

Integrated Regional Impact Assessment (IRIA) in the MacKenzie Basin, Canada (Cohen, 1993; Yin and Cohen, 1994), perhaps the most ambitious regional level assessment to have been undertaken to date. A similar approach was also adopted in the MINK study on the US Corn Belt (Rosenberg, 1993—see Box 13), at national scale in Egypt (Strzepek *et al.*, in press) and, though less detailed, in south-east Asia (Parry *et al.*, 1992). Other approaches focus on different sectors in a wide variety of regions to examine impacts on, for example, food supply or water resources (see, for example, Strzepek and Smith, in press).

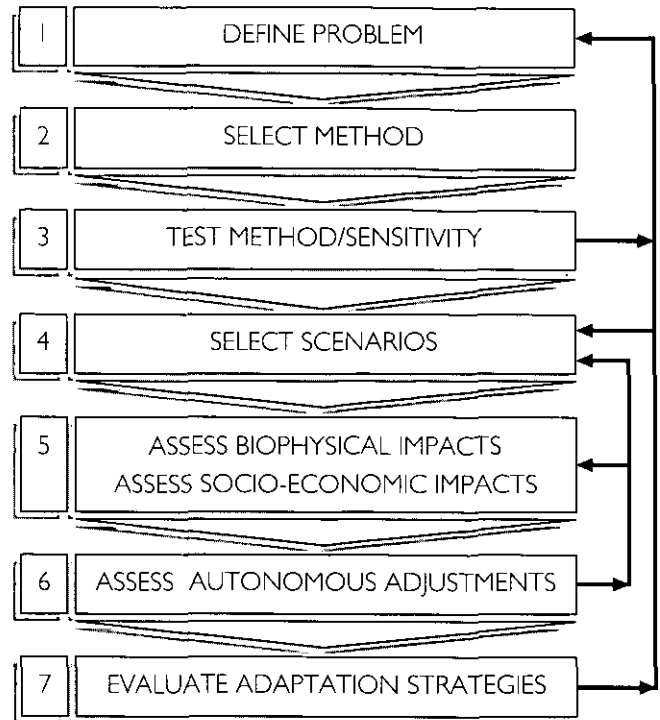
A major shortcoming of most climate impact assessments to date has been their lack of an in-depth treatment of adaptation, due in part to its complexity and in part to the lack of a suitable methodological framework. While it is represented in a simple form in Figure 3, various aspects of adaptation are implied, including adjustments that are endogenous to a system, and thus cannot be separated from the assessment of impacts, as well as exogenous adaptation, which is imposed externally on a system.

#### 2.4 A Seven Step Framework for Assessment

A general framework for conducting a climate impact assessment is shown in Figure 4. It consists of seven main steps of analysis. The first five steps can be regarded as common to most assessments. Steps 6 and 7 are included in fewer studies. The steps are consecutive (open arrows in Figure 4), but the framework also allows for the redefinition and repetition of some steps (thin bold arrows). At each step, a range of study methods is available. These are described and evaluated in the following sections. For reasons of brevity, however, only the essence of each method is introduced, along with references to sources of further information.

Each of the seven general steps includes more detailed procedures, sometimes themselves arranged in a comparable multi-step framework. For example, Section 8.3 describes seven equivalent

**Figure 4.** Seven steps of climate impact assessment



steps in evaluating adaptation strategies. Those steps fit directly into Step 7 of the overall assessment framework, but they also parallel all the general assessment steps, because the information required for evaluating adaptation is derived from, and depends on, many of the other steps, such as sensitivity analysis, impact assessment and reliance on specific models.