Behaviour Change: A Series of Practical Guides for Policy-Makers and Practitioners

Number 3

Sustainable Development as a "Collective Choice" Problem

Summer 2006

Institute of Water and Environment
Cranfield University

defra
Department for Environment Food and Rural Affairs

Contents

Defra has commissioned and funded this study, but the views expressed in this guide do not necessarily reflect Defra policy.

1. Introduction to the series

Defra's 5 year strategy (*Delivering the Essentials of Life*[1]) coupled with the UK Government sustainable development strategy (*Securing the Future*[2]) set out an ambitious agenda for environmental leadership and sustainable development. Embedding these core principles relies on influencing change and making it easier for producers and consumers to behave more sustainably. This is a sizeable task, since changing behaviours is a complex matter and innovative solutions are required.

In July 2005, Defra initiated a programme of research that aimed to broaden understanding of how Government (and others) can most effectively promote pro-environmental behaviour amongst producers and consumers. Several studies were commissioned as part of this research programme, each with a remit to explore a unique aspect of pro-environmental behaviour change.

This practical guide forms part of a series of papers that aims to summarise the key findings and policy implications from these studies.

A full list of titles in this series is provided below:

Number 1: Sustainable Resource Use in the Home

Number 2: Targeting Specific Lifestyle Groups

Number 3: Sustainable Development as a "Collective Choice" Problem

Number 4: Triggering Widespread Adoption of Sustainable Practices

Number 5: Understanding Choice

Number 6: Sustainable Shopping and Sustainable Production

Number 7: Enhancing Sustainability at Farm Level

Number 8: Tackling the Waste Challenge

Number 9: Encouraging Sustainability Amongst Small Businesses

Number 10: Sustainable Resource Use in Business and Organisations

1 Defra (2004) *Delivering the essentials of life: Defra's five year strategy*, London: HMSO. See http://www.defra.gov.uk/corporate/5year-strategy/index.htm.

2 Defra (2005) *Securing the Future: UK Government Sustainable Development Strategy*, London: HMSO. See http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm.

2. Project summary

This guide highlights the key issues from research that has explored the potential of a unique body of work, known as "collective-choice theory" or "collective-action theory", for motivating people to produce and consume in a sustainable manner. Details of the full research reports from this study are contained in section 5.

- The theory emerged from the study of a large number of situations throughout the world where local people have been able, largely on their own, to come up with an enforceable and sustainable agreement to restrain their consumption of a resource that is scarce, shared within a group, and vital to the life and livelihood of each individual member.
- The work on collective-choice theory to date has been much more successful in describing this kind of social outcome, specifying the conditions under which it tends to take place and identifying some very general features that the resulting "institutions" for mutual self-restraint have in common, than in explaining how it actually happens. However, results from recent comparative studies applying the theory to sustainable farmer-managed irrigation systems in various parts of the world (Trawick 2005[3], cited in the Summary Report) have identified a set of basic commonalities among those institutions that have the potential to increase the explanatory power of the theory while also widening its range of application, possibilities that are explored in this report.
- Such work is of interest because of the obvious possibility that the rules and principles for successful local management of water could somehow be "scaled-up" and applied to other sustainability problems requiring mutual self-restraint in resource consumption at higher levels of social organisation.
- Before attempting this, however, recent advances in research on decision-making in other fields – cognitive psychology and cognitive anthropology – must be integrated into the theory in order to strengthen it further. The revised theory will then be used in examining two empirical cases where collective action has been undertaken successfully by local farmers in the UK.

Overall, "collective-choice theory" proves to be crucial in explaining the success of all the local efforts at sustainable development examined in this report. It reveals that Defra and government can play a significant role in expanding such experiments in communities where they are already underway or, perhaps more importantly, in encouraging them to begin while enhancing their chances of success.

