

Ignorance is Contagious

The importance of critical thinking in environmental management

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Abstract

Human beings are very bad at thinking rationally in a group, particularly if fear is introduced. Blind panic was no doubt very useful as we were evolving on the African plains. If someone yelled "lion", you wouldn't survive very long if you stopped and said "are you sure....?" But that same inbuilt response means that fear and panic are easily triggered in environmental debates, debates that should be rational.

Environmental practitioners have an audience that responds asymmetrically to information. It's very easy to convince people that a false claim of safety ("lions could never harm us") is untrue but it's very hard, and sometimes impossible, to convince people that a false claim of harm ("that rock is a lion") is untrue.

Once a false claim that something awful might happen gets put into the community's mind it is almost unshakeable, regardless of how clear the science is for the contrary view. A scary claim's echo bounces around the community and gets heard again from different angles, reinforcing the claim's grip ("many independent people, including the celebrity witch doctor, think that the rock is a lion, so that's clearly what it is").

In the face of such irrationality, environmental practitioners have an obligation to both think critically and explain critically. It's not an easy task and it can make for awkward moments at dinner parties but we must not shirk our responsibilities, even when our message is not popular.

In 1506 Spain and Portugal were beset by the twin terrors of the Spanish Inquisition and the black death, and someone needed to be blamed. Forced converts to Christianity - *conversos* - were prime candidates.

In that year a strange light was seen near a crucifix in a monastery, and this was promoted by the friars and taken by the populace to be a longed for miracle, a sure sign that the church would protect them from the horrors of the plague. However, one person, who happened to be a converso, had the temerity to suggest that it may not actually be a miracle but that instead it might simply be a candle, perhaps put there by the friars. On hearing this blasphemy, outraged parishioners dragged the man out onto the street, beat him up and then set fire to him, burning him to death. Urged on by the friars, the parishioners then ran through the streets, grabbing other conversos and dragging them onto bonfires. By the time the violence ended the following day almost 2000 conversos had been burnt to death.

Human beings panic readily, and crowd behaviour in times of fear is usually disgraceful. Mob violence is the most dramatic outcome of this failing but history is crammed full of irrational group-think, and even in our own local society and with our own local issues we are all vulnerable to being overcome by mob-mentality.

Blind panic was no doubt very useful as we were evolving on the African plains. If someone yelled "lion", you wouldn't survive very long if you stopped and asked "are you sure....?".

Natural selection's message to us is: flee without thinking. It's very easy to convince people that a false claim of safety ("lions could never harm us") is untrue but it's very hard, and sometimes impossible, to convince people that a false claim of harm ("that rock is a lion") is untrue.

And when we run away, it's best to run in the same direction as everyone else. There's safety in numbers. If we separate from the crowd, we could more easily be picked off by that lion.

And so it is with public environmental debates. Environmental issues have a public audience that responds asymmetrically to information. Once a false claim that something

awful might happen gets put into the community's mind, it is almost unshakeable, regardless of how clear the science is for the contrary view. And those who choose to question the prevailing view ("perhaps it's only a rock") are likely to be shunned at dinner parties.

This has become increasingly evident in recent years. Tasmania's current pulp mill project is a prime example.

Ironically, I think that the strengthening of the asymmetrical response has come about because of the growth in the public's environmental awareness. I say ironically, because that increase in awareness is not the same thing as an increase in understanding. It's more that the shadow of the lion-thing has become bigger rather than the detail of the lion-thing being better understood. For example, we are now faced with an environmental threat as big as the world - climate change - whereas only a few years ago, environmental threats were local, and could be left to others to worry about, just so long as they were local to them and not us. All environmental threats have become heightened in the public's mind as a consequence of the global shadow of climate change.

Another component of the irony is that the public is ever more suspicious and expects ever more scrutiny of new developments, and regulators respond by demanding ever more detailed environmental assessments, yet the sheer volume and technicality of the information prepared in response to those demands makes it ever less likely that the public will read or understand it.

