Chapter Five – Participatory Planning Methodologies and Ecologically Informed Design

5 Chapter Five - Participatory Planning Methodologies and Ecologically Informed Design

5.1 Introduction

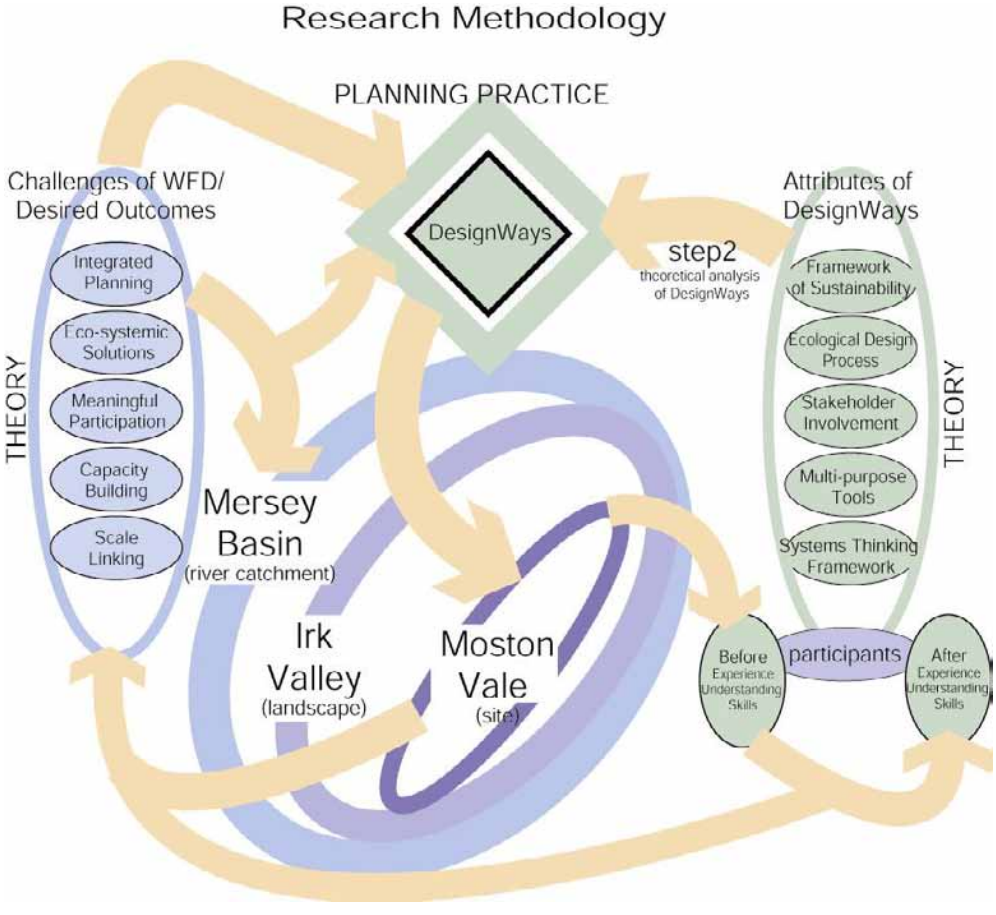
The European Union Water Framework Directive (WFD) offers an unparalleled opportunity for improving river basin management. A broad range of participation and information provision activities is essential to achieve its goals, and is required by the Directive. Active participation in catchment planning is seen as an important component of its successful delivery, and is encouraged in the CIS documentation. The environmental goals of the Directive are ambitious. This implies a need to re-examine many processes and management practices in river catchments, as well as the need for behavioural change amongst a broad range of stakeholders and community members. This research tests DesignWays, a toolkit for engaging participation in planning, as a mechanism for maximizing the long-term social and environmental benefits of stakeholder participation in planning. Following ten years of development and improvement through learning cycles in practice, the stage of research described in this chapter involved an in-depth exploration of the theoretical basis of DesignWays.

5.1.1 Structure of this Chapter

A framework for understanding the different components and stages of participatory planning is developed in the first part of this chapter. This includes brief descriptions of twenty-eight different participatory planning methodologies, followed by a description of the DesignWays approach. The following section of theoretical analysis is structured around the five key attributes of DesignWays. The major influences on DesignWays and their background are elucidated. A comparison of the 28 different methodologies introduced in the beginning of the chapter summarises each of these sections. This comparison comes in two parts: a table structured around components that can express the attribute under discussion (e.g. ecological design process), and a brief narrative exploring how DesignWays fits in the field of ecologically informed, participatory

design. A table at the end of each section takes these components and introduces the methods and tools used in DesignWays to deal with the issues raised in this chapter. These components are discussed in more depth through qualitative analysis of participants' experience of the process in Chapter 7.

Figure 5-1 Research Methodology - Step 2



5.2 Participatory Planning Methodologies, an Overview

In a broad survey conducted by the ODPM, building on a previous survey of public participation in local governments by the DETR (de Montfort University and The University of Strathclyde 1998), four broad forms of participation were identified (adapted from Birch 2002):

1. traditional forms, e.g. public meetings, consultation documents, co-option to committees and question and answer sessions;

2. customer-oriented participation, e.g. service satisfaction surveys, complaints/suggestions schemes;

3. innovative methods, e.g. interactive websites, citizens' panels, focus groups and referendums;

4. and innovative approaches that encourage citizens to deliberate over issues, e.g. citizens' juries, community plans/needs analysis, visioning exercises and issue forums.

Article 14 of the WFD recognises the need for three types of participation in river basin planning:

1. active involvement;

2. consultation (plans and options are made available for comments);

3. and information supply

Active involvement suggests a greater degree of engagement than the processes of consultation and information supply, and can be seen as moving up Arnstein's (1969) 'ladder of participation', towards greater community empowerment. It implies stakeholder and community[31] participation in the actual planning process, as opposed to responding to plans created by experts. This research focuses on innovative, deliberative approaches, through the active engagement of participation in planning. The methodologies described in the review have been taken from the broad field of participatory planning, not from that of consultation.

Participation is not a monolithic process, but is embedded in particular institutional contexts. Engaging participation in planning requires several components and processes. These are summarised in the table below. Whilst these can be read as a linear sequence,

[31] Stakeholders can be defined as groups or people with an interest in an action, program, policy or organisation. The type of interaction can be one of influence *on*, e.g. the stakeholder can exert an effect on the action or party, either positive or negative, or influenced *by* – e.g. the stakeholder is affected by an action or party. In a systems view, stakeholders are seen as "*a community who work together in a patterned interaction*" (Eden and Ackermann 1998, pg. 118). Whilst community members are a particular type of stakeholder, in as much as they have a stake in their area of residence, in this thesis the term stakeholders is used to mean people who have other interests, such as an interest in the environment of the area, or a business that operates in the area. Project Officers who work with community members are also considered stakeholders. The term 'community members and stakeholders' is used in the text to denote both groups.

starting with identifying the project boundaries, this is a fluid process with several overlaps. Many of the processes are (or should ideally be) ongoing throughout. Table 5-1 was first introduced in Chapter 3, Methodology. Its starting point was a reconceptualisation of Arnstein's ladder of participation, recognising that there are several components of participation, and that each could be carried out with a greater or lesser degree of participation. These aspects are elaborated in Table 5-1 Components of participatory planning below.

This table could form the basis of a Decision Support Tool for developing an overall programme of participation in planning. This research focuses on the stage 'Active involvement in planning'.

There has been a proliferation of participation techniques in the past several years, as the case for increasing participation in planning has become more widely accepted. In the UK the implementation of LA21 programmes has been a catalyst for increased innovation in participation. There are a range of methodologies being used, *"including visioning, community profiling and village appraisals, focus groups, Planning for Real exercises, forums, round tables, citizens' juries and advisory committees"* (Warburton 2002, pg. 8). A survey of LA21 processes conducted by International Council for Local Environmental Initiatives (2002, pg. 15) showed that the most common participation methods were *"community meetings and information sessions, questionnaires, community workshops, and working groups".* The ODPM survey referenced above shows that Local Authority use of innovative, visioning techniques has risen sharply since 1997. Experience across Local Authorities varies, however, and some practitioners feel that there are still few opportunities to use their skills in stakeholder dialogue, and little or no commitment from senior management for active participatory planning (Soutar 2003, key participant in the LGMB Consensus Building pilots of 1996/97, pers. comm.).

Table 5-1 Components of participatory planning

Component of Participation	Questions and Processes
Identify project boundaries and scope of participation – WHY, WHERE, WHAT?	• Why carry out participation? • What are the goals and objectives? • What is the strategic overview for the site/area to be planned? • What existing planning processes are happening in the area, and is there any opportunity to work with these to minimise overlap? • Where to do a project, which areas are going to have changes that benefit from participation? • Is there interest in participatory planning? • Are there local organisations and networks interested in planning? • How does this fit into the timing of funding, project approval, etc ? • Think early about decision making structures, and ask: What is the desired scope and level of participation? • Is this to be a broad based planning effort, or an attempt to elicit feedback with a more narrow, issue based focus? • Explore scope for interaction beyond project boundaries • Project identification can in and of itself be participatory, what is important in this area? Or a community group can come up with an idea and seek to be involved in developing it
Identify stakeholders – WHO?	• Are there existing residents' associations or 'Friends of' groups? • This stage requires exploration of the level of trust between stakeholders, community members and decision makers, and an analysis of previous participation and particular political concerns • Stakeholder mapping, identification of key stakeholders and players, and of 'hard to reach' groups • Needs sufficiently broad representation, including: key players; ·pivotal resources; political lynchpins; wide range of sectors included frequently excluded groups; and user groups to allow for ongoing management, maintenance and use • Explore possibilities of working within existing networks and partnerships • Consider the creation of formal stakeholder groups
Inform and engage stakeholders	• Outreach to groups and community members • Create incentives for stakeholders to participate, e g skills training • Develop plans that work in local context • Explore different possible streams for funding as develop project • Careful attention to information provision and creative communication
Active involvement in planning - developing the vision and action plan - HOW?	• Design - Active engagement in planning process (depending on the level of decision making power given to the process) • Requires decision about techniques for engaging participation • May include process of consultation to elicit a broader range of responses to options and plans
Institutional structure and professional capacity to deliver and manage projects and plans	• Can include partnerships and community trusts • Delivery can be through community devolved implementation • Consider support for 'Friends of' groups either existing or new • Explore opportunities for community-based management of site
Monitoring and review	• Can include participatory monitoring of participation process as a review of effectiveness • Develop feedback loops to incorporate learning from implementation
Governance	• Interaction of participation with planning process and policy context • Ongoing process of integration with governing structures and institutions • How is the planning integrated with formal decision making processes?

5.2.1 Introduction to different methodologies

Twenty-eight methodologies that can be used to engage active involvement in planning are compared in this chapter. Consultative methods and methods for informing a broad range of people are not included in this review. The choice of methodologies was derived from the literature and the author's international work experience. This includes several years spent studying with key people in the emerging field of ecological design and sustainability planning, and her experience developing and testing the DesignWays process (see Preface). The list of methodologies is not exhaustive, but covers a comprehensive range of techniques in common use. They are organised under the broad headings:

- Participatory Planning Processes;
- Dialogue Processes;
- Systems Methodologies;
- Environmental Management;
- Sustainability Planning;
- and Ecological Design.

It is difficult to place the methodologies under only one heading, as many of the methodologies could be used for different purposes, dependent on the context. These headings are intended to provide a general guideline, and methodologies have been placed under the heading that offers a good fit for their widely accepted use. The headings are defined below:

- '**Participatory Planning Processes'** are those active collaborative processes which have an explicitly *'territorial and spatial perspective'* (Healey 1997, pg. 4) and a focus on planning changes in the future physical environment.
- '**Dialogue Processes'** are *'deliberative and inclusionary processes'* (Jordan and O'Riordan 2000) that can have a broad range of applications and foci. They can be applied to spatial and environmental planning, but that is not necessarily their main focus.

- '**Systems Methodologies'** are predicated on applying the principles of systems thinking to real-world applications. Several of the methodologies in this review include, and are influenced by, systems thinking (e.g. Future Search), but are not placed under this heading as the application of systems principles is not their main focus.

- '**Environmental Management'** includes those methodologies mainly concerned with environmental impacts and improvements. ICM is focused on the water environment and EIA and SEA are concerned with *'evaluating the environmental consequences'* of proposed projects (EIA) and policy, programmes or plan initiatives (von Seht 1999, pg. 1).

- '**Sustainability Planning'** lies in the interplay of maintaining environmental quality, and promoting economic vitality and social equity. Whilst many of the methodologies described in this review can be used for sustainability planning[32], those classified under 'sustainability planning' in this review are those especially concerned with making the concept of sustainability operable.

- '**Ecological Design'** refers to the process of applying principles derived from natural systems to the design of future options. This process can be applied to spatial planning, building design,

- and production and manufacturing processes.

Table 5-2 includes a brief description of the twenty-eight different participatory planning methodologies, which will be explored in more depth in the remainder of this chapter. All of these techniques can be applied in a range of contexts. See Appendix Six for a more detailed version of this chart, which includes details of organisations and resources, key authors and research carried out to evaluate these processes.

These methodologies cover a range from encouraging dialogue processes in general, to a more specific concern with environmental issues. There are several overlaps in the methodologies, and some of the proprietary techniques could be seen as examples of the more general methodologies, e.g. 'Planning for Real' is a particular form of

[32] Whilst participation is considered to be the foundation of the Local Agenda 21 (LA21) process, LA21 is not necessarily a participatory planning process per se, it is a broader programme, within which "local governments are using a variety of methods to reach out to their communities to improve public participation" (International Council for Local Environmental Initiatives 2002, pg. 15).

'Community Planning and Architecture'. The differences between these methodologies in terms of accreditation and status are clarified in Table 5-3.

