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Evaluation Based on Critical Systems Heuristics

Martin Reynolds¹

1 Introduction

Critical systems heuristics (CSH) draws on the substantive work and philosophy of C. West Churchman, a systems engineer who, along with Russell Ackoff during the 1950s and 1960s, defined operations research in the United States. Churchman later pioneered developments in the 1970s of what is now known as ‘soft’ and ‘critical’ systemic thinking and practice in the domain of social or human activity systems. Churchman died in 2004. His legacy lies in signalling the importance of being alert to value-laden *boundary judgements* when making evaluations. Boundaries are what we socially construct in designing and evaluating any human activity *system of interest* (e.g., any situation of concern from a kinship group, an organisation, or a larger entity such as a national health system). The primary boundary of any human activity systems is defined by ‘purpose’. Churchman’s work is characterised by a continual ethical commitment to the overarching purpose of improved human well-being. In order to fulfil such purposeful activity, there is always a need to broaden inquiry from the particular system of focus so as to appreciate what Churchman calls the total relevant system. The effectiveness and efficiency of a system of interest depends on the actual boundary judgements associated with that system of interest. Churchman first identified 9 conditions or categories (including the category ‘purpose’) associated with any purposeful system of interest in his book *The Design of Inquiring Systems* [1, 2]. He later extended these to 12 categories in a book provocatively entitled *The Systems Approach and Its Enemies*, significantly taking into account 3 extra factors (‘enemies’) that lie outside the actual system of interest but which can be affected by, and therein have an effect on, the performance of the system [1, 2].

In the early 1980s a doctorate student of Churchman from Switzerland, Werner Ulrich, translated Churchman’s 12 categories into an operational set of 12 questions which he called *critical systems heuristics* [3]. Ulrich returned to Switzerland and worked with CSH as a public health and social welfare policy analyst and program evaluator [4].

Section 2 introduces the basic toolbox of CSH, along with suggestions on when to use it and the benefits of its use. Section 3 will guide you through a suggested operational use of CSH questions in a process of evaluation. Section 4 provides a summary of an extensive case study in which CSH was used for evaluating the role of public participation in natural resource-use planning. Section 5 provides some advice for the practitioner in developing skills on using CSH for evaluation.

2. The toolbox

2.1 CSH questions

The 12 boundary setting questions are grouped under 4 sources of influence; motivation, control, expertise, and legitimacy. My own adaptation of these questions are summarised in Table 1.

Table 1 Critical Systems Heuristic Questions for Evaluation

Sources of motivation

- 1 **Beneficiary** (‘client’): who should be /is the client or beneficiary of the service or system (S) to be evaluated?
- 2 **Purpose**: what should be /is the purpose of S?
- 3 **Measure of success**: what should be/is S’s measure of success (or improvement)?

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Sources of control

- 4 **Decision maker:** who should be/is the decision maker (in command of resources necessary to enable S)?
- 5 **Resources:** what components of S ought to be /are controlled by the decision maker?
- 6 **Decision environment:** what conditions ought to be /are part of S's environment, i.e. not controlled by S's decision maker and therefore acting as possible constraint?

Sources of expertise

- 7 **Expert** (or designer): who ought to be/is involved as providing expert support for S?
- 8 **Expertise:** what kind of expertise or relevant knowledge ought to be/is part of the design of S?
- 9 **Guarantor:** what ought to be /is providing guarantor attributes of success for S (e.g., technical support, consensus amongst professional experts, experience and intuition of those involved, stakeholder participation, political support...) and hence what might be/ are *false* guarantor attributes of success (e.g. technical fixes, managerialism, populism, tokenism..)?

Sources of legitimation

- 10 **Witnesses:** who ought to be /is representing the interests of those affected by but not involved with S, including those stakeholders who cannot speak for themselves (e.g. the handicapped, future generations and non-human nature)?
- 11 **Emancipation:** to what degree and in what way ought/are the interests of the affected free from the effects of S?
- 12 **Worldview:** what should be /is the worldview underlying the creation or maintenance of S? i.e. what visions or underlying meanings of 'improvement' ought to be /are considered, and how ought they be /how are they reconciled?

adapted from [5]

Two features of Table 1 need immediate elaboration.

1. The 3 questions associated with each source of influence address parallel issues: the first question (1, 4, 7, and 10) address issues of *social role*; the second question (2, 5, 8, and 11) address issues of role-specific *concerns*; and the third question (3, 6, 9, and 12) relates to *key problems* associated with roles and role-specific concerns.
2. Each of the 12 questions in Table 1 are asked in two modes, thereby generating 24 questions in total. In CSH all questions need to be asked in a normative, ideal mode (i.e., what 'ought' to be...) as well as in the descriptive mode (what 'is' the situation...). Contrasting the two modes provides the source of critique necessary to make an evaluation.

