

## **Towards a 1000 year vision**

**Authors: Liz Duggan, Helen Neale, Alain Quesea and Olivia Woo**

### **Abstract**

*There is a growing tension between the quest for economic growth and living within the finite capacity of the planet. In general planning processes focus on enabling the use of natural resources to meet human needs. This 'conventional' planning is more problem focussed and predominantly deals with issues on an isolated, single discipline basis, within short to medium term timeframes.*

*Visioning in contrast provides an opportunity to take an integrated, solutions-based approach that establishes a desired future state, typically over a longer timeframe, and backcasts to identify how this might be achieved.*

*Scenario planning is a tool that has been used by both of these approaches and has the potential to generate both contextual and visionary futures. This paper will examine the use of the scenario planning tool in developing different future states by first using conventional planning and then comparing this with setting a very long-term vision. Tourism is used as a case study for these different approaches.*

### **1. Introduction**

The earth today is facing a future full of challenges and uncertainty and there is growing evidence that we have exceeded the limits of sustainable growth. A vision of a future world that is sustainable is common among ecological economists however this is not the predominant view within society. "Most people think of the future as extending from the present, a natural extension of the timeline running from the past and through the present" (Bishop, 2007, p. 13). It is falsely assumed that there will be a continuous supply of many ecosystem services into the future due to their limited visibility in society (TEEB, 2010, p. 6) and as a result we risk taking nature for granted. It is now recognised that natural systems behave in non-linear ways, exhibit marked thresholds in their dynamic and social ecological systems and act as strongly coupled complex and evolving integrated systems (Folkes et al., 2002, p. 437). The earlier worldview of nature and society as systems near equilibrium is being replaced by a dynamic view which emphasises complex non-linear relations between entities under continuous change and facing discontinuities and uncertainty (Folkes et al., 2002).

The world is changing ever more rapidly, technological advances see shifting consumer habits and associated changes in cultural norms. Exponential population growth, climate change and natural capital limits all require some form of management to enable life as we know it to be sustained. This is a global issue. Plans to address the survival of

humanity do not exist despite the plethora of threats to our well-being (Tonn, 2004, p. 92).

Plans have always been used to influence a future state; they are an essential part of achieving a desired outcome. It is this ability to organise and plan for the future and our ability to modify our environment that differentiates us from most other species; this ability should imply that we have the added responsibility of stewardship for our environment.

This paper will describe conventional and visionary planning processes and how scenario planning and backcasting can be applied within these approaches. It will describe key differences and tensions and how this is illustrated within the tourism industry. The potential of long visioning as a way to address some of these tensions will be considered.

## **2. Conventional planning**

Conventional planning processes are formal procedures based on taking incremental steps towards a desired future state or result, through an “integrated system of decisions” (Mattias, 2000). It is based on contextual trends and has been effective in answering the question posed in development of a mission – “why are we here?” and vision - “what do we want to become?” This or a similar process is used by many organisations to develop plans and strategies that guide future actions.

A “mission, value, vision” hierarchy often observed implies limited divergence of values or visions from those implicitly contained within the mission, hence limiting uncertainty, and therefore implying a short timeframe or slow change environment, within which forecasting analysis has been successful. At times the terms ‘mission’ and ‘vision’ are used interchangeably, although a mission typically encapsulates the purpose of an organisation, including its strategy and values (Campbell, 1990 in Shipley & Newkirk, 1999). For vision statements the purpose is clear; it is to look to a desired future rather than to a future that is expected.

Environmental and land use planning frameworks generally set out a clear purpose. This may be, for example, the sustainable management or development of natural resources where the purpose holds a similar position to that of the mission in that all actions taken must enable the purpose to be met. This process requires that all policies plans and strategies developed at each governance level must either comply with or give effect to the purpose. The final result is typically a series of 5-10 year “plans” which follow a standard format, including set objectives and goals, which are specified by the relevant legislation.

These plans are inherently complex as they try to address the future state of industry and commerce and the interaction with communities and the environment. The sustainability

focus of New Zealand's 1991 Resource Management Act and its planning frameworks was seen as promising for environmental management but this promise has not been realised due to a combination of factors including confusion around the Act's mandate, limited local planning capability, weak plans and inadequate government support (Glavovic et al., 2010, p. 685).

Traditional planning is frequently based upon the belief that the application of professional expertise to achieve well-defined goals will ensure efficient and effective management (Scott 1998 in Peterson et al. 2003 p. 359) and has short-time horizons that constrain if not completely mask the recognition of the big picture threats (Tonn, 2004, p. 93).

### **3. Planning time frames for the future**

There is general agreement that the world needs to move towards being sustainable. This is not however being translated into action at the local, regional and global scale and the forecasting approach remains dominant within future oriented studies (Dreborg, 1996). The extent of environmental challenges the world is facing is significant and will require very long term approaches to address them. So how far ahead should we be looking?

Tonn's (1986) initial call for 500 year planning timeframes has now moved to recommending planning time frames of at least 1000 years in order to create sustainable societies (2007, p. 1102). He advocates for comprehensive integrated thousand year plans noting that short time frame documents often overlook the "big issues and threats" and do not facilitate a shift in thinking to a more qualitative framework and a mindset of what is really possible. Current examples of global plans that do exist have a narrow focus and short time frame (Tonn, 2004), thereby missing the opportunity to take a more comprehensive approach to long term solutions and providing time and space for new solutions and technologies to be developed. Research topics and concerns that may at present seem unlikely or insurmountable may become more relevant and important to our future as planning time frames are extended.

Tonn's (2007) view of sustainability is that it needs to provide for earth life on this planet until at least one alternative "home" has been found outside our current solar system. Although this idea may seem extreme, the reality is that unless current thinking and habits of today shift significantly there is a chance that in 1000 years time our current technological civilisation as we know it will have collapsed (Tonn, 2004). In 1000 years time at the current rate of removal tropical rain forests are likely to be gone forever as well as large areas of Bangladesh (Tonn, 2004) due to climate change and sea level rise.

According to the Great Law of the Iroquois, Native American Indians consider the impacts of their decisions beyond the present and up to seven generations into the future (Murphy, 2014, paras. 24 & 28). Assuming a generation of 25 years, this amounts to

about 175 years. In comparison, a 1000 year time horizon is almost 6 times this period of time, extending 40 human generations into the future. In the context of New Zealand's history 1000 years ago the first Maori arrived; Tane Mahuta, the 'father of the forest', was already at least 1000 years old and the first whalers and settlers were on the horizon a few hundred years out. Given what has occurred in the last 1000 years and the exponential speed of change evident in society today, including increasing life expectancies, it is time to start working towards the desired future state of the world in the year 3000.