For example, virtually every member of the Tasmanian public has a view - and a strong view at that - about the likely environmental impacts of the pulp mill but I expect that less than 1% of the public has actually read the documentation. Instead, the public gets its "information" from the media and from gossip, both notoriously poor at dealing with technical issues.

The public grabs onto simple messages, and lets complex ones slip through. In Tasmania, the conservation message has been grabbed very firmly because its message is very simple to understand - save or don't save. Both the public and the media confuse conservation with environmental management. Conservation is simple and neat. It's easily understood by the public and the media. Environmental management is complex and messy, and it's very poorly understood by the public and media. It requires much more thinking.

Journalists - the people who inform the public - are as vulnerable to fear as everyone else, and have the same difficulties of understanding technical information. They also help spread fear - it comes with their job. Readers are more alert to and interested in fearful stories than calming stories, and the media serves them what they want, creating a self-reinforcing feedback loop of fear, story, more fear, more stories.

Perhaps we like to think that Serious Journalists are better than that but it is a false hope. When was the last time, for example, did you see Four Corners do an expose on the opponents to a development, snaring them with a clever set-piece of questions? Journalistic exposes are invariably on developers, never on opponents. Developers are always held to be evil, opponents are always held to be friars. Journalists are as asymmetrical as the public at large. They are reluctant to point out the candle in the monastery.

This is exacerbated by what is known as *cognitive dissonance*, which is the tendency of people to avoid admitting to making mistakes. Rather than make such an admission, people dig themselves further into their entrenched positions. Once someone has publicly expressed a viewpoint on something (whether to the public at large or even just their own circle of friends), it is very unusual for them to withdraw from it, particularly if the topic is controversial. Instead, people usually dig themselves into an even more entrenched position and more loudly justify their viewpoint. George Bush and the Iraq war is an obvious example on the world stage but it acts at the local level too, including on environmental issues. Someone who has publicly opposed a development (such as the pulp mill) will be very reluctant to listen and concede to scientific argument that is contrary to

that view - to make such a concession would be to admit that they were wrong in the first instance. They are also likely to show *confirmation bias*, which means that they selectively turn off from information which is contrary to their view and turn on to information that supports it.

Due to cognitive dissonance, rather than admitting their mistake people actually become more fixed and dogmatic in their views. An associated tendency is for the community to become more extreme and more determined that their views win out. What should be a rational argument becomes a tooth and claw battle where the objective becomes victory for victory's sake, simply because they hate the thought of losing to someone who they have demonised.

In many cases, people also use their expressed opposition to a project as a convenient shorthand description of their overall personal values, wearing it like a social bumper sticker: "I oppose project X, thereby demonstrating the type of person that I am. I fit nicely into my peer group."

A third component of the irony is the hypocrisy of the public. At the demand of the community, industry must jump through all sorts of burning hoops to obtain approval for their project. Industry undertakes environmental assessments, it prepares and implements management plans and it monitors its environmental performance. The general community does very little of these things for their own activities and yet their environmental impacts are greater than those of industry - it's the community that creates the sewage, drives the vehicles, burns the wood, uses the electricity, and clears the trees for crops and houses, all without impact assessments ... and it's the community that buys the products of the industries that it rails against.

Amongst this gloom, what should environmental practitioners do? Is there a way out of the dark ages?

Well, yes. I think that there is. But it requires effort and hard work. And usually it is at odds with populist thinking. It requires critical thinking. Environmental practitioners have a responsibility to think critically and to help the community do the same.

What is critical thinking? There are formal definitions that could put us to sleep. Perhaps the simplest way of describing is to think of it in related terms like scientific thinking, rational thinking, sceptical thinking and logical thinking. Basically, it means a way of thinking by which your view on any particular matter is determined by the evidence, irrespective of any obscuring fluff, spin, emotion or peer group pressure.

Interestingly and importantly, critical thinking does not come naturally to most people. It usually has to be learned. It's hard work and it goes against the natural tendencies given to us by natural selection and evolution. The more you do it the easier it becomes but it always requires you to say, "what is the evidence telling me?".

Critical thinking minimises the risk of falling for what are nicely labelled "logical fallacies" and I'd like to use these as a way of highlighting how environmental thinking is often anything but critical.

