



# What is Community Based Auditing and how does it work?

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## ABSTRACT

Community Based Auditing (CBA) has arisen in response to the ongoing conflict over the management of Tasmania's natural resources and in particular publically owned forests and water resource. The origins, philosophy and central methodology of Community Based Auditing are described and discussed. The author discusses how melding the principles of Post-Normal Science with methods of action research and environmental auditing has led to an innovative form of community engagement where empowered citizens undertake disciplined inquiry into issues relating to natural resource planning and management. Of particular concern are the notions of certainty embedded in present frameworks underpinning government legislation, natural resource planning and management. It is believed that this has led to a pattern of decision-making that is inappropriate, unfair and ultimately counterproductive. Case examples are presented where citizens have applied the CBA methodology in dealing with contentious issues within the Tasmanian forestry industry. The author concludes that the CBA innovation has helped to improve the depth and quality of citizen involvement in natural resource management and at the same time provides the impetus for greater accountability on the part of those charged with managing Tasmania's natural resources. It is felt that the methodology may be able to be applied to other contexts where the need for greater inclusiveness in decision-making relating to natural resource management has been demonstrated. The consequences for the evolution of environmental activism are also thought to be significant as a new form of community-based activism is now possible.

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## 1. Introduction

This paper discusses the origins, philosophy and central methodology of Community Based Auditing (CBA). It shows how it relates to the principles of Post-Normal Science. CBA is an experiential tool for empowering citizens to undertake disciplined inquiry into issues relating to natural resource planning and management.

In making a case for CBA, I argue that the current serious discontent and conflict surrounding natural resource management in Tasmania are the result of numerous instances where management decisions have led to adverse environmental and social outcomes, in spite of official assurances of their safety. Such outcomes are in fact symptoms of a more serious problem that once solved could lead to reduced conflict and a better way forward. I argue that the notion of certainty embedded in present frameworks underpinning government legislation, natural resource planning and management has led to a pattern of decision-making that is inappropriate, unfair and ultimately counterproductive. The current Model of Modern Science needs radical change [1]. In particular, we need to revise the current assumption that scientific assertions (such as those used in natural resource management) are true and certain until proven false. The method

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of CBA is similar to those of grading and of peer review in science; the evidence and argument are examined and evaluated, to see whether they are good enough to support the stated conclusion. With this revised and realistic task, citizens can and do produce valid science, and are empowered, both politically and personally.

CBA is a method of auditing, based in part on the internationally recognised standard systems such as ISO 14001. It employs the highest scientific standards, but concerned citizens are quite capable of being trained to full competence in its work. When the arguments of projects' proponents are unravelled, and the assurances of good outcomes are refuted, then within a framework of constitutional governance there is no alternative to negotiation. The 'extended peer community', as discussed in Post-Normal Science [2,3] can then engage as fully legitimate partners. Although we are a long way from fully participative decision-making, the CBA methodology does represent a start in that direction.

## 2. What is Community Based Auditing

Community Based Auditing is essentially an experiential tool for empowering citizens to undertake their own disciplined inquiry into natural resource issues affecting them either directly or through their role as taxpaying stakeholders. CBA has arisen in answer to the concerns of increasing numbers of citizens who seek direct input into resource planning and management. Much of the time citizens find themselves on the outside of such process and given only limited opportunity to play an active role in decision-making. With CBA, an 'extended peer community' is created, applying the principles of PNS.

By taking the view that citizens are 'experts in their own locale', CBA creates a space where citizens can work together to develop their skills and confidence.

CBA is about citizens generating valid knowledge using inquiry processes they themselves design and implement. Although still evolving, CBA serves as a good example of how citizens can be effective managers of change. In that sense, CBA should be seen as 'work in progress'.

To date some 14 audits have been completed, directly involving nearly 200 people. This paper is an attempt to explain the approach as well as locate it in the broad church of community based change strategies.

For ease of presentation, the paper is divided into two parts. Part A discusses the origin and development of CBA between 1999 and 2003 and Part B discusses the development from 2003 to 2007 during which time the philosophy, methodology and central methods had more fully developed.

