Using learning processes to promote change for sustainable development

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Abstract

Sustainable development is widely recognised as a major change challenge, though its urgency is not as widely appreciated. This article begins by reviewing the challenge and showing how it is not currently being taken up. Drawing on the wider literature, it identifies some of the key contextual issues that need to be addressed in change programmes for sustainability. It then develops a simple model of three conditions, 'awareness', 'agency' (the identification of meaningful ways of responding) and 'association' with other people, whose development is shown to be crucial in addressing these issues and hence to promoting change for sustainable development. It also identifies a vital process ('action and reflection') for doing this. The article concludes with a case example, using this model to review a change initiative in the corporate sector.

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Introduction

Sustainable development: an urgent change challenge

'Sustainable development' has been defined as 'meeting the needs of the present without harming the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987). This definition has been widely accepted, for instance by the UK Government in its 1999 Sustainable Development Strategy (DETR, 1999). What is the future danger against which the definition is warning us?

In ecology, 'overshoot and collapse' is what happens when a species exceeds its 'carrying capacity' for a while, eroding resources as it does so, leading to eventual collapse of the population with recovery taking a very long time. In the early 1970s Eugene Odum, a leading academic ecologist, warned of the danger of human overshoot in the context of a growing global population (Odum, 1971: 183-5). Published a few months later, the Club of Rome's 'Limits to Growth' report argued that the characteristic behaviour of the world system is indeed 'overshoot and collapse'. It concluded that if the trends obtaining at that time were to continue 'the most probable result will be a sudden and uncontrollable decline in both population and industrial capacity', probably around the middle of the 21st century (Donella H Meadows, Meadows, Randers, & Behrens, 1972: 24). Other global models were surprisingly consistent. The models' conclusions rested on the assumption that resource limits are indeed real (Donella H. Meadows, Richardson, & Bruckman, 1982; Neurath, 1994).

Almost two decades later, the first three Systems Conditions of the Natural Step defined what these limits might be, supported by many natural scientists (Ayres, 1998; Bradbury, 1998, 2001; Robèrt, 2002: 64-5): In a sustainable society, nature would not be subject to systematically increasing:

1. Concentrations of substances, such as fossil fuels, extracted from the Earth's crust;
2. Concentrations of substances produced by society, such as plastics, which cannot be broken down by natural processes;
3. Degradation of nature by physical means, such as destruction of natural forests, whether in the Amazon or in Europe or North America.

As implied in the definition above, there is also widespread consensus that environmental sustainability is impossible unless human needs are met worldwide. The Natural Step includes it as its fourth and final system condition for sustainability.

If there are limits, where do we stand relative to them? It is increasingly clear that we have overshot them. Few would argue, for instance, that any of the four systems conditions above are being met at present. Ecological footprint analysis (Loh, 2002) suggests that the biosphere's carrying capacity was exceeded during the 1980s. Today, on conservative assumptions[2], 1.2 planets would be required to support humanity. By 2050, given population and other trends, our land use will need to drop from around 2.3 to around 1.1 hectares per person to come back within carrying capacity. Odum's warning of 34 years ago seems increasingly relevant.

Despite noting that trends are in the wrong direction, the Limits to Growth authors claim that reduction to within carrying capacity is still possible and even consistent with increasing human welfare. This requires increasing consumption

[2] For instance no account of pollution is taken, with the exception of climate emissions.

levels of the world's poor while decreasing overall demands on the biosphere to produce an attractive and sustainable world. If we delay even by 20 years, the options will have reduced and the world will be set for a turbulent and probably unsuccessful path. To delay by longer would be catastrophic (Donella H. Meadows, Randers, & Meadows, 2004: 244-8).

An example: climate change

Climate change provides a clear example of where swift action is needed to prevent catastrophic outcomes.

Atmospheric carbon dioxide (CO2) has varied between around 180 and 280 parts per million by volume (ppmv) over the past 740,000 years. These changes have been enough to trigger various ice ages over that period (Alley, 2000; Wolff & EPICA project members, 2004). Since the industrial revolution, however, CO2 levels have risen precipitously to their present level of almost 380 ppmv and are now rising at almost 2 ppmv per annum as emissions of carbon from fossil fuels and other sources continue to rise. This rise in atmospheric CO2 is far greater and more rapid than any seen previously. Primarily caused by human activity, it is likely to have serious consequences for humanity and other species (Grubb, 2004; Houghton, 1997). There is almost complete scientific consensus on this (Oreskes 2004).

