

3. Data Collection, Presentation And Analysis

A S IS OBVIOUS, the basis of a resource-based plan is data, and quite a lot of that! It involves understanding flows of resources in different sectors of the economy as depicted in Figure 1.2 including households, formal and informal businesses, public utilities and spaces, etc.

An understanding has to be gained on **Who** specifically is using the resource, **How** he is using it and **Where** it is being used. This is a rather complex exercise.

Scientific data collection and analysis with a very high degree of accuracy would take a long time, particularly in a developing country. Depending on the size of the region, it could take years. In this long period, the changing dynamics of society may result in large variations in the use of the resource, making the exercise futile. Besides, while the experts are collecting and analyzing the data in detail, the misuse of a resource could cause incalculable harm to the local community. Hence, any method has to be just accurate enough for decision-making and quick enough for any decision to be relevant, useful and timely.

Data collection in developing countries poses some special problems.

- 1.** The developing countries are characterized by a huge **informal sector**, the magnitude of which is not immediately obvious. For example, in place of large factories that are seen in the developed countries, millions of small and individual enterprises contribute substantially to the economies of the developing countries. The collective consumption of materials (and the resultant problems of pollution and **waste**) in this **informal sector** is often larger than in the formal sector.
- 2.** Data availability can often be a major problem. Even reliable data about formal economic activity is often hard to come by.

Given these problems, a new thought process is essential. Lessons may have to be drawn from fields such as Marketing Research to evolve methods to make estimates

of resource flows that are quick and accurate enough. The case study on the textile town of Tirupur in South India, included in this book (Chapter 5), gives a glimpse of possible problems and an approach to data collection.

3.1 Formats for Presentation and Analysis

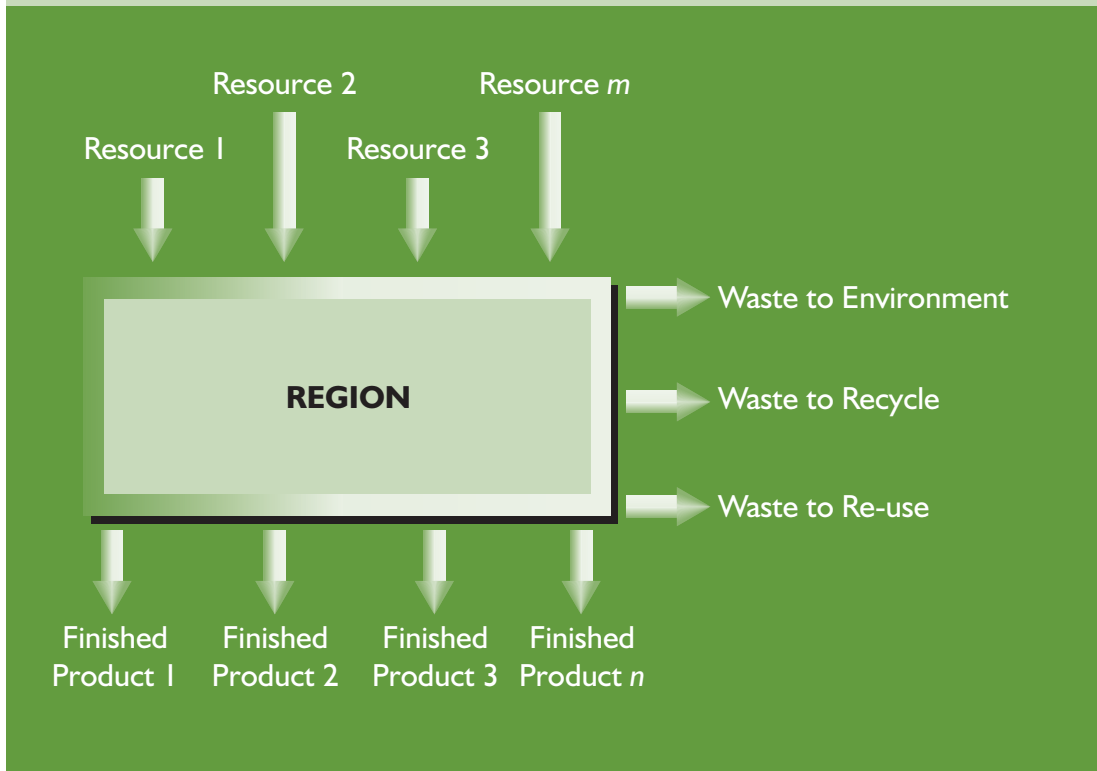
Two possible formats are suggested here for presentation and analysis of the data on resource flows and use. These formats have come about based on the field studies that were carried out in India during the period 1996–1998. These case studies are detailed later in the book. Both formats are derived from Material Flow Analysis (MFA), the core methodology of the Industrial Metabolism approach, as introduced in Chapters 1 and 2. The main purpose of the two formats presented here, is to provide planners and policy makers with a simple, quick and easy-to-use tool, to serve as a basis for sustainable resource-based strategies in the context of developing countries.

