

**Towards Land Use Planning Conflict  
Resolution through Spatially  
Consistent Participatory Scenario  
Modelling**

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## **Abstract**

The issues in this study (water quality, unprofitable agriculture, and loss of farming land - often of high quality - to non-agricultural uses) are common ingredients in many of the conflicts over proposals to rezone land for closer settlement in rural areas.<sup>1</sup> The incentive for establishing conflict resolution procedures is strong because grievances often find their way to arbitration which is expensive, time consuming, and hard to predict as to outcome. This difficulty reflects, in part, the difference between the priority given to specialist legal arguments that are only resolved in court, on the one hand, and, on the other, the terrain-centred perceptions (“mental maps”) of the conflicting parties. This study shows that the latter would be better served by collectively establishing and referring to a set of rules that allowed the land qualities and values to be taken into account by balancing the unique and the general such that all can agree on a spatially equitable solution without the expense of a court case. The rules were existing in the planning scheme but modelling cartographically the many solutions that might be offered is something that was not often contemplated until digital spatial data handling and digital spatial data bases were available, at least in theory. This study referred to a digital spatial data base manipulated with a Geographical Information System (GIS).

The evolution of methods for digital spatial data handling has reached a point where potential can be identified for its routine adoption in Local Government, not only in terms of routine Computer Aided Design (CAD) systems use, but also for spatial analysis (in GIS). Digital spatial data handling and spatial modelling are likely to be most useful in circumstances where the issues are complex, where there are multiple stakeholders, among whom there is an unequal distribution of power, and where those being regulated stand to lose rather than gain from a planning process. When one studies such conflicts, a further chronic undercurrent of grievance can be detected among the most heterogenous and information poor parties to such conflicts: the individual landowners. However, it is known that when thematic maps are used in mediation they serve as a focal point for discussions, drawing attention and away from personality issues and towards the detail on the maps.<sup>2</sup>

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<sup>1</sup> eg Foyel and Houston, 1992.

<sup>2</sup> eg. Berry, 1993.

For the application of the newly developing method, technique and power of digital GIS, I have developed a planning procedure that I call Spatially Consistent Participatory Planning (SCPP).

At the outset, SCPP recognises that on private land, the landowner is by default the land manager, who, as a consequence of a planning review that leads to asset devaluation, may be forced by circumstance to farm more intensively, and with less regard for the environment than would otherwise be the case. The SCPP procedure therefore aims to facilitate an outcome whereby a landowner can satisfy all environmental concerns while retaining the asset value of their land.

SCPP evolved from Holling's Adaptive Environmental Assessment and Management (AEAM)<sup>3</sup> process of structured workshops, and from Dryzek's discursive democracy concept<sup>4</sup> which provide the participatory framework within which all stake holders can have a say.<sup>5</sup> The weighted linear combination modelling technique implemented as Single Objective Multiple Criteria Decision Making within the IDRISI Geographical Information System,<sup>6</sup> the grid cell modelling software package used in this project, enables stakeholders to create dynamic environmental impact models in round table scenario modelling exercises and then, using MapInfo desktop mapping software, enables Decision Makers to model the impact of the models on land ownership. Planning Authorities can then use this information to...

1. assist in planning to reduce the scope for conflict resulting from unfair or inconsistent decision making,...
2. identify individual titles and areas to target for policy formulation, and...
3. minimise the detrimental environmental impact that incremental planning decision making can have by scenario modelling during planning scheme reformulation, major land rezoning exercises, and conflict resolution.

While recognising the political realities of traditional Land Use Planning, SCPP challenges its "top down" policy based land use planning, with a "bottom up"

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<sup>3</sup> Holling, 1978.

<sup>4</sup> Dryzek, 1990.

<sup>5</sup> Holling, 1978; Grayson *et al*, 1994.

<sup>6</sup> Eastman, 1995.

approach that encourages “realised” rather than “idealised” community participation in the planning process, and brings planning practice in line with planning principle. Adoption of this approach amounts to support for policies favouring public participation in the planning process in a way that offers wide scope for sharing power and information, and for mitigating the chronic grievance referred to above. This alternative to arbitration has the merit, not only of saving the time and cost of court proceedings, but also of providing a common, multiple use spatial data base that all parties can use for long term planning and management purposes.

Results show that rapid scenario modelling and other modelling that support for public participation in the planning process requires, can be made a routine procedure for any area with a digital spatial database. Adoption of SCPP would bring consensus and spatial consistency to land use change (development) permit appraisal, and to planning scheme reformulation, thereby reducing scope for conflict, and providing an incentive for data base maintenance by constructive data sharing. The logical extension of this technique would require thematically, temporally and spatially large databases to be built, so that parcel level modelling of outcomes can be achieved on a routine and regional basis.

It is argued that there will need to be much inter-organisational cooperation and cost sharing to create the appropriate databases. Data flow paths need to be given great consideration to ensure the maintenance of data standards relating to logical and spatial accuracy, currency, format, and the balancing of inter-organisational data redundancy with the need to avoid unproductive duplication of effort.

Testing of the AEAM process took place by weighting the thematic input data during a stakeholders workshop. The workshop participants were without previous discussion of weightings. One of the outcomes of the workshop was the display of enthusiasm by the participants for the use of thematic map data for land use decision making. It is suggested that the outcome of agreement over the weightings of thematic input data, and of data base building, would be greater acceptance of the planning scheme as a basis for land use decision making. The challenge would then be to implement it at all levels of administration, from policy to practice.