## 3. Part A: the origin and initial development of CBA 1999–2003

### 3.1. The origins of CBA

The emergence of CBA is based on a 25-year gestation period, during which I wrestled with the problems of community advocacy and participation. Its development was influenced by my earlier work where I provided *pro bono* support to citizens affected by pollution from heavy industry and aerial overspraying. During 1989–1990 I developed Community Based Sampling [4]. Citizens were trained to undertake their own spot checks for contamination in soil, water and food. CBS was similar in many ways to the Science Shop concept [5,6]. A series of workshops were run throughout Tasmania, with some 100 people trained in environmental sampling, laboratory selection and data interpretation. While the approach was effective, it did not enable citizens to become change agents in their own right. During 1992–1997 I began to reflect on ways to bring citizens into decision-making processes, not so much as 'clients', but co-inquirers who could convert scientific data into political action, and at the same time become empowered to undertake sustained engagement as agents of change. While CBA has similarities to both the science shop and community research movements it also differs as it places a strong emphasis on personal change and transformation. The process of inquiry that sits at the centre of CBA is as much about inquiry into the self as it is about inquiry into the 'problem situation'. This is based on the belief that further progress towards a more just and sustainable society will involve an ongoing challenge to the accepted norms that guide the beliefs and expectations of ordinary citizens.

The initial idea for CBA came to me in 1998 and further developed as a result of a fortuitous meeting of like minds during 2000.

Tasmanian Community Resource Auditors Inc. (TCRA) was formed in early 2000 by a group of scientists and activists, in response to long-running concerns at the way the views and opinions of communities across Tasmania appeared to be dismissed by industry and all levels of government.

While each member brought unique experiences and expertise to the group, there was a common concern that stood out from the myriad of natural resource issues we had dealt with over a collective period of some 50 years. The focus of the concern was the way in which citizens were being treated by industry and government. It was clear to us that citizens were somehow left out of key decision-making processes.

Our experiences were rich with examples where communities were asked for 'feedback' and 'input', but seldom if ever involved in strategic decision-making. When citizens attempted to assert their arguments a range of ploys were used to shut down or divert debate.

We all recalled instances where industry and government referred to community members 'as non-experts' or 'lay persons', inferring those citizens would find it difficult to understand complex matters. More extreme examples included situations where governments stepped in and changed the law when community expectations differed from the direction

that government and industry wanted to go. The most recent case was the problems associated with the diminution of the powers of the Resource Planning and Development Commission (RPDC) in relation to the review of the proposed pulp mill in the Tamar valley in northern Tasmania (see Flanagan [7] for further details). The RPDC was the agreed umpire whose role was to review the proponents' application as well as other relevant evidence. Amid a huge uproar over assessment time frames, technical matters (relating to scientific aspects of assessment), due process and alleged interference with the independence of the Commission there were a number of resignations from the RPDC panel and a former head of the expert panel threatened to resign citing government interference and concerns over maintaining the status and integrity of the RPDC process, and in particular the provision for public input into the pulp mill approval process. These concerns were later played out in dramatic fashion when the government of the day introduced a new law in an attempt to fast track the mill approval process. Such a move had the effect of shutting down public input into assessment process. These events caused deep concern and outrage in the community and serve to demonstrate the complexity of natural resource management issues in Tasmania.

Further discussion and reflection within the group revealed that concerned citizens were treated in one or all of the following ways:

- Outright dismissal of citizen's concerns by institutions and authorities;
- Citizens given the runaround from institution to institution or department resulting in burnout and frustration on the part of the affected citizen;
- Citizens expected to 'prove' their concerns. This was evident in several cases and was a ploy often used to put the onus back onto the citizen, although in some cases it was clear that the government/industry did have a case to answer and owed a duty of care to the community;
- Citizens threatened or intimidated in order to coerce them into dropping their concerns;
- Use of experts and advisory groups in order to convince citizens that their concerns were unfounded. Such approaches are an attempt to drown the citizen in facts and figures. This effectively leaves the citizen again isolated as they find themselves unable to connect with the language in order to mount a confident counter argument despite the feeling that their concerns have not been addressed. The air of authority that prevails during such encounters often leaves citizens with a feeling of diminished power;
- Environmental NGO's (non-government organizations) in the State are able to lend moral support and perhaps practical support by writing letters of concern to industry and government, but are not able, in the majority of cases, to provide ongoing in-depth support. Usually such support is left up to those of us who provide *pro bono* support to community. For example a case was referred to me by an NGO in 1988, which took 7 years to settle. I supported a farmer whose land was polluted by run-off from a nearby tip site. The case quickly became very high profile. The farmer sued the state government and the local shire council. The end result was an out of court settlement. I managed the residue sampling, media, and communications with government and had the job of compiling the proofs of evidence for the case to be heard in the Supreme Court. Such support come at a high personal cost, both in terms of time and money as well as reputation. There are many other examples of such support that myself and others have provided.