These two features are represented in Figure 1. (Author's note: my suggestion is to have this as an appendix to the chapter. The diagram has been formatted to A4 size for ease of photocopying for evaluator's direct use if required). Figure 1 might be used as a template for any boundary critique enquiry.

Fig 1 Recording Table for CSH Evaluation
adapted from [6]

		Social roles	Role-specific concerns	Key problems
Sources of motivation	'is'	Beneficiary/ client	Purpose	Measure of improvement
	'ought'			
	critique 'is' against 'ought'			
Sources of control	'is'	Decision-maker	Resources	Decision environment
	'ought'			
	critique 'is' against 'ought'			
Sources of knowledge	'is'	Expert	Expertise	Guarantee
	'ought'			
	critique 'is' against 'ought'			
Sources of legitimation	'is'	Witness	Emancipation	Worldview
	'ought'			
	critique 'is' against 'ought'			

Some questions may appear familiar to an evaluator's existing repertoire or stock-in-trade, and others may appear less familiar. A few initial health-warnings might be appropriate: firstly, these questions will only gain meaning to an evaluator when they are actually used *in practice*; and secondly, the precise wording of the questions may need changing with respect to different context of use and preferred vocabulary of the user. With these two caveats in mind, evaluators are likely to discover as well as nurture familiarity. Meanwhile, I will attempt to flesh out a little more meaning behind the categories.

The four sources of influence are generic interdependent categories associated with any human activity driven by a sense of purpose. The 12 categories of questions can be first delineated between an association with those *involved in* the operations of the system (associated with sources of motivation, control and expertise) and those not involved in the system but otherwise *affected by* the operations of the system (associated with sources of legitimation).

Identifying first the ideal purpose of the system of interest being evaluated (category 2) in the 'ought' mode, a CSH evaluation leads to an unfolding of key normative (i.e., ought mode) features. Stipulating the intended beneficiaries (category 1) and associated measures of success (3) - i.e., being transparent about the value-basis of the system - leads to questions regarding the resources or components needed for success (5); who has control over such resources (4)? What relevant factors ought to lie outside such control (6) but may have an important impact on the system's performance? One such set of factors requiring independence is 'knowledge' or expertise. What are the necessary types and levels of competent (ideally, *independent*) knowledge and experience (8) required to ensure appropriate implementation? Who ought to provide such expertise (7)? How might such expert support prove to be deceptive or false (9)? Given the inevitable bias regarding values (motivation), power (control) and even knowledge (expertise) inherent to any purposeful system of interest, what is the legitimacy of such a system within wider spheres of human interests? In other words, if the system is looked at from a different viewpoint (12), in what ways might the activities be considered as coercive rather than benign (11)? Who (or what) is negatively affected - i.e., the 'victims' of the system - and what type of representation is made on their behalf (10)? These last set of three questions are crucial in exploring possible longer-term feedback effects (that is, *systemic* effects) of the situation being evaluated, as well as evaluating its moral underpinnings.

A full CSH evaluation then provides a powerful tool for evaluating the built-in values, power structure and knowledge-base for a system of interest, whilst not ignoring the moral basis on which the system operates (as considered from the perspective of others who may not be beneficiaries). For a more concise overview of the actual questions and their historic derivation from practical philosophy, readers are directed to the original writings of both Churchman (particularly, 1979) and Ulrich (1983, 1988 and 2000).

2.2 When to use CSH

The CSH questions can be applied to any *purposeful* system of interest; that is, any area or situation of concern that might be associated with human purpose, whether individual or collective concern. CSH is not used merely for goal-oriented (or purposive) evaluation, where the purpose may be predefined and assumed unproblematic, with the emphasis on evaluating the means, but also for evaluating the actual purpose(s) and implications of purposeful activity with relevant stakeholder groups. As Ulrich explains: "purposiveness refers to the effectiveness and efficiency of *means* or tools, purposefulness to the critical awareness of self-reflective humans with regards to *ends* or purposes and their normative implications for the affected" (Ulrich, 1983, p.328). In other words, evaluating 'means' ought not to be confused with evaluating purposes or 'ends' (e.g., counting the number of schools does not constitute evaluating regional or national education objectives!), and any action, however well intended, will have consequences outside the immediate sphere of intended effects, but which may (i) possibly later impact back on the system of interest, and (ii) be unethical in the wider scheme of human activity.