Table 5-2 Description of different planning methodologies (summary)

Methodology	Description
Participatory Planning Processes	
Planning for Real®	Planning for Real is a participatory planning methodology that uses large-scale models and options cards to allow participants to develop and prioritise ideas for their area. It is a "*highly visible, hands-on community development and empowerment tool*" (Wates 2000, pg. 100).
Enquiry by Design	"*This technique brings stakeholders and urban design professionals together for an intensive period of joint work outside of the normal procedural context. Using creative design-driven processes, they seek to find 'win-win' solutions for sustainable development*" (Barton, Grant and Guise 2003, pg. 79)
Community Envisioning	This is a generic term that covers facilitated visioning processes. Participants are asked to imagine a desired future and to express this in a variety of ways. Workshops often use guided visualisation techniques.
Action Planning	"*Action planning events allow people to produce plans of action at carefully structured sessions at which all those affected work creatively together*" (Wates 2000, pg. 24).
Community Planning/ Architecture	Community planning and architecture are broad areas of activity that engage client and public participation in the design process for settlements and landscapes. The scope and depth of participation can vary, from a general survey of preferences to in-depth hands on design workshops, which help participants to understand the design skills utilised by professionals. "*The activity of community design is based on the principle that the environment works better if the people affected by its changes are actively involved in its creation and management instead of being treated as passive consumers*" (Sanoff 2000, pg. x).
Parish/ Community Mapping	Parish or community mapping is a process of involving residents in creating maps of their areas. The mapping process and the final products can take many forms, and may use many media. They are intended to distinguish the character and distinctiveness of a local place, drawing on the memories and knowledge of the people who live there.
Dialogue Processes	
Future Search	"*Future Search is large-group, participatory planning process aimed at building common directions for action on complex social and organizational issues*" (Polanyi 2002, pg. 357). It aims to *'get the whole system in the room'* by having as many participants as possible from a wide range of backgrounds attend.
Appreciative Inquiry	Appreciative Inquiry has been described as *"the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate, and heighten positive potential*" (Cooperrider and Whitney 1999, pg. 5).
Open Space Technology	"*Open Space Technology is one way to enable all kinds of people, in any kind of organization, to create inspired meetings and events…In Open Space meetings, events and organizations, participants create and manage their own agenda of parallel working sessions around a central theme of strategic importance*" (Herman 2003).
Citizens' Jury™	Citizens' Jury is a process that mimics a judicial model to engage 'expert witness' and allow a random sample of the population to deliberate over complex issues. The issues considered in citizens' juries can range from planning disputes to deliberating about new ways to help deliver rehabilitation to drugs offenders. An attempt is made to select a representative section of the public to participate (Jefferson Centre 2002).

Methodology	Description
Participatory diagramming	Participatory diagramming is a method of including people in analysing various aspects of community life using large diagrams, often with locally available materials such as string and rocks. There are several models, such as ranking matrices and seasonal calendars, which have been developed largely in rural development work, and have since been extended to research in urban areas.
Participatory/ Rapid Rural Appraisal	PRA/RRA is "*a family of approaches and methods to enable rural people to share, enhance and analyze their knowledge of life and conditions, to plan and to act*" (Chambers 1994, pg. 953).
Action/ Participatory Research	Action research involves direct intervention in a particular context or situation as part of the research process. Much action research has taken place in educational and health settings, with new ideas being tried as part of a 'real world' trial. Participatory Research is "*a form of action research which empahsizes the participation of research subjects*" (Pain and Francis 2003, pg. 47). This participation can include deciding on the problem to be addressed, appropriate methodologies, gathering data and participation in the analysis of data.
Roundtables and workshops	Informal meetings that include interactive group work. Can be facilitated or not, these are generic techniques which are often used to work out particular issues arising from participation. Roundtables may convene over a longer time period to develop ideas on a theme from a range of perspectives.
Participatory Theatre and Arts	This approach uses physical movement and creativity to explore people's own experience. This works particularly well with people who are alienated by more formal or verbal participation methods. Projects often start with workshops for a specific group of people, and may go on to involve the public through events in a range of settings (Lewis, J. and Walker 1999, pg. 40).
Systems Methodologies	
Soft Systems Methodologies	This is a methodology of applied systems thinking, which works with complex problems. It is a formal tool for diagramming actors' concepts and the interaction of parts of a system. The methodology is based on the assumption that is possible to make models of complex reality, and that though the models are abstract, they can be turned into physical artefacts that can then be checked against reality. Whilst there have been many variations of ways of applying Soft Systems Methodologies, a set of constituent rules has been published, which gives general principles that should be followed for a process to be called a Soft Systems Methodology (Naughton 1977).
Holistic Landscape Ecology	"*Landscape ecology is the study of spatial variation in landscapes at a variety of scales. It includes the biophysical and societal causes and consequences of landscape heterogeneity. Above all, it is broadly interdisciplinary*" (International Association of Landscape Ecologists 2003, section Landscape ecology: what is it?, para. 1).
Syntegration®	Developed by Stafford Beer as a means of "*containing and connecting the requisite variety required for a group of people to match its response to the complexity of the environment*" (Leonard 2003, pg. 1). The main focus of this method is on how to engage a number of different stakeholders in fruitful discussion and integration of a wide range of ideas.
Environmental Management	
River basin planning/ ICM	Integrated Catchment Management (ICM) is the "*integration of land and water management*" (Gardiner 1996) and as such offers a mechanism for applying such an approach. ICM was formalised in the late 80's, and is seen by some planners as "*a natural step from EIA and SEA in the evolution of ecological management*" (Flournoy 1995, pg. 85).
EIA/SEA	Strategic Environmental Assessment is "*a systematic process for evaluating the environmental consequences of proposed policy, programmes or plan initiatives in order to ensure they are fully included and appropriately addressed at the earliest suitable stage of the decision making process*" (von Seht 1999, pg. 1). It has developed from the process of Environmental Impact Assessment (EIA), assessment at the site level of scale. These methodologies differ from many of the others described in

Methodology	Description
	this table, as there is now a legal requirement for EIA in more than 100 countries, (Barker and Wood 1999) and the SEA Directive has now been adopted (European Commission 2001a).
Multi-criteria Assessment	Multi-criteria Assessment takes account of a range of variables. Attempts to provide a detailed exploration of different criteria for decision making, and encourage dialogue about weighting and prioritisation of criteria. Used in Decision Support Systems, often with graphic displays of weighting.
Sustainability Planning	
The Natural Step™	The Natural Step provides a framework for long-term 'planning for sustainability'. As a tool it reduces confusion, cutting through seemingly conflicting information in the sustainability debate. It can be used as a compass for navigating step-by-step towards long-term economic and ecological sustainability.
Holistic Management®	Holistic Management is an integrated planning process which aims to change the way that decisions are made, so that plans are tested against a clear vision of a desired future state, which has been created with an understanding of social, ecological and economic sustainability.
Quality of Life Capital	"*The Quality of Life Capital approach is a tool for identifying what matters and why, so that the consequences (both good and bad) of plans, development proposals and management options on quality of life can be better taken into account by practitioners and decision takers*" (Quality of Life Capital Website 2003).
Sustainable Regional Planning	A planning process that grew from analysing patterns of natural resources in the landscape to determine the most appropriate areas for human development. The methodology has evolved into a process for planning which emphasises local and natural values, and which integrates a large amount of information about an area into a form useful for planning through the use of maps and creation of large-scale spatial plans.
Bioregional Planning	"*Bioregionalism offers an alternative to the arbitrary nature of political divisions and boundaries. It encourages a sane use of local resources, proper management of wildlife and the development of healthy, co- operating communities.* *A bioregion is a division of land based on geographical, cultural and historical factors. Factors which can be taken into account include: watershed and water supply; landforms and soil types; vegetation types; and cultural factors, such as regional dialects and different customs; or shared concepts of belonging to an area and group of people. A bioregional ethic involves increased regional and local self-sufficiency*" (Tippett, J. 1994, pg. 14)
Ecological Design	
Permaculture©	Permaculture is a design method based on ecological principles. The focus is on the creation of high quality, sustainable human habitats. It can be applied at many levels of scale, from garden and landscape design to site planning, the integration of agriculture and forestry and urban/rural design.
Ecological Design	Ecological design is a process of thinking about future options for a particular system (e.g. product or process, buildings, community, landscape area, geographical or organisational integration of these sectors) from the perspective of long-term sustainability, which is based on principles derived from natural systems.

Table 5-3 clarifies the status of these methodologies. As discussed above, several of these methodologies could be seen as specific examples of a generic category, whilst others are proprietary. Some require accreditation, some use specific materials and several have dedicated organisations.

Table 5-3 Comparison of Methodologies – Status of Process

Main Focus	Participatory Planning Process						Dialogue Process										Systems Methodology			Environmental Management			Sustainability Planning					Eco-logical Design	
Methodology / **Component**	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal Participatory/Rapid	Research Action/Participatory	Roundtables and workshops	Participatory Theatre and Arts	Methodology Soft Systems	Ecology Holistic Landscape	Syntegration®	Multi-criteria Assessment	EIA/SEA	River basin planning/ICM	The Natural Step™	Holistic Management®	Quality of Life Capital	Sustainable Regional Planning	Bioregional Planning	Permaculture©	Ecological design
Has accredited training/ certification of process	■									■		■						■		■			■			■	■	
Uses specific tools and materials	■															■		■					■	■		■		
Has a dedicated organisation	■						■	■	■	■							■	■				■	■	■		■	■	

Legend			
has this component	■	not applicable, or no relationship	
may have component		specifically does not have this component	X

5.3 The DesignWays Approach

SUNstainable DesignWays™[33] is a toolkit developed by the author for enabling community and stakeholder participation in ecological planning (see Table 5-4 below). Large, colourful Mind Maps provide a transferable structure to coordinate the hands-on process. Participants use creative thinking tools to develop new options. It is built on a framework for understanding sustainability, and combines aspects of several methodologies, including ecological design and holistic management. The underlying 'systems thinking' approach helps to integrate these different aspects.

Its interactive tools and creative methods aim to deliver dialogue that is animated and engaging. The process was designed to help participants take a holistic view that enhances local assets. The expected results are twofold:

- viable plans that reflect resident and stakeholder aspirations and the distinctive character of an area,
- and capacity building, such that participants learn skills of communication and ecological design.

DesignWays has been developed into an Open College Network accredited course[34], including the first stages of progression through a train-the-trainers programme.

Table 5-4 Status of Process – DesignWays

SUNstainable DesignWays	
Has accredited training/ certification of process	
Uses specific tools and materials	
Has a dedicated organisation (but not yet officially registered)	

Insights from several of the participatory and sustainability methodologies reviewed in this chapter have informed the development of DesignWays. The author made a

[33] Holocene Design (Joanne Tippett and Buddy Williams) coined the term 'SUNstainability' because the term 'Sustainability' is often used without reference to ecology and the vitality of the biosphere. SUNstainable implies the capacity to continue within the sun-driven cycle of ecology, without which there would be no economy or society.

[34] Accredited through the Merseyside Open College Network, Learning Programme Title: SUNstainable DesignWays – Skills and Practice.

conscious attempt to build on and learn from her experience in the field in developing this process (described in the preface to this thesis). The influences of different methodologies on the development of DesignWays are summarised below in Table 5-5.

Table 5-5 Influence of Other Participatory Methodologies on DesignWays

Methodology	DesignWays
Participatory Planning Processes	
Planning for Real®	was influenced by
Enquiry by Design	has similarities with
Community Envisioning	has similarities with
Action Planning	has similarities with
Community Planning/ Architecture	has similarities with
Parish/ Community Mapping	incorporates aspects of
Dialogue Process	
Future Search	has similarities with
Appreciative Inquiry	has similarities with
Open Space Technology	
Citizens' Jury™	
Participatory diagramming	was influenced by
Participatory/ Rapid Rural Appraisal	was influenced by
Action/ Participatory Research	
Roundtables and workshops	
Participatory Theatre and Arts	was influenced by
Systems Methodology	
Soft Systems Methodologies	was influenced by
Holistic Landscape Ecology	incorporates aspects of
Syntegration®	
Environmental Management	
River basin planning/ ICM	was influenced by
EIA/SEA	
Multi-criteria Assessment	was influenced by
Sustainability Planning	
The Natural Step™	incorporates aspects of
Holistic Management®	incorporates aspects of
Quality of Life Capital	has similarities with
Sustainable Regional Planning	was influenced by
Bioregional Planning	was influenced by
Ecological Design	
Permaculture©	incorporates aspects of
Ecological Design	incorporates aspects of

5.4 Comparison of DesignWays and other Methodologies

In the literature review some papers commenting on the *lack* of systematic evaluation of the effectiveness of participatory methodologies were discovered (e.g. InterAct 2001; Warburton 2002), but none containing a systematic review of a range of methodologies.

In a survey into participation in local authorities by the DETR, the researchers commented, *"Most local authorities accept the principle of 'fitness for purpose' - the value of using different methods to work on different issues and with different citizen groups".* They went on to say that in practice the Authorities *"adopt ad hoc approaches to the selection of public participation methods"* (de Montfort University and The University of Strathclyde).

The guide *PARTICIPATION WORKS!* includes descriptions and brief case studies of several different methodologies, including information on general resource requirements. It suggests that readers should develop their own criteria for choosing methodologies, and provides some information to help readers to make that choice. The guide reminds readers *"that participation, and choosing participatory techniques, is not a science"* (Lewis, J. and Walker 1999, pg. 5). The following review offers a starting point for characterising different methodologies. In the absence of a systematic evaluation of many of the methodologies, such as carried out for 'Future Search' by Oels (2002), much of this information has been derived from discussion with practitioners, from printed resources, and websites of the organisations. A review of research conducted into the different methodologies has provided additional information (sources summarised in Appendix Six - Overview of Participatory Methodologies). Information has also been incorporated into these tables from several practitioners and academics that provided comments on these tables[35].

[35]Many thanks to the following for providing comments:

- Matthew Wilkinson (Sustainability Policy Officer, NWRA);
- Dr. Anna Carr (School of Human Sciences, University of Surrey);
- Dr. Emma Griffiths; (Principal Street Environment Manager, Manchester City Council);
- Angus Soutar (Permaculture Designer, participant in LGMB Consensus Building pilots of 1996/97);
- El-Moustafa Eweda, (Ph.D. researcher, School of Planning, University of Manchester);
- Perry Walker (New Economics Foundation);
- Dr. Stephen Martin (Institute of Environmental Scientists);
- and Nuala Murphy (Research Assistant, CURE).