While almost instantaneous in geological time, from a human perspective the impacts lag CO2 changes. Global temperatures are still within the adaptation zone, characterised by increases of around 0.2º C. As temperature rises reach 2º C over the next 50 years, which they are virtually certain to do, we will move into the 'damage and discomfort' zone with property and essential services threatened unless preventative measures are taken (UKCIP, 2002). As the rises approach 4º C we shall move into the 'Disaster Zone' with greater frequency of extreme weather events. As we approach 6º C we move into the Catastrophic Zone, characterised by reinforcing feedback[3] and potentially irreversible damage to global ecosystems (summary from Grubb, 2004).

While it will take centuries for the existing effects of climate change fully to work through the system, what we do in the short term is nonetheless crucial if the planet is to avoid the 'disaster' and 'catastrophic' zones. 550 ppmv, twice the top of the long run range, has been identified as the absolute maximum that can be considered safe. In order to stabilise in due course even at that elevated level, global cuts in anthropogenic emissions of 60% are required by 2050 despite rapid industrialisation in the South, particularly in China and India (RCEP, 2000). This is a huge and urgent challenge.

The inadequacy of current responses

The challenge is not being met. Ecological trends are moving in the wrong direction (Loh, 2002). Global carbon emissions rose by 2% between 1997 (when the Kyoto treaty was signed) and 2001[4].

This is not because of high costs: European companies are 'leaving money on the table' rather than save energy (Sorrell et al., 2000). Nor is it because sustainable technology is not present or feasible. Ayres claims that the necessary technological changes amount to a minor (but necessary) reversal of the historical substitution trend

[3] For instance as forests and oceans begin to release CO2 rather than absorb it.
[4] Source: www.earth-policy.org/indicators/indicator5_data1.htm

from labour to capital (1998: 32). A more subtle analysis of what limits change is needed.

Mapping the contextual factors that limit change

A simple categorisation

Ken Wilber's four quadrants (2000) provide a useful way of summarising what we know about contextual barriers to change:

1. Individual subjective factors (values, worldview, etc)	2. Individual objective factors (socio-demographics, knowledge, etc)
3. Collective subjective factors (culture, shared norms, etc)	4. Collective objective factors (Political, economic, technological, etc)

Figure 1. Ken Wilber's four quadrant structure

While it would be inappropriate in a paper of this length to attempt a comprehensive analysis, I will summarise some of the more important findings.

Individual subjective factors

Among these we find the following:

- **Emotions.** The litany at the beginning of this paper is disturbing and many back off the agenda because of this. Kollmuss and Agyeman (2002) identify fear as a significant block to developing awareness of the sustainability crisis. On the other hand, they quote evidence, supported by Maiteny (2002), that a strong felt connection to the natural world is often crucial in bringing people to act.
- **Perceptions of agency.** Without agency, the felt sense of being able to do something meaningful in response, people will not be prepared to carry the burden of awareness; a key policy objective must therefore be to provide it (Macnaghten, Grove-White, Jacobs, & Wynne, 1995).
- **Unexamined habits.** Kollmuss and Agyeman identify 'old behaviour patterns' as among the most significant blocks to change.
- **Values, beliefs, worldviews etc.** Both Stern (2000) and Kollmuss and Agyeman (2002) identify personality traits, value systems, specific values and attitudes to the environment as important factors.
- **Level of personal development.** Higher levels of personal development are more naturally moved to care for the global commons (Wilber, 2000: 137) and lower levels are more likely to focus exclusively on the self, the family or community or the organisational system. This therefore provides a personal context for pro-environmental values and beliefs. Developmental theory also suggests that higher levels of personal development are more likely to be able to reflect on prevailing frames or assumptions and so facilitate resolution of the difficult challenges that are likely to arise in promoting

environmental sustainability alongside other goals (Beck & Cowan, 1996; Cook-Greuter, 1999; Torbert et al., 2004).

