Towards an Improved Rural Data Infrastructure for Scotland

Funded for three years by the Scottish Executive Rural Affairs Department until mid 2001, this project brings together researchers from ecology, sociology, geography and statistics to develop a better understanding of the rural data infrastructure and to identify key future needs relevant to integrated rural development policy.

"More than ever before, a far more varied yet coherent infrastructure of data is required"
Haines-Young and Watkins (1996). The rural data infrastructure, *International Journal of Geographical Information Systems* 10(1): 21-36

Aims

Changes occurring in agriculture and other uses of the countryside are the result of economic, socially and politically driven processes of re-structuring which affect society as a whole. Ilbery (1988, p257) has attempted to marshal their outcomes in terms of a contemporary countryside in which:

- agriculture is less significant in terms of intensive food production and jobs;
- greater significance is attached to diversification, pluriactivity and making high-quality local food products;
- changing valuations of forestry are linked with more afforestation on farmland;
- new jobs are being created in manufacturing, high-tech and service industries, especially in SMEs;
- uses of rural space for tourism, recreation, environmental conservation and retailing are increasing;
- rural re-population continues, especially by the service classes, but also from continued out-migration of the young; and
- there is increasing differentiation in life-quality between the wealthy and powerful groups and the rest.

In this project, several questions are posed about the availability of survey data for examining such rural changes. Data that are potentially relevant include surveys of land and property ownership, agricultural production, land capability assessments, demographic structure, employment and service provision. Typically, data on these topics are collected by various national and sub-national government and non-government organisations, for a specific set of purposes, which determines how they are gathered, processed and released. In many cases, some degree of geographical referencing is recorded with or attached to these data, though the geo-referencing system varies from one data set to the next.

Though the questions raised in this project are diverse, they reflect the common assumption that ways should and can be found to improve the joint uses of survey data about rural places, for the mutual benefit of policy decision-making and applied research on rural change. Therefore, each question is regarded as tackling a particular set of issues within the general theme of data integration.

As a means for co-ordinating these investigations, and uniting their results, a single overarching question is posed - What is the rural data infrastructure and what should it be in the future? Using the increasingly popular term 'data infrastructure' implies that data deemed essential for many research and policy uses actually exist, and moreover, that they are consistent both internally and relative to one another. This project aims to investigate the reality of these ideas at present, seeking to identify the problems and opportunities connected with users' requirements and data provision, and to make recommendations about how they could be addressed in the near to mid-term future. In addition, a second strand is contributing to empirical work on specific integration problems using statistical (and possibly computational) methods, linked with a Geographical Information Systems (GIS) environment.

[Reference: Ilbery B (Ed) (1998). The geography of rural change. Addison Wesley Longman, Harlow].

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Research Framework

Different methods are necessary to investigate the varying senses in which 'data integration' is important to this project. Consequently, 4 modules have been devised. In loose terms, Modules A, B and D deal with policy-related research, whereas Module C provides complementary applied empirical research. The diagram illustrates the flow of results from the individual modules into the overall reporting structure.

Module A: To determine the needs & priorities of data users

Each organisation concerned with rural issues has its own needs for data, governed by its mission and the projects that it undertakes. Whilst this means that the precise nature of the data requirements will vary from organisation to organisation, overlaps nonetheless occur in the kinds of data that are drawn on. The aim of this module is to identify key data sets, main types of users, and the priorities that users ascribe to different types of data and to other potential data.

Methods: short series of workshops; postal questionnaire survey. (Neil Bayfield)

