LARGE SCALE AND LONG TERM IMPACTS – PRACTICAL LESSONS FROM BIG PROJECTS.

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INTRODUCTION

At the very, very small scale of things, classical gives way to quantum mechanics where the rules break down and often reverse. It's a good analogy for what happens at the very large scale of things in Impact Assessment where complexity, science, data, facts, rules and methods often give way to very simple qualitative issues of judgement, ethics, values and confidence.

This short paper, by a practitioner who both prepares and assesses impact statements of large projects, provides observations on some of the different issues and skills needed for such projects. One purpose of the paper is to console those involved when they feel a little lost and alone when the theory breaks down in the face of facts or when guidelines and standards appear to evaporate in the face of politics.

Acknowledging and accepting that this is normal can be some consolation for the isolated practitioner. Such acknowledgment can also be a challenge (or a threat) to theorists and legislators who can sometimes be unwilling to accept that one size will not fit all. Big projects *are* different.

BACKGROUND

Conor Skehan[1] has spent nearly twenty years practicing in Impact Assessment – mostly in Ireland. He works through two sister companies[2]. One company prepares guidelines and training in EIA – as well as assessing very large projects on behalf of Consenting Authorities. The other prepares Impact Statements for large scale projects. This work has included hydro-electrics schemes, on-shore and off-shore windfarms, and mining operations, as well as electronics, and biotechnology manufacturing plants which are among the largest in Europe. This work provides the practical experience that is the basis for these observations.

Lessons are to be found by examining both the preparation as well as the evaluation of Impact Statements for large projects. These will be examined, in that order, below.

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LESSON FROM THE PREPARATION OF IMPACT STATEMENTS FOR LARGE PROJECTS.

Legislation, administration, theory and discussion of Impact Assessment generally proceeds as though the issues and methods neatly scale up, or down, in keeping with the size of the project. This is not so. Larger projects distinguish themselves by a number of distinctive features that place them in a fundamentally different category.

These differences create unique challenges for practitioners and for the leader of the Impact Statement Team, in particular. Practices and attitudes that may, or may not, be matters of personality and preference on smaller projects become critical factors for success on larger projects.

These challenges give rise to the need for critical interventions and actions. The presence or absence of such actions is an often unrecognised and invisible factor in determining the success or difficulty of large projects.

Successful Impact Assessment is inevitably invisible. Problems have been quietly avoided early, confrontation has been averted and controversies are regulated to differences of opinion rather than factual disputes. A famous Impact Assessment is almost always a failure.

LARGE PROJECTS *ARE* DIFFERENT

ACCOMMODATION OF INNOVATION AND CONTINGENCY

'Large' almost always means 'exceptional' in terms of scale, extent, and resources. 'Exceptional' usually carries the burden of having little precedent - usually within the jurisdiction – in terms of contracting, administration, regulation, data or public understanding. Exceptionalism will almost always require innovation. Innovation brings the need for caution. The most fundamental manifestation of caution occurs within the documentation for the design and the contract.

All parties involved in the permitting, promotion or procurement stages of large projects are motivated by the need to maintain flexibility and responsiveness. This facilitates innovation during the tendering and contractual stages while accommodating the contingencies that will occur when unanticipated conditions are encountered. The facilitation of innovation and contingency are critical budgetary and programme elements on all large projects.

The requirement for 'loose fit' designs - that rely heavily on performance conditions - can be a source of great frustration to the Impact Assessor for whom an accurate, comprehensive and refined project description is conventionally the fundamental documentation for EIA.

In practice the most satisfactory solution is to define a reasonable envelope of maximum extent/activity/emission as a basis for the 'working hypothesis' that will be modelled into the receiving environment.

Such an acceptance is not a 'failure' to obtain a comprehensive project description. It is a victory for common sense because it establishes and acknowledges a finite boundary of effect which is far more honest and accurate than publishing a seemingly fixed and detailed description that all parties know will, inevitably, be varied from the onset of construction.

EXTENSIVE SITES

The definition of the Impact Zone is one of the most challenging tasks on large projects. Many secondary issues of manufacturing/assembly areas, spoil and borrow areas, surface and groundwater control systems, haul routes, contractor compounds, enabling infrastructure and temporary accommodation are determined by the contractor. In almost all jurisdictions the procurement process which selects the contractor by tender is finalised after the permitting stage (to maximise certainty). Therefore it is only at the competitive tendering stage that these effects, that extend the impact area, become finally known.