There is no easy way to categorise or compare participatory methodologies. This analysis is not intended as an evaluation of the effectiveness of the methodologies, but rather as an exploration of their different components. In this research these components are explored through an in-depth evaluation of an application of the DesignWays methodology. It would be useful to explore these components in a comparative evaluation of the effectiveness and impacts of these different methodologies. Such an in-depth evaluation of the different methodologies, however, is beyond the scope of this research.

5.4.1 Attributes and Components Used in Review

There are five essential attributes of DesignWays:

1. educational framework of sustainability;
2. ecological design process*;*
3. creative involvement of stakeholders in planning process;
4. scaleable design language to link different geographic levels of scale;.
5. and underlying framework of systems thinking.

The following review is structured around these five attributes. The theoretical basis of each of the attributes is explored, followed by a critical review. A table comparing the methodologies supplements the description of participatory methodologies above. These tables show several possible components that could express the attributes. The components used to compare methodologies in this review were derived from the theoretical underpinnings of the DesignWays methodology, the practical expression of this theory, and a broad literature search.

This review is not meant as a normative description of 'goodness' of these different aspects of participatory methodologies. It is not necessarily 'good' to have, for example, an educational framework of sustainability, to require a trained facilitator, or to have a structured design process. Whether or not to include these components is a choice of approach, and there are positive and negative aspects of many of the components. This reviews offers a framework to help understand differences between the approaches. This research includes a consideration of the benefits of these components as they are used in

the DesignWays approach, analysed through the lens of participants' experience in Chapter 7.

Many of the components may or may not be exhibited in a particular methodology, depending on how the methodology is applied. Many of these components are highly variable depending also on the context of application, e.g. the institutional and programmatic variables which can impact the application of the methodology. These variables account for many of the grey boxes in the tables below.

5.5 Educational framework of sustainability

Forum for the Future's definition of sustainable development is *"A dynamic process which enables all people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the Earth's life support systems"* (Forum for the Future 2002).

Whilst the goal of sustainable development is one with wide acceptance, an understanding of how to apply sustainability in practice is not as easy to come by. The concept is sometimes seen as ambiguous and sometimes even meaningless. For example, in a paper about the future of the planning system and its ability to deliver sustainable development, Rydin (2003, pg. 2) says,

> *"Policy makers and politicians have found it easier and politically more prudent to rely on the inherent ambiguities of the concept rather than risk finding themselves tied to a clear and precise definition".*

Forman (1998) suggests that while sustainable development may be more of a process than an end point, indeed that it may be impossible to achieve, it is possible to define a desired trajectory. In order to operationalise the concept, it is important to more clearly define what we are trying to achieve. Solutions developed within a framework of clear sustainability principles are less likely to have counterproductive effects in the long run.

Several researchers in the field of water management have suggested that participatory planning in complex situations requires that principles of sustainability are agreed upon at the beginning of the process, and that they are subsequently used as criteria in decision making (e.g. Gardiner 1996; Rijsberman and van de Ven 2000). The Natural Step (TNS) provides such a framework.

5.5.1 The Natural Step

The Natural Step (TNS) is a framework of sustainability criteria built on basic scientific principles (Case Study 5-1 and Figure 5-2). These have been agreed as both valid and useful in extensive rounds of dialogue amongst leading scientists and practitioners in Sweden, and subsequently in many of the countries in which TNS has been licensed (e.g. USA, UK) (Nattrass and Altomare 1999; Robert 2000; Wingspread 1997). DesignWays uses the framework of TNS as an educational tool and in its decision making process.

Case Study 5-1 Basic Science Principles – The Natural Step

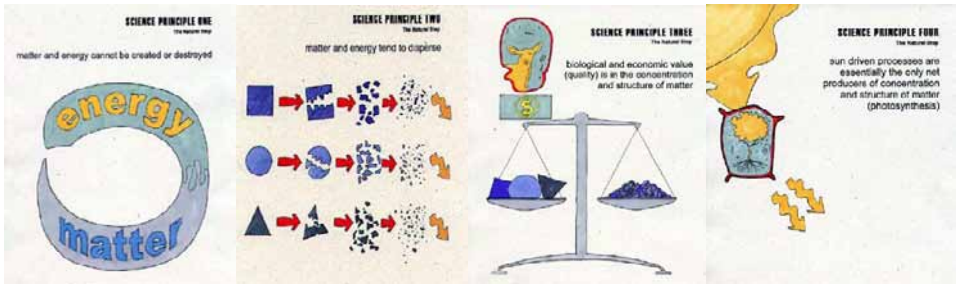
1. Matter and energy do not appear or disappear (1st law of thermodynamics & law of conservation of mass).

2. Matter and energy tend to disperse (2nd law of thermodynamics).

3. Biological and economic value (quality) lies in the concentration and structure of matter.

4. Sun driven processes are essentially the only net producers of concentration and matter (photosynthesis).

Figure 5-2 TNS Basic Science Principles (diagrams developed by the author)



The TNS framework aims to cut through confusion in the sustainability debate by defining the condition of sustainability in broad terms. It achieves this by describing the functioning of the Earth's bio-geo-chemical cycles in systems principles. It then logically works out how society is acting in systematically unsustainable ways (Case Study 5-2 and Figure 5-3). It takes *"natural states as desired end-points"* (Upham 2000b, pg. 183). Taking this as a starting point for communication about possible directions, it is possible to understand what needs to change in order for behaviour to be sustainable in the long run (Holmberg 1998). The logic of sustainability

rests in part on the concept of our reliance on the exergy (negative entropy) produced by ecosystems, upon which all human activity is reliant. This point was clarified in relationship to the economy by Georgescu-Roegen (1975) and emphasised by Daly, (2002, pg. 108) in an address to the World Bank, *"value cannot be added to nothing. Neither can it be added to ashes, dust, rust, and the dissipated heat energy in the oceans and atmosphere".*

Carpenter (1995, pg. 177) suggests *"it's possible for us to be more accurate about our unsustainability than our sustainability".* The scientific principles developed in extensive rounds of dialogue in TNS were elaborated into a framework for sustainability at the level of the entire Earth, the largest scale system directly influenced by human actions.

Case Study 5-2 System Conditions of Sustainability - The Natural Step

In a sustainable society, nature is NOT subject to systematically increasing:

1. concentrations of substances extracted from the earth's crust;

2. concentrations of substances produced by society;

3. degradation by physical means;

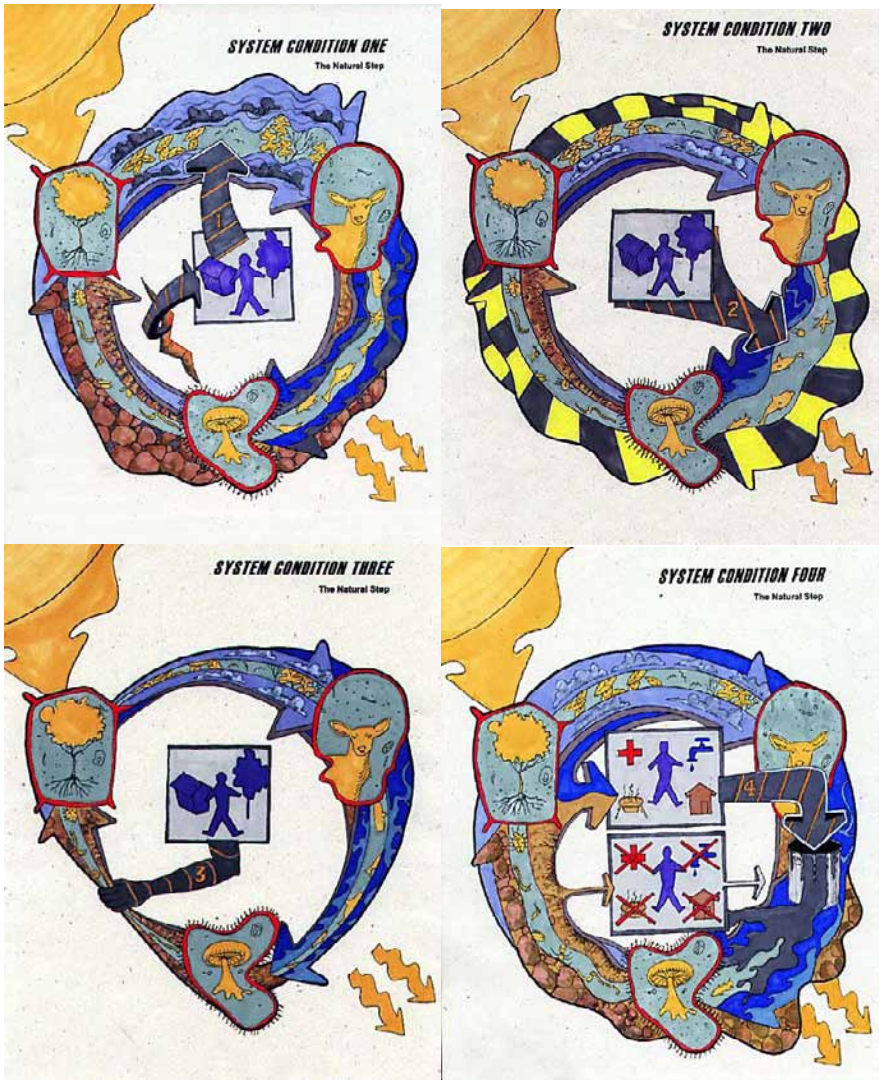
and, in that society ...

4... human needs are met worldwide.

© TNS (see **http://www.naturalstep.org.uk** for updates)

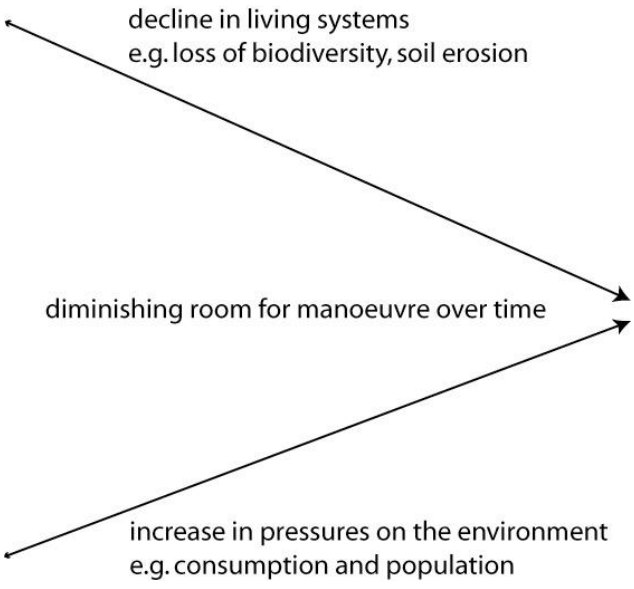
These principles describe the minimum that needs to be achieved in order to realise a sustainable 'society-in-nature' system. They do not provide a detailed explanation of the necessary steps to achieve that state, but they do provide a useful guideline to understand the major issues that need to be addressed in order to achieve sustainability.

Figure 5-3 Four System Conditions of The Natural Step (diagrams developed by the author)



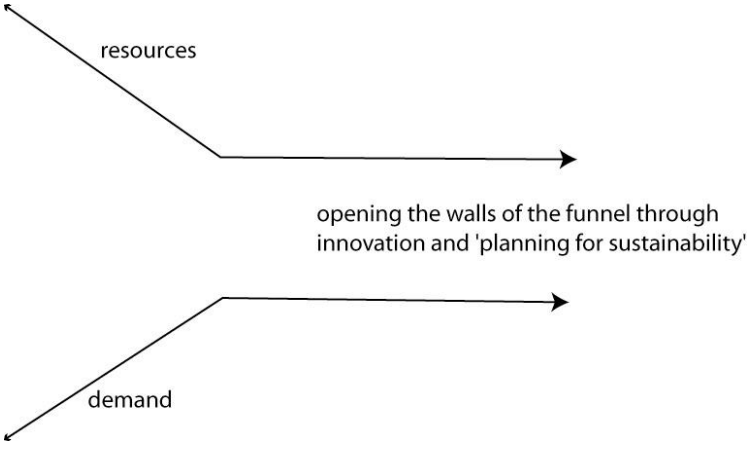
In TNS, the metaphor of a funnel is used to describe the effects of violating these system conditions (Figure 5-4). The closing walls of the funnel represent a loss in quality and capacity of the Earth's support systems, and its ability to meet human needs.

Figure 5-4 The walls of the funnel



The system conditions can be used to develop a description of sustainability, seen as opening up the walls of the funnel and increasing options for the future (Figure 5-5).

Figure 5-5 Opening the walls of the funnel



An important aspect of the TNS framework is that it can be used to develop a shared mental model, one which facilitates dialogue through building on common understanding about sustainability (Robert 1991). Discussing a visioning process to reach *"a shared vision of a sustainable and desirable USA in 2100",* Farley and Constanza (2002, pg. 246) state:

> *"What is lacking is a clear unified vision of what sustainable development entails. In short, without a coherent, relatively detailed, shared vision of what a sustainable society would look like, economists (and other policy-oriented scientists) lack the clearly defined ends required to guide their efforts".*

Much of the work on developing non-monetary measures and concepts of sustainability has focused on ways of measuring and assessing the state of the environment, or *'environmental quality indicators'*, as opposed to the *'relations between society and the ecosystems'* (Azar, Holmberg and Lindgren 1995. pg. 2). These tend to focus attention late in the causal chain, and can be slow to give warning signals about damage to the environment, as there are often time delays between emissions and effects. Once the effects can be measured, the damage has already been done.

Using the TNS system conditions focuses attention on the societal activities that *cause* environmental damage (Azar, Holmberg and Lindgren 1995). As such, they can assist in moving plans beyond 'end of pipe solutions', which deal with the symptoms of the problems, rather than changing the processes and actions that cause pollution in the first place. Such a change implies a need to *change the way we make decisions*, such that options are tested against the question: 'Is this likely to be sustainable in the long run?'.