Most typically, CSH is used in the arena of evaluating *plans* or *planning processes* either as a *post-hoc*, summative evaluation, or as a more constituent *in-situ* formative evaluation. Both Churchman and Ulrich stress the importance of locating the planning process at specified levels in order to appreciate the selectivity or partiality of any purpose associated with planning. These levels of planning are based

on the principle of 'vertical planning' originally suggested by Erich Jansch, which I paraphrase a little from a description by Ulrich (1988):

- *Goal planning* takes the purpose of the mandate as given. The job is to define the exact goals that will secure "improvement" in terms of the given purpose...
- *Objective planning* determines the purpose so as to secure improvement toward some overall vision of improvement, which is assumed to be given...
- *Ideal planning* can drop the feasible and the realistic and challenge the soundness of the visions implied by "realistic" purposes".

The three levels are associated respectively with *administrative* (or *operational*) practice, *management* practice, and practice associated with *policy design*.

2.3 Why use CSH?

There are three good reasons for considering CSH questions as a template for making evaluation.²

1. Boundary judgements encapture key dimensions of any purposeful system of interest. CSH draws in a range of factors which other evaluation approaches may inadvertently not consider. Mainstream evaluation issues regarding 'measures of success' are linked with important issues of 'power' and 'knowledge', as well as 'externalities', including the influence of those affected by, but not involved with, the built-in design of such measures. Concerning a specified system of interest, CSH is used to ascertain who important stakeholders might be ('social roles'), and what their particular stakeholdings ('role-specific concerns') and stakes ('key problems') relate to. Applying this framework of inquiry reveals important assumptions and premises underlying entities being evaluated. These are often important potential sources of underlying 'failure' in performance.
2. Value judgements are made transparent. CSH questions are asked in an 'is/ought' mode thereby ensuring a continual ethical alertness to the process of evaluation. The response to CSH questions leads to important reflection and triggers of conversation around various aspects of situational change. CSH questions can be used on a monological basis, as a reflective analytical tool, or as a dialogical tool, for generating discussion amongst stakeholders around planning issues. Whilst the mystique of 'evaluation' often interferes with stakeholders' engagement with evaluation, CSH makes the role of the evaluator transparent in the process of evaluation thereby helping with the demystification of the evaluation process.
3. Securing improvement provides the driving principle for evaluation. Purposeful systems evaluation using CSH enshrines the notion of improved well-being as a trigger for unfolding boundary and value judgements. Such improvement may take the expression of freedom from material deprivation and/ or ideological deception. CSH enables questions to be raised regarding not only whether particular 'goals' are being achieved, but whether they are the right goals to be sought after as viewed from the perspective of others, and what alternative goals might be more appropriate. In short, CSH enables a learning approach to evaluation.