The differences and difficulties arising from the need to accommodate innovation and contingency are at their most extreme for many of these items because almost all are within the control of contractors/bidders and so cannot be fully identified and assessed during the Impact Assessment process.

In practice the most satisfactory solution is for those involved in the Impact Statement – together with the Consenting Authority – to anticipate and acknowledge these uncertainties as a normal part of large projects. It is then possible to ensure that mitigation measures and permitting conditions are framed by wording that anticipates their incorporation into conditions of contract – ideally as performance criteria – for review and approval prior to commencement.

This acceptance of the impossibility of identifying the full extent of the Impact Zone can greatly reduce the scope for the accusation of 'incomplete' data that seems to bedevil every public enquiry. Such pragmatism ensures that every *actual* impact area becomes identified, assessed and mitigated *during* the course of the project. On the face of it, this appears to contradict the fundamental rationale of EIA – i.e. the evaluation of impacts *prior* to consent. But, in practice, it is not so because these are not what the principal impacts are also because provision is made for subsidiary assessment prior to detailed consent.

DIFFUSE, CUMULATIVE AND SECONDARY IMPACTS

Notwithstanding the previous observations - about the difficulty of defining how and where contractors will operate - it is also important to acknowledge that the majority of adverse impacts do arise from their actions. Large modern projects will have had the avoidance of environmental impacts integrated into the basic design from the outset. Accordingly the most significant impacts are unlikely to arise from the main project.

The real 'villains' of large projects are likely to occur when issues – too minor to consider on smaller projects – become 'scaled up'. In urban areas contractor personnel, traffic and parking, for example, can blight local amenities for many years, if not considered from the outset. While hunting, fishing and outdoor pursuits by off-duty personnel has proven to be a serious problem for projects in wilderness areas. Both of these seem so obvious in retrospect. Yet when assessing the main project it can seem too trivial to worry about while grappelling with the diversion of an entire city's traffic for a Metro or controlling water table fluctuations over tens of thousands of hectares of wilderness for a dam.

Landuse, economic activity and development - caused by 'multiplier effects' during the construction and operational phases can create significant effects in hitherto undeveloped areas. By it's nature, the location and character of such entrepreneurial activity cannot be precisely predicted – though provisions can be made for the monitoring and administration of it's development. This of course can lead to the difficulty of differentiating between the end of the 'impact' of the project and the beginning of the 'effect' that was the original intention of the project. For example, when does the sprawling expansion of a small wilderness town cease to be an adverse impact and begin to become the 'stimulation of the local economy' promised by the large project?

The same pattern is evident in these observations – about the need to acknowledge and accept accuracy limitations in Impact Statements for large projects. These can be compensated for by an increasing acceptance of monitoring and response approaches – within pre-determined performance parameters.

LONG TERM AND REMOTE IMPACTS

Large projects are born old. They typically take many years from conception to completion after which their operational life is usually measured for many decades out into the future.

'*There are no facts about the future'* are the standard open words of any beginners' introduction for foresighting – the exercise of making strategies for long term futures. Note the plural. There are many possible futures, not one single future.

These observations illustrate why it is so common for large projects and their Impact Statements to appear to be 'old fashioned' and vulnerable to the criticism of overlooking some current pre-occupation of science, politics or the media.

This is merely an explanation, not an excuse, for why it is not uncommon for Impact Studies of large projects to require supplementary studies – late in the process – to address issues that were not deemed significant at the time of conception. Retrospective criticism arising from the evaluation of long-built projects can also fall into the error of anachronism.

Humility before developing facts combined with methods that provide for the flexibility and responsiveness – as mention elsewhere – provide the best safeguard against this.

Remote impacts present a very different issue. The extraction, consumption or disposal of resources that occur as direct and indirect results of a development appear to be classic targets for Impact Assessment. But how realistic is this in a world of the global supply chains for very large manufacturing facilities where security of production requires multiple alternates and redundancy of suppliers? A deeper concern arises from efforts to extend Impact Assessment beyond the jurisdiction of the development, namely the unilateral imposition of the laws and values of one jurisdiction on another. This matter is currently unresolved though it is discussed in greater detail later as 'Environmental Imperialism'.

