in which in-depth interviews are particularly appropriate include

- complex subject matter
- detailed information sought
- busy, high-status respondents
- highly sensitive subject matter.

2.3.3 Case Study Method

The case study method is a very popular form of qualitative analysis and involves a careful and complete observation of a social unit, be that unit a person, a family, an institution, a cultural group, or, even the entire community. It is a method of study in depth rather than breadth. The case study places more emphasis on the full analysis of a limited number of events or conditions and their interrelations. The case study deals with the processes that take place and their interrelationship. Thus, a case study is essentially an intensive investigation of the particular unit under consideration. The objective of the case study method is to locate the factors that account for the behaviour patterns of the given unit as an integrated totality.

Pauline V. Young describes case study as “a comprehensive study of a social unit be that unit a person, a group, a social institution, a district or a community.” In brief, we can say that the case study method is a form of qualitative analysis where careful and complete observation of an individual, situation, or an institution is done; efforts are made to study each and every aspect of the concerned unit in minute detail, and then, from case data, generalizations and inferences are drawn.

Characteristics: the important characteristics of the case study method are listed below.

- i. In this method, the researcher can take a single social unit or more such units for his study purpose.
- ii. Here the selected unit is studied intensively, i.e., it is studied in minute detail. Generally, the study extends over a long period of time to ascertain the natural history of the unit so as to obtain enough information for drawing correct inferences.
- iii. In the context of this method we make a complete study of the social unit covering all facets. Through this method we try to understand the complexities of factors that are operative within a social unit as an integrated totality.
- iv. Using this method, the approach happens to be qualitative and not quantitative. Mere quantitative information is not collected. Every possible effort is made to collect information concerning all aspects of life. As such, the case study method deepens our perception and gives us a clear insight into life. For instance, in the case study method, we not only study how many crimes a man has committed, but we peep into the factors that forced him to commit crimes when we are making a case study of a man who is a criminal. The objective of the study may be to suggest ways to reform the criminal.
- v. In respect of the case study method, an effort is made to know the mutual inter-relationship of causal factors.

Data Collection

- vi. We study behaviour pattern of the concerned unit directly, and not by an indirect and abstract approach.
- vii. The case study method results in fruitful hypotheses, along with the data which may be helpful in testing them, and, thus, this method enables generalized knowledge to get richer and richer. In its absence, generalized social science may get handicapped.

Assumptions: the case study method is based on several assumptions. The important assumptions may be listed as follows.

- (i) The assumption of uniformity in basic human nature, in spite of the fact that human behaviour may vary according to situations.
- (ii) The assumption of studying the natural history of the unit concerned.
- (iii) The assumption of comprehensive study of the unit concerned.

Major phases involved

- (i) Recognition and determination of the status of the phenomenon to be investigated or the unit of attention.
- (ii) Collection of data, examination, and history of the given phenomenon.
- (iii) Diagnosis and identification of causal factors as a basis for remedial developmental treatment.
- (iv) Application of remedial measures, i.e., treatment and therapy (this phase is often characterized as case work).
- (v) Follow-up programme to determine effectiveness of the treatment applied.

In this section you have read about the meaning and concept of qualitative data and the tools and techniques of qualitative data collection. Now try and answer the questions given in *Check Your Progress-1*.

Check Your Progress 1

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What is the difference between the interview method and the questionnaire method?

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2. List out the important assumptions of the case study method.

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2.3.4 Focus Groups

Focus groups combine elements of both interviewing and participant observation. The focus group session is an interview, not a discussion group, a problem solving session, or a decision making group. At the same time, focus groups capitalize on group dynamics. The hallmark of focus groups is the explicit use of group interaction to generate data and insights that would be unlikely to emerge without the interaction found in a group. The technique inherently allows observation of group dynamics, discussion, and firsthand insights into the respondents' behaviours, attitudes, language, etc.

Focus groups are a gathering of 8 to 12 people who share some characteristics relevant to the evaluation. Originally used as a market research tool to investigate the appeal of various products, the focus group technique has been adopted by other fields, such as education, as a tool for data gathering on a given topic. Focus groups, conducted by experts, generally take place in a focus group facility that includes recording apparatus (audio and/or visual) and an attached room with a one-way mirror for observation. There is an official recorder who may or may not be in the room. Participants are paid for attendance and provided with refreshments. As the focus group technique has also been adopted by fields other than marketing, some of these features, such as payment or refreshment, have been eliminated.

When to use focus groups: When conducting evaluations, focus groups are useful in answering the same type of questions as in-depth interviews. Specific applications of the focus group method in evaluations include

- identifying and defining problems in project implementation
- identifying project strengths, weaknesses, and recommendations
- assisting with interpretation of quantitative findings
- obtaining perceptions of project outcomes and impacts
- generating new ideas.

Although focus groups and in-depth interviews share many characteristics, they should not be used interchangeably.

Developing a Focus Group

An important aspect of conducting focus groups is the topic guide. The topic guide, a list of topics or question areas, serves as a summary statement of the issues and objectives to be covered by the focus group. The topic guide also serves as a road map and as a memory aid for the focus group leader, called a moderator. The topic guide also provides the initial outline for the report of findings.

Focus group participants are typically asked to reflect on the questions asked by the moderator. Participants are permitted to hear each other's responses and to make additional comments beyond their own original responses as they hear what other people have to say. It is not necessary for the group to reach any kind of consensus, nor is it necessary for people to disagree. The moderator must keep the discussion flowing and make sure that one or two persons do not dominate the discussion. As a rule, the focus group session should not last longer than 1 ½ hours to 2 hours. When very specific information is required, the session may be as short as 40 minutes. The

objective is to get high quality data in a social context where people can consider their own views in the context of the views of others, and, where new ideas and perspectives can be introduced.

2.3.5 Content Analysis

Content analysis consists of analyzing the contents of documents, such as books, magazines, newspapers, and the contents of all other verbal materials, either spoken or printed. Content analysis prior to 1940's was mostly quantitative documentary materials concerning certain characteristics that can be identified and counted. But since the 1950's, content analysis is mostly qualitative analysis, concerning the general importance of the existing documents.