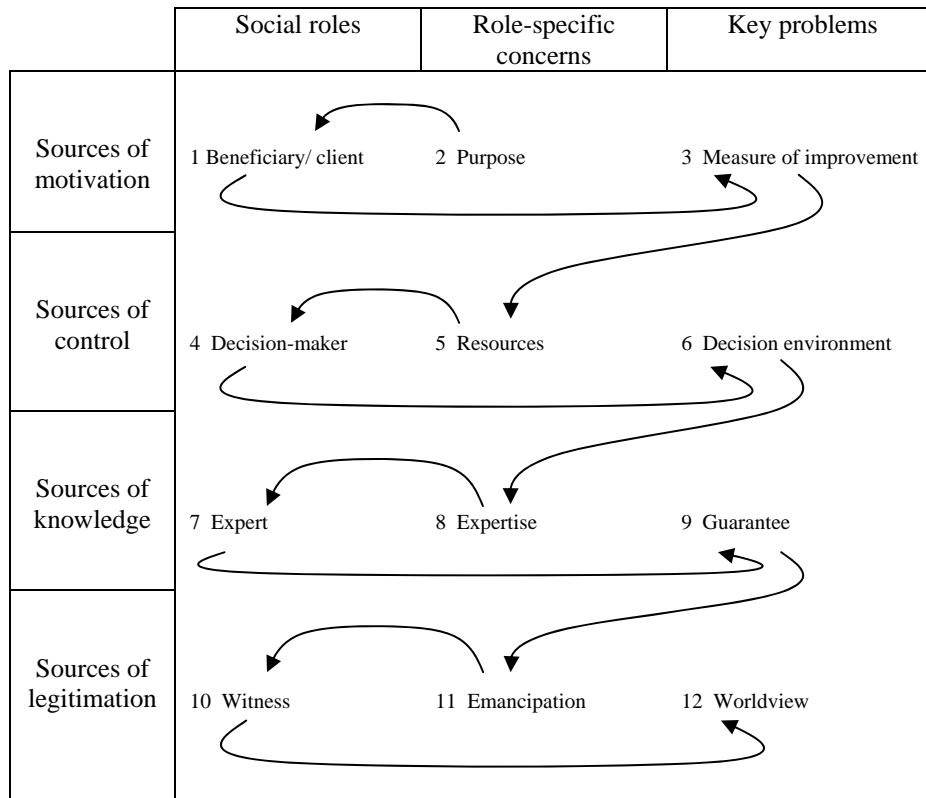
3 The Technique: doing a CSH evaluation

An evaluator would need to gain familiarisation with the use of 12 questions in a range of different 'systems' (entities being evaluated); each defined at the outset by some ideal-type 'purpose' (ie.category 2). Skill in CSH-based evaluation arises from practical use and unfolding of CSH questions, both in 'is' and 'ought' modes, in different contexts. The technique of doing CSH varies between different practitioners with different interests and prior experiences of using CSH or similar techniques, and between different contexts of use. There is no prescribed methodology. The guidelines below comes from my own experience of using CSH in a range of contexts. As with any set of guidelines regarding a technique, the suggestions are open to adaptation and critical appraisal.

² These reasons reflect broader principles associated within the wider domain of what is known as 'critical systems thinking' associated with systemic intervention 7. Midgley, G., *Systemic Intervention: Philosophy, Methodology and Practice*. 2000, New York: Kluwer/Plenum..

1. Identify the system of interest (SoI) which you are evaluating (i.e., the plan, task, project, programme, strategy, policy etc.). Name your SoI by addressing CSH question 2 assigning a higher-order, ideal, *purpose* to the entity being evaluated (i.e., 'A System to.....').
2. Reflect and make a note on your own role as evaluator in the system of interest being evaluated. Evaluation is often part of the expert support provided by sources of expertise. Do you consider yourself an 'expert' associated with the system (category 6), or more as a witness for the affected (category 10), or both, or neither? To what degree is your evaluation independent of the decision maker(s), or is there some possible compromise in the relationship which may inhibit independent appraisal? Is the evaluation a post-hoc summative or more process-oriented formative?
3. For the SoI identified, attempt to locate where it fits within the three level hierarchy of planning: (i) goal, (ii) objective or (iii) ideal planning (see 2.2 above). My own preferred vocabulary is whether the SoI operates at (i) operational/ administrative, (ii) management, or (iii) policy design level of planning. At the management and administrative levels of planning, purposes might be respectively more specifically expressed.
4. Focusing on the SoI, and its underlying purpose, identify associated stakeholders representing beneficiaries, decision makers, experts, and witnesses. Provide examples of representative individuals or groups associated with each source of influence for possible interview. There will inevitably be some crossing-over of interests associated with any one stakeholder identified. A government agency for example may claim to act in all four roles regarding a system for improving welfare development. The key point of this activity though is to get a general sense of which stakeholders are primarily concerned with particular role-specific concerns. A government agency in the context of a SoI for *health care provision* in the United States might primarily represent the 'witness' category, whereas in the United Kingdom a similar agency might primarily represent the 'decision maker' category. Depending on your capacity and resources available to you, the evaluation might be further undertaken either through your own reflection, monologically, using written resource material such as reports or, more preferably, dialogically using conversations with stakeholders themselves. Often a mixture of both approaches is used. Indeed, identifying relevant stakeholder groups represents in effect a first stage in monological appraisal before dialogical appraisal might be undertaken.
5. **Monological:** Build up a picture of the SoI through addressing CSH questions in a systematic manner, beginning with questions of purpose in the 'ought' mode. My own preferred sequence of questions for unfolding the SoI is: 2, 1, 3; 5, 4, 6; 8, 7, 9; and 11, 10, 12. (see Fig. 2). For each question, critique the 'is' with the 'ought' making notes of your reflections (possibly using the template shown in Fig. 1/ appendix).

Fig 2 Unfolding sequence of CSH questions



It is advised that this sequence of unfolding be first undertaken in the normative or ‘ideal/ought’ mode, followed by the descriptive ‘actual/ is’ mode, before then critiquing the ‘ought’ with the ‘is’.