UNIQUE CHALLENGES TO THE IMPACT ASSESSMENT TEAM

90% of the Impact Assessor's value is provided in the first 10% of the programme – perhaps in the first 1% of the programme of large projects. Very small inputs at the earliest stages can have profound effects on the ultimate sustainability (and success) of the project.

EARLY INFLUENCES

'Tend the acorn, not the oak' is a good summery of the first and most important challenge to the Impact Assessment Team. Large projects develop momentum quickly. Once the initial concept is published it can become very difficult to redirect them towards more sustainable directions.

Two basic scenarios exists for the Assessor – either to examine a developed concept and deliver the 'back to the drawing board' judgement or to participate in the concept development so that sustainability becomes one of the project's evaluation criteria. The former is a thankless task – bringing the reputation of a 'naysayer' in it's wake and potentially casting the Impact Assessment Team into an 'us' and 'them' relationship with the design team – which inevitably leads to defensiveness and inflexibility which, in turn, greatly diminishes the quality of the project and the permitting process.

The inclusion of impact assessors in the project inception team is still rare. It's a privilege that can't be legislated for. It must be earned. By far the most effective way to win a place at the 'top table' is to become known as a problem solver who understands the permitting process *and* the project's needs. Anybody who can demonstratably contribute speed and certainty to the project will be sought out. One of the key attributes necessary for this is to cultivate a reputation for making critical judgements in the early stages of a project's conception.

CRITICAL PRELIMINARY JUDGEMENTS

It has happened three times. First contact, first meeting, first sight of the project and it's wrong. Wrong. Wrong. Wrong. Events like this make or break the impact assessor's reputation with design teams. The initial judgement will be made on a combination of general experience and technical knowledge applied to the project in hand. The problem could be the technology, the assimilative capacity of the receiving environment or the likely reaction and consequences of the permitting process.

The challenge for the Assessor is to provide the earliest and most honest appraisal of the problem, without alienating the project and design teams. The critical factors in achieving this are to de-personalised the issue. Put forward facts, not opinions, ideally supported by authoritative support by a respected third party – usually a Regulatory Agency.

The real skill however, lies in presenting the problem as a solution – usually by pointing out how savings in cost and time, as well as increased project certainty, can be achieved by avoiding the problem and adopting an alternative. The latter is the key. '*Bring me solutions not problems*' is the apt and applicable management asphorism. When the advice is taken and the project is fundamentally relocated or redesigned, it is imperative for the assessor to devote attention to assisting the design or management team in documenting the rational – to avoid any residual damage to the reputations of the original decision-makers that could later rebound.

Achieving these changes requires considerable trust, not only by management and design team, but also by the third parties who manage the permitting processes. The transmission of the confidence in the Impact Assessor onward between applicant and regulator – confidence bridging – is another unique and critical challenge on large such projects.

CONFIDENCE BRIDGING

Large projects are usually exceptional for everyone – not just the development team. The Regulatory Agencies, NGO's and the public are usually faced with unprecedented issues as discussed in detail in the second part of this paper. One of the most challenging tasks for the Impact Assessor is to provide assistance – principally by sharing knowledge – to the wider community, including regulators, without causing alienation or mistrust. Sharing without steering; informing without indoctrinating; participating without patronising are all challenges. It is normal for all parties to have 'comfort boundaries' in such a process beyond which co-operation will be seen as collaboration. These must be understood and respected at times.

While the adoption of confidence bridging can be a matter of preference or inclination on smaller projects, it is a fundamental pre-requisites on larger projects. It must be prioritised, prepared for and properly resourced. The need for such bridging must be understood and supported by senior management in the project team.

It is notable that most of these challenges – that are unique in their importance on large projects – revolve around non technical, non scientific issues. They are challenges of taking human traits – of decisiveness, judgment, trust and accommodation – and translating them into the methods and practices of large teams working over extended periods of time.

Sustainability of projects is principally achieved by infecting all involved with such attitudes from the outset. These attitudes, in turn, need to be translated into action - critical actions - for which the Impact Assessment Team leader is uniquely responsible.