The analysis of content is a central activity whenever one is concerned with the nature of the verbal materials. A review of research in any area, for instance, involves an analysis of the contents of research articles that have been published. The analysis may be at a simple level, or, it may be a subtle one. It is at a simple level when we pursue it on the basis of certain characteristics of the document, or, verbal materials that can be identified and counted (such as on the basis of major scientific concepts in a book). It is at a subtle level when researcher uncovers the attitude, say of the press towards education by feature writers.

2.3.6 Other Qualitative Data Collection Methods

This section outlines less common but, nonetheless, potentially useful qualitative methods for project evaluation. These methods include document studies, key informants and alternative (authentic) assessment.

(i) **Document Studies:** Existing records often provide insights into a setting and/or group of people that cannot be observed or noted in another way. This information can be found in document form. A document can be defined as "any written or recorded material" not prepared for the purposes of the evaluation, or, at the request of the inquirer. Documents can be divided into two major categories: public records, and personal documents.

a) **Public records:** are materials created and kept for the purpose of "attesting to an event or providing an accounting". Public records can be collected from outside (external) or within (internal) the setting in which the evaluation is taking place. Examples of external records are census and vital statistics reports, district office records, newspaper archives, and local business records that can assist an evaluator in gathering information about the larger community and relevant trends. Such materials can be helpful in better understanding the project participants and making comparisons between groups/communities.

For the evaluation of educational innovations, internal records include documents such as student transcripts and records, historical accounts, institutional mission statements, annual reports, budgets, grade and standardized test reports, minutes of meetings, internal memoranda, policy manuals, institutional histories, college/university catalogues, faculty and student handbooks, official correspondence, demographic material, mass media reports and

presentations, and descriptions of program development and evaluation. They are particularly useful in describing institutional characteristics, such as the backgrounds and academic performance of students, and in identifying institutional strengths and weaknesses. They can help the evaluator understand the institution's resources, values, processes, priorities, and concerns. Furthermore, they provide a record or history that is not subject to recall bias.

- b) **Personal documents:** are first-person accounts of events and experiences. These "documents of life" include diaries, portfolios, photographs, artwork, schedules, scrapbooks, poetry, letters to the paper, etc. Personal documents can help the evaluator understand how the participant sees the world and what she or he wants to communicate to an audience. And, unlike other sources of qualitative data, collecting data from documents is relatively invisible to, and requires minimal cooperation from, persons within the setting being studied.

The usefulness of existing sources varies depending on whether they are accessible and accurate. In the hypothetical project, documents can provide the evaluator with useful information about the culture of the institution and participants involved in the project, which in turn can assist in the development of evaluation questions. Information from documents also can be used to generate interview questions or to identify events to be observed. Furthermore, existing records can be useful for making comparisons (e.g., comparing project participants to project applicants, project proposal to implementation records, or documentation of institutional policies and program descriptions prior to, and, following the implementation of project interventions and activities).

- (ii) **Key Informant:** A key informant is a person (or, group of persons) who has unique skills or professional background related to the issue/ intervention being evaluated, is knowledgeable about the project participants, or has access to other information of interest to the evaluator. A key informant can also be someone who has a way of communicating that represents, or, captures the essence of what the participants say and do. Key informants can help the evaluation team better understand the issue being evaluated, as well as the project participants, their backgrounds, behaviours, and attitudes, and, any language or ethnic considerations. They can offer expertise beyond the evaluation team. They are also very useful for assisting with the evaluation of curricula and other educational materials. Key informants can be surveyed or interviewed individually or through focus groups.

In the hypothetical project, key informants (i.e., expert faculty on main campus, deans, and department chairs) can assist with: (1) developing evaluation questions, and; (2) answering formative and summative evaluation questions.

- (iii) **Performance Assessment:** the performance assessment movement is impacting education from pre-schools to professional schools. At the heart of this upheaval is the belief that for all of their virtues - particularly efficiency and economy - traditional objective, norm-

referenced tests may fail to tell us what we most want to know about student achievement. In addition, these same tests exert a powerful and, in the eyes of many educators, detrimental influence on curriculum and instruction. The search for alternatives to traditional tests has generated a number of new approaches to assessment under such names as alternative assessment, performance assessment, holistic assessment, and authentic assessment. While each label suggests slightly different emphases, they all imply a movement toward assessment that supports exemplary teaching. Performance assessment appears to be the most popular term because it emphasizes the development of assessment tools that involve students in tasks that are worthwhile, significant, and meaningful. Such tasks involve higher order thinking skills and the coordination of a broad range of knowledge.

Performance assessment may involve qualitative activities such as oral interviews, group problem-solving tasks, portfolios, or personal documents/creations (poetry, artwork, stories). The quality of this product is assessed (at least, before and after training) in light of the goal of the professional development program. The actual performance of students on the assessment measures provides additional information on impact.

2.4 FEATURES OF QUALITATIVE AND QUANTITATIVE RESEARCH

In unit 1, we discussed various aspects of quantitative data collection methods. Let us now see the main differences between qualitative and quantitative methods.

Qualitative research	Quantitative research
Mainly for exploratory purposes and to generate hypotheses	Used to obtain descriptive data
Usual purpose is to generate a range and variety of data	Usual purpose is to consolidate the data and obtain a clear picture of the situation
The methods of inquiry are informal and flexible	All methods are, carefully planned tightly controlled
The researcher usually starts with only a broad indication of the information objectives of the project, but with clear understanding of the overall purpose of the research	The research is confined to a list of research objectives which set out what information is required
The researcher usually works from a list of the topics to be covered, but the course of each 'interview' will be influenced by the respondent	The interviewer uses a questionnaire, which must be followed exactly as instructed in every interview
Based on small numbers of respondents who take part individually or in small groups	Based on larger numbers of respondents; data are collected from each person individually

It cannot be known how true the findings are of the population from which the respondents are drawn	May be possible to estimate how reliable the findings are. It depends on which sampling method is used
Data collection is usually handled by research professionals	Usually done by trained interviewers or through self-completion questionnaires
A qualitative project cannot be repeated exactly, because every data collection event in a project is different	Can usually be replicated, because every interview in the project follows the same procedure
The findings can rarely be expressed in statistical form	Findings are expressed in number and can be analysed using statistical techniques
Analysis and conclusion rely heavily on the researcher's perceptions and interpretation skills	Because statistical procedures are used the analysis is less likely to be disputed

Source: John Boyce, *Marketing Research*, MacGraw Hill Pvt Ltd, Australia, 2005.