3 The ethnographic research has been carried out over a period of more than a decade in several peasant communities in the Peruvian Andes and, more recently, in several additional communities of much larger scale in Spain and in northern Chile. The latter research, particularly the work in Spain during 2003-2004, was made possible by a generous Research and Writing grant by the John D. and Catherine T. MacArthur Foundation in the U.S., in their Program on Global Security and Sustainability. Thanks also go to Fergus Sinclair of Bangor University for his help and strong interest.

3. Key findings

The new urgency of the sustainability problem

Sustainable development policy has been elevated rapidly in importance by Defra and the governments of the UK and the EU lately, partly due to the increasing pace of CO_2 build-up and the resultant global warming. The growing urgency of this problem is reflected in a move by government away from the appealing idea that we simply need to consume more efficiently, i.e. at less energy cost, towards the much more problematic realisation that people must actually *reduce their consumption of material goods and energy*, and especially their emissions of CO_2.

Changing individual lifestyles across all strata of society and delivering "*aggregate reductions in resource throughput*" are now acknowledged to be essential for responding to environmental challenges. The government's broad agenda for reducing the overall human "footprint" on the global ecosystem now includes:

- preserving, restoring or enhancing local landscapes and the ecosystem services that these provide; and
- particularly in the case of Defra, encouraging any and all efforts by people to pool their resources and cooperate in order to cut costs and reduce consumption of both raw materials and energy, for example by carpooling or jointly purchasing expensive energy-intensive tools and equipment.

A great number of recent studies of global warming have shown that we must do all of this now on the widest possible scale, and that we have very little time. Stakeholder interactions of the kind routinely carried out by Defra and other government agencies can and will be a primary forum for this effort. If properly framed in ways outlined briefly in this report, these exercises in public engagement could promote a "culture of cooperation" and sustainability that, it will be argued, already exists. This latent willingness to respond from within society itself appears to be readily activated in situations of scarcity with examples already emerging widely throughout the world in response to people's changing perceptions of environmental and 'quality of life' pressures.

Collective-choice theory: Getting beyond the illusion of the "sovereign consumer"

"Collective-choice" theory limits itself to choices regarding the use of natural resources that people hold in common or somehow control as a group. It focuses particularly on 'common-pool' resources that are characterised by "subtractability," meaning that one person's harvesting or consumption inevitably reduces the availability of the resource for everyone else.

Expectations regarding other users' behaviour are thus central to individual motivation and choice in forming such groups, and the theory of collective action gives appropriate emphasis to these considerations. These social factors can either strengthen or weaken the incentives (or restrictions) that individuals have to agree to maintain a form of common property and to exercise mutual self-restraint in its use.

People in situations of collective choice have a primary objective to minimise a pervasive kind of risk: i.e., that some resource-users who fail to cooperate after a decision by the group will receive the benefits nonetheless and be able to "free ride". The seminal work of Ostrom (as cited in the

Summary Report) has shown that, in order to achieve the public good of sustainability and mutual restraint in resource use, people must devise institutions, i.e. collectively-chosen rules, principles and procedures, that somehow solve three basic problems which are nested hierarchically within each other. All of these themselves present dilemmas because their solution is fraught with its own "free-rider" problems:

- the problem of **supply** – i.e., of devising a workable set of rules, procedures and sanctions governing resource use;
- the problem of **credible commitment** – i.e., of achieving and maintaining peoples' long-term commitment to those rules and to the goal of mutual self-restraint; and
- the problem of **mutual monitoring** – i.e., of effectively monitoring individual resource use as well as the activity of any designated officials whose duty it is to do such monitoring.

Laboratory experiments and empirical studies have shown that the last of these "nested" problems is the most crucial, the one upon whose successful resolution the solving of the other two depends. Once mutual monitoring of individual behaviour is achieved, or is shown to be achievable in a convincing way, the other dilemmas tend to be resolved quickly by people and in effect to disappear.

Collective action of this kind produces a stable equilibrium outcome that, in Game Theory simulations, is referred as a "game 5 solution": a mutually-imposed, self-financed and binding contract to limit individual resource consumption. Field research has confirmed that such sustainable outcomes are very widespread throughout the world, especially in irrigation. Moreover, that local people have often worked out a way to monitor each other successfully rather than having to employ an outside agency, thus bearing the entire cost of such a solution (indeed nearly all of the associated "transaction costs") themselves.