To do this, I have borrowed (not all 20) from a list of the Top 20 Logical Fallacies from my favourite podcast, the *Skeptics Guide to the Universe*. This is a weekly podcast that is always very informative and entertaining, and I highly recommend it.

In the attached table, I have retained the original explanations¹ of what the fallacies mean because they are interesting in themselves. For each logical fallacy I provide an environmental example. I acknowledge that my examples are all of illogical opposition to developments, and that examples of illogical support for developments could no doubt also

¹ Steven Novella at www.theskepticsguide.org/logicfallacies.asp

be found. However, the bias is consistent with the theme of my talk - examples in opposition far outweigh examples in support.

These examples can help us think about the traps that we could fall into, and therefore help prepare ourselves and others to avoid them. By being aware of these traps, and working hard to stop being sucked into the irrational side of environmental debates, we can help to extract environmental decision making from an irrational mire of ill-informed public catch-cries and try and focus assessment attention on where it should be - environmental science.

These are things we can and should do as individual environmental practitioners.

I'd like to finish by also giving some thought to the environmental assessment process itself.

In Tasmania, assessments under the *Environmental Management and Pollution Control Act 1994* typically involve the preparation of a Development Proposal and Environmental Management Plan (DPEMP). As the name says, the assessment documentation includes a description of the proposed development (the DP bit) and a description of how it will be environmentally managed (the EMP bit), all integrated into a single document, for a single decision.

In concept, this is a neat idea and it has served us reasonably well - for assessments that have a low public profile, that is. I don't think it is ideal for projects that have a high public profile, however. Once an assessment gets into the public arena in a big way, it moves onto another planet, Planet Panic.

On high profile projects, the ever increasing assessment demands that I've described above mean that DPEMP preparation is becoming increasingly difficult and costly for developers to prepare (expenditure that must be incurred even before they know whether they have a project or not) and for regulators to assess, while the likelihood of the public firstly reading and secondly understanding the mass of technical documentation prepared for the DPEMP is becoming less and less.

Regulators feel public pressure too. The public throw darts at unpopular development proposals, and the more controversial a project is the more darts that are thrown in the hope that the project will bleed to death. Regulators - being human - tend to protect themselves from criticism of inadequate assessment by hanging a study or management plan requirement on every dart that sticks, and even some that fall to the ground. All the darts hurt equally and tend to be given equal treatment, regardless of their true environmental validity or priority.

I think the result is that environmental assessments on publicly controversial projects are becoming too big, too all-encompassing, too know-it-all. The assessments are becoming shrouded in a fog of information, through which only populist misinformation emerges.

Developers are often forced by public pressure to spend money on environmentally insignificant but politically significant issues, just to jump through the approval hoops. This money would be far better spent on actual environmental management of the development itself - it would result in a better environmental outcome.

To fix these problems, on projects that have a high public interest (say, those equivalent to Projects of State Significance and also major level 2's) it would be nice if the DP and the EMP parts of DPEMPs could be separated into distinct assessment processes.

This may seem like a retrograde step because their integration 15 or so years ago was at the time seen as an improvement. However, I'm not arguing that we go back to where we were - rather, we should separate them as a better way forward. To their credit, regulators are pragmatic and in effect do this to some extent already under the current system - they often grant an approval conditional on environmental management plans

being prepared for approval later. However, the current system is forcing regulators to tinker at the edges like this, and I think their pragmatism highlights the need for a system change.

On high profile projects, the DP assessment would come first. Proponents would prepare a Notice of Intent, describing their proposal and key environmental issues. The assessment authority would review the Notice of Intent and issue guidelines identifying threshold environmental requirements that must be satisfied for the project to be allowed to proceed. The Threshold Requirements would be restricted to go-no-go matters, asking the question: Is there anything fundamental that means that the proposal must be refused? Examples might include the potential for irreparable environmental harm, the unavoidable loss of a major population of a critically endangered threatened species or the emission of a pollutant for which there is no available technology that could achieve water quality objectives in the project's receiving environment.