In this section you have read about Focus Group Discussion, Content Analysis and other qualitative data collection tools. You also read about features of qualitative and quantitative research. Now try and answer the questions given in *Check Your Progress-2*.

Check Your Progress 2 :

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. Differentiate between multiple choice and open ended questions.

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2. What is the importance of pre-testing the interview schedule or questionnaire?

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2.5 LET US SUM UP

In this unit, we discussed the meaning and concept of qualitative data collection and found that the selection of appropriate method for data collection and research design depends on nature, scope and objective of

enquiry. Each method of data collection, however, does not suit all categories of research design. The selection and preparation of tools for collecting data depends upon the types of data to be collected. Qualitative data are descriptive in nature and can be statistically analyzed only after processing, and, after having them classified into some appropriate categories. Qualitative data can facilitate in-depth analysis of a social situation. We also discussed the various methods and techniques of qualitative data collection. Finally the differences between qualitative and quantitative research have also been discussed.

2.6 KEY WORDS

- Key Informant** : A key informant is a person (or group of persons) who has unique skills or professional background related to the issue/intervention being evaluated, is knowledgeable about the project participants, or has access to other information of interest to the evaluator.
- Content analysis** : Content analysis consists of analyzing the contents of document, such as books, magazines, newspapers and the contents of all other verbal materials either spoken or printed.
- Sociometry** : Sociometry is a technique for describing the social relationships among individuals in a group.
- Case study** : The case study method is a very popular form of qualitative analysis and involves a careful and complete observation of a social unit, be that unit a person, a family, an institution, a cultural group, or even the entire community. It is a method of study in depth rather than breadth.
- Pre-testing** : Pre-testing means testing the interview schedule/questionnaire in advance to find out whether it is capable of eliciting appropriate responses from respondents.

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2.8 CHECK YOUR PROGRESS – POSSIBLE ANSWERS

Check Your Progress 1

1. In the interview method, the questions are presented to the respondents in a face-to-face situation as oral-verbal stimuli, and the researcher, or personnel trained for the purpose (interviewers, enumerators) note down oral-verbal responses. In the questionnaire method, the questions are delivered (generally mailed) to the respondents, who note down their responses on it and send them back to the researcher.
2.
 - (i) The assumption of uniformity in basic human nature, in spite of the fact that human behaviour may vary according to situations.
 - (ii) The assumption of studying the natural history of the unit concerned.
 - (iii) The assumption of comprehensive study of the unit concerned.

Check Your Progress 2

1. There are two principal forms of questions: multiple choice and open ended. For a multiple choice question, the researcher prepares a set of probable replies (generally after pre-testing) and presents it to the respondents. The respondents select a reply or replies considered most appropriate for each of them. In the case of open ended questions, the respondents reply in their own words, which are then recorded.
2. Pre-testing means testing the interview schedule/questionnaire in advance to find out whether it is capable of eliciting appropriate response from the respondents. Pretesting shall help to find out if the questions are properly understood by the respondents and it shall also help to identify whether the questions are logically organized, the replies could be properly recorded in the space provided for, or there is any scope for further improvement. On the basis of the responses obtained, appropriate changes in the interview schedule/questionnaire should be made.

UNIT 3 DATA SOURCES

Structure

- 3.1 Introduction
- 3.2 Sources of Data
- 3.3 Process of Sourcing Data
- 3.4 Qualities of Data Source
- 3.5 Data Sources for Agriculture
- 3.6 Data Sources for Infrastructure
- 3.7 Data Sources for Service Sector
- 3.8 Other Data Sources
- 3.9 Global Data Sources
- 3.10 Let Us Sum Up
- 3.11 References and Selected Readings
- 3.12 Check Your Progress – Possible Answers

3.1 INTRODUCTION

Data can be defined as the quantitative or qualitative information values of an aspect that one is studying. The aspect can take the quantitative or numerical value for example the average household income of India is \$1670 in 2016. The data can be relative or subjective for example the population in Africa on an average are dark skinned. Data is the plural form of the word datum which literally means to give or something given. Data is thought to be the lowest unit of information from which other measurements and analysis can be done. Data can be images, words, figures, facts or ideas. Data in itself cannot be understood and to get information from the data one must interpret the values into meaningful information. Beyond interpretation the data vary considerably based on the type of data collected and the source from where the data is collected. The source of data is important as it gives the full information of the aspect one is studying. The data can vary based on the source and the methodology used to bring out the information. Many a time's data sometimes give weird values which become difficult to explain and turn out unreliable. Thus the source of data is critical for any work in economic, social or political.

After reading this unit you will be able to

- Discuss about the data sources for agricultural data
- Describe the data sources for infrastructure data
- Elaborate on the data sources for service sector data
- Discuss about the global data sources

3.2 SOURCES OF DATA

The source of data is the origin from where data is collected. The data is either collected by individuals or private bodies or by Government agencies or Multilateral International Public Organization. The former data

sources are privately owned data and while the later ones are referred to Official Statistics. The private bodies collect information of specific market or sectors which are meant for corporate objectives. While data collected by Government bodies or multilateral international public bodies are official statistics which help economic data users knowledge about a particular topic or geographical area, make comparison between countries or understand changes over time. It provides basic information for decision making, evaluations and assessments at different levels and keep public well informed and assists good policy making and decision making.

3.2.1 Broad Sources Classification

Information is collected by private individuals, companies, government bodies or international organisations. Based on the collection design data sources can be classified on many concepts. As suggested Government bodies have an important role in collecting and processing data to compare and evaluate economic, social and political information. These data are called 'Official Statistics' making accessible to public, corporate and policy makers to improve accountability. So the process of data collection is dynamic and at every stage over years improvements are made to give better clarity or to prove a particular objective. The categories of Official statistics range from population, employment, gender, economy, trade, environment and energy. Private or business bodies also collect information to understand demography, tastes and political interest in a way to fulfill their corporate objectives. In both types the users play an important role for the sourcing of data.