Collective choice and mutual self-restraint in consuming irrigation water

Comparative ethnographic research (Trawick 2002; 2005a,b; in press) has revealed striking commonalities among the principles governing successful locally-managed irrigation systems in several parts of the world, cooperative agreements that in many cases have persisted for very long periods of time. Most such communities appear to be examples of the aforementioned "game 5 solution" but, contrary to what collective-action theory originally predicted, *their success does not seem to depend in any strong way on the size or scale of the irrigation system*.

The key variable in this regard was formerly thought to be the relatively high degree of visibility of individual behaviour in small and medium-sized communities, compared to large ones where people's activity is assumed to be much more difficult to monitor. The ethnographic research shows that mutual monitoring is actually fairly easily achieved, and in the same basic way, in irrigation systems of small scale as in those of much larger scale. The most important rules and principles that the communities have in common, aside from the fact that water is scarce in each case, are listed in Table 1.

Table 1: A 'universal' model: cross-cultural principles for successfully sharing scarce water

Autonomy – the local community or farmer organisation has and controls its own water flows.

Contiguity – fields and sectors of land receive water allotments in an order that is fixed, systematic and uninterrupted in terms of the movement of water utilisation through space, e.g., through designated sectors of irrigated land.

Uniformity – everyone receives water from any major source with the same frequency, or, if higher frequencies for some people and some crops are sometimes allowed, everyone is assured of getting that opportunity within a specified period of time.

Proportionality – individual water rights are related proportionally to land ownership, as are accompanying duties to contribute to the operation and maintenance of the irrigation system.

Transparency – the rules for allocation and use of water are known to all users and compliance is capable of being monitored by all.

Regularity – the rules for allocation are always the same under scarcity, with no exceptions allowed and unauthorised expansion of the system prohibited.

Graduated Sanctions – penalties for rule violations are severe but vary according to the gravity of the offence.

These principles interact in a remarkable way to produce a mutually-beneficial and sustainable outcome for all water-users. Together they create:

- **a strong sense of "equity" or fairness** among water rights, and between rights and duties, through the act of sharing a water scarcity on a single schedule in allotments that are proportional to plot size;
- **a tangible notion of the common good**, one that people are very much concerned with maintaining because it is vital for their survival;
- **a strong sense of security regarding individual water rights**, simply because those rights are clearly defined and easily protected by the users themselves;
- **a clearly-perceived compatibility between individual self-interest and the common good**, mainly created by the fact that, by obeying the rules and limiting their own consumption of scarce water, people are maximising the frequency and productivity of water use for themselves and everyone else in the long run.

The Additional Explanatory Power of Other Theoretical Perspectives

Bounded rationality: How people really make choices

Due to the complexity of most situations of choice, people make use of several means of "bounding" the reasoning process and simplifying their decision-making (Kahneman 2002, Kahneman and Tversky 1979), which must be integrated into the theory of collective action.

Intuitive judgments, which are made automatically and without deliberation, normally predominate in everyday life. These "snap" judgments both set and reflect the preferences that determine most human choices, unless they are overridden by a conscious questioning and close examination of preferences that can somehow "kick in", i.e. the mode of fully *rational deliberation*. Clearly both are involved in decisions about consuming vital resources that are held in common, especially irrigation water.

- The ethnographic research on the latter has revealed that the two modes of thinking are activated periodically, and quite deliberately by the group, in such a way that they reinforce each other through increasing returns or "positive feedback". This is done most obviously, though not exclusively, in public tribunals over rule violations. All of the information relevant to choices about using water is provided or "framed" in such a way that the wisdom or 'utility' of cooperating – its high probability as the preferred choice of other people and its high positive value relative to other possible choices for oneself (such as cheating or "free riding") – are demonstrated publicly from time to time.
- This "framing effect" activates the mode of rational deliberation, reinforcing its basic logic so that it becomes "intuitive", self-evident and automatic, leading most people to cooperate most of the time. These insights about the provision and framing of information can potentially be used by organisations like Defra in order to reframe and facilitate stakeholder engagement exercises.