There are numerous examples of TNS being used as a pedagogic and strategic planning tool in companies such as Tarmac, BP Air, Wessex Water, Electrolux, Ikea, Scandic Hotels, McDonalds Sweden, Interface and Collins Pine (e.g. Holliday, Schmidheiny and Watts 2002; Martin, Stephen et al. 1999; Nattrass and Altomare 1999). A dialogue process using the TNS framework has been organised amongst different stakeholders in fields as diverse as Sustainable Urban Drainage Systems and the PVC industry, with the aim to find areas of consensus as a common platform for action (e.g. Everard, Monaghan and Ray 2000; Everard and Street 2001).

By conceiving of a picture of sustainability as a goal in the future, Robert (1997, pg. 4) suggests that it is possible to overcome many of the limitations of other models of sustainability, which start with today's conditions and circumstances. These disadvantages include the possibility of investing in *"sub–optimised measures, or blind alleys that do not lead to the significant environmental improvements possible by taking into account a larger picture of what a*

sustainable society could look like". Through a process of backcasting[36], a tool used in the TNS framework, it is possible to see if there are solutions to problems outside the trends of today, such that thinking is not limited to what appears to be realistic given today's issues and concerns (Robert et al. 2002).

5.5.2 Critique of The Natural Step model

There is an implicit emphasis in the TNS framework on the precautionary principle, which is considered by some practitioners to be too conservative. Due to the aim of promoting principles with a broad base of consensus, TNS deliberately refrains from making judgements of damage thresholds or critical concentrations, which are open to interpretation, hard to predict, or likely to be contentious. Instead, they use a *"criterion of systematic progression or worsening",* which are based on rate corollaries, contrasting anthropogenic[37] rates of dispersion of matter with natural flows and break down of matter. These are difficult to measure accurately and there is no agreed-upon methodology for converting global flows into measures for local areas (Upham 2000a, pg. 447).

Upham's (2000a, pg. 451) assertion that *"failure to explicitly deal with toxicity is a serious shortcoming of TNS"* is a criticism that only holds when TNS is used in isolation from indicators relevant to local and sectoral conditions and decision making criteria. The development of such criteria is an essential component of implementing TNS in a management or design process. TNS explicitly deals with global trends that are likely to cause unsustainable conditions, and recognises that there may be other, local problems caused by emissions that would not necessarily constitute a long-term risk to global sustainability, but have significant local impacts. In particular, any analysis of emissions should be linked to likely effects on human health, and to an understanding of the concept of critical load and level in local ecosystems, so that the

[36] The process of backcasting creates an image of a desirable future, from which a process of development can be worked out to achieve the future envisioned state. It focuses on how to achieve a desirable future state, and as such is a normative tool, which involves working backwards from the imagined point in the future to the current situation and working out how the desirable future can be attained. Backcasting is a suitable methodology for situations when (adapted from Dreborg 1996):

- the problems under study are complex;
- there is a need for a major change;
- dominant trends are part of the problem;
- the problem consists of or is affected by externalities, or factors with which the market cannot adequately deal;
- there is a long enough time horizon to allow for deliberate choice.

[37] Anthropogenic – induced by the action of humans.

vulnerability of receptors is factored into any decision making on a project level (O'Riordan and Jordan 2000).

The combination of the use of water quality standards, the setting of emission limits and the monitoring of 'ecological status' in the WFD (Kampas, Edwards and Ferrier 2002) reflects the concern that the measurement of single aspects of environmental quality failed to capture overall environmental quality, and often failed to identify *"casual linkages or drivers of ecosystem function or dysfunction"* (Tait et al. 2000). Use of the TNS system conditions, in combination with landscape ecology and local scientific investigation, can help to clarify those drivers and causes.

Upham (2000a, pg. 449) suggests that a strict adherence to TNS conditions would make it difficult for less industrialised regions to develop *'expanded physical economies'*. He also mentions in his article that lithospheric materials and synthetic substances already in use and present on the Earth's surface should be *"repeatedly circulated and their access more equally distributed".* In Europe, an area where the development of such physical economies has created many of the water quality problems that the WFD aims to address, the challenge is to learn how to redesign our physical infrastructure and resources flows such that we are able to maintain healthy ecosystems. This knowledge could prove invaluable in less industrialised regions, enabling 'leapfrogging' over the 'Western' route of development to one that does not create such a legacy of environmental problems.

Upham (2000a, pg. 449) suggests that any decisions as to what level accumulation of materials may be considered to be appropriate in human society are in themselves value judgements, which *"complicates the scientific pretensions of TNS".* The fact that applying TNS principles involves value judgements, and decision making using the tool does have to deal with the situation as it is today, does not necessarily invalidate it as a model for 'planning for sustainability'. Cortner (2000) suggests that value judgements are an inevitable part of any attempt to deal with the interplay of social and technical issues. O'Riordan (1998) suggests that value judgements are *part of* the scientific process and that what is deemed as fact is often decided by consensus. In a discussion of land use planning, Owens and Cowell (2002) stress that the application of sustainability principles inherently involves moral judgements.

The concept of searching for areas of consensus amongst the research community has been gaining wider acceptance in the discourse following a post-Kuhn and post-modern questioning of the possibility of an objective scientific viewpoint (e.g. Hammersley 1990; Smith and Deemer 2000). As discussed above, the formation of the scientific principles that underpin the system conditions underwent an extensive peer review process[38].

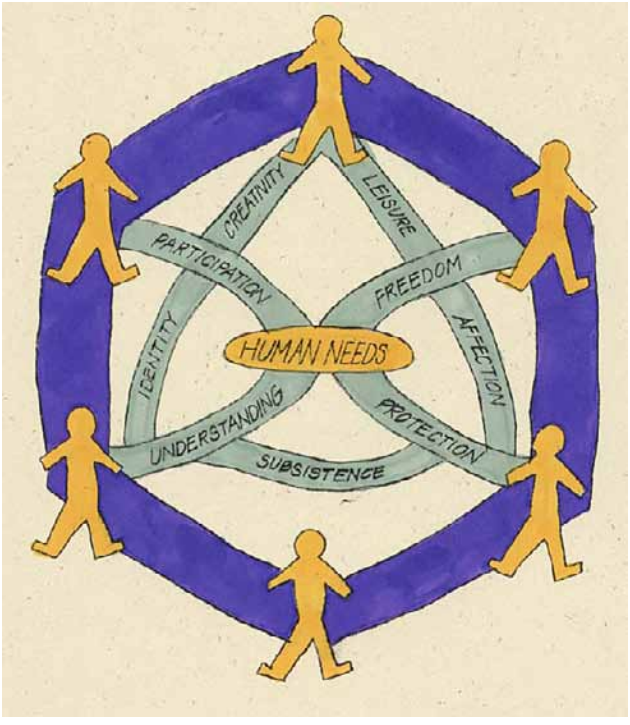
Another major criticism of TNS has been that the fourth system condition, which deals with the concept of human needs, is not a scientific principle, and that it implies value judgments as to what constitutes a 'fair' use of resources. Such a view is supported by many critiques of the current trajectory of 'development', which often serves to make the rich richer, and erodes local control over resources and technology, such that local food security and employment is threatened, with the poorest the most affected by any negative consequences (e.g. Lappe and Collins 1986; Shiva 1989).

Much discussion has centred on exactly what human needs are amongst TNS practitioners. Manfred Max-Neef is a Chilean economist and 'development' expert, who has elaborated a system of human needs[39] (Max-Neef 1991a, b) (Figure 5-6). Integrating this system into the pedagogy of TNS has moved this discussion into a more fruitful and creative avenue. This integration was discussed by Holmberg and Robert at the May 1998 Natural Step conference in Chicago, and is further discussed in a recent article on backcasting and TNS (Holmberg 1998).

[38] This has been repeated in several countries, for example, at the Wingspread conference in Racine, Wisconsin, more than twenty scientists, including Nobel Prize winners, signed a declaration: *" We believe that the application of The Natural Step's four system conditions is a valid approach for addressing [environmental] problems, and is especially useful for organising information regarding sustainability"* (Wingspread 1997).

[39] Max-Neef's system of human needs suggests that there are nine fundamental needs, which remain the same in different cultures (Max-Neef 1991b). The way cultures in different times and places satisfy these needs changes, rather than the needs themselves. In this analysis economic development is seen as a satisfier of more fundamental needs, not a need in and of itself. The form of economic development can inhibit the meeting of other needs. Rydin reminds readers that the background of the concept of sustainable development lay in alleviating poverty, and led to the idea of *"a new kind of economic development, one that allows all groups within society to benefit from economic activity (whilst also taking ecological systems into account)"* (Rydin 2003, pg. 3). As in TNS, Max-Neef's definition of human needs is seen as an inter-related *system*, if one of them is not met, there will be pathologies in the system. After subsistence (which includes sufficient food, water and shelter, and is a prerequisite for the other needs to be met) these needs are non-hierarchical, and all are essential.

Figure 5-6 Max-Neef's System of Human Needs (diagram developed by the author)



The use of TNS in participatory planning is discussed in more depth in Tippett (2004b). Table 5-6 shows the relationship between participatory methodologies and the use of an educational framework of sustainability.

Table 5-6 Comparison of Methodologies - Educational framework of sustainability

Main Focus	Participatory Planning Process						Dialogue Process									Systems Methodology			Environmental Management			Sustainability Planning					Eco-logical Design	
Methodology / Component	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal Participatory/Rapid	Research Action/Participatory	workshops Roundtables and	and Arts Participatory Theatre	Methodology Soft Systems	Ecology Holistic Landscape	Syntegration®	Assessment Multi-criteria	planning/ICM River basin	EIA/SEA	The Natural Step™	Management® Holistic	Capital Quality of Life	Planning Sustainable Regional	Bioregional Planning	Permaculture©	Ecological design
Explicit focus on sustainability		■															■			■	■		■	■	■	■	■	■
Uses sustainability criteria in decision making																							■	■	■	■	■	■
Focus on social capital	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■			■	■		■	■	■	■	■	■
Focus on environmental integrity		■															■			■	■		■		■	■	■	■
Focus on economic vitality		■															■			■	■		■		■			

Legend			
has this component	■	not applicable, or no relationship	
may have component, depends how applied		specifically does not have this component	x

5.5.3 Comparison of Methodologies - Educational framework of sustainability

Whilst not all of the methodologies in the above table have an explicit focus on sustainability, it can be seen that all of these methodologies, apart from roundtables, Syntegration and multi-criteria analysis, do have an explicit focus on social capital. Attention to maintaining social capital is implicit in sustainability planning and its development is a goal of most participatory methodologies.

Not all sustainability planning tools are necessarily participatory, or have a focus on the process of participation at their core. The concept of sustainable development has, however, included the need for enhanced participation in decision making from its beginning. The Brundtland Commission made the link between sustainable development and increased participation:

> *"The law alone cannot enforce the common interest. It principally needs community knowledge and support, which entails greater public participation in the decisions which affect the environment" (World Commission on Environment and Development 1987).*

5.5.3.1 DesignWays and an educational framework of sustainability

The use of a clearly understood, common framework of sustainability is an important aspect of the DesignWays process. In its early development this was derived from ecological design principles. These provided a good general model of what to aim for, but did not provide a rigorous set of principles against which to test options. After several years of development, a framework of sustainability based on TNS was added to the DesignWays model. TNS was chosen for several reasons:

- it is based on scientific consensus;
- it offers clear principles for defining the state of sustainability;
- it provides a useful tool for testing whether or not a process or decision is, or is not, tending towards sustainability;
- it is a transferable tool;

- it has been developed to promote dialogue and understanding of the underlying principles of sustainability;
- and its underlying rationale is based in systems thinking.

Of the participatory planning methodologies, DesignWays and 'Enquiry by Design' both include education about different sustainability options, to help broaden participants' understanding of what is possible. Many of the other participatory planning methodologies in the table above aim towards a socially and ecologically sustainable outcome in general terms, without necessarily having an implicit focus on sustainability. The sustainability and environmental management methodologies above tend to have a higher emphasis on education about sustainability. EIA, River basin planning/ICM and Multi-criteria assessment tend to have more of a focus on the technical aspects of monitoring, data collection and analysis than the other techniques. These form an essential complement to participatory processes such as DesignWays.

Table 5-7 introduces the methods used in DesignWays to deliver the components used to compare different methodologies above. These are described in more detail in Chapters 6 and 7.

Table 5-7 Methods to express 'Educational framework of sustainability'

DesignWays Attribute 1 Educational framework of sustainability	
Component	**DesignWays Methods**
Explicit focus on sustainability	• includes education about sustainability • process implicitly encourages discussion about how the participants' ideas relate to principles of sustainability
Uses sustainability criteria in decision making	• uses system conditions of The Natural Step throughout design process • developed a technique for making this use visible in the decision making process
Focus on social capital	• encourages thinking of assets and future possibilities to enhance social capital by including a template dedicated to social capital as part of its organising structure • uses Max-Neef's system of human needs as a stimulus for dialogue in goal setting • design process encourages social learning between different stakeholders and community members
Focus on environmental integrity	• ecological design process and tools help participants to apply the principles of TNS to plans • encourages thinking of assets and future possibilities to enhance ecological integrity by including templates dedicated to landscapes and the built environment as part of its organising structure
Focus on economic vitality	• encourages thinking of assets and future possibilities to enhance economic vitality and sustainability by including a template dedicated to economics as part of its organising structure • includes workshops designed to be of use to businesses to encourage input from business participants

5.6 Ecological design process

> *"Vision, when widely shared and firmly kept in sight, brings into being new systems" (Meadows, Meadows and Randers 1992, pg. 224, emphasis in original).*

Design is the creative process of developing new ideas and possibilities and integrating them within the context of a particular organisation, place and time. It is the active process of engaging with the environment and others to achieve desired outcomes. Design can be seen as a hinge between the future, present and past and between goals, vision and context. It involves *"conceiving and shaping complex systems"* (Lyle 1994, pg. ix).