(i) *Official Statistics*

The users of Official Statistics follow from a Policy Perspective where data is meant for users in Research which will further provide valuable inputs and validation to the political objectives. The different departments of the Government agencies provide their data with specific objectives cater to their users. The official statistics of the government broadly cover a wider target catering to the general public to whom they are accountable. Then based on the users corporate bodies use their statistics to strategise their business and marketing interest and many a times they synergise with the Government bodies. The maximum utilization is by the Research bodies and individuals who constitute a very small percentage of people.

(ii) *Private Statistics*

The users of private statistics follow a private or business or social objective where data is meant for users to advocate certain objective based on the sponsors mandate. Research users further pursue objectives which would cater to validation or discovering market or social objective which is meant for advocacy. The private statistics target a specific issue of marketing or business interest. The prime users are corporate bodies using the statistics to strategise their business and marketing interest. Their other users are research individuals and bodies which interpret their results and share it with sponsors. Many a times these data are sold to government and individuals for profit. The maximum utilization is by the corporate Sponsors who use it to maximize their objectives.

3.3 PROCESS OF SOURCING DATA

Information present everywhere is data and what really matters is how this data is organized. Data has many components before it can be of any use. The main component in any data is the process of collecting the data, who is collecting data and the time of collection of data. These three things are important for data assimilation and further analysis. The first aspect in data sourcing is the process involved in collecting data. If a person goes in the street and asks particular information directly from an individual and it is recorded is called primary sourcing of information. Here the primary source is the individual whom you are getting the information from. Primarily data can be collected directly from the respondents. And if the information collected passes on to another stage in which the information is changed on the basis of parameters and categorization it becomes secondary sourcing information. If the information is collected in a periodic manner over time interval and recorded it becomes secondary information. If the information is analyzed and presented into reports with another categorization and sequence it becomes tertiary sourcing of information. Another important part in the process as suggested earlier who is collecting the information. If the collector has the authority to collect the information and can it represent the source. This aspect is important as dealt in the earlier section about the authenticity of the data and the reliability of the information. The time of collection of data is crucial in sourcing of data as it provides a relevance and comparability. Sourcing of data involves many aspects like how the information is collated, time and at what level is the data collected. Another important aspect is the quality of the data source and it strongly interlinks with the process of sourcing the same.

3.3.1 Forms of Sourcing

As distinguished earlier there are two main sources official source of data and private source of data which can be classified as primary, secondary and tertiary. Most often official sourcing of data is made to make it a formal source of data most often referred to as the most authentic source of data. These data can also take forms in the way the sourcing is done which involves variation in the methodology of collecting data.

(i) Statistical Survey or sample survey

This form of sourcing of data involves collecting of information based on inductive approach where we move from specific observation to give the general observation of all. In simple words the recall of specific sets of people or respondents are used to generalize for the whole population. It collects data from a sample of the population and estimating the characteristics of the population by systematic use of methodology.

Advantages of sample survey source

The sample survey takes a small set of observation and it is more relevant for particular time and complete enumeration not possible. It saves cost and time as it involves only few observation and trained staff not required. As sample is done on selected observation at the outset the process clearly indicates the limitation which leaves errors very minimum the bias in enumerator is avoided and the reliability can be assessed easily. For validation in complete enumeration like Census sample survey is usually conducted.

Disadvantages of sample survey source

The sample survey takes a fixed design and cannot be changed throughout the process of data gathering. Sample may not work in conducting controversial issues like religion issues because of recalling difficulty. Sometimes the questions in the survey are standardized and may not be appropriate.

(ii) Census

Census is process of sourcing of complete enumeration of a population or groups at a point in time with respect to well defined characteristic (population, production). Data are collected for a specific reference point of time. Usually a Census is taken at regular interval of time for making the sourcing of data comparable. Most Census enumeration is conducted every five to ten years. Data is collected through questionnaire mailed to respondents, via the internet or completed by an enumerator visiting the respondent or contacting them by telephone. The respondents are trained to handle such enumeration and involved huge costs.

Advantages of Census source

The Census enumeration is the most accurate and complete information gathering mechanism and does not include any option of error. It covers a wide spectrum of people covering the complete population. It involves meticulous planning and the Enumerator is adequately trained to gather the desired information.

Disadvantages of Census source

Census involves huge cost as it is sent out to the whole population. It is very time consuming and many a times the data becomes out of date once it is collected. It sometimes excludes people who are temporarily not available during the period. In many unidentifiable issues like fishes census cannot be carried out. It sometimes has a limitation of geographical area.

(iii) Register Sourcing

Register is the process of collecting information that is updated continuously for a specific purpose and from which statistics can be collected and produced. It contains information on a complete group of units. It is done by official organization like National Sample Survey Organisation or the National Household Survey.

Advantages of Register sourcing

An advantage of the register sourcing is the total coverage even if collecting and processing represent low cost. It allows producing more detailed statistics than using surveys. Different registers can be combined and linked together on the basis of defined keys (personal identification codes, business identification codes, address codes etc.). Moreover, individual administrative registers are usually of high quality and very detailed.

Advantages of Register sourcing

A disadvantage is the possible under-coverage that can be the case if the incentive or the cultural tradition of registering events and changes are weak, if the classification principles of the register are not clearly defined or if the classifications do not correspond to the needs of statistical production to be derived from them.

There are different types of registers:

Administrative registers or records like National Sample Survey Organization (NSSO) in India help in collecting data. Using the existing administrative data for statistical production may be approved by the public because it can be seen as a cost efficient method; individuals and enterprises are less harassed by a response burden; data security is better as fewer people handle it and data have an electronic format.

Private registers such as registers operated by insurance companies and employer organizations can also be used in the production process of official statistics, providing there is an agreement or legislation on this.

Statistical registers are frequently based on combined data from different administrative registers or other data sources.

For businesses, it is often legally indispensable to be registered in their country to a business register which is a system that makes business information collection easier.

It is possible to find agricultural registers and registers of dwellings.

Even though different types of data collection exist, the best estimates are based on a combination of different sources providing the strengths and reducing the weakness of each individual source.