One vision developed for the USA in 2100 (Farley & Costanza, 2002) was based on a world view with more balance between the limits imposed by the natural environment and human society and included reference to worldviews, built capital, natural capital, human capital and social capital, a step in the right direction although its implementation remains uncertain.

Ecological economics with its sustainability focus is inherently concerned with maintaining the quality of human life into the future, both at an intra and inter generational level. A significant shift in thinking is needed from local through to the global level to generate support for a sustainable view of the future which includes living in a way where resources are not depleted faster than they are able to be replaced, waste is assimilated at the same rate as it is produced and hunger and poverty are eliminated. Active and ongoing envisioning of how the world works and how we would like it to be is the first step in looking for solutions for the future (Costanza, 2001; Forstater, 2004).

#### **4. Visioning**

Visions and envisioning are frequently used as ways to approach the future. Although there may be little theory or methodology attached to them (van der Helm, 2009) they are a critical step in any policy process (Meadows, 1994) as they establish "where we want to be" as the starting point. While modelling, information and implementation are useful in a policy process, focussing on these aspects initially can leave little room for the broader and more thoughtful and potentially transformational conversations about the future that are needed. A defining feature of the multitude of vision statements throughout the world is that they are future focussed in some way and reflect a desired future state (Raynor, 1998). Meadows (1994, p. 4) notes that although individual visions may be difficult to articulate, globally they are "astonishingly alike".

In the words of Holmberg and Robert (2000) "The future cannot be foreseen but its principles can" (p. 305) and looking out 1000 years provides this opportunity. Costanza (2000) believes the development of a "shared vision of a sustainable and desirable society" that provides for prosperity, fairness and equitability for all species today and in

the future within the limits of the biophysical world is the “most critical task facing humanity today” (p. 1).

Van der Helm (2009) describes 7 different types of vision which are contextually based (humanistic, religious, political, business, community, public policy and personal) and identifies distinguishing characteristics for each type. Reference to the future, looking for an “ideal” future and the desire to work on a deliberate change are common features of visions although individual interpretations will vary. Visions aim to be motivational, to elicit some form of action in the relevant group that enables the vision to be attained. Shipley and Michela (2008, p. 226) state “motivation is an internal state that leaders or other agents seek to inculcate, so that people will have a propensity to act in ways to bring about the end state described in a vision”. Shipley and Michela (2008, p. 229) also suggest that “a fundamental question in the mind of a person who receives a visionary presentation is ‘will I be better off if this vision comes to pass?’”.

In considering the question, at the very least, a subconscious reaction of “what will this mean for me and how much will I have to change my actions” will take place. Change is seldom embraced by politicians, individuals or society. It inherently involves uncertainty and disruption for those involved and inevitably the more radical the change, the longer the lead in period required and the greater the associated uncertainty of outcomes. “Uncertainty can be confusing and demoralising, it can lead to inaction ‘paralysis by analysis’ rather than decisive action”. However, “uncertainty can also inspire action because the future is not already determined, but is being created by the plans and actions of people” (Peterson, 2003, p. 359). An example of a 1000 year vision is presented in Figure 1.

#### **A 1000 year vision for Planet Earth**

*The land, people and other life forms coexist in harmony.*

*The Blue Marble is a continual source of wonder for its inhabitants and people celebrate Earth Day in full force with gratitude every year. Humans are caretakers of the planet and step up to their responsibility. An ethic of stewardship and respect towards the earth, rather than domination, exists and people actively protect other species and their habitats. People recognise they are part of the web of nature.*



*The human population is 1.5–5 billion<sup>1</sup>. With a reduced human population size previous pressures on the earth due to excessive resource consumption and waste generation have eased and ecological footprints are now quite reasonable. People freely contribute to natural capital restoration with the guidance of knowledgeable others.*

*Human settlements have evolved so that sustainable architecture is the norm and diversity in housing types caters for all sorts of people in society and allows them shelter and security. Should major damage occur to*

<sup>1</sup> This is a ball-park range, which uses as the lower value, information from Daily, Ehrlich, and Ehrlich (1993) who roughly estimate an optimum human population size of 1.5 to 2 billion.

*settlements after natural disasters, these are seen as opportune times for communities to regroup and evaluate possibilities for reconstruction, at a pace that allows dialogue amongst community members to consider matters of equity and sustainability among other things. The effects of climate change that were experienced earlier on in the millennium have resulted in descendants who are alert to the sense of an ecological age.*

*Economic growth is no longer an esteemed aspiration of corporations and individuals. New institutions have replaced the old. Subsidies for fossil fuels are history and goods prices capture environmental externalities.*

*Advances in energy efficiency, conservation and investment in renewable energy have reduced energy demand. Cities seek soft energy paths which reduces impacts on the environment. Dramatic advances in technology since the last millennium have enhanced human well-being. Smart buildings are less energy consumptive. Living more in tune with nature and advances in and smarter use of technology has made the link between cause and effect more transparent, known and immediate.*

*Human powered travel is commonplace. Walking, trishaws, bicycles are common methods of travel in local areas. The true cost of non-renewable (fossil) fuels is realised and former ubiquitous modes of transport that relied on them are out of fashion. In towns, roading material and design of neighbourhoods make it enjoyable for people to travel more slowly and pause in natural parks and reserves before hopping on the next solar powered public transport carriage.*

*Some indigenous people have developed ecotourism enterprises. Their long history draws tourists to their ancestral lands. Openness to travellers and sharing of their core culture brings pride and increases esteem in these peoples.*

*Work is enjoyable and meaningful. New local industries have blossomed and previous energy intensive industries reliant on fossil fuels are no longer around. People's lives are enriched through personal fulfilment, connectivity to others and the land, and meaningful work. In the mature ecological age, social justice, ecological awareness and peace prevail in society.*

**Figure 1. An example of a 1000 year vision.**

## **5. Backcasting**

Backcasting emerged in the 1970s and was initially employed in the field of energy but has since shifted focus to the area of sustainability after the publication of Our Common Future in 1987 (Vergragt & Quist, 2011, p. 748). It is a planning approach and methodology that is well suited to complex and uncertain circumstances where current trends are part of the problem (Holmberg & Robert, 2011, p. 293). Backcasting can be described as encouraging “the searching for new development paths when the conventional paths do not seem to solve the problem” (Phdungsilp, 2011, p. 709). It offers an alternative to looking at the future from a forecasting perspective and is more concerned with what is attainable for the future rather than what is likely to happen (Robinson, 1982, in Dreborg, 1996, p. 814). Backcasting includes the development of a future desired state through an envisioning process, which then looks back, or “backcasts”, to investigate possible pathways to achieve the vision (McDowall, 2006). For backcasting to be effective there need to be adequate scope and time frame inherent in the process so that real choices are able to be made (Holmberg & Robert, 2011, p. 294). This also allows time for any major changes needed to be socialised.