6. **Dialogical:** Design an interview questionnaire for each of the key stakeholder groups identified. Focus the inquiry on issues regarding the purpose of the SoI in focus. The questionnaire can be designed around CSH questions in two ways. In either way, it is important that the terminology used in asking the questions is adapted for the particular context in which you are working. Firstly, the questionnaire might be structured to systematically unfold a perspective of the SoI from each stakeholder group through adapting all 12 CSH questions in the same unfolding sequence as suggested in Figure 2.. Alternatively, you might like to start your conversation with the ‘role-related concerns’ associated with the particular stakeholder group that you are addressing. It may be that given the context of the evaluation, a limited number of more specific role-related questions is all that is required, but changing these questions in relation to different stakeholder roles being questioned. In this way, a composite evaluation evaluation might be gradually established.
7. The ‘final’ evaluation will then need to be written up in a clear narrative form. Simply presenting 12 sets of critiques will not make much sense outside the evaluator(s). In writing a narrative, it is advised that, (i) your own role as evaluator is clearly registered (i.e., which views are yours and which views are assumed?); a useful device for this, though often uncomfortable amongst evaluators, is to write in the first person singular (using terms like ‘I’ and ‘in my view..’) and to avoid any pretence towards making scientific judgements; (ii) reference to a normative ‘ought’ is clearly explained (and open to challenge); and (iii) crucially, you present your evaluation as an invite for further comment and deliberation. Evaluation using CSH, whilst sometimes done in a summative post-hoc context, is an essentially iterative learning process. A key task is to engage stakeholders in a continual reflective learning cycle around the system of interest in order to develop a sense of mutual development of purposeful collective activity rather than an ‘inspection’.

4 Case Study: natural resource management

The notes below are a brief summary of an extensive evaluation exercise made during fieldwork in Botswana in the mid 1990s. The aim of these notes is to briefly illustrate the techniques employed rather than to detail the substantive outcomes. Further detailed reference to the process and outcomes of this evaluation can be sought from [8]. The notes are ordered in the same sequence of technique stages outlined in the previous section. The category numbers referred to are CSH categories illustrated in Table 1.

4.1 Identifying the system of interest

Botswana is often cited as an African economic success story. Economic planning has been based principally on the trickle-down strategy of using revenue from a rich source of *non-renewable* diamonds to finance public sector expansion and improvements in rural infrastructure including provision of health, education, agriculture and communications. The impact of planning *renewable* natural resource-use is less impressive, as evidenced by persistent high levels of rural poverty amidst a diminishing and degrading stock of communal (as against privatised) natural resources.

Since the early 1990s, considerable attention has been given to promoting participatory planning in less-developed countries as a means of poverty alleviation and protection of the natural environment. In Botswana, participatory planning was being extensively piloted as a means of natural resource-use appraisal in rural areas during the 1990s with the support of donor agencies and the national government.

The situation of interest to me was the role of participatory planning in rural development. My *system of interest* (SoI) for evaluation might be simply phrased as follows: A system to enhance natural resource-use appraisal (NRUA) through participatory planning for assisting rural poverty alleviation and protection of the natural environment in Botswana.

4.2 Role of evaluator

My own role as an evaluator was closely associated with both categories 7 ('expert') and 10 ('witness') relating to the SoI described above. I was not commissioned or paid for by any stakeholders associated with the system of interest, and so can claim a fair degree of independence. My own source of support derived from the UK Economic and Social Science Research Council which financed my fieldwork as part of a wider package of support for doctorate studies. The reports produced were written and presented to the stakeholder representatives without prior conditions.

In relation to the SoI, the evaluation was intended to be more 'formative' than 'summative', as my input became part of a wider on-going appraisal of participatory planning in Botswana.

4.3 Level of planning

Three separate on-going projects were chosen for evaluation:

- (i) *Participatory Rural Appraisal (PRA) Pilot Project*
- (ii) *Natural Resource Management Project (NRMP)*
- (iii) *Botswana Range Inventory & Monitoring Project (BRIMP).*

The projects successively represent the three progressively wider domains of planning: The PRA Pilot Project was oriented towards *administration* ('goal planning'); NRMP was oriented towards *project management* ('objective planning'); and BRIMP was oriented more specifically towards *policy* design ('ideal planning').

Whilst occupying different levels of planning, each project shared important features: firstly, their prime objectives are social and environmental rather than economic; secondly, significant direct or indirect non-governmental sources of expertise (NGOs, private consultants and parastatals) - reinforced

with donor support - were commissioned; and thirdly, each project promotes the use of ‘participatory techniques’.

In effect there are three systems of interest being evaluated. Each nested within a particular level of planning.

4.4 Stakeholder groups

Four institutional types were identified as representing generic social roles of beneficiaries, decision-makers, experts, and witnesses associated with NRUA in Botswana. These are, respectively, government departments, donor agencies, consultants, and non-government organisations (NGOs) (see Table 2). Their generic roles are not mutually exclusive, but whilst there might be considerable overlap in roles and role-related concerns, it was useful to have this first mapping of stakeholders as a basis for starting a more detailed evaluation of NRUA associated with each project.