Schemas or "cultural models": The idea of a latent "culture of sustainability"

A complementary approach focuses on "cultural models": shared interpretive frameworks analogous to cognitive "schemas" which are used to understand events and motivate choice, and which are internalised on the basis of learning and experience. Such models are shared and publicly instituted, passed down through the generations, and often specific to a given society. They are mental constructs that people in a given irrigation community have in common, like the natural resources which they are often quite important in managing.

In each of the successful irrigation systems studied (nine systems in three countries on two continents), people clearly share a local "culture of irrigation" consisting of several components:

- a mental model or map of the water distribution system;
- a listing of the working rules of, and for, resource distribution and use; and
- a set of operating principles (as shown above) that summarise in a moral sense how the system should work, for example by being equitable or fair.

It now seems clear that the same general "schema" for irrigation is found in a great number of local hydraulic societies throughout the world. Thus the common elements of these cultural models can arguably be considered 'universals', the ideas: of reciprocity, equity and fairness in sharing a scarcity; the fundamental right of all community members to work, subsist and survive; and even more concrete ideas like the principles of uniformity and proportionality. This is a clear case of what anthropologists call parallel or convergent social evolution, the emergence of basically the same solution to the same problem by people in diverse environments in many places throughout the world.

These elements, it is argued, are shared in some way by all peoples *as potentials or latent values that are activated in situations where individuals face a potentially life-threatening scarcity or an impending subsistence crisis*. They come readily to mind whenever people are forced to make the best of a bad situation in using a resource that is vital and that they hold in common, making them of great potential importance in meeting the challenge of sustainable consumption.

"Collective-choice" theory applied to emerging sustainable communities in the UK

Case study 1: East Suffolk Water Abstraction Group

Today having roughly 100 members, this group of commercial arable farmers formed in 1997 in response to an effort by the Environment Agency to decrease groundwater withdrawals for irrigation in response to the 1989-92 drought and, somewhat later, to impose bans on water abstraction during the 1996-1997 irrigation season. The major impulse for the group's formation came from five major commercial irrigators, who saw the impending risk as well as the potential benefits, and who were locally seen as influential farm business leaders.

- The group had no formal constitution until 2002, when it successfully applied for funding from Defra and the England Rural Development Programme. A grant of £70,000 was delivered over four years to appoint a Company Secretary and help to establish a Company Limited by Guarantee, based on the holding by each member of a £1 share. The opportunity for such funding and, importantly, the need to obtain indemnity insurance, spurred this collective decision by the members.
- The Company is now owned by the members, whose rights and benefits are uniform even though the underlying abstraction licenses are not.
- The latter are based on a mixture of older permanent licenses (pre-1963) and more recent temporary or time-limited licenses, awarded by the Environment Agency (EA) on the basis of 'reasonable need' for crop production. Thus licenses are loosely tied to areas of irrigated land, but not necessarily proportional to the amount of land held by any one farmer.
- In all other respects, the rights of members are uniform: membership provides equal entitlement to representation, and to the benefits of other group activities such as legal advice, extension or education.
- Monitoring of individual conformance to the conditions of abstraction licenses is not carried out by the members or their leaders but is monitored directly by the EA, thus solving the all-important problem of mutual monitoring.

Case study 2: Pontbren

An informal cooperative of small farmers in Wales, this group consists of ten households that began to organise gradually in 2000 to pool their limited resources and provide mutual support for a way of life that, according to the members, had become unsustainable and unbearable in terms of the work load required. It began as mutual-aid among three sheep farmers in a forestation effort supported by a grant, for planting trees. Once the many side benefits of such cooperation became evident, the activity soon spread to include other neighbours, leading to a limited expansion of both the group (to include a total of 10 farming families) and its activities.