Dreborg (1996, p. 816) states that the following characteristics favour backcasting:

- When the problem to be studied is complex, affecting many sectors and levels of society;
- When there is a need for major change, i.e. when marginal changes within the prevailing order will not be sufficient;
- When dominant trends are part of the problem – these trends are often the cornerstone of forecasts;
- When the problem to a great extent is a matter of externalities, which the market cannot treat satisfactorily;
- When the time horizon is long enough to allow considerable scope for deliberate choice.

Such studies can play an important role in development of shared visions of the future, creating powerful expectations of the potential of emerging technologies and mobilising resources necessary for their realisation (McDowall, 2006, p. 1236).

## 6. Scenario planning

Scenario planning is a planning tool associated with both creative visioning and backcasting. Scenarios can be described as “stories or snapshots of what might be” (Wollenberg, Edmunds & Buck, 2000, p. 66) or is possible within human and environmental systems (Swart, Raskin & Robinson, 2004). Scenario planning was developed by the military and adopted as a strategic planning tool for commercial purposes by Royal Dutch Shell (Börjeson et al., 2005; Wilkinson, 2009). The military, corporate and natural science spheres represent socially powerful sectors of society and have needed a principled way to grapple with and sharpen their thinking towards a future of great complexity, unpredictability and consequence (Garb et al., 2008). Scenarios have been used extensively for communicating climate change assessments and environmental change (Alcamo et al., 1996; Sala et al., 2000; Raskin, 2005). Traditionally, model based scenarios used in climate change research have been developed using sequential processes focussed on step-by-step and time-consuming delivery of information between separate scientific disciplines (Moss, 2010).

There are now many categories of scenarios for planning purposes, each tending to utilise a slightly different technique in development, but all having similarities of identifying: key drivers; secondary drivers; wildcard or surprise drivers; that may impact on a desired future state complex and interrelated manner (McGuinness, 2008; Moss, 2010; Raskin, 2005). No clear agreement on a typology for scenarios has been agreed although one approach is to base their categorisation on three future focussed questions they seek to answer (Börjeson et al., 2006, p. 725). These are:

- “What can happen?” (*explorative scenarios based on events considered possible to occur*)

- “What will happen?” (*scenarios based on forecasts and ‘what if’ scenarios for events that are likely to occur*)
- “How can a specific target be reached?” (*scenarios based on reaching a target by adjusting the current situation (preserving) or by looking towards a target that requires a break in a trend (transforming)*).

Dreborg (1996) similarly allocates scenarios to three categories being 1) thinking predictive, 2) eventualities and 3) visionary, noting that forecasting, external scenarios and backcasting are methods that correspond respectively to each of these categories.

Within the transforming/visionary category for the typologies described above, scenarios can be used to generate creative thinking and new “pictures” of the future that are able to step outside current ways of thinking and thereby also become a learning tool (Wollenberg et al, 2000). If there is a genuine desire for a different future, backcasting can then be utilised to work out how this future could be achieved. All of these studies however typically refer to a 25-50 year time frame only (Börjeson et al., 2006), inadequate for addressing the complexity of issues and high levels of uncertainty associated with achieving a sustainable future. A backcasting approach allows a broader range of possible future options to be considered as well as how to achieve them.

Roberts (2004, p. xviii) points out that “Backcasting from scenarios is helpful when dealing with emotionally charged decisions. By asking decision makers (and associated stakeholders) to envision a specific picture of the future, bias and value judgements are exposed and can be dealt with in an open manner.” This approach differs slightly from the idea of backcasting from a vision and using scenarios to flesh out the vision and explore paths to be taken to achieve it, however, the need to ensure that decision makers and stakeholders value judgements and biases are identified and dealt with is important. Without these underlying views being explicitly addressed the process may well become divisive.

#### **a) Predictive scenarios**

Traditional planning scenarios fall mostly into the category of predictive forecasts. They are characterised by the use of quantitative methods to predict futures based on current trends, or based on survey of expert opinion and tend to explore shorter time scales. (McDowall, 2006, p. 1241).

Alcamo et al. (1996) developed a series of three baseline environmental scenarios to assess what would happen if no change was made to current practise. They used the driving forces of population and economic growth and economic activity at different generalised growth rates. These were then used to assess coupled global change indicators e.g. food demand, consumption and production, changes in land cover, emissions of greenhouse gases.

The work was done using an IMAGE 2 computer model and they found that over time each of the scenarios converged for a variety of different indicators due to the complex interactions of the driving forces and the causal loops that these set up.

### **b) Exploratory scenarios**

Explorative scenarios address what can happen to development of external factors beyond the control of the relevant actors. Strategic scenarios resemble what-if scenarios. Explorative scenarios start in some future time and can be used in times of rapid and irregular change or when mechanisms that will lead to some kind of threatening future scenario are not fully known (Börjeson et al., 2005, p. 18).

Rather than extrapolating from existing trends, exploratory scenarios seek to inform policymaking by illuminating underlying drivers of change, often drawing upon tacit knowledge and expertise, to build internally consistent storylines describing a number of possible futures. These may be longer term; up to approximately 100 years (McDowall, 2006, p. 1241).

### **c) Normative scenarios**

The intuitive (normative) scenario process leans strongly on qualitative knowledge and insights from which scenarios are developed. Creative techniques such as the development of stories or storylines are typically intuitive approaches (van Notten, 2003, p. 427).

Van Notten (2003, p. 427) also suggested that normative and the more formal predictive and exploratory scenarios have actors, factors and sectors. Actors are individuals, organisations or groups of organisations such as governmental bodies, companies, NGOs and scientists. Factors are societal themes such as equity, employment, and consumption behaviour. Sectors are arenas in society where factors and actors interact e.g. water, energy, transport and consumer products.

Normative scenarios are most appropriate for developing the storyline of very long term visions.

## **7. Society in scenarios**

As recommended by Haines-Young (2011) in the UK NEA (National Ecosystem Assessment) work there is a need to ensure that social sciences are addressed when developing scenarios. Traditional scenario development has not addressed issues of social science, how useful the scenarios developed have been for policy makers, or if indeed they have had any influence on policy makers at all. Garb et al. (2008) have studied this issue and have found that the social scientist would add value in several ways. For example, they would help to develop the storyline and facilitate dialogue

between disparate actors by helping to identify boundary objects that link different social worlds. They found that there has been little research into the policy use of scenarios. The MEA (Millennium Ecosystem Assessment) rate its direct impact on policy formation and decision making, especially in developing countries, as one of its weaknesses. There is a need for attention to scenario theory to realise their potential contribution as a rigorous activity within the domain of public policy and strategy development (Wilkinson, 2009, p. 111).