Individual objective factors

Among these we find the following:

- **Role.** While a role does not in itself give meaningful agency, it does provide a context within which agency can be discovered.
- **Skills and knowledge.** Although Kollmuss and Agyeman are clear that it does not determine behaviour, they do see environmental knowledge as important: there is no guarantee that actions will actually benefit the environment without appropriate knowledge.
- **Socio-demographics.** A Norwegian study found that income, age and gender are correlated with pro-environmental behaviour (Olli, Grendstad, & Wollebaek, 2001). There is substantial evidence that people are most likely to become involve in the sustainability 'field' through local projects that they regard as meaningful, which will very likely be linked to socio-demographic factors (Burningham & Thrush, 2001; Church & Elster, 2002).

Collective subjective factors

Among these we find the following:

- **Cultural solidarities.** There is an influential sociological literature claiming that different 'cultural solidarities' construct reality and perceptions of risk very differently and so respond to environmental and other issues differently. (Thompson, Ellis, & Wildavsky, 1990).
- **Level of wider organisational and social development.** A recent study identified six stages of organisational response to sustainability issues. The wider sustainability agenda only begins to be recognised at the fifth stage, which few organisations have reached (Dunphy, Griffiths, & Benn, 2003: 22-6).
- **Regimes of denial and of acknowledgement.** Cohen (2001) invites us to consider how regimes of denial become established. If we accept that such regimes exist, he claims, it is also clear that regimes of acknowledgement may also become established. Consistent with this, Norwegian researchers have identified that the single most important factor in determining pro-environmental behaviour was participation in environmental groups (Olli et al., 2001).

Collective objective factors

There is a substantial literature on wider Political, Economic, Social, Technical, Legal and Environmental factors. It is clear that each of them can be highly significant. Here are some examples that are relevant to the later case example:

- **Economic.** Delays at any stage of a major construction project are very costly, and this tends, for instance, to discourage creative discussions as to how a building might be redesigned so as to minimise energy use.
- **Technological and social lock-in.** Technologies and supporting services tend to settle into mutually supporting systems that resist change. The provision of heat-exchange solar panels, for instance, will

have a significant impact on the design of heating systems, on installer skills, on maintenance routines, etc. This makes change harder.

- **Legal.** European competition law specifies the process of bidding for major construction projects in great detail, which limits creative discussion between client and contractors of specifications for energy reduction until very late in the process.
- **Environmental.** The 'damage and discomfort' impacts of climate change discussed above will have a major effect on buildings now under construction with costly fabric damage being likely, leading to possible building collapse (Sanders & Phillipson, 2003).

A new model of the change process for sustainability

A number of authors have developed checklists for sustainability change agents (for instance Church & Elster, 2002; Collins, Thomas, Willis, & Wilsdon, 2003; Stern, 2000); these are generally sensible, if not always memorable. Can a simpler model be identified that might be helpful to practitioners and that is also consistent with the insights above?

Based on the above analysis and on my reflections from years of practice in this field, I propose three conditions as being required in responding to the challenge of sustainable development. These are: a) 'awareness' of what is happening and of what is required, b) 'agency' or the ability to find a response that seems personally meaningful, and c) 'association' with other people in groups and networks. Each is necessary but insufficient in isolation, which means that any change programme needs to work across all three. Doing so successfully, and engaging with the vital contextual agenda outlined above, requires a key process, that of (d) 'action and reflection'. I will expand upon each of these in turn.

Condition 1: Awareness

What types of awareness matter and why? I can identify four levels.

1. **Awareness of the agenda.** There is considerable basic awareness of the issues, which provides a context for acting, avoiding the need for lengthy scene-setting. In the UK, 99% of people have heard of climate change, 85% agree that it is happening and 71% agree that humans are causing it. While almost no-one has heard of the phrase 'sustainable development', people easily understand, and tend to agree with, the overall argument (DEFRA, 2001; Macnaghten et al., 1995).
2. **Awareness of scale, urgency and relevance.** Many fewer people recognise that that these are urgent problems that concern all people, even ourselves. For instance as many as 85% wrongly think that the effects of climate change will not be experienced for generations (DEFRA, 2001; Hillman, 2004: 54). I believe that awareness at this level destroys complacency; my experience is that it can change the direction of people's lives[5].
3. **Awareness of the structure of the issues.** The sustainability crisis is complex with many delays and feedback loops. Failure to appreciate this leads to inadequate policy responses. For instance, participants in a