Table 2: Stakeholder map associated with natural resource-use appraisal in Botswana

Institutional type	Primary role in NRUA projects
Government department	<i>Beneficiary:</i> improved NRUA practice for better delivery on, and design of, government policy.
Donor agency	<i>Decision-maker:</i> providing resources efficiently for effective NRUA practice
Consultancy (academic or private business)	<i>Expert (professional):</i> ensuring impartial production of knowledge for sustainable and ethical natural resource use
NGO	<i>Witness:</i> representing interests of impoverished natural resource users, future generations, and non-human nature

Whilst impoverished natural resource users would clearly represent the *ultimate* ‘ideal’ or intended beneficiaries (see Table 3 below), for the purpose of identifying actual stakeholders, it was considered more manageable within the constraints of the evaluation being undertaken to deal with *immediate* beneficiaries of NRUA whilst keeping in-check assumptions that (a) government would make appropriate representation of such stakeholders, and if not, (b) NGOs would ensure such representation.

4.5 Monological appraisal

As a first step to unfold normative use of participatory planning for NRUA practice in Botswana, an initial ‘normative mapping’ (or ‘ideal mapping’) of the system of interest was undertaken based principally on background reading of the situation. Table 3 illustrates an initial pass through normative mapping using the 12 CSH categories in the sequence as described in Figure 2.

Table 3: Normative ('ideal') mapping of natural resource-use appraisal in Botswana

Sources of influence	Role	Role-specific concerns	Key problems
Motivation	<i>Beneficiary</i> Rural poor, future generations and non-human nature.	<i>Purpose</i> To improve natural resource use planning in addressing needs of the vulnerable	<i>Measure of improvement</i> Indices of rural poverty alleviation and enhanced condition of natural resources
Control	<i>Decision-maker</i> Communal resource users	<i>Resources</i> Necessary components to enable NRUA; including (i) natural (ii) project/ finance (iii) human	<i>Decision environment</i> (i) natural environment not required as resources (ii) interest groups affected by project (iii) expertise not beholden to decision maker
Expertise	<i>Expert</i> Communal resource users informed by natural and social scientists and other sources of relevant knowledge/ experience	<i>Expertise</i> (i) technical and experiential know-how & knowledge, including rural peoples' knowledge; (ii) interdisciplinary and intersectoral facilitation skills (iii) social & environmental responsibility	<i>Guarantee</i> Avoidance of incompetent expertise and false guarantors of 'scientism' (sole reliance on objective and statistical 'fact'), 'managerialism' (sole reliance on facilitating communication), and 'populism' (allowing loudest collective voice as sole guarantor)
Legitimation	<i>Witness</i> Collective citizenry representing interests of all affected by natural resource use, both local and global, and present and future generations	<i>Emancipation</i> Freedom from (i) material deprivation (poverty) (ii) deception/ ideological coercion (iii) degradation of natural environment	<i>Worldview</i> NRUA depends on continual dialogue between involved and affected with attention to improved human and natural well-being

In the *ideal* world of purposeful human activity, the roles of beneficiary, decision maker, expert and witness are closely interrelated and at-one together. For natural resource-use appraisal, a system of self-organisation and appraisal amongst conscientious natural resource users might therefore be considered as the ideal situation.

This initial ideal mapping provided a benchmark for developing further iterations of normative mapping at each level of planning, as well as providing the basis to critique 'descriptive mapping' when evaluating each of the three projects.

4.6 Dialogical appraisal

The stakeholder mapping and normative mapping were also useful as a basis for designing the format of semi-structured interview schedules for different stakeholder interviewees. These interview schedules were kept deliberately open in order to allow respondents to develop their thinking/ reflection during conversation. Rather than systematically going through each of the 12 CSH questions (see Fig. 2) for each interview in both the 'ought' and 'is' modes (which in some circumstances might be appropriate), each schedule for this evaluation was customised according to (i) the perceived stakeholder role (beneficiary, decision-maker etc.), (ii) the particular level of planning/

project being focused upon (often, interviewees would have a stakeholding in several projects at same time, though it was important to record level-specific notes where appropriate), and (iii) information arising from prior interviews with other stakeholders. After introducing the focus of evaluation in terms of participatory planning for NRUA, each schedule began with questions relating to what the stakeholder considered to be their main role, and their main concerns and key problems in fulfilling their role. Time and interest permitting, more general questions were then asked about relationships with other stakeholders, and an impression of what the roles, concerns and problems associated with these stakeholders might be. The CSH ideal mapping provides possible prompts in developing the conversation throughout the interview (e.g., see Table 4).