Normative scenario development can use a Delphi like approach to encourage participation. The UK NEA used this approach by running a survey of users of its website. In total, 72 people were invited to contribute to the web survey. The target population consisted of UK NEA user and client groups, members of the UK NEA expert panel, and the lead authors of the UK NEA chapters. The website was open for 50 days in the second quarter of 2010. Thirty-six individuals made a return and altogether they posed 71 questions (UK NEA, 2011). The group was self selecting and expert. To gain greater acceptance a wider range of stakeholders will need to be encouraged to participate in scenario development. Different worldviews occur, not only due to cultural background, but also through education and habituation in a working environment. Scientists, politicians, business people and lay people need to be able to view the same vision through a similar lens and enabling understanding of the impacts of attaining or not attaining a vision will have.

## **8. A borrowed vision**

Peter Head, OBE (2008), director of consulting firm Arup, has over the last few years been proposing that we should now be entering the “ecological age.” He sets out three policy areas where change is needed: “First, policies which drive towards the sustainable or optimal scale need to address the limiting of scale and the fact that previously free natural resources and services have to be declared scarce economic goods. Second, as sustainability is the criterion for scale, justice is the criterion for distribution to ensure that there is fairness across society and globally. Thirdly, policy needs to ensure that allocation of resources is as efficient and cost effective as possible.” These policy areas echo the three problems addressed by ecological economics (Costanza, Cumberland, Daly, Goodland, & Norgaard, 1997, p. 80).

We can take this idea and adapt it slightly, at least within this paper, so that the 1000-year vision becomes “In the year 3000 we have mature ecological age”. The vision will evoke different emotions across all levels of society, some will see this as a threatening state, while others will embrace it and yet others will be unsure of what it would mean for them. As discussed earlier, such a vision will inevitably lead to some fundamental questions. In this case it is probable that the questions will revolve around ‘how much will we have to change now?’ and ‘what will be the costs and benefits of the changes?’. To

enable the vision to be attained the answers to this question will need to be carefully explored and explained. For this to occur one of the aims of the visioning process must be to enable diverse emotional reactions to change and uncertainty to converge and motivate development of appropriate responses to the challenges that will be encountered. This long-term vision may “allow humanity to achieve the next to impossible” (Tonn, 2004, p. 94).

To enable the vision to be understood by a wider audience a process of scenario development could be implemented. Assumptions about the year 3000 would in the first instance have to be clearly articulated. With this particular vision assumptions would include but not be limited to: 0% fossil fuel use; 100% renewable energy; all waste generated is reusable; housing and all other infrastructure is made from renewable resources; there has been no extra-planetary importation of raw materials; or extra-planetary export of waste material.

Backcasting scenarios would enable potential pathways to be considered and storylines developed. They would need to cover an agreed time period, perhaps of 100 years, leading to the first scenarios being developed for the years 2900-3000 and for every 100 year period back from then, until such time as a shorter time period was considered appropriate.

Scenarios in this backcasting exercise would be normative, transforming (Börjeson et al., 2005, p. 14) and judgement based. A modified Delphi approach could be used, where groups of experts were required to imagine how the year 3000 would function if it were truly a “mature ecological age” and what actions in the preceding 100 years have enabled it to function in this way. These scenarios would need to be developed on multiple scales, from local to global and consider uncertainties around climate change impacts, population growth and technology. The wildcard events such as pandemics, major food shortages or extra-terrestrial migration could also be considered.

Höjer (1998, p. 17) elaborates on the use of the Delphi method of scenario development for the purpose of backcasting. In this process experts were given a survey that addressed four strongly structured technical scenarios, the Delphi experts were asked to evaluate among other things the feasibility of the long-term effects of the scenarios, with this evaluation being divided into two parts - technical and public acceptability. As scenarios were progressively developed for time periods closer to the present this feasibility assessment would become increasingly important. Testing such scenarios would be impossible, but in the first instance this process would be more about story telling than about fixing directions through policies or strategies.

To achieve greatest value predictive scenario development of both the forecasting and what-if approach could be undertaken for a long-term view. Where these predictive

scenarios and the normative scenarios converged it would seem appropriate to encourage stakeholder involvement, as at this point there would be some at least semi-quantitative information brought into the development process. It is also at this point where many tensions between the desired future and the current trajectory will become evident. Decision makers will be placed in a position of needing to make decisions that will involve potentially significant trade offs.

Börjeson et al. (2005, p. 22) point out that “a problem with the backcasting approach is that it can result in decisions that are expensive in the short-term and that the long-term targets, or available options, can change before the target year is reached.” However, as with any goal or vision, if there is sufficient time to prepare then hedging can be undertaken through a number of actions that could be identified and assessed through the scenario development. It may, for example, be found that by introducing a tax, an incentive or a market within a given time period the money needed to develop a new major infrastructure could be raised. A very long-term vision gives governments and communities a certain amount of freedom to explore the possibilities of attaining a future and to consider what they are willing to trade for humanity’s survival.

### **9. Tensions between planning timeframes**

There is an inherent tension between the different planning approaches to the future which become more apparent as time frames converge. This requires decision makers to address what tradeoffs are needed to enable the different views of the future to eventuate. Conversely, as time frames are extended out the usefulness of predictive scenarios and quantitative data diminishes (Swart, Raskin & Robinson, 2004) providing a space for more qualitative options to emerge through the use of visionary scenario analysis and backcasting. This then enables the integration and synthesis required for sustainable solutions to be developed.

Stubbings and Ceasar (2010, pp. 30-31) describe the moment for businesses when they face a decision point: conventional or business-as-usual steps could continue to be taken or, at the other end of the spectrum, the business might ask more fundamental questions pertaining to the organisation’s purpose. By asking fundamental questions the business looks deeper to core issues and at this point has the opportunity to make more effective changes to a system, harnessing the more effective leverage points like exploring goals and paradigms as discussed by Meadows (2010). This tension is also evident in post disaster recovery plans where plans to rebuild as quickly as possible are placed alongside plans for the future and there is currently little research on how to respond to this tension (Blanco et al., 2009) The ability to make this trade-off “strategically and purposefully is rare” (Blanco et al., 2009., p. 207) but in meeting obligations to hand on a sustainable world to future generations strategic long term decisions need to be made now to ensure future options are maintained.

A multi-level, adaptive and integrated approach is advocated by Stubbings and Ceasar (2010) which involves engaging stakeholders and a cycle of sensitising, re-visioning and transforming. This approach is very similar to an adaptive management tool used in ecological economics consisting of cyclical steps of envisioning, assessing, planning, implementing and monitoring (see van den Belt, 2009, p. 5). The adaptive management model is notably adaptive and participatory. A strength lies in the collaborative approach and reflective learning by stakeholders and decision makers.