[5] This is born out both by my own experience and by research into change 'champions' on climate change in which I am currently participating: virtually all of those that we have identified had a keen appreciation of scale, urgency.

sustainable development simulation game routinely but wrongly assume that they will be able to respond when the first evidence of problems appeared, but it is too late at that stage. Even postgraduate students with outstanding scientific degrees mostly do not understand key delays in the climate system, which suggests that awareness at this level is very rare (Ballard, 2000; Sterman & Booth Sweeney, 2002).

4. **Awareness of the limits of human agency.** A common assumption is that humans can make changes to natural processes without causing worse problems. This is exemplified by the following quotation on carbon sequestration from the Los Alamos laboratory's website: 'In the 21st century, all these methods used in some combination could enable human-dominated systems to continue to grow while maintaining the natural environmental balance of the planet'.[6] One of the 'four laws of ecology', on the other hand, is that 'Nature knows best' (Commoner, 1972). It seems clear that decisions are better taken by people who know this and exercise appropriate humility when they act; a point that Gregory Bateson regarded as essential to those who seek to influence policy. He cautions, however, that awareness at this level is extremely hard to acquire (Bateson, 2000).

These four levels of awareness are of increasing importance and appear to be of increasing difficulty to acquire. While it is clearly unrealistic to expect every person to have high levels of awareness, I believe that work for sustainability needs access to them all. For most people the primary challenge seems to be that of developing awareness of scale, urgency and relevance.

Condition 2: Agency – the ability to do something meaningful

There is very strong evidence that promoting awareness does not stimulate behavioural change unless agency is developed in parallel (Macnaghten et al., 1995). I am therefore persuaded that this is crucial.

In developing agency, people may need to develop their role and acquire new skills. I, for instance, gained agency when I changed role to become an Environment Manager in 1991. Whereas my own family's carbon emissions were perhaps 4 or 5 tonnes per annum at that time, my company's were considerably in excess of 100,000 tonnes and could be much larger if I defined them differently (Ballard, 1994; THORN EMI plc, 1994). I needed to develop new skills to do this.

The most significant agency is usually found in addressing the wider contextual issues, for instance by changing a law or by amending the public procurement process for major projects so that sustainable development issues may more reliably be incorporated in the design.

Condition 3: Association

On huge issues such as climate change or absolute poverty, most things that are 'meaningful' are very difficult unless we do them with others. Association with other people can support wavering willpower and can bring a variety of perspectives to an issue and so lead to better decisions. Such association is likely to reinforce a sense of agency, since it is more likely to offer validating feedback on pro-environmental actions that might be seen as irrelevant by a more typical group[7]. For all these

[6] Source: www.lanl.gov/orgs/pa/science21/CarbonSeques.html, 22nd December 2004
[7] I am grateful to an anonymous reviewer for this insight.

reasons, association is at the heart of work for sustainable development. Other authors agree (Bradbury, 2001; Carley & Christie, 2000: 162-4; Donella H. Meadows et al., 2004: 275)

Association works both ways: it empowers when we are able to mobilise wider support for action, or participate in a supportive group ourselves; however it often constrains when the socially-constructed natural conservatism of groups works against change. It is also important to system transformation through network effects (Gladwell, 2002; Masini & Pich, 2004; Watts, 1999).

Action and reflection: a necessary learning process

There is wide agreement on the centrality of learning for sustainable development, with action and reflection processes seen as central to this (Bradbury, 2001; Carley & Christie, 2000; Dunphy et al., 2003; Jackson & Michaelis, 2003; UK Round Table for Sustainable Development, 1998). There is wider empirical evidence supporting this. For instance Hobson (2003) showed in her review of Global Action Plan Eco-Teams that success depends on individuals bringing habitual actions into 'discursive consciousness', thereby opening them up to change. Church and Elster (2002) showed how most people begin with action and then develop awareness later[8].