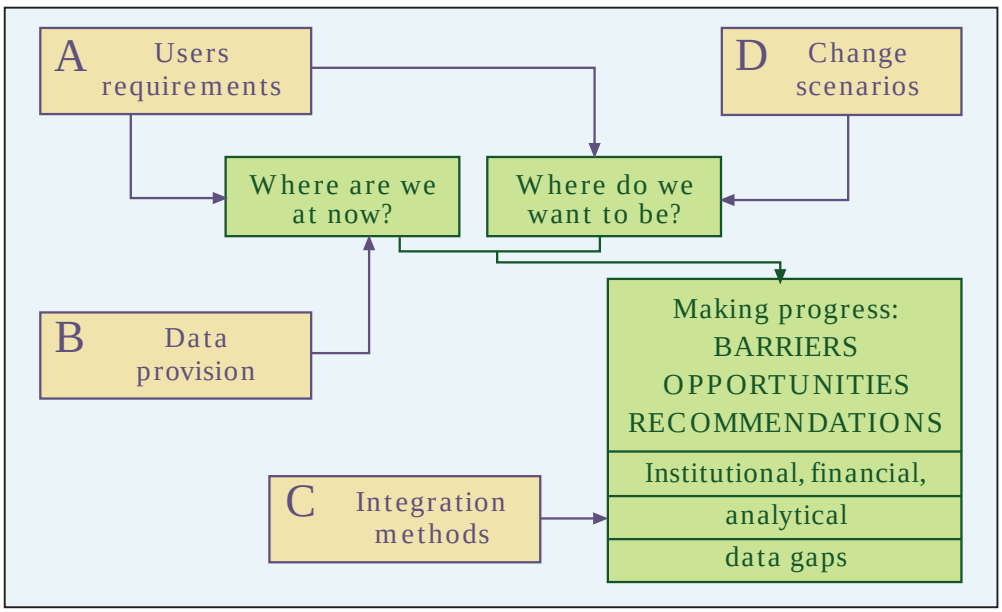
Module D: To assess future rural change scenarios

A key issue is to link knowledge of the current situation with possible future requirements, geared towards a data infrastructure which would provide better support for analyses and reporting on the environmental and socio-economic dimensions of rural land use change. The findings from Module A will provide some indications of what is required. Module D takes the problem from a different angle. Its purpose is to develop and analyse a range of credible rural change scenarios, and to link these back to the analysis of the current rural data infrastructure. These scenarios will be based around the three agricultural/rural development policy scenarios for the UK set out in an earlier Land Use Research Review (Birnie et al. 1995).

Methods: Analysis of policy documents and research literature; seminar(s); workshop(s).

[Reference: Birnie RV, Morgan RJ, Bateman D, McGregor MJ, Potter C, Shucksmith DM, Thompson TRE and Webster JPG (1995). Review of Land Use Research in the UK. MLURI, Aberdeen].

(Mark Shucksmith)



Module B: To assess the provision of infrastructure data

Several organisations, particularly in the public sector are responsible for collecting or holding relevant data about rural areas. Consequently, they may be regarded as the creators of the rural data infrastructure. Due to the widespread adoption of networked geographic information handling technology, these data providers are operating in circumstances which are requiring them to re-appraise the needs and means for both collecting data, and delivering them to a widening composition of users. Similarly, it is spurring initiatives involving both providers and users to promote the identification of commonly used data, the broadcast of descriptive metadata, and participation in multilateral data-sharing projects. This module aims to investigate what data are provided, by whom and why, considering such factors as the value attached to data, policies on enabling access and preserving privacy, and awareness of current and future users.

Methods: semi-structured interviews; concluding workshop. (Alistair Geddes)

Module C: To apply & develop spatial data integration methods

Spatial data sets on environmental and socio-economic variables forms come in many forms, imposing constraints on their joint use for informal comparison or formal integration. Data about rural phenomena often have certain other characteristics which must be taken into account. For example, population data sets commonly contain only small numbers of observations at relatively coarse resolutions. In contrast, data on some environmental characteristics, such as land cover and certain land uses are becoming more detailed as a result of the developments in high resolution remote-sensing technology. This module aims to find techniques appropriate for exploring large, multivariate data sets, and for dis-aggregating zone-based data sets. Exploring refers to methods for simplifying the complexities associated with handling large numbers of variables and observations, and for attaining better understanding of their distribution and correspondence. Dis-aggregating addresses the issue that data are sometimes needed for geographical area frameworks (e.g. parishes, postcode areas or grid squares) other than those for which they are supplied. Thus, techniques for transferring data between different frameworks are needed.

Methods: (Exploring) statistical software and/or computational techniques. (Dis-aggregating) statistical modelling software or custom-written code. (David Elston)