There is also much to learn from indigenous cultures who have developed sustainable management techniques of resources through “more than a thousand years of trial and error” (Peet, 2006). Their wisdom should be placed alongside that of scientific and social disciplines in looking for alternative options for the future.

#### **10. Key distinctions between conventional and longer term planning**

The key characteristics of conventional and longer term planning, i.e. forecasting versus visionary backcasting, is summarised in the following table (adapted from Dreborg, 1996):

<b>Forecasting approach</b>	<b>Visionary backcasting approach</b>
Short to medium time frames	Able to consider longer view issues
Context of justification	Context of discovery - ideas, creativity
Causality - predicting the future of a system	Purposeful /strategic choices - based on desires and values
Problem/issue focussed	Solutions focussed - produces alternative views of the future

*Table 1: Comparison of forecasting and backcasting approaches*

#### **11. Scenario planning and tourism**

Tourism has been regarded as among the world’s top industries playing an important role in the economic and social development of many destinations and communities. The World Travel and Tourism Council projected that tourism will have a global value of US\$10.5 trillion and will employ 125 million people by 2018 (WTTC, 2013). The United Nations World Tourism Organisation likewise estimated that there will be 1.8 billion travelling tourists by 2030 (UNWTO, 2013). This increasing demand for tourism puts pressures on destinations to become both competitive and sustainable. To address these pressures effective planning and management is imperative.

Planning horizons within the tourism industry are short, generally in the order of 5 to 25 or 30 years. This is understandable given the volatility of the industry and its vulnerability

to economic downturns. Taking a longer term view into the future should be considered by tourism planners and policy makers. Policies should then address cumulative impacts on the environment, economic and social aspects of the destination in the longer term future and also consider how a community that has a significant proportion of its income derived from tourism will survive periods of economic downturn. In this context, tourism policies can facilitate inter-generational equity.

Ritchie (1999) points out that a shift from the traditional short and medium to a longer term planning time frame is crucial to realise sustainable destinations. He adds that destination planning should incorporate a vision that serves as inspiration and sets direction over the desired future (Ritchie, 1999). This inspiration is likely to come from a vision of the destination as it is currently and how it will look in the future. This is particularly so for ecotourism, where those taking part are socially inclined to want to preserve the present for future generation, that is ecotourists tend to be conservationists. It can be anticipated that a vision of healthy fauna and flora at a destination that is currently or has been under pressure from external threats (e.g. invasive plants and animals, illegal or legal logging, habitat fragmentation etc) will produce a feeling of well-being in the tourists.

Scenario planning has been recognised as a suitable tool for destination planning. Its use for this purpose started in the late 1970's and early 1980's (Krippendorf, 1982). Scenarios encourage a participatory approach that enables people (decision-makers) to grasp possible representations of a destination in the future (Haywood, 1988). It is increasingly used and accepted in government and business policy making relating to tourism (Gossling & Scott, 2012). In addition to enabling decision-makers and local stakeholders (the actors within a scenario as identified by van Notten, 2003) to assess likely tourist numbers and responses, scenarios can assist in predicting how the potential changes caused by climate change are likely to impact the natural, built, human and social capital of the location.

Scott and Jones (2006) used three climate change scenarios produced by the National Center for Atmospheric Research in the United States. They assessed the direct and indirect impacts of climate change on nature-based tourism. They developed a model for the direct impacts using statistical regression analysis of the current relationship between climate and monthly visitor numbers during peak and shoulder tourist seasons. The models were then run for one park, with three climate change scenarios used to project changes in seasonality and numbers of people visiting the parks in the 2020's, 2050's and 2080's.

Indirect impacts such as loss of key landscape features (e.g. glaciers and erosion of coastal areas), and iconic species (e.g. grizzly and polar bears, moose etc) from the parks was assessed by surveying visitors to two of the national parks. They had a 53% response

rate and found that visitor numbers were likely to increase for the 2020's to 2050's with most of the increase outside of the traditional peak seasons, and that population growth would have more impact on visitation numbers over this period. However, there was a threshold of change at which current visitors would no longer visit the parks. They noted that it was questionable that current visitors' behaviour would be representative of visitors in 80 years time.

This work is important as it identifies a number of tensions. Ecotourism operators are likely to want a longer tourism season and the additional infrastructure associated with greater visitor numbers, while the conservationist is concerned about the impact of tourists on wildlife as well as the impact of climate change on species range and resilience. Ecotourism is undertaken in some of the most ecologically sensitive areas of the world. In developing countries such tensions will be more acute and the need to develop appropriate infrastructure, such as solid waste facilities, water and waste water treatment systems, roading and energy requirements and the associated environmental damage of having or not having this infrastructure will be immense. If there is to be any chance of sustainable development it is an imperative that we enter the ecological age.

## **12. Destinations that use scenarios in tourism planning**

### Sagarmatha (Mt Everest) National Park, Khumbu, Nepal, (Daconto and Sherpa, 2010)

The growth of tourism in Sagarmatha National Park has brought changes to the park. The increase of visitor numbers has also resulted in an increase of settlers, migrant workers and in tourism establishments. Despite the park protection system, tourism has caused degradation to the environment through, for example, solid waste and water pollution. It has contributed to increased demand for forest products, soil and sand mining, as well as wildlife poaching. In addition, social and cultural change within the park and buffer zones has been recognised and linked to the effects of tourism.

As park management is being devolved to the local community, gaining insights on the social and ecological future of the park is important. Participatory scenario planning has been utilised to assess the long-term challenges and to develop alternative future scenarios for the park. The workshop was attended by local communities, tourism businesses, Department of National Parks and Wildlife Conservation, NGOs and religious groups.

The participants formulated 25-year scenarios concerning government systems and the role of tourism actors in the park. Among the formulated scenarios were Sherpa Unity - where local governance fails to manage tourism impacts; Loss of Voice – where outside investors asserts tourism development; Missed Opportunity – where non-Sherpa interests encroach on local enterprise; and, Autonomous Khumbu - where Sherpas manage the park and share tourism revenues.

The scenarios provided a platform to discuss among stakeholders their aspirations about the park and tourism. The long-term focus facilitated non-confrontational discussion over conflicting interests. The exercise also widened stakeholders understanding on the uncertainties and controllable drivers of change. As a result, appropriate policies and strategies were implemented to mitigate pressures and threats in the park.

#### Tourism Scotland (Yeoman and Lederer, 2004)

In order to understand the potential of tourism in Scotland, four scenarios have been created to illustrate contrasting futures of tourism by 2015. These are Dynamic Scotland which features tourism as a top industry accounting for a £10 billion economy; Weekend Getaway which sees tourism based on consumerism and play, with the value of tourism in this scenario is £7.6 billion; Yesterday's Destination which recognises that the industry is too complacent and would only account for £ 5.1 billion value; and Exclusive Scotland where the economy has failed but favourable exchange rates attract high spending tourists. In this scenario, tourism was valued at £2.6 billion. The themes have been constructed from a range of drivers which shape tourism including the environment, governance, GDP, exchange rates, price sensitivity, fiscal policies, transport and perpetual values.