Of course, these types of experiences are not necessarily unique to Tasmania. When citizens raise concerns over safety, health or environmental issues government, industry and their experts usually move to address such concerns. In some cases however the legitimate concerns of citizens are ignored or overlooked for a range of reasons. For a thorough discussion about the importance of valuing the views of ordinary (lay) folk, see Harremoës et al. [8].

The TCRA Inc. Board members agreed that while in some cases the concerns of citizens may be unfounded, there were many other cases where concerns appeared to be legitimate. Time and time again, our experiences showed that citizens with legitimate concerns would have to fight an uphill battle just to be heard, let alone listened to. The official response has been to simply ignore concerns especially where there is the potential for serious outcomes that may reflect badly on industry or the government. For their part, the various groups within the Tasmanian environment movement are so fixed on their main agenda of 'saving the environment' that they simply have little energy, time or resources to support the range and number of issues raised by community members.

On the basis of our experiences it was also clear that governments, industry and even environmental NGOs and activists of all persuasions were either telling communities what was good for them or advocating on their behalf without actually ever undertaking regular dialogue as to their concerns and opinions. We found this left citizens confused and de-energized and likely to simply 'turn-off', such was their sense of frustration and feelings of isolation. Little wonder we hear claims by government authorities, industry and sections of the environmental NGO's that communities are growing apathetic. The unfortunate upshot of all of this is that the community is open to exploitation as long as these conditions exist. In short, the waters are continually muddied, as vested interests claim to be acting on behalf of communities who, some of the time at least have simply turned-off. Once that happens the scene is set for overt exploitation by vested interests.

When TCRA board members reflected on these issues and possible ways forward, the question arose as to whether our efforts would simply be more of the same, namely supporting citizens on a cases-by-case basis, fighting each battle as advocates 'leading the charge'. On the other hand, we wondered whether our efforts would be better spent tackling the

problem of citizen empowerment in a more systemic way. We posited that our task was actually about embarking on a process of social change and at the same time provide technical support to concerned citizens. This was an important turning point for our group.

Having identified what we felt was the main problem we then attempted to put in place a strategy to assist citizens in need. At the same time, we reflected on ways to ensure that the process would be self-perpetuating as it spread through the community with citizens helping each other, either on a one-to-one basis or via support groups.

The initial stages of CBA were fraught with difficulties and problems as we wrestled with the emerging issues. Supporting citizens with a view to somehow liberating them, although laudable and gratefully received, still left us with the feeling that we were treating a symptom and not the cause. While there was evidence that CBA was beginning to take off, we still had to work on a case-by-case basis, slogging through the maze of issue and problems surrounding the core problem in each case. We were sure that the key 'problem' was a social one and that working with citizens in the context of their world was a viable way to progress meaningful and informed action that would lead to empowerment. By 2003, a new concept of CBA began to take shape as ideas about context, methodology and methods emerged. By mid 2003 an important finding occurred to do with the basis of the ongoing conflict over the way natural resources were being managed. It became clear, on the basis of several interventions and subsequent reflection sessions that the underlying problem was to do with certain expectations held by all of those affected by the conflicts over natural resource management. At issue were differing expectations over the concept of certainty. For their part, the communities have been led to expect binding guarantees that management proposals would not lead to negative impacts on community or the environment. Industry expects to see approval for projects once the necessary minimum requirements of regulations have been met. The governments expect 'best practice' and that its codes and regulations will be met so that environment and community will be protected from loss or damage. Each expectation is underpinned by an implicit belief in certainty. Several CBA projects had shown quite clearly that the expectations and values of citizens could not be met, and furthermore, nor could those of industry and government. In short, it was clear that natural resource planning and management (as practiced in Tasmania) could not guarantee certainty for anyone.