3.4 QUALITIES OF DATA SOURCE

The quality criteria of a national statistical office are the following: relevance, impartiality, dissemination, independence, transparency, confidentiality, international standards[citation needed]. These principles apply not only to the NSO but to all producers of official statistics. Therefore, not every figure reported by a public body should be considered as official statistics, but those produced and disseminated according to the principles. Adherence to these principles will enhance the credibility of the NSO and other official statistical producers and build public trust in the reliability of the information and results that are produced.

1. *Relevance*

Relevance is the first and most important principle to be respected for national statistical offices. When releasing information, data and official statistics should be relevant in order to fulfil the needs of users as well as both public and private sector decision makers. Production of official statistics is relevant if it corresponds to different user needs like public, governments, businesses, research community, educational institutions, NGOs and international organizations or if it satisfies basic information in each area and citizen's right to information.

2. *Impartiality*

Once the survey has been made, the NSO checks the quality of the results and then they have to be disseminated no matter what impact they can have on some users, whether good or bad. All should accept the results released by the NSO as authoritative. Users need to perceive the results as unbiased representation of relevant aspects of the society. Moreover, the impartiality principle implies the fact that NSOs have to use understandable terminology for statistics' dissemination,

questionnaires and material published so that everyone can have access to their information.

3. *Dissemination*

In order to maximize dissemination, statistics should be presented in a way that facilitates proper interpretation and meaningful comparisons. To reach the general public and non-expert users when disseminating, NSOs have to add explanatory comments to explain the significance of the results released and make analytical comments when necessary. There is a need to identify clearly what the preliminary, final and revised results are, in order to avoid confusion for users. All results of official statistics have to be publicly accessible. There are no results that should be characterized as official and for the exclusive use of the government. Moreover, they should be disseminated simultaneously.

4. *Independence*

Users can be consulted by NSOs but the decisions should be made by statistical bodies. Information and activities of producers of official statistics should be independent of political control. Moreover, NSOs have to be free of any political interference that could influence their work and thus, the results. They should not make any political advice or policy-perspective comments on the results released at any time, even at press conferences or in interviews with the media.

5. *Transparency*

The need for transparency is essential for NSOs to gain the trust of the public. They have to expose to the public the methods they use to produce official statistics, and be accountable for all the decisions they take and the results they publish. Also, statistical producers should warn users of certain interpretations and false conclusions even if they try to be as precise as possible. Furthermore, the quality of the accurate and timely results must be assessed prior to release. But if errors in the results occur before or after the data revision,[22] they should be directly corrected and information should be disseminated to the users at the earliest possible time. Producers of official statistics have to set analytical systems in order to change or improve their activities and methods.

6. *Confidentiality*

All data collected by the national statistical office must protect the privacy of individual respondents, whether persons or businesses. But on the contrary, government units such as institutions cannot invoke statistical confidentiality. All respondents have to be informed about the purpose and legal basis of the survey and especially about the confidentiality measures. The statistical office should not release any information that could identify an individual or group without prior consent. After data collection, replies should go back directly to the statistical producer, without involving any intermediary. Data processing implies that filled-in paper and electronic form with full names should be destroyed.

7. *International standards*

The use of international standards at the national level aims to improve international comparability for national users and facilitate decision-

making, especially when controversial. Moreover, the overall structure, including concepts and definitions, should follow internationally accepted standards, guidelines or good practices. International recommendations and standards for statistical methods approved by many countries provide them with a common basis like the two standards of the International Monetary Fund, SDDS for Special Data Dissemination Standards and GDDS for General Data Dissemination System. Their aim is to guide countries in the dissemination of their economic and financial data to the public. Once approved, these standards have to be observed by all producers of official statistics and not only by the NSO.

Till now you have read about data sources, process of data sourcing and the qualities of data sources. Now try and answer the questions given in *Check Your Progress-1*.

Check Your Progress 1 -

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What is Census method of data sourcing?

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2. What are the desirable qualities of a data source?

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3.5 DATA SOURCES FOR AGRICULTURE

In this section we will discuss about the various national and international sources of data related to agriculture.

(I) National Agricultural Data

Major Sources of data related to agriculture at national level include:

- i. Agriculture Census:** At micro level, the agricultural holding is the ultimate unit for decision making. Agriculture Census collects information regarding operational holdings such as land use and cropping pattern, irrigation status, tenancy data etc. The ninth Agriculture Census data with reference year 2010-11, is now available on public domain. All India Reports on Number and Area of operational holdings has also been published and available in the public domain. The data is available online on the following link:

<http://agcensus.dacnet.nic.in/>

- ii. **Input Survey:** The main aim of input survey is to collect data related to the consumption of various agricultural inputs. The following data are collected in the input survey: chemical fertilizers, HYV seeds, pesticides, farmyard manures/compost, bio-fertilizers, agricultural implements and machinery, livestock and agricultural credit, use of certified/notified seeds, high yielding variety seeds, pest control measurements adopted by cultivators and some personal details of the cultivators like educational qualification, age and size of households. The data is available online on the following link:
<http://inputsurvey.dacnet.nic.in/>
- iii. **Livestock Census:** Livestock Census was first done in 1919. The livestock Census conducted in 2012 is the 19th in the series. Like the population Census, a house to house enumeration is done to ascertain the number, age, sex, etc., of livestock/poultry possessed by every household or household enterprises, non-households or non-household enterprises and institutions in rural & urban areas. The documents related to livestock census is available on the following link:
<http://dahd.nic.in/documents/statistics/livestock-census>
- iv. **Marine Fisheries Census:** The Central Marine Fisheries Research Institute Conducted a well organized marine fisheries census in 1980 covering all maritime states in the mainland. The latest Census data available are of 2010 which is available on the following link:
<http://www.cmfri.org.in/marine-fisheries-census/8/2017>
- v. **Land Use Statistics:** The land use data is very important for planning and policy formulation in agriculture. The Directorate of Economics and Statistics in the Ministry of Agriculture has been collecting the data related to Land Use Classifications, Source wise Irrigation, Crop wise Irrigation and Area under Crops. The data is available online on the following link:
<https://data.gov.in/catalog/land-use-statistics-lus>
- vi. **General Crop Estimation Survey:** The estimates of yield of principal food and non-food crops are obtained from the crop cutting experiments conducted in major states and UTs under the National Programme of Crop Estimation Survey (CES). The results of CES are brought out in annual publication titled “Consolidated Results of Crop Estimation Survey on Principal Crops”.
- vii. **Integrated Sample Survey of Major Livestock Products:** The Animal Husbandry Statistics Division of the Department of Animal Husbandry, Dairying and Fisheries conducts Integrated Sample Surveys of Major Livestock Products to estimate production of milk, egg, meat and wool. The soft copies of various publications of the Division is available online on the following link:
<http://dahd.nic.in/Division/statistics/animal-husbandry-statistics-division>