The Notice of Intent and Threshold Requirement Guidelines would be advertised for public comment, then both would be finalised. The proponent would then undertake studies and investigations and prepare a Threshold Requirement Report, which would be subjected to a public assessment process. There could be different levels of assessment, depending on the scale of the development and the importance of the threshold issues, similar to the different assessment levels under the EPBC Act, for example. There would be a public appeal process.

The outcome of this assessment would be a go-no-go decision on whether the project can proceed in-principle. The decision would be based on very focussed, make-or-break considerations, without the fog of information demands and overload from matters that are not fundamental.

If the decision is favourable to the proponent, this would not mean that they could go out and start building, only that they could now move on to the EMP phase of the assessment. However, they would move to this phase in the knowledge that there is nothing fundamentally flawed with the proposal that would see their investment in the studies and investigations needed to prepare the EMP wasted by a belated refusal due to something that was fundamental.

In the EMP phase, the assessment authority would issue EMP guidelines, and the proponent would prepare an EMP to address those guidelines. The EMP would then be advertised for public comment and the authority would assess the EMP, taking public comments into account, and requiring the EMP to be amended as necessary. If the assessment authority is satisfied with the final EMP, it would be approved and the project could then proceed. If the proponent cannot prepare a satisfactory EMP, the project could not proceed. Appeal rights would be restricted to whether the EMP decision is reasonable (there would be no reopening of threshold issues).

The above suggestions might be seen as favouring developers but this is a misreading. Such a process certainly would make it easier for developers to understand and address what's environmentally important and it would allow them to better target their assessment money and efforts but this does not mean that their environmental obligations would be weakened in any way.

On the contrary, it means that the information prepared and used for the assessment of their proposal will be targeted, relevant and efficient. Decision making can then itself be more targeted, relevant and efficient. Importantly, the environmental debate about the project could therefore be more rational (*entirely* rational is a forlorn hope) and the environmental management measures that emerge would reflect environmental science, not political sensitivities. The environment would be the beneficiary.

Top Logical Fallacies (in alphabetical order)*

Ad hominem (attacking the person) An ad hominem argument is any that attempts to counter another's claims or conclusions by attacking the person, rather than addressing the argument itself. True believers will often commit this fallacy by countering the arguments of skeptics by stating that skeptics are closed minded. Skeptics, on the other hand, may fall into the trap of dismissing the claims of UFO believers, for example, by stating that people who believe in UFO's are crazy or stupid.

Environmental example: This is very common. Opponents of a development will demonise the developer, attacking them personally (whether it be a company or the head of a company) irrespective of the science of the proposed development. Human nature being what it is, this is a very effective tactic. The public is easily led to hate a demonised proponent, and this shifts the assessment attention away from environmental considerations and replaces them with a choice between good and evil. And given such a (false) choice, who in their right mind would choose evil?

Environmental practitioners may also be the recipients of such attacks, with opponents of a development attempting to discredit a consultant's science by arguing that the consultant was engaged by the evil developer, so how can they be trusted?

Ad ignorantiam (argument from ignorance) The argument from ignorance basically states that a specific belief is true because we don't know that it isn't true. Defenders of extrasensory perception, for example, will often overemphasize how much we do not know about the human brain. UFO proponents will often argue that an object sighted in the sky is unknown, and therefore it is an alien spacecraft.

Environmental example: In environmental debates, this might appear in the form of: "You haven't surveyed every square metre of your proposed mine site, so there are probably threatened species that you've missed. Your development will therefore destroy them, so it shouldn't go ahead."

Argument from authority Stating that a claim is true because a person or group of perceived authority says it is true. Often this argument is implied by emphasizing the many years of experience, or the formal degrees held by the individual making a specific claim. It is reasonable to give more credence to the claims of those with the proper background, education, and credentials, or to be suspicious of the claims of someone making authoritative statements in an area for which they cannot demonstrate expertise. But the truth of a claim should ultimately rest on logic and evidence, not the authority of the person promoting it.