Developing agency is a key process in change for sustainable development and action and reflection is perhaps crucial in developing it, both at the individual and the collective levels. As we reflect across the four 'territories of experience' (Torbert, 1991; Torbert et al., 2004), purpose, strategies, behaviours and outcomes, on what has happened or not happened, on how well our strategies and behaviours have served our purpose, we can develop our sense of agency and our association with others to encompass issues that had previously been seen as contextual and outside our remit. As we reflect on our deeper motivations in the context of the sustainability challenge and the circumstances of our lives, we begin to discover what our own unique role might be. In this way, in my experience, the work becomes a joy rather than a burden.

At another level, Torbert claims that action and reflection processes are central to our developing the higher levels of awareness which, as shown above, tend to support pro-environmental action.

Using the model diagnostically and to prompt further inquiry

Action and reflection is also necessary in integrating work across the other three conditions. These interact, each potentially reinforcing changes in the others. If one of them remains stuck for long, perhaps because of a breakdown in action and reflection processes, development of the other two will be harmed.

- If there is association and awareness, but agency has not been developed, what is left will be little more than a talking shop;
- If there is association and the opportunity for agency, but the opportunity to develop awareness has not been taken, then actions will tend to miss the point and might even be trivial.
- If there is awareness and the opportunity for agency, but no association with a wider group, change agents will probably be ignored and almost certainly become increasingly stressed and resentful.

None of these seems to be a useful position: any coherent strategy for change needs to address the three conditions in parallel. The need for balanced progression

[8] Looking back at my own first experiences with a neighborhood recycling scheme in 1988, I realise that that was true of me too.

may also explain why organisations often seem to make a change but then do not maintain the progress.

In seeking to avoid premature stagnation, the model is offered as an invitation to consider how well the various conditions of awareness, agency and association are being addressed when undertaking change initiatives, to review the effectiveness of action and reflection processes, and to consider where efforts might next be directed.

Case example: an inquiry project in the corporate sector

To illustrate this, I offer a reflective account of a project within a company that I shall call 'Excelsior Holdings Ltd' or 'EHL'. It is one of the UK's leading providers of public infrastructure (hospitals, schools, bridges, roads, etc), which it provides by bidding for large public sector contracts which are then operated by arm's length companies in which EHL has a financial stake and to whose Board it would nominate a Director. This stake would last for over 30 years in some cases.

For reasons of commercial confidentiality I cannot share all that we learned. Nonetheless there is much that can be shared.[9] To do this I will change voice to speak from my direct experience of the project, to which I acted as a consultant.

Preliminary work with the client

The internal leader of the project was one of EHL's Directors, whom I will call 'Colin'. I first met him in early 2001 as part of an environmental benchmarking review which I was carrying out for the parent company. He assured me that EHL had no environmental impacts of any significance. After all, they only produced a large amount of paper! I disagreed, judging that their indirect impact was very significant, and scored them very low. Nonetheless Colin and I got on well and met regularly as he began to put in place a basic managerial response. Over time, it became increasingly clear that EHL's projects were not particularly sustainable and that there seemed to be systemic reasons for this.

Through a review of the contractual process we soon established that clients' specifications were rarely very sustainable and that public procurement guidelines left only a tiny window for more sustainable options to be explored once the developer had been chosen. By that stage, however, project completion pressures were already becoming very great. Time is money on a project, after all, and no-one wants to open an issue up when all the pressures are to get on with things as they stand. On the other hand, contextual changes such as increasing energy prices (part of the UK Government's carbon reduction strategy) and likely climate impacts were likely to affect costs significantly. So what could be done?

We broadened association by holding a seminar in April 2002 to explore these issues further. We invited people from different levels, markets and functions of the organisation and stressed that we welcomed a range of views. In so doing we were seeking both organisational legitimacy and the 'requisite variety' that would make any subsequent work resilient (Ashby, 1956).

Aware of the research on the inter-relationship between agency and awareness, I gave a fairly challenging overview of the sustainability crisis, but also took care to stress that the company could play a potentially significant role in reducing emissions and in making social facilities resilient for future generations. We

[9] All names, other than Deborah Seamark's, are disguised. Indicative data have been altered. 'Colin' and Deborah approved a draft of this case account, which also draws on structured feedback from other participants.

then asked the group to suggest some principles in responding to these issues. They emphasised continuity, developing competence and a culture of continuous improvement.