Besides there are also various publications which are available online. These include

1. Agricultural Situation in India (Monthly)
2. Agricultural Prices in India
3. Agricultural Wages in India
4. Cost of Cultivation of Principal Crops
5. Districtwise Area and Production of Principal Crops in India
6. Land Use Statistics at a Glance
7. Farm Harvest Prices of Principal Crops in India
8. Agricultural Statistics at a Glance

3.6 DATA SOURCES FOR INFRASTRUCTURE

Infrastructure is the core of development of any economy. Non-availability of infrastructure can seriously hamper the productive capacity of the economy. Statistics related to availability and geographical distribution of infrastructure is important from the policy planning perspective and also for guiding the investment decisions in the infrastructure sector. Infrastructure includes

- (a) Construction
- (b) Electricity generation, transmission and distribution
- (c) Gas generation and distribution through pipes
- (d) Water works and supply
- (e) Non-conventional energy generation and distribution
- (f) Railway tracks, signalling system and stations
- (g) Roads and bridges, runways and other airport facilities
- (h) Telephone lines and telecommunications network
- (i) Pipelines for water, crude oil, slurry, etc.
- (j) Waterways
- (k) Port facilities
- (l) Canal networks for irrigation
- (m) Sanitation and sewerage

Let us look into the type of data and the source of data available on some of these infrastructures.

1. **Railways:** In transport, railways have the most extensive and elaborate database. The data is available on the length of rail networks, passenger and freight transport, energy consumption, earnings and expenditure and administrative statistics. The data is published in the Indian Railway's annual statistical statements and annual report and accounts.
2. **Roads:** The data available on roads include road length for urban, rural, municipal, railways and port roads. Road length: total and surfaced, type of surface, width of road length, number of culverts and bridges on national and state highways. Category wise registered

motor vehicles in states and metropolitan cities. Revenue generated from motor vehicle tax, outlay and expenditure on road transport in different plan periods in center and state, fuel consumption in road transport and enterprises in transport sector activity.

Major sources of data on roads include PWD (Roads/National Highways) of State Governments and Union Territory Administrations, Rural Development and Panchayati Raj Departments. Much data on roads is also available on the Open Government Data Platform India.

3. **Airways:** Air transport as of today has numerous players and as far as the national airlines (Indian Airlines and Air India) are concerned, substantial data is available on aircraft hours flown, revenue generated, passengers, freight, mail carried, volume of cargo embarked and disembarked.
4. **Waterways:** Water Transport includes international water transport and domestic water transport including inland waterways.

- (a) Data available on ports include: Commodity-wise capacity availability, cargo traffic handled by major ports, overseas and coastal traffic; import and export by country of origin and by country of destination for major ports, passenger and container traffic at major ports, data is also available on performance for selected indicators, Time series data on port wise employment, revenue and expenditure, net and operating surplus, operating ratio, income, cost, surplus or deficit per tonne of cargo handled for major ports.

These data can be found in: Annual Administrative Report of Major Ports and Minor Ports, Maritime states for Minor Ports Data, Container Corporation of India, India Ports Association, Monthly Bulletin of Statistics.

- (b) Data available on shipping include: Indian fleet of coastal and overseas ships, Shipping Tonnage, Fleet owned by SCI, Growth of Indian shipping since independence, Share and growth of Indian Fleet and Indian tonnage, Financial Statistics of SCI, Foreign exchange earnings and savings of Indian Shipping Companies, Tanker freight rates - single voyage rates, Dry bulk cargo freight rates, World Sea borne trade etc.

These data can be obtained from: For overseas trade data can be obtained from Major Ports, other sources of data are Directorate General of Shipping, Shipping Companies, Lloyd's Register - World Fleet Statistics and Statistical Tables, Indian Oil Corporation. Various data on inland water transport can be obtained from State IWT Directorates, Shipping Companies, IWT Companies, Central Water Commission, Central Inland Water Transport Corporation, Inland Waterways Authority of India.

5. **Telecommunication:** This is one of the most rapidly growing segment of infrastructure. The data pertaining to this sector includes equipped capacity, working connections, rural telephony, revenue statistics, telephone traffic, telegraph traffic, staff statistics, etc. Different divisions or cells in the Department of Telecommunications and the statistical

cell under the Economic Research Unit (ERU) in the Department are the main sources of data pertaining to the Sector.

6. **Electricity:** The electricity statistics can mainly be obtained from the Central Electricity Authority. CEA comes out with a publication titled “Public Electricity Supply- All India Statistics” which gives information on: Generating capacity at the national and state level, Actual generation of electricity, Electric power supply and system losses, Transmission, distribution and utilization of electricity, Consumers of electricity and connected load, Urban and rural electrification.
7. **Housing:** Housing is an important component of urban infrastructure as most of the developing countries face the problem of housing shortages in the urban areas. The data related to housing are primarily collected by the National Buildings Organization, Registrar General and Census Commissioner of India and NSSO. The data collected includes number of houses, residential fractions, structure of houses, building material, labour wages, urban indicators, social housing etc.
8. **Urban Infrastructure:** Urban infrastructure includes urban transportation, water supply, sanitation, electricity supply, communications, schooling facilities and public health facilities. The *Handbook on Urban Statistics*, a periodical prepared by National Institute of Urban Affairs. It provides data related to investments on urban infrastructure, various schemes and projects etc. Other sources of data related to urban infrastructure include HUDCO (www.hudcoindia.com), Ministry of Urban Development and Poverty Alleviation (www.urbanindia.nic.in), Society of Development Studies (www.sdsindia.org), Infrastructure Development and Finance Corporation.
9. **Rural Infrastructure:** Some of the important data pertaining to rural infrastructure include that of transportation, sanitation, water, health, electricity, communication, schooling, irrigation, watershed development, rural forestry etc. The data on rural infrastructure is generally scattered in several sources including census, Ministry of Rural Development, the Open Government Data Platform to name a few.