Environmental example: This is a classic in environmental debates, usually twisted not towards alternative scientific authorities but rather to celebrities of one form or another (film stars, musicians, television personalities), who are rolled out in protest campaigns. People know these celebrities, think they're important because they're public figures, and see them as having an aura of credibility for those reasons alone. In fact, on the technicalities of environmental science these sorts of celebrities are probably among the most scientifically ignorant of our society (they are more likely to have studied arts than science), yet their opposition to projects is seen as confirmation that opposition is the right thing.

Argument from personal incredulity I cannot explain or understand this, therefore it cannot be true. Creationists are fond of arguing that they cannot imagine the complexity of life resulting from blind evolution, but that does not mean life did not evolve.

Environmental example: "I just can't believe that something that big won't destroy the environment, so it must be stopped."

Confusing association with causation This is similar to the post-hoc fallacy in that it assumes cause and effect for two variables simply because they are correlated, although the relationship here is not strictly that of one variable following the other in time. This fallacy is often used to give a statistical correlation a causal interpretation. For example, during the 1990's both religious attendance and illegal drug use have been on the rise. It would be a fallacy to conclude that therefore, religious attendance causes illegal drug use. It is also possible that drug use leads to an increase in religious attendance, or that both drug use and religious attendance are increased by a third variable, such as an increase in societal unrest. It is also possible that both variables are independent of one another, and it is mere coincidence that they are both increasing at the same time. A corollary to this is the invocation of this logical fallacy to argue that an association does not represent causation, rather it is more accurate to say that correlation does not necessarily mean causation, but it can. Also, multiple independent correlations can point reliably to a causation, and is a reasonable line of argument.

Environmental example: This is very common in the climate change debate. While the evidence for human-induced climate change is very strong, that does not mean that the current drought, or the next cyclone or the next flood is caused by global warming. These events may be entirely unrelated to climate change. While it is a good thing that climate change has finally made it onto the public stage, it has done so with a bang and we now have to be careful that we don't wrongly ascribe every extreme weather event to climate change. There has always been and always will be extreme weather, regardless of what may or may not be happening on the wider climate scale.

False dichotomy Arbitrarily reducing a set of many possibilities to only two. For example, evolution is not possible, therefore we must have been created (assumes these are the only two possibilities). This fallacy can also be used to oversimplify a continuum of variation to two black and white choices. For example, science and pseudoscience are not two discrete entities, but rather the methods and claims of all those who attempt to explain reality fall along a continuum from one extreme to the other.

Environmental example: Environmental debates often get reduced to a black and white position of "if there is any risk the project must not be allowed to proceed, regardless of the benefits of a project". In fact, everything we do carries risk and we constantly make risk-weighted judgements. The same should be true for environmental decisions - environmental risk needs to be weighed against economic and social benefits, and a risk-weighted decision made, not a black and white decision. Black and white - yes or no - decisions may be appropriate for conservation decisions but not for environmental decisions.

Inconsistency Applying criteria or rules to one belief, claim, argument, or position but not to others. For example, some consumer advocates argue that we need stronger regulation of prescription drugs to ensure their safety and effectiveness, but at the same time argue that medicinal herbs should be sold with no regulation for either safety or effectiveness.

Environmental example: This is almost ubiquitous in the public's attitude to environmental impacts, particularly comparing their demands on industry for (more costly) higher environmental performance with the community's own unwillingness to pay (through higher rates and taxes) for improvements to their own environmental performance (eg. improved sewage treatment, reduced carbon emissions from petrol use).

Moving goalpost A method of denial arbitrarily moving the criteria for "proof" or acceptance out of range of whatever evidence currently exists.

Environmental example: Moving the goalpost is common in environmental assessments. For example, environmental guidelines, such as emission limit concentrations, may be set for developers to meet and then when they demonstrate that they will in fact better them, the limits are tightened further to reflect those lower levels. Usually, the sequence is:

1. The guideline limits are set and the developer undertakes their assessment on the assumption that those limits will apply;
2. The developer demonstrates that they will better those guidelines;
3. Under public pressure, the regulator then uses those lower values as the new limits (incidentally, removing any incentive for the developer to do anything more than simply meet - not better - guideline limits on their next project);
4. Usually, the defence against moving the goal posts like this is that it is driving continual environmental improvement. However, this is after-the-fact reasoning and is reduction for reduction's sake. It fails to demonstrate whether there is any tangible environmental benefit from the lower limits - the implicit presumption being that lowering always achieves a better environmental outcome, which itself is a logical fallacy. For example, the limits for, say, nutrients may already be much lower than what comes from nearby natural sources, and forcing lower limits on the development may have no tangible benefit.