Use of action research methodology

I resisted participants' advice to appoint an Environment Manager (I doubted that many would have the skills to lead the learning processes that I thought would be necessary). I proposed instead that we might approach this through action research.

Action research involves investigating questions of the form 'how can I / we …?' through cycles of action aimed at increasing understanding or at stimulating change interspersed with periods of reflection. It is well suited to issues that we don't yet fully understand, since the reflective processes continually encourage us to challenge our own frames as well as look outwards at the world (Marshall, 2001). It is very good at developing rich understanding of the texture of difficult issues and at developing the subtleties of practice. It is less appropriate (though not impossible) when formal statistical understanding is needed. I believe that there is so little 'sustainable' practice that to search for statistical validity would in any case be a chimera: a recent study identified no major companies at level six of the authors' hierarchy, the level at which organisations begin to address wider contextual issues (Dunphy et al., 2003: 26).

In September 2002, Colin and I issued an open invitation to people to join a group to inquire into the provisional inquiry question 'How can we respond profitably and creatively to the challenge of sustainable development?' This was in practice a gentle form of 'co-operative inquiry' with Colin and (particularly) myself as initiating researchers.

In the co-operative inquiry approach, the group itself 'owns' the research question (hence its being framed in a provisional way) and its members become both subjects of the research and researchers themselves (Heron, 1996; Heron & Reason, 2001). This also applies to external facilitators such as myself and my colleague Deborah Seamark, who therefore need to find a balance between the group's need for support, guidance and (in this case at least) technical expertise and the risk of over-determining outcomes, while also inquiring into our practice as consultants.

Setting up the project

The group was oversubscribed with most, but not all, participants having attended the earlier seminar. As we had hoped, by no means were all of them environmentally-minded: two later said that they had begun the project as climate sceptics (their motivation was that the project seemed to be interesting enough to justify the time from what could be very busy schedules). At the first meeting the provisional question was accepted as 'good enough' (it did not change throughout the project) and we began to discuss what we would do to investigate it.

We spent part of the first session in various activities to get to know each other better. Over time Deborah and I established relationships of considerable mutual respect and trust with each other, with Colin and with the wider group.

In practice, we took a more active facilitation role than in a classic co-operative inquiry. However, as if to show us that the underlying principles still applied, the group threw away our proposals for action during the first session and defined their own!

The structure of the project

We went through six cycles of action and reflection, 'Action' phases worked in a number of ways, often with several streams running in parallel. My experience in working with graduate students on action research projects is that great learning comes from bringing very large questions (such as those to do with sustainable development) down to a very small scale level with a great deal of attention being paid to the smallest details of what happens within us and around us. I have found that larger interventions flow naturally from these in due course. On the other hand, the participants were used, as project managers, to taking on big tasks and getting them done quickly. We had an ongoing tension between these different approaches throughout and in practice balanced them. For instance:

- We would agree on small changes to everyday practice that could be tried out by every member of the group, such as seeing what happened when we raised sustainability issues with colleagues.
- Members of the group in turn took action in one of their current projects. For instance, 'Gary' invested time in generating more creative energy options on a major schools project (a considerable effort of will during the pressures of preparing a bid); 'Jeannette' looked at steel vs. concrete issues on a civil engineering project; 'Sam' raised issues of energy management with the client during the operations phase of a community hospital; and 'Sandrine' developed sustainability indicators for a road lighting project.
- We held a series of structured conversations with clients, intermediaries and colleagues to share issues, find out their views and plans, identify what help they needed, etc.
- The company's project-oriented culture emphasised action rather than reflection, so we used the core practices of dialogue (attentive listening, suspension of our personal positions, respect, and intentional speaking) to develop this skill, emphasising one of them at each session and integrating the four at the end of the project (Isaacs, 1999).

In reviewing each action phase, we were at least as interested in the process (what helped, what got in the way) as in the outcome (developing a good energy specification), though some of the outcomes were very positive.

During each meeting we also introduced sustainable development concepts (for instance, Natural Step principles) and other process tools (for instance, using open questions in discussions with stakeholders). By doing this, we were aiming to develop some of the core competencies that would be required to support progress in the company after our eventual departure and to build the association that could support a manager in due course.