3.7 DATA SOURCES FOR SERVICE SECTOR

In India, the service sector holds great importance from the point of view of employment potential and also its contribution to the national income. Hence maintaining a sound statistical database for the service sector is very important. The task becomes difficult due to the vastness of the sector and due to the fact that the new services keep being included and the one's that are obsolete keep being deleted from the list of services in this sector. The important service sectors in India based on their significance in terms of GDP include aviation, telecom, tourism, shipping and ports; and railways and storage. Let us look at the data sources and data availability of some of the important service sectors:

1. **Banking and Insurance:** This is one of the leading service sector in India. To a great extent, banking statistics can be obtained from the Department of Financial Services, Ministry of Finance, Government of India. <http://financialservices.gov.in/data-statistics/banking-statistics>.

A lot of data on Banking and Insurance services is also available on the Open Government Data Platform of India. Information related to insurance services can also be availed from Insurance Regulatory and Development Authority of India.

2. **Trade:** International trade in goods as well as services has seen upward trend post liberalization. Trade statistics can be obtained from several sources. One of them is the Indian Trade Portal (<http://www.indiantradeportal.in/index.jsp>) which provides data related to foreign trade, tariffs, export promotion schemes etc. Directorate General of Commercial Intelligence and Statistics also provides export and import data on various goods and services (<http://dgciskol.gov.in>). The Agricultural & Processed Food Export Development Authority publishes data related to trade and international prices of agricultural products (<http://apeda.gov.in/apedawebsite/#>).
3. **Aviation:** The data pertaining to aviation can be obtained from the publications of the Ministry of Civil Aviation. Another source of data on aviation is the Open Government Data Platform which gives data related to personal statistics of various airlines, operating traffic statistics and other performance indicators of selected airlines and cargo, operating revenue and expenses per revenue passenger kilometer performed, staff strength, fleet size, employee productivity etc of various airlines.
<http://www.civilaviation.gov.in/>
4. **Telecom:** Data related to the telecom sector can be obtained from various publications of the Department of Telecommunication. The Open Government Data Platform also has data related to telecommunication performance, state wise number of telephone lines in rural and urban areas, Foreign Direct Investment in Telecom Sector, Internet Subscribers, Average revenue and minutes of use per user, Number of Telephones (all India and state level) etc.
<http://www.dot.gov.in/#>
5. **Tourism:** The Ministry of Tourism, Government of India has two publications titled “Indian Tourism Statistics” and “Indian Tourism Statistics at a Glance” which contain a wealth of information related to the tourism sector. The information available in these publications include tourists arrivals, destinations, source countries, revenue earned, domestic tourists, approved hotels, tour operators and travel agents, various schemes of Ministry of Tourism etc.
<http://tourism.gov.in/>
6. **Shipping and Ports:** The services provided by the maritime transport influence the pace and pattern of development. The Ministry of Shipping, Government of India comes out with useful publications which provides various shipping and port statistics. These Publications include: “Indian Shipping Statistics”, “Basic Port Statistics”, “Statistics of India’s Ship Building and Ship Repairing Industry” and the Annual Reports.
<http://shipping.nic.in/>

7. **Railways:** India's national railway system, the Indian Railways, is operated by the Ministry of Railways and is the fourth largest railway network in the world. Data of the Indian Railways can be obtained from the publications of the Ministry of Railways which include 'Indian Railways Statistical Publications', 'Indian Railways Annual Statistical Statements', 'Indian Railways Yearbook', 'Indian Railways Annual Report and Accounts', 'Indian Railways Facts and Figures'. All these publications are available online on the following link: http://www.indianrailways.gov.in/railwayboard/view_section.jsp?lang=0&id=0,1,304,366,554.

The 'Statistical Year Book India' published by the Ministry of Statistics and Programme Implementation also has a section pertaining to the Indian Railways and can be accessed online on the website of the Ministry. <http://www.mospi.gov.in/statistical-year-book-india/2016/188>. The Open Government Data Platform also has several data pertaining to the Indian Railways.

3.8 OTHER DATA SOURCES

There are several other parameters of importance to a development researcher on which relevant and useful data sources are available and discussed in this section.

1. Government Budget

The Union Budget documents and data of various years can be found on this website (<https://www.indiabudget.gov.in/rec.asp>). The data on budget including the budget estimates, budget provisions by different heads, plan and non-plan subsidies and grants, investments and all other relevant data can be obtained from the Open Government Data Platform.

2. National Statistic

The National Data Bank of the Ministry of Statistics and Programme Implementation provides national level data on various socio-economic parameters including education, health, labour and employment, data on programmes and schemes, data on socio-economic caste census, Census data etc. All this information can be obtained on the following link <http://www.mospi.gov.in/national-data-bank>. National level census data can also be obtained from official census website <http://censusindia.gov.in/>. Similarly, data on various macro-economic aggregated like Gross Domestic Product, State Domestic Product etc. can be also obtained from the website of the Ministry of Statistics and Programme Implementation.

3. National Health

Health is an important indicator of development of a country. National level health statistics can be obtained from various sources like the National Family Health Survey Reports which is also available online <http://rchiips.org/nfhs/>. The Annual Health Survey Report from the Office of the Registrar General & Census Commissioner, India is also an exhaustive repository of health related data and indicators <http://censusindia.gov.in/2011-common/AHSurvey.html>.

4. Environment and Forest

Development and environment have a very strong interrelation and development, if seen in isolation without any consideration for environment, will not be sustainable. There are several sources of data on environment and forest. The Statistical Year Book published annually by the Ministry of Statistics and Programme Implementation has a section on environment and forest which gives data on state wise recorded forest area and forest estimates. The Open Government Data Platform is another source of data on environment and forest.