In a search for deeper understanding, we undertook further reflection and analysis, which led us to conclude that natural resource managers were making decisions using an inappropriate methodological framework. The frame of 'applied science' (as understood in the terms of PNS) has been the cornerstone of the legal, planning and decision-making processes that underpin natural resource management. An Achilles heel was soon evident. Applied science is unable to deal with any but the simplest forms of uncertainty, and is totally incapable of accommodating human values and perceptions. Therein was the root of the problem. Other authors, such as Funtowicz and Strand [1] have eloquently discussed the tangle of problems faced by the 'Modern Model' of science and have proposed new approaches to grappling with the above problems. The Model of Expanded Participation is particularly relevant to this discussion.

#### 4. Part B: development of Community Based Auditing 2003–2007

##### 4.1. Introduction

2003–2004 saw the progressive development of a philosophy and methodology to guide not only our interventions in the field, but also the development of the TCRA group itself.

##### 4.2. The philosophy of CBA

The present form of CBA emerged out of the critical inquiry paradigm. Inquiry strategies within this paradigm place a strong emphasis on legitimization of the knowledge and ideas of 'ordinary' citizens. Indeed, there are traditions within the paradigm that advocate empowerment of workers and citizens generally. The case is made for 'ordinary' people as experts, charting their own course and setting their own destiny.

CBA has two parts: the auditing process, or the 'hard science' part, where data is collected, measurements and comparisons are made. The second part is the 'soft science' part, where views, perceptions and emotion enter the process. In this part provision is made to support the growth and development of participants, including the facilitators. At its kernel, CBA is a learning process, where participants explore human nature and the nature of change in order to achieve a practical understanding. It is based on *experience* within the contexts they are operating in. No extant theory is used in any prescriptive way, save the use of a broad process of iterative inquiry, based upon a rigorous scrutiny of arguments and evidence. I shall elaborate on these matters below.

##### 4.3. Methodological basis of CBA

The Community Based Audit process uses an action research approach to guide participants as they engage in the strategy of *plan-act-reflect* [9]. The action research process is a cyclic process that involves joint planning, action and reflection on outcomes and learning (including personal development), prior to subsequent cycles of inquiry. The action research process

guides participants as they move from identifying the reasons for their concerns through to clarification of ideas about what is wrong and what should be done. The action research inquiry process invites reflection and discussion on the audit findings as well as reflection on outcomes from the intra- and interpersonal interactions. As well, matters relating to the social and political contexts and the personal growth experienced by each participant (including the facilitators) can be explored. The methodology, in taking many forms, can draw upon any number of methods and tools during the inquiry process. The form we are using is known as Participatory Action Research or PAR, where the distinction between expert and layperson becomes blurred as they work in partnership as co-learners about problematic situations in which they also take action to bring about change for the better. In PAR learning takes place on many levels—from solving the problem that originally brought team members together, to embarking on journeys of self-discovery and personal improvement. Over the past 7 years TCRA has seen several instances where participants have undergone what they feel is significant personal change leading to improvements in their personal competence as activists and change agents. Typically, an engagement with a community group can last 3–6 months during which time TCRA facilitators work with the team, beginning with problem/issue definition through to investigation, reporting and publication. A series of workshops and reflection sessions are held during the course of the intervention. At all times the TCRA facilitators seek out opportunity for team members to experience personal growth as they move to become empowered and confident citizens. In the end though it is the individual's decision as to how in-depth they wish to go. In the case of CBA we drew inspiration and ideas from Post-Normal Science in order to set up the basic inquiry process. Likewise community teams may wish to introduce their own ideas and methods, e.g. use of art or theatre to present findings. The methodology is open to all sorts of ideas and innovations. The only requirement the TCRA facilitators insist on is final publication in order to make findings and the inquiry process available to the public. This ensures ongoing debate and the creation of a citable public record.