3.1.1 Regional Resource Flow Analysis (RFA)

Given a defined geographical region, a Regional Resource Flow Diagram could be prepared as in Figure 3.1, which would show the quantitative inputs of resources into the selected region, and outputs from the region, both as wastes to other geographical areas for reprocessing or as wastes to the environment, in addition to the end products for sale or consumption.

A figure such as this would immediately give a detailed quantitative account of the flows of different resources in the region. Without such an analysis, it is often difficult to get a quick assessment of the issues of importance in the area. This is particularly so in a developing country where the use of resources is very fragmented and dispersed over the domestic and informal sectors. Since the use of these resources is distributed over a large number of points, their consumption patterns are often not obvious. For example, it is easier to notice and estimate the volume of waste in a large waste dump rather than litter in a city, spread over the streets, although the litter when collected could be twice as voluminous as the dump.

A Regional Resource Flow Diagram would clearly indicate the resources that are of significance in the region. Since the consumption figures of all the resources

FIGURE 3.1**Regional Resource Flow Diagram**

are clearly quantified and qualitatively assessed, it will be easy to assess the relative importance of any resource in the region, and design sound policies accordingly. For each resource that is an input into the region, the following questions may be relevant:

- Is the resource scarce in the region?
- Is the availability of the resource likely to be a problem in the future?
- Is the use of the resource likely to do any damage to any other resource?
- Can the resource be more efficiently utilized in the sphere/segment of activity, or can it be put to more profitable use for any alternative purpose?

Based on a study of a Regional Resource Flow Diagram, it is possible to identify the resources that need more detailed attention in priority. It is also easy to identify resources that are wasted so that new activities could be planned to use them.

3.1.2 Resource Utilization Map (RUM)

Once a specific resource has been identified as critical, considerably greater information is needed on the way it is used, before any strategy can be planned. For that purpose, a Resource Utilization Map (RUM) is suggested as a possible format (Figure 3.2). This diagram can give a great deal of information about the usage of a particular resource.

Such quantitative data are essential for taking any relevant action to optimize the use of a resource; particularly, to plan the use of scarce resources—be it energy, water, land or forest. The “resource” in the RUM is as defined by the user—it could be a material like coal, or a facility. For example, an RUM can be prepared for the transport infrastructure—its utilization (the selected resource) being mapped.

Data presented in the RUM can be very effectively used to:

- See clearly how a resource is shared between different sectors
- Identify the major users of the resource
- Get a breakdown (if data can be generated) of the purposes for which the main user consumes the resource. For example, having identified a major industrial user of water, it may be possible to assess how much of the water is used in process, how much is used for non-industrial (domestic) purposes in the industrial unit, etc.

Unless such quantified data are available, a lot of time may be spent on actions that do not substantially improve the situation, and the change, if any, remains just symbolic.

In summary, the collection, presentation and analysis of data on the **flows** of resources in a region are an essential first step in planning. The cases that have been detailed in the following pages of the book are illustrative of possible methods for data collection and some ways in which the data could be analyzed and interpreted to aid decision-making. This is a first attempt, and much more work is needed to refine methodologies for data collection and analysis in developing countries.

FIGURE 3.2

Resource Utilization Map (RUM)