The moving goalpost is also very common in "dinner party" discussions. Someone might say that they are opposed to a development for reason X, which could be countered by evidence demonstrating that reason X is wrong. The person then shifts their ground with a "yes but" argument that moves onto reason Y.

Non-sequitur (doesn't follow) In Latin this term translates to "doesn't follow". This refers to an argument in which the conclusion does not necessarily follow from the premises. In other words, a logical connection is implied where none exists.

Environmental example: The original environmental Precautionary Principle has, in my view, the distinction of being one of the mostly poorly worded principles around. Maybe the bureaucrats were in a hurry in the back rooms of the Rio convention but somehow they managed to get a triple negative into it: '...absence of certainty...shall not be used...to postpone...'. Nevertheless, it is an important and useful principle. It was quickly adopted in environmental legislation around the world, including Australia, and is now as entrenched as the QWERTY keyboard. However, it is often misappropriated by the public to argue that unless a proponent can prove that their project won't have some particular environmental impact, the project should not be approved. It doesn't follow from the precautionary principle that developers must prove a negative. The Precautionary Principle is not a hat stand on which to hang every opposition to a project.

Slippery slope This logical fallacy is the argument that a position is not consistent or tenable because accepting the position means that the extreme of the position must also be accepted. But moderate positions do not necessarily lead down the slippery slope to the extreme.

Environmental example: This is probably more common in planning decisions than in environmental decisions. The argument typically goes something like: how could this development possibly be approved because if it is there will be a rash of similar applications and we'll be smothered by them?

Straw man Arguing against a position which you create specifically to be easy to argue against, rather than the position actually held by those who oppose your point of view.

Environmental example: This is very common in controversial environmental debates. At a project-scale, for example, there are two pulp mills that are proposed in Tasmania. One is the real mill that will actually be built and the other is the fantasy mill that opponents have created in the public's mind. The fantasy mill has all sorts of nasty environmental impacts, none of which are supported by real-mill science. It is the fantasy mill that the opponents are actually attacking, not the real mill.

At a smaller scale, the straw man fallacy is manifest by opponents selectively picking bits of information from a proponent's assessment, or selectively quoting them out of context. They re-present this information to the public to make it seem that the proponent has done or said something outrageous. They then attack those self-created outrages.

Tautology A tautology is an argument that utilizes circular reasoning, which means that the conclusion is also its own premise. The structure of such arguments is A=B therefore A=B, although the premise and conclusion might be formulated differently so it is not immediately apparent as such. For example, saying that therapeutic touch works because it manipulates the life force is a tautology because the definition of therapeutic touch is the alleged manipulation (without touching) of the life force.

Environmental example: An environmental example of this fallacy is the argument that a development must be bad, otherwise everyone wouldn't be opposing it.

Tu quoque (you too) Literally, you too. This is an attempt to justify wrong action because someone else also does it. "My evidence may be invalid, but so is yours."

Environmental example: An example might be arguing that a particular development should be refused because a similar one was refused due to public outrage somewhere else.

*Source of original Top 20 Fallacies: www.theskepticsguide.org/logicalfallacies.asp

Suggested podcasts

Skeptics Guide to the Universe
Point of Inquiry

Suggested reading

Don't Believe Everything You Think: The 6 Basics Mistakes We Make in Thinking (Thomas Kida)
Mistakes Were Made (But Not By Me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts (Carol Tavis and Elliot Aronson)
Predictably Irrational: The Hidden Forces That Shape Our Decisions (Dan Ariely)
Extraordinary Popular Delusions and the Madness of Crowds (Charles Mackay)