Fig. 1 shows the interrelationships among the components making up the methodology.

#### 4.4. The key process within CBA

Over the past 3 years CBA has developed further by drawing on the ideas within Post-Normal science [10]. It is well known that PNS seeks to deal with uncertainty through the use of participatory strategies, such as extended peer review. In my view the adoption of a PNS approach to managing our natural resources here in Tasmania would lead to a significant reduction in conflict now rife at all levels of our community. However, I suggest that any attempt to embrace fully participatory approaches (such as PNS) in the context of the present social/political reality in Tasmania would be difficult. Having said that, it is my view that a shift toward more participatory forms of resource planning and management will be made possible by focusing debate on the way uncertainty is managed.

The idea of Post-Normal Science is rather general; it is mainly concerned to show the need for a new methodology of participatory decision-making. We have found that CBA is a way of giving PNS a real, practical content. CBA has adopted processes that if used skillfully will bring the issues relating to the notion of certainty into focus, thereby paving the way for the progressive introduction of participative concepts into the wider discourse. The process of critical scrutiny, which sits at the centre of the audit process, drives this subtle agenda for change toward a new science that explicitly requires citizen participation.

CBA is based upon a rigorous search for disconfirmation or mismatch. The term is used here to mean bringing opposites together in order to create 'controlled conflict'. That is to say, a way of generating issues and problems that lead to a sense of

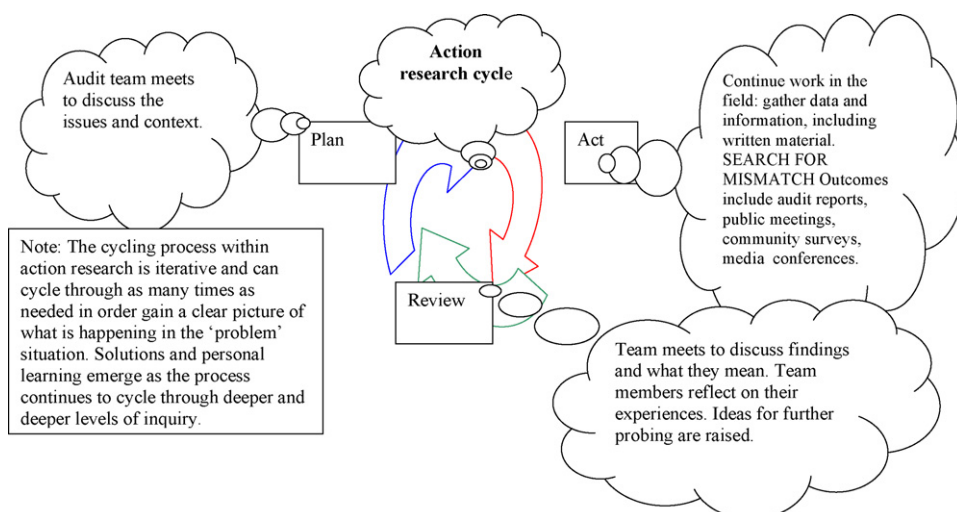


Fig. 1. Relationships among the processes within the CBA methodology.



unease and discomfort and, in the end, call for solutions and resolution. This is the essential driver in any audit process as it raises questions that have the potential to carry the inquiry to ever deeper levels. Processes are also needed to generate information to feed into the mismatch process. I will explain this process before going on to explain the disconfirmation process.

#### 4.5. Generating information

We use a process not unlike the ‘aspect and impacts’ process within ISO 14001 (see Box 1). The use of environmental aspects and their impacts (both positive and negative) helped citizens see the proponent’s management methods in a new light. From that point the process of critique could begin. In many cases citizens identified new aspects and in some cases highlighted where negative impacts had not been identified or risks not been assessed. This had the effect of commencing a spiral of uncertainty where citizens pursued ever deepening lines of inquiry. This tool took citizens beyond indignation and anger to a place where they could begin to deconstruct the assertions contained within the proponent’s management prescriptions. In short, it helped citizens move beyond “No!”. In terms of the CBA methodology, this innovation was vitally important as it enhanced opportunities for learning and empowerment (see Box 1 for further discussion on the use of this process).