The 'ideal' scenario among the four is the Dynamic Scotland where the industries contributes significantly to the economy and generate more employment and livelihoods. In this scenario, Scotland is accessible to all visitors where favourable policies and programs for tourism development exist. However, Yeoman and Lederer (2004) raised that in order to achieve this scenario, an appreciation for the value of tourism is important. They added that creating a vision for tourism is imperative to realise Dynamic Scotland.

#### Climate Change and Tourism in Bernese Oberland, Switzerland

Muller and Weber (2008) employed scenario analysis to evaluate possible impacts of climate change on different tourism destinations in Bernese Oberland by 2030. Two scenarios were used to consider how the probable minimum and maximum increase of temperature will affect different destinations in the region. Scenario planning is an adequate approach to deal with such uncertainties as it expresses specific assumptions based on sound scientific evidence (Muller and Weber, 2008). The study used the temperature and rainfall forecasted by the Intergovernmental Panel on Climate Change (IPCC, 2007).

The study determined that winter tourism will suffer considerable losses in revenue except on the high-altitude ski areas. However, summer tourism will partially offset the revenue loss. Different providers that specialise in winter tourism like ski schools, mountain railways and winter destinations will experience a significant impact in 2030.

On the other hand, the study suggested mitigating strategies where tourism can share responsibilities such as promoting measures to reduce emissions.

The use of scenarios enabled the stakeholders to evaluate the possible impacts of climate change on the tourism industry in Bernese Oberland. It provided a useful basis for discussion in planning alpine tourism destinations. The study also provided mitigation and adaptation strategies to sustain tourism growth over a longer period.

#### Preserving the intangible cultural heritage of Tibet through tourism

Pan, Shizhou and Crone (2007) presented measures to preserve the intangible cultural heritage (ICH) of Tibet using tourism as leverage. The ICH includes social values, traditions, beliefs, customs, practices, languages, aesthetics, artistic expressions and other aspects of human activity. Tourism is dependent on the cultural aspects of a destination and preserving ICH is therefore important for tourism to become sustainable. More importantly, it will enable the Tibetan culture to persist (Pan et al., 2007).

The study found that ICH is declining in Tibet. The degradation of natural resources, changes in lifestyle, abandonment of traditional language, mass production of traditional handicrafts and the neglect of indigenous people's well-being are among the reasons for ICH deterioration. In this regard, the study proposed different participatory methods to enable ICH preservation and transition towards sustainability.

The use of backcasting together with the five-level framework, sustainability principles, ABCD methodology and the golden rule were included in the model. The five-level framework scoped the problem, created the vision for success, formulated the strategies, described the actions and utilized tools. Based on a value-laden vision, backcasting was utilised anchoring on sustainability principles. This approach identified incremental steps towards ICH preservation. On the other hand, the ABCD methodologies guides backcasting process and put forth the vision relating to ICH and tourism. Finally the golden rule, offers overriding methods and guidance in humanising decisions towards ICH preservation.

By using the above methods, the study found that the long-term development goal, knowledge for social systems and guidelines for social sustainability were inadequate to allow ICH to survive in the long run. In addition, the study suggested dematerialisation where efficient use of resource is important; substitution where abundant materials replaced rare ones; and, humanisation to do away with destructive practices that affect other people. The study also enumerated actions to realise ICH preservation. These are identification of stakeholders, create awareness about ICH importance, and promote capabilities of Tibetans to safeguard their culture.

Through backcasting and the other sustainability approaches, Tibet's intangible cultural heritage has a chance to persist in the coming generations. Tourism becomes leverage as it is the main sector that has direct interaction with local and indigenous culture.

#### Comparison of tourism case studies planning scenarios

In looking at these case studies the Sagarmatha case study offers the most forward looking scenarios and opportunity to look at the future in a new light. A key element of this study was the inclusion of local communities and other key stakeholders in the workshops that were run with one of the four scenarios clearly providing a pathway for the local Sherpa people to manage the park and thereby the opportunity to grow their own capability and autonomy.

On the other hand, the model presented in preserving Tibet's intangible cultural heritage provided for local and indigenous people to create a vision, backcast and identify actions towards their shared vision of a sustainable culture. The model seems to be useful in achieving a sustainable destination because it will create a socio-economic system in harmony with the natural system for a longer period. The use of the model will not only be beneficial for tourism destination, but more importantly it could introduce strategic sustainable development into societies and local communities around the world.

In considering these different scenarios some key distinctions can be drawn between these cases as shown in Table 2 below:

<b>Scenario studies in tourism</b>	<b>Scenario type</b>	<b>Time frame</b>	<b>Planning values and approaches</b>
Tourism Scotland	Predictive	10 years - 4 scenarios Short term	Market Driven Focus on the destination's sustainability
Climate Change Bernese Oberland	Exploratory	20 + years - 2 scenarios Short term	Market Driven Focus on the destination's sustainability
Sagarmatha National Park	Normative	25 years - 4 scenarios	Values and Market Driven Focus on the destination's sustainability and community empowerment
Preserving the	Normative	Long term	Values Driven

cultural heritage of Tibet			Focus on sustainability and inter-generational equity
----------------------------	--	--	---

*Table 2: Distinction of scenarios in the four cases studies*

The four cases demonstrate how scenarios have been used as a tool in long-term destination planning. The development of scenarios in these cases was participatory where the key stakeholders such as the tourism agencies, environment department, business sectors, park management and local communities were involved in scenario making. The common theme among the cases is the pursuit of sustainable tourist destinations amidst the challenges and uncertainties in the future.

However there are key distinctive characteristics among the cases presented. These are shown in their respective typologies, time-frames and approaches. For example, Tourism Scotland is a predictive type scenario. It uses quantitative analysis on the current visitor trends and extrapolates with tourism drivers such as exchange rates, disposable income and fiscal policy to predict the ideal future. Tourism Scotland scenarios are also market driven that sees the contribution of tourism to national revenues and employment. For the Bernese Oberland study the scenarios were exploratory and the impact of external factors in the form of climate change were considered. It may occur beyond the control of relevant actors especially in the absence of explicit greenhouse gas reduction policies. In addition, the scenarios developed in Bernese Oberland are market and advocacy driven and will guide winter tourism operators to become resilient and profitable, and at the same time foster shared responsibilities to reduce emissions especially for Alpine destinations.