CRITICAL ACTIONS BY TEAM LEADER

Leading an Impact Assessment Team on a large project isn't very difficult. Suitably experienced teams should be able to do the work as a matter of routine and need little direct supervision. The main skill for the team leader is to be able to sustain high levels of concentration and alertness over a prolonged period while overseeing the hard work of others. This is necessary to notice when key moments occur where critical intervention can favourably alter the outcome of the endeavour.

Every Impact Statement requires the engagement of two teams – those who *purpose* as well as those who *decide*. The team leader needs to assist both in the following ways:-

SETTING TRAJECTORIES

'Start as you mean to continue' is the key philosophy. The team leader can have a big influence to a sustainable and successful outcome by early and effective interventions. These ensure that the methods that are adopted are appropriate to the unique needs of large projects – as outlined above. The principal issue being to ensure that there is a high degree of early and constructive dialogue between designers and assessors and to arrange for constructive and timely exchange of ideas.

Large projects will need early, extensive and *in person* attention from senior environmental specialists who often need to be coached and coaxed to make early appraisals and 'judgement' calls based on preliminary data. Notwithstanding these needs the team leader must be prepared to exercise leadership on behalf of such specialists both to secure their resources (data, money, time, access and personnel) and to secure attention for their concerns. Most of these interventions occur at the earliest stages of a project. They require tact, patience, perseverance, energy and good communication skills. Once again note that this critical action is not technical, methodological or legal.

'Values' is a word that can often seem out of place when dressed in a hard hat and protective clothing on a remote site or at a polished conference table in the heart of the downtown business district. It's a tricky subject to bring up without sounding 'preachy', idealistic or sanctimonious – but it's at the core of any assessment. Jokingly warning the design and management team at the outset about *'telling them what they <u>need</u> to hear instead of what they <u>want</u> to hear'* is a good way to break the ice. It can be very useful to provide practical advice on how openness, honesty, and accountability will avoid delays (from being found out), expense (from having to fix it) and disreputability (from having to admit it). Humour, anecdotes (and a few scare stories) make this critical action more palatable

The experience of the team leader provides an important bulwark against another important issue which is the gradual erosion of objectivity and values due to proximity to, and familiarity with, the design team. '*Client Capture*' is the term used to describe the

process. One of the best antidotes to 'client capture' is early and frequent exposure to the values and attitudes of the EIA community. (The Regulatory Agencies and those concerned about, or opposed to, the project).

LEADING THE EIA COMMUNITY: NOT JUST THE EIA TEAM

The process whereby society decides whether the benefits of large scale projects outweigh the impacts on the environment – Environmental Impact Assessments - are not always as adversarial as first might appear.

A necessary co-dependence must exist for the exchange of data, parameters, interventions and expectations to allow meaningful decisions to be made. The process draws in many strands of society – structured and unstructured, official and private, so that an 'EIA Community' may be imagined to exist which consists of all of those who, by interest or obligation, are involved in the decision.

While the dynamics and interventions of public participation in decision making are well researched and reasonably predictable – it remains a fact that there are qualitative differences to the process from project to project. The successful ones largely go un-noticed – there's no news in harmony and cooperation – only in confrontation and strife. The Impact Assessment team leader can do a great deal, by addressing the confidence bridging challenges described above, to influence the attitudes that characterise a project.

The leadership required should not be mistaken for a popularity contest. A team leader who is performing successfully is likely to experience resistance and resentment from both the design team *and* the wider EIA community when tying to replace ambition or emotion with facts.

Real success is where a project gets to go ahead with the goodwill of a community whose concerns have been listened to and respected by the design team.

FIVE LESSONS ON PREPARING LARGE IMPACT STATEMENTS

1. Big is Different – Spread the Word

Try to achieve early acceptance and acknowledgment of the fact that normal expectations of detail in the descriptions of existing environments, designs or impacts may not apply on large projects. Different techniques –principally 'monitoring and response' conditions according to performance criteria within an envelope of agreed parameters - are likely to lead to a much more sustainable and satisfactory outcome.

2. Tend the Acorn – Not the Oak

Early interventions by Impact Assessment team leaders are critical for project sustainability and success. These range from constructive and decisive initial evaluations of the viability of core concept through to establishing methods, attitudes and values, at the outset, that will ensure that sustainability is a core criterion for decision making

3. Sustainability is an Attitude – Infect Them!

Ensuring the environmental compatibility of large projects is best achieved by attention to opportunities for critical interventions throughout the design and permitting process. Early influence combined with continuous consensus building among a wide range of actors is the key.