#### 4.6. The disconfirmation process

CBA uses what is termed a dialectic process, whereby the inquiry team (composed of citizens and TCRA facilitators, who act as co-learners and trainers) seeks out discrepancy and mismatch. For example, if a proponent’s on-ground actions are at odds with directions laid down in their management prescription then a mismatch is said to exist. From that point, a process of deepening inquiry can begin. The management prescription document forms the basis of the audit process where the actual on the ground practices (actual or proposed) are compared with the requirements as set out in the proponent’s plan.

CBA starts with the recognition that the science and technology used by the institutions (including governments) is based on the notion of certainty. By contrast, those using CBA are introduced to science in terms of a *quest for knowledge*. This distinction between knowledge and certainty is important as it brings to the fore the reality that much of science is based, ultimately on assumptions and probable outcomes: nothing is certain. This is of particular importance for those proponents who make assertions along the lines of, ‘we are assured that there will be no adverse consequences resulting from this project. ...’. Those who beg to differ are expected to prove the proponents wrong. They are forced to accept the burden of proof, and to create their own counter scientific argument. Experience shows that in pursuing such challenges citizens often fall for what is in effect a trap. They may use their own experts to prove the proponents wrong. What ensues is a game of ‘expert versus expert’ that, if not carefully managed, leaves citizens ‘rich with data but poor in useful information’. Experts unavoidably have their own agenda, which may differ significantly from that of their clients. Disappointed with the experts, they may turn to public protest. While this may sometimes be successful, by itself it can prove to be of limited value. The Modern Model of Science does little to alleviate this tension, whereas approaches that utilize expanded peer review through participation may well provide a way forward.

CBA takes a path involving unpacking the proponents’ documented arguments in order to unearth the underpinning assumptions, thus opening up the possibility of criticism of the claimed soundness of the proponent’s science. These can be effective in a political and social context that assumes that certainty in science is possible (see Tattersall [11] for a further discussion). Once the audit process begins to unearth weaknesses in the proponents’ science the potential for a *spiral of unravelling* is then possible as the proponents’ ‘science’ continually fails the test of *certainty*. This part of the process must be handled in a sensitive and ethical manner, as it is important that the audit team strives to pursue the facts and not the persons involved (the proponents). Here the arguments must be carefully thought through, as it is not just a case of presenting counter facts. It is one thing to meet a fact with another ‘counter’ fact, but quite another to show that another’s supposed ‘facts’ are based on faulty reasoning. The situation is analogous to that in a courtroom. It is not necessary for the defence to prove that someone else committed the crime; it is enough for them to show that guilt has not been established ‘beyond reasonable doubt’.

**Box 1.** Our initial framework for auditing resource management plans was to examine the management processes and biophysical components within a given operational area. We then moved to examine the consequences of positive and negative impacts that could arise from each of the processes and components. This gave rise to a form of risk assessment. We surveyed the available literature for similar frameworks and found that ISO 14000, an environmental management system, was very similar to the process we were using. Our ‘process and components’ and ‘positive and negative impacts are similar to the ISO 14000 ‘aspects’ and ‘impacts’. We took an aspect to be anything that could cause a positive or negative impact within the sphere of a proponent’s operations or beyond its boundary. Examples of a negative impact would be depressed water yield and quality from a catchment caused by plantations. A positive impact would be opportunities for environmentally sensitive ecotourism. The aspects in these cases would be water quality/quantity and community enjoyment/economic well being respectively. Basic details of ISO 14001 can be found at: (<http://www.deq.virginia.gov/export/sites/default/ems/pdf/emstot6c.pdf>).

To put it in terms of ‘real world experiences’, the community based audits conducted to date demonstrate that in many cases the management prescriptions developed by proponents have failed because they were developed within an ‘applied science’ framework that cannot deal adequately with uncertainty. The experiences from the field show that proponents go to great lengths to confirm that they are certain about the claims they make in their management prescriptions. For their part, those using CBA simply ask the proponents to produce evidence in support of their claims, which of course leads to another turn of the spiral of uncertainty. Users of CBA just need to invoke the ‘post-normal questions’, “what-if?”, “what about?” and “how do you know for certain?”.