In contrast, the Sagarmatha National Park and Tibet cultural heritage scenarios are normative and used the qualitative knowledge of the key stakeholders, particularly the host communities, in making storylines about their intuitive visions of the destinations. In addition, both cases are value driven. The values of exercising restraint and respect for others are demonstrated. This means that restraint from excessive use fosters respect for others. In this context, intra and inter-generational equity are possible. These values are linked to the concept of karma wherein the future outcomes are intertwined with present deeds.

### **13. Conclusion**

Tonn (2007) has indicated that very long-term planning is required to enable assessment of the big picture problems facing our world and to ensure our species survival. Conventional planning systems have primarily focussed on short to medium term time frames and predictive futures as a way to address issues and plan for the future. They

have enabled the use of natural resources at levels that are now known to be unsustainable. In contrast to this, envisioning, backcasting and normative scenarios provide a way to look to the future in a much longer time frame, looking for multiple solutions with the aim to ensure that future generations have the full range of options and opportunities available to them as we currently have.

The use of scenario planning in the tourism industry provides real examples of these two approaches in action. They have highlighted how scenarios have been used to help achieve different purposes including the development of more complex/complete scenarios which enable the big picture, big challenges to be considered and solutions proposed. The case studies have also demonstrated how normative scenario planning for destinations can support sustainability, inter-generational equity and empowerment within local communities.

This approach, if extrapolated out, could be used to generate support for the concept of a mature ecological age and a vision for the year 3000. While we cannot predict the future by forecasting, through the use of backcasting from a vision and the use of scenarios, we expand the ability to influence the desirability of its form.

Points of tension are encountered as differences between present pathways and desired states emerge which requires some reconciliation and understanding of potential tradeoffs. In these situations, when forecasting meets backcasting, the use of adaptive management, characteristically proactive, multi-scale, cyclical, reflective, and participatory, is supported to reassess the situation and plan how to move forwards, towards a shared sustainable and desirable future vision.

## References

- Alcamo, J., Kreileman, G. J. J., Bollen, J. C., van den Born, G. J., Gerlagh, R., Krol, M. S., Toet, A. M. C., & de Vries, H. J. M. (1996). Baseline scenarios of global environmental change. *Global Environmental Change*, *6*, 261-303.
- Bishop, P., Hines, A., & Collings, T. (2007). The current state of scenario development: An overview of techniques. *Foresight*, *9*, 5-25.
- Blanco, H., Alberti, M., Olshansky, R., Chang, S., Wheeler, S., Randolph, J., London, J., Hollander, J., Pallagst, K., Schwarz, T., Popper, F., Parnell, S., Pierterse, E., & Watson, V. (2009). Shaken, shrinking, impoverished, and informal: Emerging research agendas in planning. *Progress in Planning*, *72*, 195-250.
- Börjeson, L., Höjer, M., Dreborg, K. -H., Ekvall, T., & Finnvedon, G. (2005). Towards a user's guide to scenarios – a report on scenario types and scenario techniques. *Royal Institute of Technology, Stockholm*.
- Börjeson, L., Höjer, M., Dreborg, K. -H., Ekvall, T., & Finnveden, G. (2006). Scenario types and techniques: Towards a user's guide. *Futures*, *38*, 723-759.
- Campbell, A., Devine, M., & Young, D. (1990). *A Sense of Mission*, in Shipley & Newkirk (1999). Vision and visioning in planning: What do these terms really mean? *Environment and Planning B: Planning and Design*, *2*, 573-591.
- Costanza, R., Cumberland, J., Daly, H., Goodland, R., & Norgaard, R. (1997). *An introduction to ecological economics*. Boca Raton, FL: St. Lucie Press.
- Costanza, R. (2000). Visions of alternative (unpredictable) futures and their use in policy analysis. *Conservation Ecology*, *4*(1). Retrieved 25 January, 2014 from [www.consecol.org/vol4/iss1/art5](http://www.consecol.org/vol4/iss1/art5)
- Costanza, R. (2001). Visions, values, valuation and the need for ecological economics. *Bioscience*, *51*(6), 459-469.
- Daconto, G., & Sherpa, L. N. (2010). Applying scenario planning to park and tourism management in Sagarmatha National Park, Khumbu, Nepal. *Mountain Research and Development*, *30*(2), 103-112.
- Daily, G. C., Ehrlich, A. H., & Ehrlich, P. R. (1993). Optimum human population size. *Population & Immigration*, *4*(2), 9–12. Retrieved from <http://www.urbanhabitat.org/node/955>

- Dreborg, K. (1996). The essence of backcasting. *Futures*, 28(9), 813-828.
- Farley, J., & Costanza, R. (2002). Envisioning shared goals for humanity: A detailed, shared vision of a sustainable and desirable USA in 2100. *Ecological Economics*, 43, 245-259.
- Farley, J., Baker, D., Batker, D., Koliba, C., Matteson, R., Mills, R., & Pittman, J. (2007). Opening the policy window for ecological economics: Katrina as a focussing event. *Ecological Economics*, 63, 344-354.
- Folkes, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C. S., & Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio*, 31, 437-440.
- Forstater, M. (2004). Visions and scenarios: Heilbroner's worldly philosophy, Lowe's political economics, and the methodology of ecological economics. *Ecological Economics*, 51, 17-30.
- Gössling, S., & Scott, D. (2012). Scenario planning for sustainable tourism: an introduction. *Journal of Sustainable Tourism*, 20(6), 773-778.
- Glavovic, B. C., Saunders, W. S. A., & Becker, J. S. (2010). Land-use planning for natural hazards in New Zealand: The setting, barriers, 'burning issues' and priority actions. *Natural Hazards*, 54(3), 679-706.
- Haines-Young, R., Paterson, J., Potschin, M., Wilson, A., & Kass, G. (2011). The UK NEA scenarios: Development of storylines and analysis of outcomes. *UK National Ecosystem Assessment, Technical Report*. Cambridge: UNEP-WCMC.
- Hausler, E., Biberacher, M., & Blaxhke, T. (2012). GIS-based Backcasting: An innovative method for parameterisation of sustainable spatial planning and resource management. *Futures*, 44, 209-301.
- Haywood, K. M. (1988). Responsible and responsive tourism planning in the community. *Tourism management*, 9(2), 105-118.
- Head, P. (2008). Entering the ecological age. The Institution of Civil Engineers Brunel Lecture Series. Retrieved from [http://www.arup.com/Publications/Entering\\_the\\_Ecological\\_Age.aspx](http://www.arup.com/Publications/Entering_the_Ecological_Age.aspx)
- Holmberg, J., & Robert, K.-H. (2000). Backcasting – a framework for strategic planning. *International Journal of Sustainable Development and World Ecology*, 7(4), 291-308.