4. 90% Impact in First 10% of Programme

Large projects develop momentum quickly after which it can be difficult to re-direct them in more sustainable directions. Early involvement by an Impact Assessor in concept formulation, goal setting and the allocation of resources can play a critical role in determining whether and how a project proceeds through the permitting process.

5. Leading is more than Overseeing

The EIA team leader needs to provide direction and confidence to the entire EIA community – i.e. all of those with a role in deciding on the project.

ASSESSING LARGE IMPACT STATEMENTS

INTRODUCTION

Project promoters spread three years, three million euro and employ the top thirty specialists in the world to prepare an Impact Statement. The consenting authority have three months, thirty thousand euro and three specialists to asses the project and also have to write a legally binding decision that will withstand a full legal challenge. This is no rhetorical exaggeration. This is a commonplace reality faced by most consenting authorities when given the task of making a decision on very large projects.

This section provides observations on the context and challenges of assessing large projects and, in particular, on the issue of decision making and how non environmental factors – and political considerations - are critical considerations.

THE SIX 'P'S

The impact of the arrival to a Consenting Authority of an Impact Statement for a large project is worthy of an Assessment in it's own right. Before considering the specific challenges and issues that arise in connection with the assessment it is worthwhile pausing to reflect on the administrative context in which such decision are normally made. Many years of experience in the assessment of many Impact Statements[3] on behalf of Competent Authorities suggest that some, or all, of the following six conditions are likely to apply at some stage during the evaluation process.

PRESSURE

Very few jurisdictions[4] have dedicated units or agencies that are solely responsible for the evaluation of Impact Statements. The task is usually ancillary to a planning or development control function which conventionally deals with a high volume of smaller decisions – which continue to need to be processed in parallel with the large project. This typically results in pressure on staff and resources.

Senior staff are usually assigned to the project – creating further disproportionate, impact, because their experience and effectiveness are withdrawn from day-to-day operations. The senior staff are usually generalists with little or no directly relevant experience of the scale of the project so they will usually need to make a case to be assigned for additional external technical assistance for the determination.

Finally, there is the matter of the publicity, that usually is associated with large projects – whereby all parties will attempt to impress on the Regulators that they are involved in a momentous decision-making process.

[3] The Author has been involved in the evaluation of over 100 Impact Statements.
[4] The EIA Commission of the Netherlands is an example of such a specialist Agency

All of these factors combine to create conditions of pressure within the office of the decision making authority. Add the inevitable expectation of a positive decision by the government with the inevitable concern about potentially significant environmental impacts and the conditions for pressure increase. Significantly.

PROXIMITY

Is it just bad luck that big projects inevitably encounter rare, endangered or exotic environmental resource which – opponents claim will be 'destroyed', 'damaged', 'lost' by the development? Can all the people involved in all of the big projects really be so stupid all of the time? Perhaps it's 'Skehan Proximity Principals'(see box), which holds that sensitivities exist in direct proportion to the proximity of a major project. Practitioners will be well aware that this, in fact, occurs because of the intensity of studies within the project area compared to equivalent – but unstudied - areas elsewhere.