- Sharing ideas and looking for grants for tree planting, fencing and reduction of stock numbers. Reciprocity was practiced in planting hedgerows and buying and installing fences which, along with the trees, provided shelterbelts that made it possible for the farmers to change the breed and keep their sheep and lambs outside all year round, significantly reducing production costs.
- Establishment of a tree nursery which now produces some seedlings for sale to neighbouring farmers; and the proposed start of a farm shop for meat products, whose profits will be evenly divided up but may later be re-pooled and invested by the group.
- A wood chipper has recently been purchased by the group in this way to produce bedding for the animals as well as profits from commercial sales that, like all of the benefits (and costs) of group affiliation, are shared uniformly among the members.

It is important to note that the upper limit on the group's size was imposed partly in order to avoid the costs that would have arisen with further growth, as trust and close personal familiarity would necessarily have given way to more formal and regular monitoring of individual behaviour.

4. Policy implications

Encouraging local sustainability

It seems clear that Defra and other agencies involved with the environment could, at very little cost, play a pivotal role in encouraging the emergence of sustainable community experiments like the examples discussed above, which are now forming locally throughout much of the world of their own accord. This could be facilitated widely and systematically through participatory planning and through promoting and even sponsoring a kind of local "mutual aid".

Any "mutual aid" should be initiated "from the ground upward" by trying to 'replicate' successful groups while expanding their range of conservation activities, or by expanding the communities themselves. This could be done, for example, by providing subsidies, loans or grants which help pay start-up and other transaction costs, as Defra did with the East Suffolk Water Abstraction Group. Replication of successful collective action such as Pont Bren could be stimulated, for example, by helping prospective members with a grant or loan for financing their initial purchase of trees. The overall objective would be to help meet the start-up costs of such groups and through properly conducted stakeholder engagements explore and reinforce existing perceptions, capacities and strengths, i.e., to build "social capital".

At the same time, a parallel effort is needed perhaps at the level of popular culture, in an explicit attempt to disarm the "culture of consumption" and replace it with something else: an alternative "culture of sustainability" that is already emerging widely throughout the world and may well have existed right alongside the consumer culture for a very long time. A combined approach involving both kinds of effort is suggested intuitively as the most promising choice, one that might involve, but would certainly not be limited to, stakeholder engagement exercises. Such an approach would need to...

- Emphasize the urgency and the pervasive nature of the sustainability problem, by discussing the environmental and social imperative of achieving mutual self-restraint in consumption generally beginning with natural resources of all kinds, at various levels and scales of activity. According to the scientific community, all of the natural ecosystems of the earth, from the most local to the global in scale, are now in decline, and the ecosystem services that they provide, upon which all our lives depend, are in serious jeopardy. This situation is a direct result of over-consumption, of the consequent accumulation of waste, pollution, and heat, problems that demand collective action now beginning at the local level but building upward and outward from there.
- Note emphatically that, contrary to what conventional economic theory claims, mutual self-restraint in the consumption of vital resources has been achieved by local people countless times in thousands of places around the world. This most basic kind of collective action has not been achieved through the market and through competition but rather through a fundamental kind of cooperation.
- Identify clearly the many public goods and "common pool" resources upon which our daily lives depend for example, a reasonably stable climate, relatively uncontaminated and healthy local environments, as well as the ecosystem services that the latter provide. The main feature that these resources and many other kinds of public goods share is "subtractability", the fact that one person's use, consumption or harvesting of them reduces their availability for everyone else.

- Constantly convey the message, through careful choice of language, that the challenge of achieving sustainability is not a problem to be solved by "me" or "you" – the supposedly sovereign consumer — as a simple cumulative result of our individual choices, but rather through deliberative reasoning and concerted mutual action by "us", by groups of people organised at various scales and levels, by a collective "we".

In interacting with stakeholders, a focus should be placed, not on the *differences* among stakeholders and their assumedly divergent stakes or interests, as conventional guides for conducting stakeholder consultations typically recommend, but instead *give greatest emphasis from the start to similarities and common interests*, especially to the common-pool resources around which such groups will form.