We held one meeting at the Earth Centre near Doncaster, an inspiring trip that showed how land devastated by mining could be brought to life again and that showed leading edge sustainable engineering in use. There was also an extremely moving audio visual display celebrating the fecundity of life on our planet. This affected me, and I think others, very deeply. Participants later saw this trip as a turning point in the project.

We eventually narrowed the focus down to climate change. This was both because of limited time given the enormity of the broader issues and because it became increasingly clear that both climate impacts and any governmental mitigation measures (tax, carbon trading, etc.) would have a major impact on the company, on its clients and on the fitness for purpose of their projects.

A sudden deepening of awareness

After about six months the group really 'got' the enormity of what is happening to the world, shifting in terms of the model above to the second level of awareness. From my own experience, and that at Schumacher College with graduate students (Maughan & Reason, 2001), I had expected that this might happen at some stage, but I had a model in my mind as to how it normally happens and it took me by surprise when it did. The trigger was when I sketched a graph of the Antarctic Vostok ice record (Alley, 2000). This completely exploded any idea that what humanity is doing to the climate is 'normal' and made the potential consequences very visible.

Colin suggested that we spend a few minutes in groups to let the realisation sink in. With each others' support participants began to take the work increasingly seriously. The two self-identified 'sceptics' put their positions aside and became advocates of the programme. Group members gained more confidence to initiate action themselves and to raise the issue with their clients, although they found this difficult at first. Group members, and I too, began to use the Vostok graph more widely and we found that other groups were also affected by it.

Reflecting on this experience helped me in developing the model above. The group had begun to explore its agency and had seen what was possible at the Earth Centre. Its members had also become comfortable with each other and with Deborah and me. She and I had gone through this ourselves, which may have given the group confidence; at the very least it meant that we did not back off the discussions that followed the incident. The group then needed time and support to make changes to their practice. In reflecting on this, noting that the effect on other groups seemed less pronounced, I now am much less likely to use similar material to boost awareness unless I am confident that the other elements (agency and association) are in place.

Outcomes

We learned so much that it took a lot of work to make sense of it all. The group identified a credible positioning for the company in response to the inquiry question and a series of pragmatic recommendations, including the continuation of the group in some form, to achieve it. After some preparing of the ground by Colin, the project culminated in a presentation to the Board. This presentation and the accompanying report were praised both by the Board and more widely and the Board agreed the recommendations.

Participants stressed how much they had enjoyed the project (though their incredible action orientation meant that they sometimes found the pace slower than they were used to). One commented how liberating he found letting go of the idea that he needed to be an expert himself. He did need access to expertise but found it more creative to position himself as a co-inquirer trying to help his clients come to terms with a complex agenda. Deborah and I learned more about how we could provide our expertise in a way that empowered him and others in this process.

What else did we discover? First, that this issue is of huge strategic importance to the company and its clients, with direct relevance to current projects. Second, that its customers, almost entirely large Governmental agencies, are almost totally ignorant of this (a conclusion reached in parallel by Sanders & Phillipson), which means that there is no easy marketing advantage to be gained in the short run at least. Third, by focusing on climate impacts, where there is greater agency (because buildings can be made more resilient and because company risk assessment processes could be extended to include them), we found that it is possible to talk with each other and with clients about these issues in their enormity and yet find the resources to

act.[10] Fourth, when ordinary people talk together about this, they can usually improve things, even if sometimes in relatively small ways; while expertise is needed, action need not be left to 'experts'. Fifth, there are many internal issues which can be addressed to make this issue more manageable and lead towards more profitable and creative responses, resulting in lower emissions and buildings that are more resilient to climate impacts. Sixth, the public procurement process works against these issues being looked at seriously. There was much more.

Several of these findings address contextual issues such as those at the beginning of this paper. For instance, participants no longer saw clients' perceptions, or the practices in partner companies, as a given fact but as something that they could and would engage with. On the other hand, while the public procurement process was clearly important, the group did not feel able to engage with it. I was frustrated by this, but should not have been surprised: my own earlier benchmarking exercise had established that EHL was nowhere near the advanced level where such issues begin to be addressed (Dunphy et al., 2003: 22-6). On the other hand, later benchmarking of EHL (in which I did not participate) showed a significant increase in performance, so in this sense at least the context had been developed, perhaps making later developments possible.