Ecological design is a process in which societal forms of production, housing and infrastructure are integrated into the landscape with minimal environmental impacts (e.g. Van der Ryn and Cowan 1995). In the process participants are encouraged to step outside of the boundaries of their disciplines, and to view projects over a long time

scale. In an audit of assessment of EIAs of project planning in the UK, Wood, Dipper et al (Wood, C., Dipper and Jones 2000) found that many EIAs *"overlook construction and decommissioning phase impacts, which can often be adverse".* Design on a *'life cycle basis'* requires consideration of the implications of the project over its total time span (Selman and Wragg 1999). This helps to encourage what Brand (2000, pg. 2) terms a *"balancing corrective to [society's] short-sightedness … that encourages the long view and the taking of long-term responsibility"*[40].

Ecological design has a long history of precedents. In the UK in the late nineteenth century, John Ruskin and William Morris questioned the developing industrial model of production and explored instead how to learn from 'nature' in design. Ebenezer Howard developed this work into the idea of the Garden City (1850 – 1928), exemplified by Letchworth and Welwyn Gardens (Farmer 1996). The Town and Country Planning Association (TCPA) was developed to further these ideas.

McHarg (1992) promoted the idea of designing with nature, and designing within the context of landform, watersheds and vegetation of an area. He set out a comprehensive approach to analysing ecological and cultural characteristics of landscapes, in order to determine the best areas for development for particular purposes. At the University of Wisconsin Lewis (1996) has developed a regional design process for sustainability, and advocates the development of 'Sustainable Design Academies', which would offer both a framework, and a location, for interdisciplinary planning on a regional scale.

NGO's, such as Urban Ecology and The New Urbanism Congress, are promoting 'planning for sustainability' concepts and practices. This has been given added impetus from the current political discussion of 'Smart Growth' to counter suburban sprawl in the development of the landscape in the USA. Mollison and Holmgren developed permaculture, an early form of ecological design, in the 70's in Australia. It was originally conceived as an approach for applying ecological principles to productive land management, and has been developed into a holistic system for designing human landscapes and settlements (Holmgren 2003). Permaculture is now promoted and taught by an internationally recognized institution (Mollison 1990).

[40] The Long Now Foundation, which Brand co-chairs, is developing several projects to help encourage long-term, creative thinking about the future, thinking into 'deep time', over a period of 10,000 years, considered to be suitable as this is roughly the time span since the last Ice Age, in which humans have developed agriculture and major civilisations (www.longnow.org/). Such an effort to expand time horizons in thought was behind the author and partner's decision to name their company Holocene, the current geological epoch.

Fuller (1969) was an early advocate of applying ecological principles to human settlements on *'Spaceship Earth',* and the influential design thinker Papanek (1995) has extended his work on design for human needs to include what he calls the *'Green Imperative'*. The philosophical roots of much of the recent work on appropriate technology and green design stems from two influential thinkers, Schumacher (1973), with his focus on *'Small is Beautiful';* and Illich (1987), with his focus on the role that technology plays in structuring social interaction, power relations and learning.

The principles of ecological design can be applied in three main areas:

1. human infrastructure and resource flows;
2. productive landscape management and agricultural areas;
3. and ecological restoration and land use management.

The process of ecological design should look at all three aspects within a geographical area.

5.6.1 Critique of ecological design

Criticisms of the concept of ecologically informed solutions fall into two categories, the practical and the theoretical.

On the practical level, ecological design is difficult to implement, requiring different skills and competencies, both in design and construction, than those for common practices. It is not clear how an ecological design approach fits in with existing policy and procedures. There are high up front costs from the time spent in design. This is the case especially in strategic and large-scale plans, and where there is a high degree of stakeholder involvement. These costs may be mitigated by efficiency gains through streamlining of later projects (e.g. Bass and Herson 2000; Brooke 2000; Verheem 2000).

On a more fundamental level lies the question, 'Do we really know that an ecologically informed design is actually more sustainable than another alternative?'. Several researchers caution about the difficulty of 'measuring' or assessing relative ecological sustainability of options, emphasising uncertainty in any scientific endeavour to understand ecosystems (e.g. Carpenter 1995; George 1999).

The question ‘How do we know that the principles are scientifically based?’ can be asked of ecological design principles. It could be said that these principles cannot be scientifically proven. They originate from theoretical understanding of ecology, observation of ecosystems, and the incorporation of traditional ecological knowledge. The incorporation of the framework of TNS into the decision making process provides a tool for assessing the outcomes of application of the principles. The approach taken to such uncertainty in DesignWays is discussed in Section 5.9.1 ‘Critique of systems thinking’ on pg. 193.

There are thinkers who suggest that design aimed at reducing damage to ecosystems is not necessary. This is termed a ‘cornucopia’ view of nature, in which human needs will invariably be supplied by natural systems. The approach of ‘technological optimism’ suggests that human ingenuity will always be able to solve problems created by technology, so there is no need to limit the application of technology in consideration of ecosystems (e.g. the debate between Norman Myers, a well known environmentalist, and Julian Simon, an economist and outspoken critic of environmentalism, in Myers, Myers and Simon 1994). Botkin (1990) discusses the recent revision of the theory of climax ecosystems to a more dynamic view of change in ecosystems. He contends that the historical role of humans in maintaining ecosystems implies that ecosystems are inherently capable of adapting to human changes. He suggests this means that ecosystems will be able to adapt from human induced changes, without the need for us to be overly concerned about our effects on those systems.

Table 5-8 shows the relationship between participatory methodologies and the use of an ecological design process.

Table 5-8 Comparison of Methodologies - Ecological design process

Main Focus	Participatory Planning Process						Dialogue Process										Systems Methodology			Environmental Management			Sustainability Planning					Eco-Design	
Methodology / Component	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal	Participatory/Rapid Research	Action/Participatory workshops	Roundtables and	Participatory Theatre and Arts	Soft Systems Methodology	Ecology	Holistic Landscape	Syntegration®	River basin planning/ICM	EIA/SEA	Multi-criteria Assessment	The Natural Step™	Holistic Management®	Quality of Life Capital	Sustainable Regional Planning	Bioregional Planning	Permaculture©	Ecological design
Use of creative thinking tools											■					■													
Focus on maximizing existing assets	■	■				■		■			■	■												■	■	■	■	■	■
Tools to apply eco-design principles																											■	■	■
Involving spatial design/ analysis	■	■			■		■												■		■						■	■	■
Holistic perspective - human & ecological	■	■																	■		■	■	■	■	■	■	■	■	■
Focus on underlying processes & patterns																			■						■		■	■	■
Structured design process	■								x								■			■										

Legend			
has this component	■	not applicable, or no relationship	
may have component, depends how applied		specifically does not have this component	x

5.6.2 Comparison of Methodologies - Ecological design process

As can be seen from the table above, ecological design, and some of the sustainability planning methodologies, have a high concentration of the components of an ecological design process as set out in this table, although none of these necessarily has a structured design process. As the participatory planning methodologies focus on spatial planning and design, they also use some of these principles and processes, but do not include techniques for analysing resource flows or ecological processes. The dialogue processes can be used to apply ecological design principles, but this is not their main focus.

5.6.2.1 DesignWays ecological design process

Several practitioners and researchers have developed concepts and principles of design from the point of view of landscape ecology (Forman 1998; Lewis, P. H. 1996; McHarg 1992; Naveh and Lieberman 1994; Thompson, G. and Steiner 1997). These integrate principles (mainly focused on ecological integrity from a landscape point of view) and ideas on timing and stages of design. Their ideas form an essential backdrop, context and integrating matrix for the design of human structures. Forman develops concepts of patterns and form in the landscape, and suggests a generic process for planning spatial development to conserve important ecological features in the landscape. This has influenced the ecological analysis of DesignWays. The landscape ecology approach does not, however, provide an integrated approach for designing human settlements and productive infrastructure in an ecologically informed way, such as in the fields of industrial ecology or ecological design.

Ecological design does not *necessarily* involve a participatory process. Indeed, Fletcher and Goggin (2001, pg. 16) contend, *"the success of a range of approaches to ecodesign is at least partly contingent on people and this largely has been overlooked to date".* Permaculture design places emphasis on working with the client's interests and needs. Accredited design courses include sessions on local economic development and community building (e.g. Statham 2000), and there is a strong emphasis in the teachings on the interrelationships between human and natural systems (e.g. Bradshaw 2000, writing about community gardens on a brownfield site in Newcastle). The Rudina Permaculture Research Institute (http://www.rudina.org.mk/), a

permaculture development on a former refugee camp in Macedonia, integrated local participation at all levels, including participation from the Gypsy population as the most vulnerable group in the area. This was seen as *"fundamental to the sustainability of the project"* (Bradford 2000, pg. 8). In the UK, many permaculture projects have developed in tandem with LA21 processes, engaging the community in landscape restoration and agriculture (e.g. Charter 1995). The permaculture process was the starting point for developing the DesignWays approach.

In a discussion of the potential application of participatory futures studies for delivering the WFD, van der Helm (2003) states that there are few examples of such an approach. He cites the visioning tool used in the Georgia Basin Futures Project, QUEST which invites interested citizens and stakeholders to take a 'backcasting' approach *"that identifies the most desirable future and explores the trade-offs involved in achieving it"* (Georgia Basin Futures Project 2003), and the global scenarios work developed in the World Water Visions (Cosgrove, Rijsberman and For the World Water Council 2000).

Table 5-9 introduces the methods used in DesignWays to deliver the components used to compare different methodologies above.

Table 5-9 Methods to express 'Ecological design process'

DesignWays Attribute 2 Ecological design process	
Component	**DesignWays Methods**
Use of creative thinking tools	• the emphasis of the process is on a futures orientated approach, the design steps help to integrate thinking about existing assets and a possible future system • creative thinking skills are taught • parts of the toolkit help to include creative thinking in the design process
Focus on maximizing existing assets	• several stages of the design process encourage focus on assets and thought about how to enhance them in any future plans • colour coded tools encourage focus on assets
Tools to apply eco-design principles	• permaculture design principles are clarified and organised into tools for design • design templates are used to help make the principles visible and easy to communicate
Involving spatial design/ analysis	• focus of the process is on spatial planning and associated social and economic systems • combines use of maps and overlays with a holistic framework for understanding the interrelated aspects of the physical and non-physical environment • incorporates techniques of community mapping • includes techniques of landscape analysis, including overlays of different landscape types and resource patterns • encourages thinking of assets and future possibilities to enhance ecological integrity by including a template dedicated to the built environment as part of its organising structure
Holistic perspective - human & ecological	• uses templates that ask participants to consider economics, social capital, the built environment and landscapes • the design process asks participants to trace effects of actions in the wider environment • the holistic goal setting process asks participants to consider different ways of meeting human needs and their impact on both the environment and quality of life
Focus on underlying processes & patterns	• ecological design tools help to uncover the underlying dynamics of ecosystems and human/ecological interactions • use of maps and overlays • principles of holistic landscape ecology are used in the process of mapping landscapes and considering changes over time • focus on natural patterns in tools, analysis, and discussion about placement of future elements
Structured design process	• the order of the design process has been carefully considered to promote creative thinking and productive dialogue

5.7 Creative involvement of stakeholders in planning process

Discussion of the Common Implementation Strategy for the WFD recognises the value of *"encouraging creative participation of interested parties"* (European Commission 2001b, pg. 17). Active participation goes beyond consultation, which only

asks people for information and reactions to plans, and instead works with participants to design solutions to achieve their goals. The philosopher John Stuart Mill commented:

> *"It is hardly possible to overrate the value… of placing human beings in contact with persons dissimilar to themselves, and with modes of thought and action unlike those with which they are familiar,… Such communication has always been… one of the primary sources of progress" (Mill 1897; quoted in Wondolleck and Yaffee 2000, pg. 133).*

It is widely accepted that the concept of sustainable development itself can be understood in fairly simple terms, but that implementation and making the concept practically operable are complex and difficult to achieve in practice. Thus there is a need to animate this process, to develop a way of making it more engaging and comprehensible for participants (Linehan and Gross 1998). Speaking of decades of research into planning in the West of the USA., Duane (1999, pg. 59) commented:

> *"The form of community participation matters too, so we should not rush blindly to embrace any form of community participation without regard to whether it will lead to effective planning".*

This insight is echoed by Wondolleck and Yaffee, in their book *Making Collaboration Work*, which summarises a decade of research into collaborative processes between large government agencies (such as the USDA Forestry Service and the US Fish and Wildlife Service), interest groups and communities. They say, *"Taking care of process goes a long way toward improving interpersonal dynamics and can lead to better on–the-ground management of natural resources and communities"* (2000, pg. 101). The top ranked factor for success in one major piece of research they carried out into ecosystem management was: *"the fact that a process was used that differed in significant ways from traditional decision making approaches… the process was more open to real public involvement"* (Wondolleck and Yaffee 2000, pg.101).

5.7.1 Critique of participation in planning

Criticisms of participation range from the practical to more fundamental questions involving power.

From a practical perspective, participation can be time consuming (for both the consulted and consulting) and expensive. Criticisms that participation is costly can imply that the resources devoted to participation siphon off energy and resources from implementing programmes to achieve measurable change.

It is hard to determine if participation has been effective, as there is a lack of easily measurable indicators of process. Attendance at meetings is often taken as a proxy for participation. There is a need to develop more *'downward accountability'*[41]. Such accountability can be enhanced through *"transparency and community monitoring of projects"* (Kolavalli and Kerr 2002, pg. 232). NGOs have an important role to play in ensuring transparency. They act as checks and balances and should be involved in monitoring use and provision of funding, playing *"a counterbalancing role of civil society"* (Kolavalli and Kerr 2002, pg. 233).

Poor application of participatory methodologies can negatively impact their effectiveness. Researchers cite the need for skilled facilitation (de Venney-Tiernan et al. 1994) and careful design of the overall process. Tuxworth (2002, pg. 32) reminds us *"poorly organised participative processes are the bad sex of local politics – they promise so much, only to leave the participants more fed up and frustrated than ever".* Increasing the quality of participation implies the need to invest sufficient time and resources (Jones 2000), and the need to make communication more appealing and efficient (Vos and Meekes 1999).