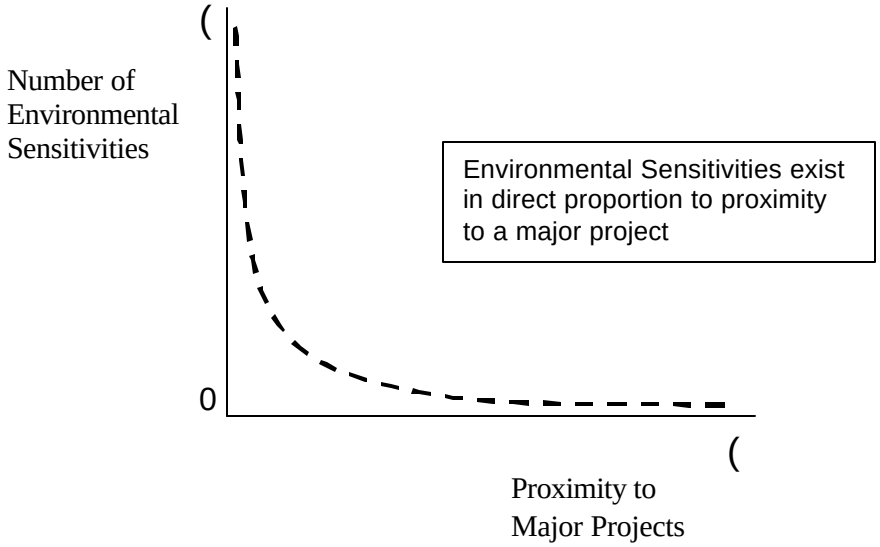

Fig 1 – The 'Skehan Proximity Principle'

Intensive studies of large areas in the vicinity of the sites of large projects will result in an apparent increase in the significance of the area relative to other more distant but unstudied areas. This is an illusion. If all areas outside of the impact zone where studied in equal detail the increase in knowledge would also increase the environmental significance of the wider area – thus diminishing the contrast with the Impact Zone

PARALYSIS

When appointed as an external consultant to provide technical assistance for the evaluation of Impact Statements for large projects it is not unusual to arrive at the first meeting (when over 50% of this time for evaluation has already elapsed) to find that nothing substantial has yet been done. Everyone present is likely to have tried to read as much of the documentation as possible (despite it being very technical and boring) but nobody can move on from here. 'Where could we begin? It's so huge' is the most common response. These circumstances arise because of the seeming impossibility of condensing down such a large volume of data and controversy into a simple 'Yes' or

'No' decision. The usual way that people try to break the deadlock is to seek additional studies or data – but this just defers to the inevitable

PANIC

The prospect of being responsible for the decision to grant/refuse such a large project is very daunting when the project's scale makes it a subject of public controversy. Nobody enjoys the prospect of being publically named and criticised – as you will be right or wrong. Symptoms of panic include, paralysis, anger (at the applicant – for being so inconsiderate as to make such a big application); hopelessness (deadlines always coincide with holidays!) and guilt (because it seems impossible to do what everyone expects of you).

The best solution to panic and paralysis is to begin by quickly preparing two parallel cases (often by two teams) one to make a case for refusing and a separate one to make a case for granting. This clarifies matters very quickly – highlights data deficiencies, fatal flaws and overwhelming circumstances. It's amazing how often the first quick 'gut' drafts prove to be substantially similar to the final decision. ['Just do it'].

Box: A patent solution for panic and paralysis induced by assessing very large impact statements.

POLITICS

The Prime Minister will have told your Minster who will have told your Secretary General who will have told you – as head of section – that the Cabinet assume that you will make a completely objective and fair decision based on the principals of sustainable development and conformance with all relevant national and international environmental legislation. He particularly asked that a briefing be supplied to the Ministers for Finance, Employment and Enterprise as well as the Central Bank – who may need to hedge the natural currency against fluctuation around the time that the decision is announced. All routine, normal – no pressure – you understand.

PERSPECTIVE

It can be very difficult to keep this. The principal consolation that experience offers is this. Through EIA the environment is given a voice. The facts – the real facts – speak for themselves. There is such an inevitability about large decisions that they (almost) decide themselves. This is where the sense of perspective comes in. The environment is one set of facts. Just one. Politics is a fact. Economics are facts. The dreams and fears of communities are facts too. The environment is just one of a whole series of facts. Your only job is to let the environmental facts speak for themselves.

BIG PROJECTS – BIG IMPACTS

Media reports like to give their readers graphic images of how high (compared to Eiffel Tower), wide (as many football fields) or expensive (annual G.D.P of small nations) the effects of the large project will be. Descriptions of the sheer size of the projects and it's impacts are often presented as a sufficiently fatal condemnation. This attitude can infect the assessors too, but when does 'Big' really become 'Bad'?

IS BIG BAD?

One of the most important early tasks for decision-makers is to attempt to differentiate between impacts that are merely large and those that are adverse.