Besides, there are also private organizations which collect and publish many useful data on different issues.

3.9 GLOBAL DATA SOURCES

This section covers some of the commonly used data sources by development researchers.

1. United Nations Data Sources:

The United Nations has several data bases which would be of use to the development researchers.

- i. **FAO:** The Food and Agriculture Organization of the United Nations has a huge repository of data on food and agriculture for more than 245 countries and the data can be accessed free of charge. It provides data on production, inputs, agricultural emissions, trade, population, food security, forestry, prices, agri-environmental indicators etc. The web link to faostat is <http://www.fao.org/faostat/en/#data>.
- ii. **UN Comtrade Database:** This provides free access to global trade data. The users can extract the data they need or also use the analytical tables provided. It also has link to International Trade Statistics Yearbook which can be downloaded for free. <https://comtrade.un.org/>
- iii. **United Nations Statistical Commission:** UNSC is the highest body of global statistical system. It also contains data on main aggregates of national accounts, population census, demographic data, disability statistics etc. The web link to UNSC is <https://unstats.un.org/unsd/statcom/>.
- iv. **United Nations Conference on Trade and Development:** UNCTAD is a permanent intergovernmental body of the UN, established by the United Nations General Assembly in 1964. Statistics is an inherent part of UNCTAD and it produces more than 150 indicators and time series data pertaining to international trade, economic trends, population and labour force, maritime transport etc. The web link to UNCTAD is <http://unctad.org/en/Pages/statistics.aspx>.

2. World Bank

The World Bank maintains a data catalogue of statistical databases and other data collections. The World Bank open data provides the users with open access to World Bank data. Besides you can also access

data underlying impact evaluations conducted by the World Bank. Data available is time series data, micro data or geospatial data. The web link to the data catalogue is <https://datacatalog.worldbank.org/>.

3. OECD Database

The OECD ilibrary is the online library of the Organization for Economic Cooperation and Development. It is a gateway to OECD's data and consists of its books, papers and statistics. The web link to the data that can be obtained in the OECD ilibrary is <https://www.oecd-ilibrary.org/statistics>.

Till now you have read about data sources for agriculture, infrastructure, services and international data sources. Now try and answer the questions given in *Check Your Progress-2*.

Check Your Progress - 2

Note: (a) Write your answer in about 50 words.

(b) Check your answer with possible answers given at the end of the unit.

1. What are the sources of agricultural data?

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2. What are the global data sources?

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3.10 LET US SUM UP

Data is an essential part of any research. Timely and accurate data help in generating results which can be further used for policy formulation at various levels. The ability to take timely and useful decisions is crucial to the development process which further necessitates the availability of timely and accurate data which can facilitate in decision making. In this unit you read about the forms of data sourcing. You also read about the qualities of data source. The economy largely consists of three sectors viz the agricultural, industrial and service sector. The data sources for each of these sectors have been discussed separately. Besides, other sources of data which would be of importance to development research have also been discussed. Towards the end, the international data sources have also been discussed.

3.11 REFERENCES AND SELECTED READINGS

The following web links can be referred to:

<http://agcensus.dacnet.nic.in/>

<http://inputsurvey.dacnet.nic.in/>
<http://dahd.nic.in/documents/statistics/livestock-census>
<http://www.cmfri.org.in/marine-fisheries-census/8/2017>
<https://data.gov.in/catalog/land-use-statistics-lus>
<http://dahd.nic.in/Division/statistics/animal-husbandry-statistics-division>
www.hudcoindia.com
www.urbanindia.nic.in
<http://financialservices.gov.in/data-statistics/banking-statistics>
<http://www.indiantradeportal.in/index.jsp>
<http://apeda.gov.in/apedawebsite/#>
<http://www.civilaviation.gov.in/>
<http://www.dot.gov.in/#>
<http://tourism.gov.in/>
<http://shipping.nic.in/>
<http://www.mospi.gov.in/statistical-year-book-india/2016/188> https://view_section.jsp?lang=0&id=0,1,304,366,554.
<http://www.mospi.gov.in/statistical-year-book-india/2016/188> <https://www.indiabudget.gov.in/rec.asp>
<http://www.mospi.gov.in/national-data-bank>
<http://rchiips.org/nfhs/>
<http://censusindia.gov.in/2011-common/AHSurvey.html>
<http://www.fao.org/faostat/en/#data>
<https://comtrade.un.org/>
<https://unstats.un.org/unsd/statcom/>
<http://unctad.org/en/Pages/statistics.aspx>
<https://datacatalog.worldbank.org/>
<https://www.oecd-ilibrary.org/statistics>

3.12 CHECK YOUR PROGRESS – POSSIBLE ANSWERS

Check Your Progress 1

1. Census is process of sourcing of complete enumeration of a population or groups at a point in time with respect to well defined characteristic (population, production). Data are collected for a specific reference point of time. Usually a Census is taken at regular interval of time for making the sourcing of data comparable. Most Census enumeration is conducted every five to ten years. Data is collected through questionnaire mailed to respondents, via the internet or completed by an enumerator visiting the respondent or contacting them by telephone. The respondents are trained to handle such enumeration and involved huge costs.

Data Collection

2. The desirable qualities of a data source are:
 1. Relevance
 2. Impartiality
 3. Dissemination
 4. Independence
 5. Transparency
 6. Confidentiality
 7. International standards

Check Your Progress 2

1. The data sources for agriculture include:
 - i. Agriculture Census:
 - ii. Input Survey:
 - iii. Livestock Census:
 - iv. Marine Fisheries Census:
 - v. Land Use Statistics:
 - vi. General Crop Estimation Survey:
 - vii. Integrated Sample Survey of Major Livestock Products:
1. The global data sources include
 1. United Nations Data Sources:

The United Nations has several data bases which would be of use to the development researchers.

 - i. FAO:
 - ii. UN Comtrade Database:
 - iii. United Nations Statistical Commission:
 - iv. United Nations Conference on Trade and Development:
 2. World Bank
 3. OECD Database

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(6 CREDITS)

BLOCK	UNIT NOS	UNIT TITLES
1		Fundamentals of Social Science Research
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