Engaging *meaningful* participation, in which the results are actually used, requires a genuine commitment on the part of those initiating the participation to listen to the results (Chambers 1997). This implies a need to change governance procedures, including building in incentives and rewards for incorporating participation into decision making, so that it is not perceived as merely an extra duty. It may also require a change in the perceptions of the roles of government workers, who often see themselves as experts providing solutions. Such an attitude can prevent them from communicating meaningfully with communities, as this can be seen as undermining their *'authority and expertise'* (Kolavalli and Kerr 2002, pg. 228).

[41] Downward accountability implies accountability on behalf of the organisations implementing projects to the communities who are supposed to benefit from them. Upward accountability would imply accountability to funders or regulators.

Without careful attention to process, and an attempt to include many voices on an equal footing, participatory processes can be abused and manipulated by vocal or politically aware stakeholders. This is particularly a concern as stakeholders have different power bases and access to resources. For example businesses are able to use money to influence decision making, whereas community groups are often struggling to find the resources to have biscuits at their meetings, much less run television commercials or lobby politicians. Power can also be skewed by the *"unfair influence of those more aware of how to manipulate the process",* which increases the likelihood of creating groups of people who are 'in the know' about participation (usually the articulate and already powerful), as opposed to those who are not effective in the process (Glenn 1994, pg. 26). The process itself might be confusing or off-putting for participants unused to formal meetings, or with little formal education.

Participation processes can entrench existing power relations. Some researchers suggest this can be counter-productive for the very groups it is supposed to help. Despite the recent explosion of interest in reaching the socially excluded (e.g. Burnigham and Thrush 2001/2002; Pain and Francis 2003), participation still has a tendency to be a democracy for those whom practitioners know how to reach, and a decision making process for those who show up. The fact that participation can be time consuming also points to the need to *"analyse the resources that people need to be able to participate in development efforts"* (Cleaver 2001. pg. 55).

The recent book *Participation - The New Tyranny?* explores a range of possible ways that the current 'devspeak'[42] of participation may be counterproductive to the original, emancipatory aims of much of the original emphasis on participation in development work (Cooke and Kothari 2001b). The book discusses cases where the new orthodoxy of participation allow development agencies to carry on with programmes that do not address power inequalities in any deeply structural way, at the same time as applying a gloss of respectability. The contributors to this book do not conclude that this means that the project of increasing participation should be abandoned, but rather that there is a need for careful analysis of structural power relations. They suggest that the way in which participation is deployed and the language used in all aspects of planning participation still requires careful scrutiny if it is not to fall down the 'ladder' towards tokenism and manipulation. The editors, Cooke and Kothari (2001a), whilst unwilling to

[42] 'Devspeak' – the prolific use of the term in development literature and programmes.

answer the central question of the book as to whether or not participation will inevitably be tyrannical, suggest that participation practitioners need to develop a high level of reflexive self-awareness, and cultivate a practice of questioning the process of 'development'.

This criticism echoes those of thinkers who suggest that the very foundations of 'development' (and it could be added 'regeneration') require careful analysis (e.g. Lappe and Collins 1986; Lappe and Lappe 2002; Shiva 1989). Who is developing whom, and for what purpose? Who stands to gain from the regeneration process? Who defines what is in need of development, and what is an appropriate outcome from a development process? Attention to the micro-politics of participation can obscure the need to focus on larger scale inequalities and power relations. There is also concern that focusing on the local scale may obscure the bigger picture of regional priorities, or issues which participants don't perceive as important (Groundwork UK 2002). This may be particularly important when considering sustainability issues. Participative democratic decisions developed through dialogue, as advocated in Habermas' (1984) *Theory of Communicative Action*, can still have negative, irreversible effects on the environment, no matter how democratically sound the process (Skollerhorn 1998).

An important issue in terms of thinking about participation in catchment planning is the degree to which local people and groups are given actual powers to make decisions. In India, the success of NGO-led participatory approaches to natural resource planning led the Ministry of Rural Development to give local people a high degree of power to make decisions about watershed projects since the early 90's. The Ministry of Agriculture has also adopted a similar approach to local empowerment (Kolavalli and Kerr 2002).

Attempts to devolve power through participation raises legal questions. For example, to what extent should the opinions of a few individuals, who have been involved in planning, override those of elected representatives? The extent of public participation needs to be carefully thought out and the relationships to legal structures clarified (Cate 1999).

Table 5-10 shows the relationship between participatory methodologies and the process of participatory communication.

Table 5-10 Comparison of Methodologies - Creative involvement of stakeholders in planning process

Main Focus	Participatory Planning Process						Dialogue Process									Systems Methodology			Environmental Management			Sustainability Planning					Eco-Design	
Methodology / Component	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal Participatory/Rapid	Action/Participatory Research	Roundtables and workshops	Participatory Theatre and Arts	Soft Systems Methodology	Ecology	Syntegration®	River basin planning/ICM	EIA/SEA	Assessment	The Natural Step™	Holistic Management®	Capital Quality of Life	Sustainable Regional Planning	Bioregional Planning	Permaculture©	Ecological design
Active engagement in developing plans/options	■	■	■	■	■		■											■					■			■		
Use of visual and presentational knowledge	■	■			■	■	■				■	■				■		■					■			■	■	■
Incorporate use of 'multiple intelligences'	■					■	■				■	■			■	■		■									■	
Hands-on process and dialogue	■					■	■		■		■	■			■	■		■					■			■	■	
Use of facilitation and process management	■	■	■	■	■		■		■	■						■		■										
Content education incorporated into process		■					X		X	■	X	X						X				■	■				■	
Skills training as part of process											■	■														■	■	
Attention to decision making process	■	■	■	■			■	■	■	■		■				■		■		■	■	■	■	■				

Legend			
has this component	■	not applicable, or no relationship	
may have component, depends how applied		specifically does not have this component	X

5.7.2 Comparison of Methodologies - Creative involvement of stakeholders in planning process

In the table above, whilst there is a focus on participatory processes under 'Participatory Planning Process' (not surprisingly), many of the other methodologies share some of the components of active involvement in planning. Planning for Real, Future Search, Community Mapping, Participatory Diagramming, Participatory Rural Appraisal, Soft Systems Methodology, Syntegration, Holistic Management and Bioregional Mapping are all tools which have been developed to encourage 'hands-on' processes and manipulation of ideas by participants, as can be seen from the areas of black in the above table.

5.7.2.1 DesignWays and creative involvement of stakeholders in planning process

Much of the participation that has occurred in statutory processes, e.g. in public inquiries and EIA, has involved the opportunity to comment on several different options. There is a focus on reactions to designs and plans rather than on actively creating plans and options with participants. Roundtable approaches and focus groups have often developed from such processes, and are seen as a valuable way to bring together different stakeholders, with an emphasis on creating a non-hierarchical atmosphere (Barton, Grant and Guise 2003).

DesignWays is, in some respects, an attempt to 'animate the table itself', to give participants tools they can manipulate and use. Early work on participation in less industrialised regions led to the development of PRA and RRA techniques (Chambers 1994). DesignWays incorporates aspects of these approaches, in particular the emphasis on valuing local knowledge and the use of simple interactive diagrams to allow participants to express that knowledge. Similar to Soft Systems Methodology, the use of visual diagrams is considered to be an important aspect of helping participants to understand complex relations and processes (Checkland 2000).

The two most similar approaches to DesignWays in terms of participatory planning are 'Enquiry by Design' and 'Planning for Real®'. 'Enquiry by Design' requires an intense period of work involving stakeholders and urban design professionals, often outside of procedural and statutory processes (Western Australian Planning Commission 2003a). It is similar to DesignWays in that it uses *"creative design-driven processes, to*

seek to find 'win-win' solutions for sustainable development" (Barton, Grant and Guise 2003, pg. 79). Both processes require a longer time frame than many participation exercises (Prince's Foundation 2000). Both methodologies have a specific focus on the design process. Both allow stakeholders to step outside of their roles and ask the questions: 'how could this be improved; what are the examples of best practice; how could we be doing things differently?' (Western Australian Planning Commission 2003a).

'Planning for Real' uses large scale maps and models of an area with 'options cards' showing different possibilities to engage participants in thinking through concepts and planning issues. It provides a medium for communication between professionals and community members (Neighbourhood Initiative Foundation 2003). Similar to DesignWays, the provision of a physical aid for planning helps encourage non-threatening communication, as *"participants' efforts become focused on the physical model"* (Kingston et al. 2000, pg. 113). The use of options cards or flags for participants to place ideas on the model is similar to the use of blank 'leaves' for brainstorming new ideas in used to facilitate participation in DesignWays. A 'Planning for Real' approach can be particularly useful in designing small scale physical improvements to an area, especially given the resource intensive requirement of building a model, though it has been used successfully on a larger scale (e.g. Wise Use of Floodplains, Cuff 2001). DesignWays aims to offer a framework for considering non-physical aspects of the environment as well as physical, through the use of the EASEL. Non-physical aspects may not be emphasised as well, if the only physical artefacts used for encouraging dialogue are maps and/or models.

'Future Search' is similar to DesignWays in that it is a facilitated, structured process. Both processes aim to help a wide range of people find common ground and develop a shared future vision about a particular topic or area of inquiry (Weisbord and 35 contributing authors 1993). It is also similar in its use of Mind Maps, and the active engagement of participants in writing ideas and developing the Mind Map. There is an emphasis in Future Search on building transparency in the process by displaying all the ideas developed by participants (Lewis, J. and Walker 1999). This is similar to the emphasis in DesignWays on allowing any ideas that participants come up with to be displayed on the emerging Mind Maps, which are used throughout the workshops. In Future Search conferences it is not recommended to include educational sessions,

instead the process relies on the resources assembled for the workshops at the time (it is an aim of setting up Future Search conferences to recruit the 'whole system' into the room, so the relevant knowledge and skills should already be present). In DesignWays educational sessions are encouraged, if appropriate. The process posits that the more people and viewpoints involved the better. Recognising the difficulty of assembling lots of people at one time, however, the process has been designed to allow for flexibility, and for different stakeholders to be engaged at different stages, as they are able to dedicate the time.

Future Search techniques have been used to create physical plans (Groundwork UK 2002), to develop visions of a sustainable future (Farley and Costanza 2002), and in future planning in water management (for the Water Development Board in Bangladesh discussed in van der Helm 2003). In contrast to DesignWays, the process does not have a set of ecological design principles associated with it, nor does it have as strong a focus on spatial planning.

DesignWays shares some similarities with the approach known as 'Action Planning', which is an event aimed at providing futures-orientated assistance to communities wishing to plan their areas, utilising the skills of a multidisciplinary team of experts (Sanoff 2000). Similarities include that this approach takes several days, requires skilful facilitation, and is seen as a collaborative event which allows people from a range of different backgrounds to work together (Wates 1996). Both approaches provide a framework to bring experts together with lay people.

Table 5-11 introduces the methods used in DesignWays to deliver the components used to compare different methodologies above.

Table 5-11 Methods to express 'Creative involvement of stakeholders in planning process'

DesignWays Attribute 3 Creative involvement of stakeholders in planning process	
Component	**DesignWays Methods**
Active engagement in developing plans/options	• engages participation by involving stakeholders and community members in the design of options • community and stakeholder goals and local knowledge are clarified and developed into a decision making framework
Use of visual and presentational knowledge	• large, colourful Mind Maps used to coordinate information • metaphors for different processes colour coded in the toolkit • meaning is reflected in the size, colour, symbols and form of tools • colourful diagrams are used to introduce complex ideas, built from smaller pieces to form whole picture • graphic themes are repeated in the tools
Incorporate use of 'multiple intelligences'	• tools use colour and imagery • verbal and written words used • spatial awareness encouraged through maps and arrangement of branches of Mind Maps • kinaesthetic knowledge engaged through moveable pieces of toolkit and site visits
Hands-on process and dialogue	• participants are asked to write, draw and manipulate ideas • possibility to write on 'leaves' and add them to the Mind Maps at any point • many people can input ideas simultaneously • 'leaves' can be moved around the Mind Maps to encourage dialogue
Use of facilitation and process management	• group composition is guided by facilitator but flexibility is encouraged • the stages of design are facilitated to allow for different processes to be carried out by individuals and groups • clearly defined process pays attention to order of stages to encourage productive dialogue • design processes animate the use of the toolkit, basic data is analysed in different ways • toolkit structure and format facilitates process • use of simple acronyms and design language to facilitate communication • design process is cumulative, principles are taught in several different ways
Content education incorporated into process	• TNS framework taught as part of process • examples and case studies of eco-design and sustainable technologies illustrate possibilities • participants encouraged to share knowledge of subjects and the area under discussion
Skills training as part of process	• Mind Mapping taught and practised • skills of creative thinking are taught • skills of landscape analysis are taught • ecological deign skills are taught and practised
Attention to decision making process	• encourages focus on common goals and values • ideas are tested against the sustainability principles of TNS • ideas are tested against participants' goals • movable icons make the decision making process more visible and encourage dialogue

5.8 Scaleable design language to link different geographic levels of scale

> *"Success in attaining sustainability is more probable for a region. Yet, landscapes offer significant advantages. ...Planning, conservation and policy are more likely to make a difference, i.e. to have a visible effect" (Forman 1998).*

The above quote from Forman summarises what he terms the *'paradox of management'*. One of the key difficulties in catchment planning is connecting the local scale, which is generally the scale at which the public is engaged and project decisions are made, with strategic, basin-wide planning. A long-term consideration is at the root of the concept of sustainability, embedded in the maxim to consider the consequences of our actions on future generations. Environmental thinking implies thinking about landscapes. Strategic sustainable thinking thus implies a linking of spatial and temporal considerations. It can be difficult for community members (and many stakeholders) to consider long time spans, but thinking at a larger geographic level of scale can encourage a longer time perspective (de Groot 1992).