Change brings uncertainty and unfamiliarity and most people are adverse to change from what is familiar because of this. But mere discomfort with unfamiliar circumstances is not a significant impact. A wry example of change aversion is to witness two communities in adjoining valleys, one campaigning to prevent the clearfelling of commercial forestry around their favourite lake while the other opposes the planting of new forestry around theirs. Our training in EIA leads towards a very polar 'good or bad?' division. There is little scope for 'different' – i.e. 'not better or worse – just different'.

The differentiation between large and adverse impact is not a semantic exercise. Adverse impact will usually have an objective fact-based source that can be addressed and quantitively reduced by mitigation or condition. Impacts that originate from an aversion to change are largely subjective and are less likely to be capable of being addressed – to the satisfaction of complainants – by concrete mitigation measures or conditions.

The task of evaluation and decision-making can therefore be significantly eased by grouping impacts into the categories of large and adverse, because only the latter will form the basis for transparent and objective decision-making that is readily defensible on rational grounds. Decisions and conditions based on the former will always rely on a significant element of preference and subjectivity that can rarely be satisfactorily defended.

The task of clearly defining *large* from *adverse* is rarely easy, however, effects – such as construction traffic or soil erosion – which might be barely noticeable at a small scale can become significant and adverse on a larger scale. Impacts from large projects need to be further scrutinised before decision making – particularly to determine whether the impact is proportionate to the benefit.

PROPORTIONATE IMPACTS

Large projects – that usually cause large impacts – are usually undertaken because large benefits are expected to occur. At the most basic level the decision-making process can be characterised by seeking to ensure that any adverse impacts are proportionate to the expected positive benefit.

Conventional projects usually involve some reasonable local balance between gain and pain, however, the challenge with larger projects is that the location(s) of the benefit is frequently remote from where the impacts occur. The benefits of larger projects are often diffused throughout a society, an economy, a region or even a nation. It is important to articulate and acknowledge this characteristic of large projects because it helps to provide reassurance on two issues:-

i. it is *normal* for one territory or area to appear to bear a 'disproportionate' amount of the burden of large projects.

ii. The determination of the balance between adverse impacts and positive benefits will involve comparing specific environmental losses with more abstract societal gains.

ENVIRONMENTAL VERSUS OTHER IMPACTS

Where decisions about large projects will need an evaluation of the balance between adverse environmental impacts and positive social and economic gains it is vital for the assessment team to establish clear terms of reference from the outset. The purpose is to clearly differentiate between the assessment of environmental impacts and the decision-making exercise. This clarity is required to anticipate, and provide for, the inevitable necessity of a political or administrative role in the final decision. Where properly structured, the EIA assessment team limit themselves to providing an objective evaluation of the likely consequences of a decision to grant. The decision about whether the wider needs of society will be met by the project – in an equitable and effective way – is political and administrative.

While noting that there are wide variations in the evaluation processes in different jurisdictions – it is nevertheless noticeable that as the EIA process matures there is a marked tendency to mistaken the EIA process as the decision-making process instead of what it is intended to be, namely the information to support a decision. A society is a complex market place where many ideas and values compete. It is important to maintain a sense of perspective for accepting that the environment is but one of a number of equally valid factors that influence a decision. Economics and social development as well as cultural continuity and integrity are powerful determinants. The balance of emphasis on these issues reflects the values of the society in which large projects occur.

It is unreasonable to expect one value system, the environment for example, to be able to monopolise or disproportionately influence on decision-making.

While stressing the need for a sense of perspective and proportion in relation to the role of environmental values, in the decision-making process for large projects, it is also important to maintain vigilance for factors and issues which give rise to circumstances where it is valid for environmental concerns to override other circumstances.

BIG DECISIONS

'Success has many fathers but failure is an orphan'

The refusal to permit the development of a large project is a defining event. The processes and ideas that lead to refusal decisions define the most essential characteristics of the EIA process. They are what makes it unique. Making a decision to refuse can feel like being orphaned, it can feel very lonely. There is surprisingly little guidance on this critical topic. The following observations, while not definitive, share experience arising from involvement in the decision-making for large projects. What are the boundaries that uncontestably define where refusals must be made on environmental grounds alone?

EXTINCTION OR INCONVENIENCE ?

A spectrum of the significance of adverse impacts may be identified. Examples of the most extreme forms of uncontestably unacceptable impacts include:-

- Species extinction (floral and faunal).
- Irreversible and uncontainable contamination (e.g. radio-active fall out).
- Complete loss of globally unique cultural resources.
- Complete loss of ethnic or cultural continuity (e.g. language).