- IPCC (2007). *Climate Change 2001: The Physical Science Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge and New York, NY.
- Krippendorff, J. (1982). Towards new tourism policies: The importance of environmental and socio-cultural factors. *Tourism management*, 3(3), 135-148.
- Mattias, H. (2000). What is the point of IT. *Backcasting Urban transport and Land Use Futures*. Doctoral Dissertation, Department of Infrastructure and Planning, Institute of Technology, Stockholm.
- McDowall, W., & Eames, M. (2006). Forecast, scenarios visions, backcasts and roadmaps to the hydrogen economy: a review of the hydrogen futures literature. *Energy Policy*, 34, 1236-1250.
- McGuinness, W., Henley, D., Foster, L., & Perquin, J-C. (2008). Four Possible Futures for New Zealand in 2058. *The Sustainable Futures Institute Limited (now the McGuinness Institute)*.
- McGuinness, W., Hickson, R., & White, D. (2012). Project 2058, Report 9 Executive Summary, Science Embraced, Government funded Science under the Microscope. *The Sustainable Futures Institute Limited (now the McGuinness Institute)*.
- Meadows, D. (1994). *Envisioning a Sustainable World*. Proceedings of Third Biennial Meeting of the International Society for Ecological Economics, October 24-28, San Jose, Costa Rica.
- Meadows, D. H. (2010). Leverage points: Places to intervene in a system. *Solutions*, 1, 41-49.
- Moss, R., Edmonds, J., Hibbard, K., Manning, M., Rose, S., Vuuren, D., Carter, T., Emori, S., Kainuma, M., Kram, T., Smith, S., Sctouffer, R., Thomson, A., Weyant, J., & Wilbanks, T., (2010). The next generation of scenarios for climate change research and assessment. *Nature*, 463, 747-756.
- Müller, H., & Weber, F. (2008). Climate change and tourism—scenario analysis for the Bernese Oberland in 2030. *Tourism Review*, 63(3), 57-71.
- Murphy, G. (2014). *The constitution of the Iroquois nations: The great binding law, Gayanashagowa*. Retrieved from <http://www.indigenouspeople.net/iroqcon.htm>

- Pan, B., Shizhou, Y., & Crone, C. R. (2007). Preserving Intangible Cultural Heritage to Facilitate a Transition towards Sustainability A Case Study of Tibet's Tourism Industry.
- Peet, J. (2006). Systems Thinking and Common Ground. *International Journal of Transdisciplinary Research*, 1(1), 88-99.
- Peterson, G. D., Cumming, G. S., & Carpenter, S. R. (2003). Scenario planning: A tool for conservation in an uncertain world. *Conservation Biology*, 17, 358-366.
- Phdungsilp A. (2011). Future studies' backcasting method used for strategic sustainable city planning. *Futures*, 43, 707-714.
- Raskin, P. D. (2005). Global scenarios: Background review for the millennium ecosystem assessment. *Ecosystems*, 8, 133-142.
- Raynor, M. (1998). That vision thing: Do we need it? *Long Term Planning*, 31(3), 368-376.
- Ritchie, J. R. (1999). Crafting a value-driven vision for a national tourism treasure. *Tourism Management*, 20(3), 273-282.
- Robinson, J. B. (1982). Energy backcasting: A proposed method of policy analysis. *Energy Policy*, in Dreborg, K. (1996). The essence of backcasting. *Futures*, 28(9), 813-828.
- Sala, O.E., Chapin III, F., Armesto, J., Berlow, E., Bloomfiel, J., Dirzo, R., Huber-Sanwald, E., Huennecke, L. F., Jackson, R. B., Kinzig, A., Leemans, R., Lodge, D. M., Mooney, H. A., Oesterheld, M., Poff, N. L., Sykes, M. T., Walker, B. H., Walker, M., & Wall, D. H. (2000). Global Biodiversity Scenarios for the Year 2100. *Science*, 287, 1770-1774.
- Scott, D., & Jones, B. (2006). Climate change and Nature-Based Tourism. Implications for Park Visitation in Canada. Waterloo, ON: University of Waterloo, Department of Geography.
- Shiple, R., & Michela, J. L. (2006) Can vision motivate planning action? *Planning Practice and Research*, 21, 223-244.
- Shiple, R. & Newkirk, R. (1999). Vision and visioning in planning: What do these terms really mean? *Environment and Planning B: Planning and Design*, 2, 573-591.
- Stubbings, A., & Ceasar, N. (2010). From light-bulbs to light-bulb moments: Creating sustainable value. *Converse*, 7, 30-33.  
<http://www.ashridge.org.uk/Website/IC.nsf/wFARPUb/From%20Lightbulbs%20to%20Lightbulb%20Moments?opendocument>

- Swart, R., Raskin, P. & Robinson, J. (2004). The problem of the future: sustainability science and scenario analysis. *Global Environmental Change*, 14, 137-146.
- TEEB (2010). The Economics of Ecosystems and Biodiversity for Local and Regional Policy Makers.
- Tonn, B. (1986). 500 Year Planning: A Speculative Provocation. *Journal of the American Planning Association*, 52(2), 185-193.
- Tonn, B. (2004). Integrated 1000-year planning. *Futures*, 36, 91-108.
- Tonn, B. (2007). Futures sustainability. *Futures*, 39, 1097-1116.
- UK NEA (National Ecosystem Assessment) (2011). *The UK National Ecosystem Assessment: Synthesis of Key Findings*. UNEP-WCMC, Cambridge.
- UNWTO (2013). *UNWTO tourism highlights, 2013 edition*. Retrieved from [www.unwto.org](http://www.unwto.org)
- van den Belt, M. (2009, July). *Multi-scale integrated modelling for sustainable adaptive systems*. Paper presented at the System Dynamics Society Conference, Albuquerque, New Mexico. Retrieved from <http://www.systemdynamics.org/conferences/2009/proceed/papers/P1389.pdf>
- van der Helm, R. The vision phenomenon: Towards a theoretical underpinning of visions of the future and the process of envisioning. *Futures*, 41, 96-104.
- Vergragt, P. J., & Quist, J. (2011). Backcasting for sustainability: Introduction to the special issue. *Technological Forecasting & Social Change*, 78, 747-755.
- Wilkinson, A. (2009). Scenarios practices: In search of theory. *Journal of Future Studies*, 13, 107-114.
- Wollenberg, E., Edmunds, D. & Buck, L. (2000). Using scenarios to make decisions about the future: anticipatory learning for the adaptive co-management of community forests. *Landscape and Urban Planning*, 47, 66-77.
- WTTC (2013). *Continued growth signalled for travel and tourism industry*. Retrieved from [www.wttc.org](http://www.wttc.org)
- Yeoman, I., & Lederer, P. (2005). Scottish tourism: Scenarios and vision. *Journal of Vacation Marketing*, 11(1), 71-87.