Challenging conventions: mutual self restraint and co-operation really can work

Initially, it will be of greatest importance to get the message across that mutual self-restraint and cooperation of the sort that is now so urgently needed can be, and has been, achieved widely throughout the world throughout most of human history. Hardin's famous "tragedy of the commons" argument, which held that such local cooperative action is futile and, in effect, that the associated "free rider" problems are nearly unsolvable, has clearly filtered down and become pervasive throughout Western culture. This research provides the evidence that Defra needs to question more proactively that notion explicitly in stakeholder engagement exercises where the many possibilities for sustainable living amongst both producers and consumer are discussed.

The main point might be underlined by noting that a civil society based solely on competition is impossible. In order to play a positive role in human affairs, competition must take place within arenas of social interaction that are themselves based on cooperation and are structured by collectively-chosen rules or institutions. Like all conceptual opposites, competition and cooperation are in fact two sides of a single coin, as a discussion of some of the empirical cases examined in this report could illustrate. Conventional economic theory fails to acknowledge this kind of social action as a possibility, and is incapable of accounting for cooperation itself. Thus it is unable to explain the emergence of the conditions under which the market itself, and even the modern nation-state, appeared.

A way forward

All of this would seem to suggest that some other approach to achieving sustainable development is needed, and one is in fact now emerging widely across different academic disciplines. Known variously as "collective-choice" theory, "collaborative environmental management" and "collaborative environmental planning", the approach is trans-disciplinary and, given the high degree of similarity between its specific manifestations, it may well exemplify what is known in the sciences as a "paradigm shift". The theory clearly holds great promise for Defra in its effort to motivate sustainable production and consumption of resources in a world characterized increasingly by scarcity. At the most basic level, this emerging paradigm reveals that mutual self-restraint in consumption can in fact be achieved, and that it will be done, not by 'sovereign' individuals, but by highly interdependent people who come together, out of simple necessity, to form well-defined groups.

5. Supplementary information

Suggested Further Reading

- Trawick, P (2006) Sustainable Development as a "Collective-choice" Problem: *Theoretical and Practical Implications of Success Exemplified in Locally Managed Irrigation: final summary report* (Defra, 2006). See http://www.defra.gov.uk/science/project_data/DocumentLibrary/SD14003/SD14003_3522_FRP.doc
- Trawick, P. In press "Scarcity, Equity, and Transparency: General Principles for Successfully Governing the Water Commons", forthcoming in E. Wiegandt, Ed., *Mountains: Sources of Water, Sources of Knowledge*, Kluwer series Advances in Global Change Research.
- Trawick, P. 2005a "Going with the Flow: The State of Contemporary Studies of Water Management in Latin America", invited essay for the Latin American Research Review, Vol. 40(3): 443-456.
- Trawick, P. 2005b Final Report on "The Moral Economy of Water: A Cross-Cultural Study of Principles for Successfully Governing the Commons", John D. and Catherine T. MacArthur Foundation, on a Research and Writing Grant in their *Program on Global Security and Sustainability*.
- Trawick, P. 2002 "The Moral Economy of Water: General Principles for Successfully Governing the Commons". GAIA: Ecological Perspectives in Science, the Humanities and Economics. Vol. 11: 191-194.
- Kahneman, Daniel 2002 "Maps of Bounded Rationality: A Perspective on Intuitive Judgment and Choice." Nobel Prize for Economics Lecture, Stockholm, Dec. 8, 2002.
- Kahneman D. and A. Tversky 1979 "Prospect Theory: An Analysis of Decisions under Risk." Econometrica, Vol. 47, Pp. 313-327.

Contact details

For further information about this work contact:

Paul Trawick
Senior Lecturer in Environmental Anthropology
Institute of Water and Environment
Cranfield University
Silsoe, Bedfordshire
MK45 4DT

Tel: 01525 863280
Email: p.trawick@cranfield.ac.uk