There is a need to integrate 'bottom-up' planning, and the rich local knowledge generated in this process, with strategic planning at a larger level of scale, especially for issues such as flood control and pollution prevention in river catchments. Strategic planning looks at major priorities and concerns, which can create opportunities for enhanced environmental benefits and synergies between projects. It also tends to produce projects with a greater *'value for money'* over the lifetime of the project, including decommissioning costs (as opposed to much economic evaluation which focuses on delivery costs related to short-term benefits) (e.g. Briggs 2001; Gardiner 1997; Martin, Steve and Pearce 1993).

Integrating planning across the range of site (or ecotope[43]), landscape[44] and regional[45] levels of scale provides many benefits. A strategic framework can guide project work.

[43] An **ecotope** is "the smallest, above-organismic, homogenous, and mapable landscape unit" (Naveh 2000, pg. 78).
[44] **Landscape** as a delineation of geographical scale can be defined as a sub-regional category of geographical scale that incorporates smaller ecotopes, and is a coherent, recognisable unit, such as a river basin (Forman 1998).
[45] A **region** is a broad geographical area with common features, and can be defined by a combination of administrative and political boundaries, cultural and historical factors, broad landform, macroclimate and vegetation types (Forman 1998, pg. 13).

Detailed project design can utilise both the strategic information, and the more detailed information collected at a finer grain (e.g. Gardiner 1997). A bottom-up process of planning and observation can inform the creation of the strategic framework.

5.8.1 Critique of working at different levels of scale

In their recent survey of the concept of scale and global environmental change Gibson, Ostrom and Ahn (2000, pg. 236) state that the concept of scale is *"one of the most important conceptual challenges to [the] union [of social and natural sciences]",* and suggest that this is partly due to different definitions and interpretations of scale, and partly to different methodological approaches used when dealing with complex subjects at different levels of scale.

With regards to coordination of information and data sets, a regional scale may allow for increased ability to coordinate research results and planning outcomes from multiple projects. Planning at a large level of scale, however, tends to be characterized by reduced precision and predictive certainty (e.g. Funtowicz and Ravetz 1994; O'Connor 2000; Tacconi 1998).

The concept that bottom-up planning processes should inform larger scale planning is challenged both by the inherent difficulty of coordinating such a process and a more fundamental question as to validity. In his survey on Landscape Ecology research, Hobbs (1997, pg. 3) questions whether *"small scale studies can be reliably extrapolated to larger scales".* The question of appropriate levels of scale for planning is not a simple question. The theoretical framework of systems theory offers a possible mechanism for overcoming some of these concerns (de Rosnay 1975).

One of the important theoretical concepts to emerge from systems theory is that of causal relationships acting at different levels of scale. Thus, a phenomena observed at one level of scale may have been caused by (or strongly influenced by) a factor at another level of scale, which may not be noticed due to the limits on observation of the study's focus. The concepts of hierarchy in systems theory provide useful insights for research into interactions across levels of scales.

This theoretical viewpoint leads to an understanding that descriptions of reality must of necessity involve analysis at several levels of complexity, preferably linked in an iterative cycle. Analysis and comprehension of any complex system requires

"understanding the constraints at higher and lower levels of spatial-temporal resolution" (Gibson, Ostrom and Ahn 2000, pg. 225).

There is a need for further research into effective coordination between various policy, planning and research agencies, and into effective ways in which to organise, categorise, store and increase access to information from different levels of scale. Multiple feedback loops between planning at various levels of scale may assist in increasing the quality of information available for sustainability programs.

Table 5-12 shows the relationship between participatory methodologies and the use of scaleable design language to link different geographic levels of scale.

Table 5-12 Comparison of Methodologies – Scaleable design language to link different geographic levels of scale

Main Focus	Participatory Planning Process						Dialogue Process									Systems Methodology			Environmental Management			Sustainability Planning					Eco-logical Design	
Methodology / Component	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal Participatory/Rapid	Research Action/Participatory	workshops Roundtables and	and Arts Participatory Theatre	Methodology Soft Systems	Ecology Holistic Landscape	Syntegration®	River basin planning/ICM	EIA/SEA	Assessment Multi-criteria	The Natural Step™	Management® Holistic	Capital Quality of Life	Planning Sustainable Regional	Bioregional Planning	Permaculture©	Ecological design
Uses transferable tools and materials	■					■	■				■	■				■		■					■			■		
Provides meta-data structure for planning																												
Process linking multiple geographical scales																	■		■	■		■	■	■	■	■	■	■
Use of transferable principles		■					■		■								■	■				■	■	■	■	■	■	■

Legend			
has this component	■	not applicable, or no relationship	
may have component, depends how applied		specifically does not have this component	X

5.8.2 Comparison of Methodologies – Scaleable design language to link different geographic levels of scale

The sustainability planning and ecological design methodologies have an inherent focus on multiple geographic levels of scale. These methodologies have been developed within an understanding of environmental and social effects of actions across multiple levels of scale, and thus the necessity of working at more than one level in order to solve these problems. The process 'Quality of Life Capital' has an explicit focus on multiple levels, as any one feature or area can provide different benefits at different levels of scale (CAG Consultants and Land Use Consultants 2001). Holistic Landscape Ecology has an explicit focus on scale and the role of understanding ecological processes that cross levels.

The other methodologies can be applied at more than in a level of scale, but this is not necessarily implicit in their process. Several of them, namely Planning for Real, Future Search, Participatory Diagramming, Participatory Rural Appraisal, Soft Systems Methodology, Syntegration and Holistic Management incorporate transferable tools and materials that could facilitate transfer across levels. The two processes that focus on mapping, Community Mapping and Bioregional Planning, could also be seen to apply across levels of scale, as the process of mapping itself is transferable.

5.8.2.1 DesignWays and scaleable design language to link different geographic levels of scale

DesignWays aims to provide a framework and design protocol that can be used at multiple levels, such that several different groups working on different projects use the same framework, and are able to communicate easily with each other. The process provides a way to integrate the generic, essential principles of sustainability, with the contextual, value-dependent, historical aspects of a particular place, community or development.

DesignWays differs from many of the methodologies described in this review in that there is an explicit focus on a systems based view of sustainability, with the emphasis on participants learning about how to use the design skills and decision making processes embedded in the DesignWays process. The use of a holistic meta-data structure based on large, moveable Mind Maps provides a structure for coordinating the process. The same basic structure is used in all of the workshops, providing a

framework for communication between different stakeholders, and between different projects planned using the DesignWays process.

Table 5-13 introduces the methods used in DesignWays to deliver the components used to compare different methodologies above.

Table 5-13 Methods to express 'Scaleable design language to link different geographic levels of scale'

DesignWays Attribute 4 Multipurpose tools to link different geographic levels of scale	
Component	DesignWays Methods
Uses transferable tools and materials	• using the same basic structure and templates facilitates communication between participants working at different levels of scale • uses the same format in templates for ease of recognition • develops a common language of design in the metaphors and colour coding of the toolkit
Provides meta-data structure for planning	• main elements of the templates used in the process to organise information are the basic ingredients of any sustainable plan • structure of the organising templates encourages participants to look for connections and to fill gaps in knowledge
Use of transferable principles	• TNS principles are transferable across scales, as it is based in an understanding of global flows of resources • ecological design principles can be applied at many different levels of scale, e.g. to product design, to a house, to a region
Process of linking multiple geographical scales	• uses a process of ecological design that helps to link DesignWays's various components • teaches design skills • applied at more than one level of scale in interacting, parallel process • dialogue between stakeholders at different levels of scale is encouraged

5.9 Underlying framework of systems thinking

> *"Perception is, to a much greater extent than previously imagined, a function of the linguistic categories available to the perceiver...It is only a slight exaggeration to say we 'see' with our language" (Postman 1993, pg. 91).*

In a speech in the Hall of Independence, the former president of the Czech Republic, Vaclev Havel (1994) suggests that a *'meaningful world order'* needs to be rooted in different metaphors than those of the Enlightenment and 'modern science' (in the broad sense of science since the Enlightenment). He proposes the Gaia Hypothesis, which allows us to see that *"we are parts of a greater whole. Our destiny is not dependent merely on what we do for ourselves but also on what we do for*

Gaia as a whole". Systems thinking can provide useful new metaphors of design in an attempt to design for sustainability.

'Planning for sustainability' is influenced by the concept of holism, a central tenet of systems thinking (e.g. Allen, A. D. and Hoekstra 1992; Checkland 1991; Smuts 1926). The report, *The Law of Sustainable Development* produced by the European Commission, explores the *'legal theory of sustainable development'* and states: *"today, no serious study and application of the principles of sustainable development is possible without the help of systems science"* (Decleris 2000, pg. 8). Principles of sustainable development and their application are elaborated in this report, which acknowledges the positive role of schools of ecology in formulating public policy and environmental law, and *"extending the structuring of the problem"* (ibid. pg. 55). The report goes on to state, *"The control system for sustainable development is based on a new philosophy and a different design"* (ibid. pg. 56).

Systems thinking is an emerging discipline. It has developed over the last 40 years in many different fields and through a range of applications. A system is *"an integrated whole whose essential properties arise from the relationships between its parts"* (Capra 1996, pg. 27). Systems thinking can be characterised as an attempt to find common principles that apply at different levels of scale and across different types of phenomena. It is *"a methodology that makes possible the collection and organization of accumulated knowledge in order to increase the efficiency of our actions"* (de Rosnay 1975, pg. 57).

In terms of increasing knowledge about causality and possibilities for technology, 'reductionist thinking' has had tremendous success. Its intellectual process has been characterised by fragmenting the world into its smallest indivisible pieces, and attempting to describe and understand the forces interacting on these parts. This has led to an increased ability to predict events in many circumstances. The role of many of the institutions of science has been to provide sufficient information and predictive ability to enable humans to control and manipulate nature.

Recent discoveries of the interconnected and complex dynamic nature of the world have suggested, however, that there is a fundamental limit to knowledge derived in this way. Ecological systems cannot be fully described and understood from a description of the interaction of simple particles in a Newtonian field of forces. This was brought to

attention by the meteorologist Edward Lorenz in the 1960s, through his attempts to model the weather. In his words, *"I realized that any physical system that behaved non-periodically would be unpredictable"* (quoted in Capra 1996, pg. 134). Systems thinking has arisen in part in response to three problems in science: *"complexity in general, the extension of science to cover social phenomena, and the application of science in real world situations"* (Checkland 1991, pg. 74).

As an approach looking at interactions and relationships, systems thinking has *'inherent interdisciplinarity'* (Maiteny and Ison 2000, pg. 582). Systems practice is a process of applying these insights in order to operationalise this knowledge. There is a reciprocal relationship between theory and practice, as the application of systems thinking helps to illuminate the theory.

There are three major strands of systems thinking, first order cybernetics, or 'hard systems', 'soft systems' and second order cybernetics, which combines insights from the first two strands. Hard systems approaches are concerned with information theory, feedback and control. Methods include attempts to model interactions, based largely in engineering, mathematical modelling and operational research (Maiteny and Ison 2000). Studies often have a clear objective of optimising a particular system, such as the early work during World War II planning military operations, e.g. intercepting aircrafts with missiles.

Soft systems methodologies include the perceptions of actors in the system, and are concerned with systems within systems. Unlike 'hard systems' approaches, systems are not seen as actual *'things in the world'*, but rather as constructs that are *'brought into being' by* observers, thus including the worldview of the actors within them (Ison, Maiteny and Carr 1997). Ison (1998) suggests that the definition of a system *"an integrated whole… whose essential properties arise from the relationships between its parts"* needs to include the concept that it is *"distinguished by an observer".* Beer (1980) states *"A system is not something presented to the observer, it is something recognized by him".* Soft systems approaches are based on a learning paradigm. Checkland (1991, pg. 285), author of *Systems Thinking, Systems Practice*, says, *"The unquestioned prime value embodied in 'a systems approach' is that continuous, never-ending learning is a good thing".* Soft systems methodology emerged initially from the

application of insights of systems engineering to social problems, and the realisation that a description of real world systems as 'machines', in need of engineering to be able to better meet their objectives, was inadequate. Instead, systems were seen as including purposeful human actors, which were behaving in ways that were meaningful to them (Checkland 2000).

Second order cybernetics incorporate general principles derived from biology which can be applied to other systems and *"a theory of the observer that emphasizes the interpreted and constructed nature of social reality"* (Mingers 1997, pg. 304). Second order cybernetics includes insights from hard and soft systems perspectives.

More recent developments of 'hard systems' approaches have expanded their scope to look at interactions of many variables. The advent of high speed computing has allowed models to be built to test different scenarios, often involving sustainability questions, such as interactions of population and resource use. The 'World3 Model' for example includes the implicit outcomes of different world views in its scenarios, which are partly based on political and social factors (e.g. scenario – double resources, pollution control technology, land yield enhancement and land erosion protection), which are modelled as a comparative tool (Meadows, Meadows and Randers 1992).

River basin modelling has benefited from applied systems thinking. For example, the Environment Agency has developed a systems strategy for flood forecasting and warning (Knott and Haywood 2001) and recent advances in understanding neural networks have been applied to flood forecasting models (Huffman 2001). Many of these models include human interactions in the environment as data, such as channelisation effects on flood plain functioning (Franklin et al. 2001) and effects of pollution incidents and consumer behaviour on water quality (Nimah, Haddad and Dandan 2001). The MULINO project[46] aims to support the decision making of multiple stakeholders in complex institutional environments. From the beginning, the project included social science (La Jeunesse, Rounsevell and Vanclooster 2003). This interdisciplinary approach has included ecological anthropologists and sociologists to look at how managers will interact with the modelling tools, how people are likely to use the

[46] MULINO project - Multi-sectoral, Integrated and Operational decision support system (DSS) for sustainable use of water resources at the catchment scale, funded by the Environment and Climate Programme of the European Union.

information, and how the tools can be designed to support learning between fragmented decision making structures.

Conceptions of science and the nature of living systems influence understanding of human culture. A shift in scientific paradigm could have profound implications for the organisation of society and its relationship to natural systems. These implications are explored in the book *Gaia: A Way of Knowing, Political Implications of the New Biology* (Thompson, W. I. 1987).