What happened next?

Unfortunately and suddenly, for completely unconnected reasons, Colin retired shortly afterwards, greatly missed by me and many others. He was succeeded by a colleague who went through what the group had done in great detail before agreeing that the recommendations made a lot of sense. An environmental manager was eventually appointed and the group was acknowledged as a significant resource to support her. In terms of Lewin's model of change, the point of appropriate refreezing had been reached (Schein, 1995)[11]. And so my involvement with EHL came to an end after three very enjoyable years.

What did I learn?

In my earlier endeavours for sustainable development, given that my awareness was already unusually high, I had begun with an idea for agency, usually very ambitious, and only then sought association. These projects were exciting, but usually failed. This project, more successful, grew out of warm relationships, first with my colleagues and clients in the work at parent company level, then with Colin and with Deborah, then with the inquiry group. While there was some tension at times, we were able to handle it and a year later I still smile when I recall the time that I spent with these people.

This meant that I found reflective processes much easier. I was able to reflect with colleagues rather than alone where I could more easily avoid the effort. The group's wider relationships made further association possible (for instance with Colin's Board colleagues and with clients), though I am still reflecting on how this can be used to stimulate further learning of the quality experienced by the initial group.

This project was therefore crucial to me in developing the model offered in this paper.

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[10] I wish to thank Oxford University's Professor Steve Rayner for this insight.

[11] I am grateful to an anonymous reviewer for this insight.

As I reflected on this project I became fascinated by what I had learned about how significant agency opens up for a short while during major projects but then closes down again quickly, usually before it can be realised or perhaps is even recognised. I became very interested in pursuing this further, along with what I had learned about the limiting effect of the public procurement process. Recognising that I could not expect EHL to do this for me, I eventually took what I had learned to one of the UK's Research Councils, trying to interest them in investigating barriers to change in a construction research programme that was just beginning. This approach failed (I was just too late) but I was invited to another workshop at the launch of another programme. This led to a completely new group of people being invited to submit what became an exciting proposal for an action research project.

Some conclusions

The project showed how interplay between action and reflection processes, in this case in the form of collaborative action research, was able to help participants, me, and the wider organisation improve our practice on sustainable development issues. It demonstrates how association, agency, and awareness work together when supported by action and reflection processes. As a consequence, important contextual issues were identified and some were actively addressed.

The project certainly shifted participants' awareness of the sustainable development agenda to the second level at least, that of appreciation of urgency and scale. Through exploration of avoidance routines, and in other ways, participants learned how to bring this issue into conversations with clients and others who might be unaware of it.

The project shows how ideas of agency significantly shifted for many of those involved. While agency might be fleeting on large construction projects, it certainly potentially exists. By closely attending to what happened when they acted, participants were better able to identify how they could act more meaningfully.

Agency was also developed around contextual issues. One of Kurt Lewin's key insights is that change is considerably assisted by attending to limiting factors: trying harder just reinforces resistance (Schein, 1995). Action research was extremely helpful here; we were certainly able to identify a whole host of issues that prevented change from happening, both in the day to day processes of the organization and also in the wider context.

Collaborative action research is extremely well suited to supporting association. Group members supported each other in their work and so created a safe space to make sense of their experience. Certainly they would not have been as well supported in their everyday working relationships. The group was able to explore how association might be extended to colleagues and intermediaries, to clients and eventually to Colin's board colleagues. My own inquiry process helped me to establish new association as I shifted the context of my own work.

Afterword: an invitation to action researchers and others

At the beginning of this article, I demonstrated that the challenge of sustainable development is both urgent and serious. Many hold back from engaging with it because it seems overwhelming. In the body of the paper I have shown how a group of mainstream managers discovered that there are opportunities to engage with the challenge and how action and reflection processes helped them to do this. I strongly believe that the skills of action researchers and other reflective practitioners are vital

at this time and encourage readers to find ways of offering their valuable skills in the service of creating a more sustainable and just world.

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