In recording feedback from such conversations, it was useful to continually update the impression of what 'is' the situation with respect to each level of planning. In other words, the descriptive mapping is a continually evolving exercise during conversations and any associated reading of informal 'grey' material (e.g., internal reports, memos, discussion documents etc.) that are revealed and made available from such conversations. At the same time, critiques were emerging from the descriptive mapping. It was important to keep a record of the developing critique as this became the basis for reporting back. There is not the space here to look at any actual descriptive mapping associated with the projects, though Boxes 1-3 give some indication of the final critiques that emerged from the mapping exercise.

Table 4: Sample stakeholder role-specific questions associated with NRUA in Botswana

Primary stakeholder role in NRUA projects	Initial generic prompts for further inquiry
<i>Beneficiary:</i> Government department	How to reconcile tradition of centralised roles for government extension officers (supply) with decentralised imperatives for appraisal (demand from ultimate intended beneficiaries)? Is appraisal undertaken at cross purposes (i.e., supply not addressing demand)?
<i>Decision-maker:</i> Donor agency	How to transfer 'ownership' and control to national & local agencies whilst maintaining some control over natural resource intervention ('global commons')? Is the decision 'environment' in which appraisal is undertaken properly understood and clear?
<i>Expert (professional):</i> Consultancy	How to ensure impartial production of knowledge whilst changing validity criteria for appraisal output? Is 'participation' enough as a guarantee of good knowledge?
<i>Witness:</i> NGO	How to avoid conflict of interests given that NGOs are generally answerable primarily to government & donors? Is there a risk of losing representation of intended beneficiaries?

4.7 Reporting

The three projects were evaluated over a relatively long period of time (2 years), with a substantial number of interviewees (78), many of whom (24) were interviewed on 2 separate fieldwork occasions. Along with fieldwork observation of participatory rural appraisal techniques in operation, and analysis of a substantial amount of grey material associated with each project and level of planning, inevitably this exercise generated a large amount of data and information to assimilate. Keeping an up-to-date record or journal of the critique became a particularly important feature of this particular evaluation, along with the development of a series of three successive interim reports submitted back to the stakeholders which provided important feedback for further iterations.

Each report began with an explicit statement on (i) what I perceived were the main issues of the evaluation, couched in terms appreciated by the stakeholders (ie., underlying values and purpose of the project, issues of relevant power and decision making, relevant knowledge, and moral underpinnings), and (ii) my own role and purpose with respect to the evaluation exercise. In hindsight, it would also have been appropriate to add (iii) a disclaimer regarding any pretence to having made a 'scientific' evaluation. Reporting back on a CSH based evaluation requires transparency as well as skill in translating findings and impressions in a mutually appreciated vocabulary and narrative. A key to successful evaluation is in eliciting recognition and critical appreciation and further engagement

amongst the stakeholders involved. All stakeholders were invited to comment on the interim reports either through written submission and/or verbal communication through either further private communication or special discussion sessions (one exclusive seminar and one public seminar were specially convened in Botswana for such feedback).

Boxes 1 to 3 provide very brief summaries of the final critique presented for each respective project. Each embellishes some descriptive mapping and specific critique of 'role', 'role-specific concern' and 'key problems' associated with each source of influence (i.e., as derived from template in Fig.1/ appendix).

Box 1 Participatory Rural Appraisal (PRA) Pilot Project ('goal' or administrative level of planning)	
Motivation critique	Predominant purpose to <i>alleviate perceived rural social inertia</i> . Local government <i>extension officers</i> were chief beneficiaries rewarded with facilitation skills to enable greater involvement of local people in extension work. The key measure of success for the project was centred on <i>high levels of participation</i> and generation of <i>self-help projects</i> . Alternatively, rural poor possibly need better access to and control over resources rather than being subject to further (effectively) top-down extension practices.
Control critique	Under trajectory of (i) increased privatisation and fencing of communal land resulting in further alienation of natural resource, and (ii) reduced government assistance for local development projects, rural poor livelihoods are increasingly dependent on contracts with landowners and donor support for collective projects. Also, risk that rural peoples knowledge loses its independence in becoming increasingly subject to government extension practice.
Expertise critique	Participation levels amongst rural poor in PRA exercises provide a questionable guarantee for success in that participation levels (i) are unlikely to be sustainable if benefits are not quickly realised, and (ii) distract from large body of empirical data and experience indicating significant correlation between rural poverty and land fencing policy since the mid 1970s.
Legitimation critique	Dominant underpinning belief that benevolent government (through tradition of generous handouts and transfer of technology projects) has been responsible for generating rural social inertia, hence the need for government to step back and allow 'development from within'. Possible further marginalisation of rural poor through not addressing perceived root cause relating to control and access to land.