Lakoff and Johnson (1999) illuminate the way humans construct meaning through metaphor. The important role of metaphor in the creation of meaning, and the role of mental models in filtering information, suggests that changing the metaphors of design is central to a shift in both our *conceptions* of design and the way in which we *can* design. Metaphors are not merely useful mental constructs, but can provide a powerful generative framework for rethinking the way in which humans interact with the environment. In a review of shifts towards sustainability in leading organisations, Doppelt (2003) argues that changes in mental models and assumptions are essential. They facilitate the organisational and cultural change he suggests is necessary to achieve changes in management and practice.

Attempts to apply new metaphors to reconceptualise fields of enquiry based on paradigms of systems thinking include:

- Jouni's (2001) application of ecosystem metaphors to industry;
- an application of the metaphor of the living cell to community based rehabilitation for people with disabilities (Johnstone 2003);
- thinking of democracy and consciousness from a perspective of the lessons of evolution (Banathy 2003);
- and applying an understanding of networks to understanding possible antidotes to terrorism (Ackoff and Strumpfer 2003) .

Concepts of systems thinking have also had a profound influence on the field of ecosystem management, in helping to understand *"the complexity of ecological and organizational systems"* (Wondolleck and Yaffee 2000, pg. 15). *'Whole ecosystem approaches'* have yielded valuable insights in applications ranging from forestry to fishery management, to integrating indigenous concepts of nature with

'modern' modelling and management of wildlife populations (e.g. Kendrick 2003; Seixas and Berkes 2003; Trosper 2003).

Research instigated by the Resilience Network explores systems concepts such as resilience, scale and emergence in relationship to *"social-ecological system change"* (Berkes, Colding and Folke 2003). The 'Shire Conference' brought together leading practitioners in the fields of landscape design, planning and ecology to explore the possible implications of the new paradigms for the art and practice of landscape planning (Pulliam 2002). The book developed from the conference discussions concludes that both ideas about nature and the relationships between humans and nature are shifting. It highlights the advantages and the difficulties of bringing ecology into a closer relationship with design, as a *'framework for learning'* (Hill and Johnson 2002).

5.9.1 Critique of systems thinking

One of the criticisms of systems theory is that it is too general to provide meaningful interpretations of phenomena. Application of systems thinking requires a balancing act between the drive for generalisable principles and thick description, or grounding in content and context of a situation. Checkland (1991, pg. 9) quotes an influential paper by Boulding (1956) with regards to this challenge:

> *"We always pay for generality by sacrificing content, and all we can say about practically everything is almost nothing. Somewhere however between the specific that has no meaning and the general that has no content there must be, for each purpose and at each level of abstraction, an optimum degree of generality. It is the contention of the General Systems Theorists that this optimum degree of generality is not always reached by the particular sciences".*

This balancing act can be done, but needs to be considered in each particular case, and requires continuous attention to the process of enquiry.

In an article reflecting on the possible limitations of synergetics (an application of systems principles to dynamic systems), Knyazeva (2003, pg. 55) suggests that there are major limits in two areas:

- horizontal transfer, the ability *"to transfer the models, constructed for explanations in one scientific field, to another field";*
- and vertical transition, the ability *"to make a transition, or a leap, from a model constructed and verified within a certain scientific field to the conclusions of a general theoretical value and even to some interdisciplinary conclusions".*

Some researchers feel that the contributions of systems thinking to research methodologies, science and sociology are still unknown and under development (Lyle 1994; Naughton 1981). Maiteny and Ison (2000) suggest that recent applications of systems thinking to real world research would suggest that there have been real benefits from using systems thinking as a framework. This view is echoed by Checkland (2000) who suggests that while the original aim of General Systems Theory, to develop a mathematical language which could express and help solve the problems in many different disciplines, has not been realised, the application of systems thinking has provided useful insights both in practice, and in developing systems theory.

It is not surprising that there is uncertainty as to the benefits of systems thinking. As an approach, it attempts to deal with inherently messy and complex problems. As Noble (2000, pg. 105) says, *"although systems research has advanced significantly since the 1970s, what we know about real systems behavior is much less than what we do not know".* There is a burgeoning field of systems thinking applied to complex research. The tools and concepts seem to offer a useful, and in the light of global environmental change, possibly necessary, way of describing and understanding complex systems.

Table 5-14 shows the relationship between participatory methodologies and the use of a systems thinking framework.

Table 5-14 Comparison of Methodologies - Underlying framework of systems thinking

Main Focus	Participatory Planning Process						Dialogue Process									Systems Methodology			Environmental Management			Sustainability Planning					Eco-logical Design	
Methodology / Component	Planning for Real®	Enquiry by Design	Community Envisioning	Action Planning	Community Plan-ning/Architecture	Parish/Community Mapping	Future Search	Appreciative inquiry	Open Space Technology	Citizens' Jury™	Participatory diagramming	Rural Appraisal Participatory/Rapid	Research Action/Participatory	workshops Roundtables and	and Arts Participatory Theatre	Methodology Soft Systems	Ecology Holistic Landscape	Syntegration®	River basin planning/ICM	EIA/SEA	Multi-criteria Assessment	The Natural Step™	Management® Holistic	Capital Quality of Life	planning Sustainable Regional	Bioregional Planning	Permaculture©	Ecological design
Based on systems thinking							■									■	■	■				■	■		■		■	■
Underpinning metaphors from living systems							■															■				■	■	■
Use of tools to apply systems thinking insights							■				■	■				■	■	■				■	■			■	■	■

Legend			
has this component	■	not applicable, or no relationship	
may have component, depends how applied		specifically does not have this component	x

5.9.2 Comparison of Methodologies - Underlying framework of systems thinking

In the above table, the methodologies under the categories of sustainability planning, ecological design and systems thinking show a strong relationship with the use of systems thinking as a framework. This is not very surprising for the systems thinking tools. For example, in the management process based on systems principles Syntegration, systems modelling tools may be taught to participants in order to support the process (Leonard 1996).

The ecological design and sustainability planning methodologies have been developed on the whole within the last three decades, and reflect an increasing interest in the insights of systems thinking methodologies. Several of the key thinkers in these areas cite systems thinking and living systems biology as an inspiration in the development of the methodologies.

The methodology 'Future Search' is an application of systems thinking to organisational design and management, with an emphasis on *'getting the whole system in the room'* (Weisbord and 35 contributing authors 1993) and exploring interactions between the groups in the room. Several recent articles on 'Future Search' have been published in the journal *Systems Research and Behavioral Science* (e.g. Oels 2002; Polanyi 2002; Whittaker and Hutchcroft 2002).

Alexander (1977) developed the idea of a pattern language, another approach to design that focuses on common patterns applied in a particular context. This process takes a holistic view of the design of space, and describes fundamental relationships between elements that help to create 'living' spaces (see www.patternlangugage.com). This process goes some way to developing a process of communication in groups about desired future systems. It has elements of a design process to link different patterns together, and focus attention on different levels of scale, but does not provide a methodology for communicating about this process. More recent work has looked at patterns on a more basic level in terms of designing space (Alexander 2003a, b). This work has included developing what Alexander (2000, para. 3) terms *'generative sequences'*, which aim to *"allow a person to generate a good design, step by*

step". Whilst environmental issues, such as providing open space, maintaining access to water and minimising traffic, are covered in the pattern language approach, it lacks a consistent approach of applying ecological principles to design and a systematic consideration of the environmental impacts of the design decisions, such as implications of energy and resource flows. Alexander's pattern language concept has influenced permaculture design and the development of DesignWays[47].

De Rosnay and Meadows are both systems theorists who write about the application of systems thinking to real world problems. De Rosnay (1975) develops a systemic view of how to use systems thinking to analyse and understand complex systems in the book *The Macroscope, A New World Scientific System*. He describes potential applications of the tools and conceptual framework that he has developed to education. In the chapter 'Scenario for a World', he sets out some of the ways in which a systemic approach could change our views of the future. At the end of their update on using systems analysis to model potential states of the environment under different economic, technological and social practices, Meadows et al. (1992, pg. 224) suggest, *"a sustainable world cannot come into being if it cannot be envisioned",* and offer several principles and ideas of what a sustainable world could entail. Neither development offers guidelines on a process of design for applying these principles.

At the end of his synthesis of developments in systems thinking in the book *Web of Life*, Capra (1996, pg.297) suggests, *"the theory of living systems… provides a conceptual framework for the link between ecological communities and human communities".* He advocates the development of 'ecoliteracy', a concept developed by Orr (1994). This work has since been developed into a set of principles for ecologically sound systems for use in education (California Department of Education and The Center for Ecoliteracy 1996). This work has not, however, developed a clear process for applying these principles to envisioning and designing future systems.

Some practitioners and academics have developed ways of applying generic systems principles to ecological design, (e.g. Holmgren 2003; Lyle 1994;

[47] The author took a graduate studio with Alexander in the Department of Architecture at the University of California at Berkeley in order to learn more about the approach.

Mollison 1990; Orr, D. 1994; Todd and Todd 1994; Van der Ryn and Cowan 1995). This work has many promising applications (e.g. Baschak and Brown 1995; Paterson and Connery 1997; Rijsberman and van de Ven 2000). Much of this work centres on principles of design, without much attention to the process of design, or the process of engaging participation of multiple stakeholders in the design process. Mollison and Lyle develop ideas on the process of design, but this is not explicitly related to systems principles.

5.9.2.1 DesignWays and an underlying framework of systems thinking

The development of DesignWays was a conscious attempt to embed 'new paradigm' living systems metaphors into a useful tool for design and decision making. This included an endeavour to move beyond a mechanistic metaphor for design as 'thinking like a machine'.

There is a developing field of applying systems principles in holistic decision making, which has informed the DesignWays process (e.g. Holmberg 1998; Rijsberman and van de Ven 2000; Robert 2000; Rosner 1995; Savory 1991; Savory and Butterfield 1999). DesignWays has built upon this work by attempting to make its underlying systems paradigm explicit in its tools, and in creating a process of design that helps participants to develop systems thinking, at the same time as facilitating dialogue and cooperation in the design process.

Table 5-15 introduces the methods used in DesignWays to deliver the components used to compare different methodologies above.

Table 5-15 Methods to express 'Underlying framework of systems thinking'

DesignWays Attribute 5 Underlying framework of systems thinking	
Component	**DesignWays Methods**
Based on systems thinking	• systems thinking framework integrates diverse aspects of process • TNS principles are a systems thinking tool • ecological design principles apply systems thinking insights
Underpinning metaphors from living systems	• living systems metaphors are expressed in the communication tools • living systems metaphors are used to tie together the design process
Use of tools to apply systems thinking insights	• the design process uses tools to apply systems thinking insights • the same basic data (ideas developed by brainstorming) are analysed in different ways through the design processes • landscape analysis helps participants to understand the relationship between process and pattern • working at more than one level of scale helps participants to understand links and networks across different levels

5.10 Need for a diversity of approaches

Whilst DesignWays aims to offer a comprehensive and adaptable planning tool, it is not necessarily suitable for every type of planning requirement. There are situations where extensive participation is not appropriate, and the methodologies described in this review each have aspects that could be useful in particular contexts. For example, a 'Future Search' or 'Open Space' approach may be more appropriate for exploring a particular issue in depth. Oels (2003, pg. 322) suggests whilst *"community based Future Search Conferences which try to address the whole complexity of issues at once have trouble producing meaningful outcomes"* they seem to produce very good results with sector or issue based conferences.

DesignWays is not meant to replace other forms of participation, instead it offers a framework that can complement approaches such as 'Quality of Life Capital' or 'Planning for Real'. For example, exercises such as community mapping can be given a greater or lesser emphasis in DesignWays, depending on the needs and interests of the community and the resources available. A broad scale participatory programme needs to be combined with creative communication and ways of informing a wide range of stakeholders and the public.

Activities and programmes that offer opportunities for community members to deepen their understanding of the area are also important, such as history days, programmes linked to school education, and nature walks. It is important to look at creative ways of engaging the public and stakeholders in implementation and ongoing management, through activities and programmes such as awards and artistic events. Supportive mechanisms such as community trusts can help to provide technical and financial assistance to development (e.g. Wates 2000). The framework of DesignWays can offer a way to coordinate such activities.

Scientists and stakeholders with expert knowledge about the ecology of the area are encouraged to attend the DesignWays workshops. Scientific information is incorporated into the dialogue through these stakeholders. Existing technical information is also incorporated into the process through the use of maps and provision of data about the information in the workshops. This information is synthesised in the design process and informs the results. Depending on the

context (and resources available), it may be necessary to supplement this process with more in-depth multi-criteria assessment, especially if there are aspects of high uncertainty and risk in the area or plans.

5.11 Conclusion

Active involvement in planning suggests a greater degree of engagement than consultation and information provision. It can help to enhance the benefits of participation, as the knowledge and aspirations of stakeholders are incorporated into various design options. Attention to the process of communication can facilitate dialogue and the development of viable plans.

Whilst it is widely agreed to be a difficult task to implement 'planning for sustainability', and ecological design processes are a long way away from much of contemporary planning processes, this review shows that there are several methodologies that can be applied to develop sustainable solutions. Criticisms of attempts to develop sustainable solutions include the charge that there is actually no need to do so, either due to a perception of abundance, or due to technological optimism that suggests that humans have always been able to solve problems within their environment. The author takes the view that attempting to solve the problems before they are manifested in the environment is a sensible precaution, and posits that both participatory processes, and a framework of ecological design, will be necessary to do so successfully.

DesignWays was developed with the view that 'business as usual' in planning and design was not going to deliver sufficient changes to move towards sustainability and that new mental models will be a necessary to make such change. Shifts in paradigm implied by living systems thinking provide the underlying metaphors and principles for the approach.

The following chapter describes the DesignWays process as it was applied in the in the heavily urbanised Irk Valley of North Manchester, and outlines the results of this process. Participants' experience of the process is analysed in Chapter 7. This analysis is structured around the five attributes that were explored in this chapter.