These experiences told us that what were needed were planning and management frameworks capable of handling degrees of uncertainty, where professional judgment, local knowledge and ‘soft’ data are admissible. This was the main finding that the disconfirmation process had highlighted in successive audits.

#### 4.7. Auditing methods used in CBA

The CBA audit process occurs on 3 levels:

1. First there is an audit of the management prescriptions (such as management plans, detailed impact statements and the like) a proponent intends to use to guide management of a project. Here the auditors, in consultation with their experts seek to discover gaps, discrepancies or anomalies in the prescriptions and/or the science that underpins them. Auditors seek verification of any assertions or claims made in support of prescriptions. They also seek proof of risk assessments in support of proposed practices that may have an impact on communities or the environment. This intense cyclic process continues as the audit team mounts an exhaustive search for possible cases of failed logic and faulty reasoning. The aim is to discover whether either the basic planning assumptions were wrong in themselves or wrongly applied to the site in question. Even worse, should the team show that the actual knowledge about the site was incomplete or deficient in some way, then this would constitute a major error. A number of past audits have shown that the application of general theories to a specific site can be fraught with problems.
2. Then there is an audit of the site where the management prescriptions are to be applied. Walking the site is vital. Samples and photographic evidence may be sought during this phase of the inquiry. Experts are used to interpret the application of the prescriptions to the site. Again mismatches, anomalies and errors are exposed, tested and documented using a rigorous cyclic process of inquiry.
3. Community members then create a publicly available text of their inquiry. This is an important step in the process, both from the point of view of the participants and the wider community, who can then learn from documented experience, glean ideas and inspiration. Each audit represents a growing literature carrying common themes linking the need for participation in order to reduce risks of proposed developments.

#### 4.8. Examples of Community Based Auditing

A recent community audit [12] examined a proposal to clear fell a forested area in a catchment in the North East of Tasmania in an area known as The Blue Tier. A local community group was concerned that clear felling in the catchment would negatively impact on water quality and yield, flora and fauna, tourism amenity and cultural heritage values. The group initially surveyed their wider community and discovered significant community attachment to the proposed logging area. The group then proceeded to audit. The focus of the audit was to determine whether or not the proponents of the logging operation had, in the first instance, identified the same environmental aspects as those already identified by the community group and whether or not a thorough risk assessment had been completed.

The group began by accessing information on the biophysical aspects of the area including the proponents’ Forest Practices Plan. The group then walked the site, taking photos and making observations. The group met and asked critical questions of the Forest Practices Plan and then met with the proponents to discuss their concerns and issues. Unresolved issues were then taken for expert review. Remaining mismatches and concerns were then taken back to the proponents for discussion prior to writing up of the audit. The upshot of the inquiry was the discovery that the proponents had not adequately addressed significant environmental issues such as soil stability, water quality and yield, cultural values and tourism amenity. Once again logging in fragile catchment areas could not be supported by the available science.

The experts working for the community group concluded that the soils, “...developed on the granites of the Blue Tier are sandy and highly erodible...”. This was in contrast to the proponent’s findings that the soil erodibility was “moderate” (Nicklason et al., p. 11 [12]). Another expert (an Associate Professor of Hydrology) concluded that, “One of the more alarming features of the recent developments on forestry in northeast Tasmania under the Commonwealth Regional Forest Agreement is that major vegetation change is being carried out with no assessment of the consequences for catchment water yield” (Nicklason et al., p. 12 [12]). The issue of water yield was also highlighted in the very first audit conducted in 2001 [13], in which independent experts found that logging and replanting of upper catchments could reduce water yield (as measured in fresh water springs) by up to 50%. These highly significant audit outcomes contributed to the initiation of wide community debate over the impact of tree plantations on water yield from upper catchments. They also showed quite clearly that the proponents had not conducted adequate risk assessments and in some instances were simply unaware of the impacts of their ‘management’ plans.