Box 2 Natural Resource Management Project (NRMP) ('objective' or management level of planning)	
Motivation critique	Participatory techniques considered useful for <i>triggering multisectoral planning</i> to counter problem of intersectoral conflict around natural resource planning. Key beneficiaries are the <i>project managers</i> responsible for eliciting support/ resources from different line Ministries (e.g., Wildlife & Tourism, Agriculture, Water Affairs, Local Government). Key measure of success is the number of community based natural resource management (CBNRM) projects being generated. Questionable long-term actual impact of CBNRM on rural poverty reduction and natural environment.
Control critique	CBNRM 'projects' become currency for rural development, each controlled by project manager. Short term 'projects' elicit funding support from donor agencies, allowing government to divert resource support away from local rural development.
Expertise critique	Project management requires multidisciplinary expertise and skills in facilitation. Participatory techniques involving rural participants appreciated as a useful trigger for intersectoral collaboration and communication between traditional disciplinary

	experts. Rural peoples knowledge (RPK) also regarded as useful check on professional judgements rather than as a prime driver for rural development initiatives.
Legitimation <i>critique</i>	Dominant underpinning belief that appropriate expertise (supported by evidence from RPK through participatory techniques) ought to drive rural development rather than traditional dependence on civil service bureaucratic functions which inevitably create the closed 'silo' mentality. Possible conflict with local understandings of the need for greater autonomy and control over development amongst rural participants rather than project managers.

Box 3 Botswana Range Inventory & Monitoring Project (BRIMP) ('ideal' or policy domain level of planning)	
Motivation <i>critique</i>	Predominant purpose to <i>instil longer-term co-ordinated planning</i> in tune with national economic development planning, to address problems of piecemeal development. Immediate beneficiaries are the <i>policy advisors</i> who wish for greater responsiveness to market pressures whilst wishing to avoid piecemeal planning. Will this benefit rural poor?
Control <i>critique</i>	Commoditised resources provide the most appropriate means for economic or econometric planning. Thus fencing of communal land, privatising water supply, project-oriented development, and having rural participants on-tap for consultations during monitoring and evaluation efforts, are all important measures of control. Risks further disenfranchising of rural community.
Expertise <i>critique</i>	Central guarantee for ensuring properly co-ordinated efforts is through purposive <i>monitoring and evaluation</i> using econometric indices based on criteria of efficiency and effectiveness in terms of generating economic wealth from natural resources. Participatory techniques using rural peoples knowledge, regarded as a means of ground-truthing or checking information arising from more technically oriented surveillance systems like remote sensing.
Legitimation <i>critique</i>	Belief that free-market determinism using econometric devices applied to natural resource-use provide most effective means for reducing poverty and protecting the natural environment. Possibly sidelining Tswana tradition in democratic debate as a means of determining policy.

5 Summary: reflections on skills development

Critical systems heuristics is not a prescribed methodology. There is a wide variety of practice in the use of CSH questions. In some circumstances, not all the questions may need addressing. Descriptive mapping might be appropriate before, or as a trigger to, normative mapping. Ulrich himself uses CSH in slightly different ways in evaluating two substantial planning case studies – economic planning in President Allende's Chile, and health systems planning for Central Puget Sound in North America (Ulrich, 1983).

The key to developing CSH skills rests with appreciating the systems principles embodied in the tool: (i) the idea of boundary critique, in being systemically aware (and generating systemic awareness) of, and making explicit, the boundary judgements implicit in any human activity; (ii) appreciating your own role and values relating to a situation of evaluation and the need for nurturing critical conversation amongst stakeholders to develop, rather than merely protect, stakeholdings; and (iii) using CSH evaluation to serve wider ethical interests of well-being, both social and ecological.

More specifically, I offer some practical tips in the use of CSH arising from personal experience.

- (i) Practice at deploying CSH questions is the only way of developing skills and appreciating the interrogative power of the questions being asked.

- (ii) Adapt the terminology to your own needs/ culture, whilst retaining the essential meaning of the 12 categories.
- (iii) Practice using a system of interest relevant to you personally (e.g., a domestic or work situation, activity, proposal in which there is some 'purpose' attached)
- (iv) Be prepared to encounter moments of discomfort in using CSH. Making values transparent is not a painless exercise, either for the evaluator or stakeholders involved with evaluation.

Further reading

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