In the case of the 2001 audit, the deeper the audit team probed the more tenuous the proponents' position became. On-ground surveys by the audit team showed that the proponents had failed to correctly map streams and take into account a number of other significant matters. Similar findings were made in another audit that led the proponents to withdraw their management plan [13].

The use of a well-designed community survey by the community group was a very useful way to test community feeling and at the same time to gather something in the way of an 'authority to act'. Having community backing is vitally important and also ensures the audit group has to 'report back' to its community.

The group was also able to put forward logical and convincing arguments relating to inadequacies of the proponents' Forest Practices Plan and the *State Forest Practices Act*. Finally, the group put forward alternative plans for the area, which included the development of a nature recreation area [12]. The final report was then distributed to the Local Council, the proponent, media, government, libraries and general community through a series of community forums. This process, given only in summary here, was very powerful in that not only were the community members involved in action and *learning* [14], but they were also creating a clear record of *their work—their science*. The audit team and the community group supporting it underwent important learning, both in terms of technical expertise and personal capacity. Such are the outcomes of the action research process. Although the 'battle' is not over, the community group has a firm grasp of the detailed issues and a knowledge of the vital importance of an ongoing mandate from its community of concern.

Once produced the Community Audit report, replete with its expert evidence, graphic evidence (including transcripts of interviews) and journal format, stands as a credible, well argued and logical case study in an 'easy read' style. Each edition has an ISSN, which means it is sent to State and National libraries and is in demand in other government and NGO libraries as well. The audit report is a vitally important outcome as it is a building block of an emerging literature that when viewed in total integrates a coherent and citable argument for change. In this way, the 'extended peer community' creates genuine science, of a Post-Normal sort.

## 5. Conclusions

CBA is an innovation that seeks to come to grips with two key and interrelated problems. The first is about improving the depth and quality of citizen involvement in natural resource planning and management. CBA seeks to answer a call from increasing numbers of citizens for greater accountability on the part of industry, governments and the environment movement. At the same time citizens want a greater say over the decisions relating to natural resource management and planning. How to make this happen is of itself a major undertaking. Although this was the original reason for CBA, it is not the *main* or key problem that CBA now seeks to address. Indeed there is something even more fundamentally *wrong*, that once addressed will lead, in all probability, to reduced conflict. The main problem for CBA now relates to the mismatch between the assumptions of a supposedly neutral public planning process and the powerful interests that try to bend it their way. Playing within the rules of that game, CBA introduces uncertainty into the debate. This weakens, sometimes fatally, the optimistic cases advanced by the proponents of development projects. Although the proponents can still play many tricks, an aroused citizenry has real powers of its own; and the discrediting of the proponents' case lends moral and political force to citizens' campaigns. In this way, the use of uncertainty by CBA assists the struggle for improved governance and community led democratic change here in Tasmania.

Decisions affecting natural resources involve risk, uncertainty and value-conflict. History has shown that many of the prescriptions put in place to manage natural resource projects do not survive rigorous independent scrutiny [12,13,15–19]. The prescriptions fail because they are developed within a 'hard science' framework that cannot deal adequately with uncertainty. This suggests that planning and management frameworks are needed capable of handling degrees of uncertainty, where professional judgment, local knowledge and 'soft' data are admissible. I propose a process of 'extended peer review' along the lines of that discussed by Gallopini et al. [20].

Over the past 3–4 years CBA has partly addressed these two complex problems, but much more remains to be done. In any case, it is clear that the growing chorus of voices calling for greater citizen involvement represents an ideal opportunity to move forward via innovative approaches to participative decision-making such as PNS. In short, part of the answer is in the problem. The main obstacle preventing a move forward appears to be the rigid legal systems that require the operationalization of the notion of certainty. Even when this is used by CBA in opposition to developments, it still prevents an open dialogue among stakeholders.

For its part CBA seeks to use a reasoned process to challenge and ultimately overthrow that norm. A recognition of uncertainty, as in PNS and the Five Models of Funtowicz and Strand [1], could pave the way to genuine dialogue and the fruitful resolution of disputes over development. The ideas of Post-Normal Science make a vital contribution to that effort. Indeed the prospect of post-normal activism may be just around the corner.

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