While these are clear they are rarely encountered in practice as the likely consequence of a major project. More typically the evaluation is confronted with the choice of significantly altering a significant proportion of a highly valued resource. Frequently the balance of this resource (species numbers, remaining habitats, pristine waters, monuments in context, indigenous communities etc.) occurs over extensive and distant areas - often in other jurisdictions. This again points to the fact that decision-making may need to take account of cumulative effects over a much wider area than the location of the project, necessitating trade-offs between concrete local factors and more abstract high level considerations.

Consideration of issues such an International Agreement or Accords can be very difficult to defend within a local or national debate. For this, evaluation needs to be able to refer to some fundamental principles.

Experience suggests that *reversibility* is the most fundamental and readily communicated basis for decision-making on large scale projects.

REVERSIBILITY

The extreme examples of unacceptable adverse impacts, referred to above are all characterised by the irreversible disruption of the continuity and integrity of a resource. The key issue being the irreversibility. It is profoundly unreasonable for any individual society or age to make decisions that deny the right of future generations to enjoy the same range of choices and decisions that we and previous generations have had.

'Extinction is Forever' neatly captures one facet of this. This highlights a characteristic of this decision-making criterion that can be usefully extracted and amplified for use in developing responses to the less clear cut areas in the spectrum of impacts. The 'Time Content' of environmental and cultural resources is a useful adjunct to the criterion of reversibility. In general the greater the amount of time 'invested' in a resource the higher it's significance ranking for decision-making purposes. The table below provides an illustration of the 'Time Content' scale to assist in decision-making.

ITEM	TIME CONTENT
Genus	100 million years
Species	3.5 million years
Eco systems	100,000 years
Soils/habitat complex	1,000 years
Mature Oak Woodland	500 years
Mature trees	100 years
Mature garden	10 years
Grass establishment	1 year

Fig. 2 Examples of relative significance and value of nature resources according to time value

In general, decisions should favour impacts that affect resources with a shorter time content – no matter how extensive – rather than those with a high time content no matter how small.

Such criteria provides a transparent and replicable basis for systematic decision-making when evaluating the significance, and hence acceptability, of residual impacts – particularly when selecting from among a range of alternatives. The issue of alternatives introduces the further criterion that where very severe residual impacts are anticipated then these must be demonstrably 'unavoidable'. This then points to the existence of a self-defining category of fundamentally unacceptable impacts as '**a significant irreversible avoidable impact'**

WHEN TO SAY 'NO'

Two sets of circumstances give rise to fundamental reason for refusal. The significant irreversible avoidable impact has already been considered. The other occurs where the impact cannot be predicted. Where there is no knowledge of the likely consequences of a decision, then there is no basis for a decision.

Unknown impacts must never be mistaken for uncertain impacts. The description of degrees of uncertainty is a standard component of good science. Unknown impacts refer to situations where the location, extent, character, consequences or degree of effect cannot be described or reasonably inferred by reference to verifiable 'worst case' parameters.

The situation can arise as a result of factors.

i. A complete absence of data on the receiving environment.
ii. No precedence for interaction of the proposed or analogous development with any comparable environment.
iii. A complete absence of means to detect or monitor the occurrence of impacts.

In summary where it appears that there is likely to be unknowable impacts or significant irreversible avoidable impacts then there is no basis for approval and permission must be withheld.

ADVISING OR DECIDING?

The importance of the evaluation team having clear terms of reference has already been discussed. On very large projects it is important to clearly and separately document the outcome of the evaluation and the decision-making process. The most pragmatic approach is to prepare a staged evaluation where the ultimate decision makers are given at least 3 structured reports.

1. *Issues Briefing* (the likely challenges and controversies of the decision)
2. *Options briefing* (the range of potential decisions and their likely consequences)
3. *Decision briefing* (the central wording and rationale of the decision)

The sequence and context of these briefings has two purposes. The first is to minimise the scope for duplication of effort arising from conflicts between the EIA evaluation and decision-making activities. The second is to protect the evaluation team from accusations of executive unilateralism.

CONSEQUENCES OF DECISIONS

The single most important early briefing is to describe the fundamental consequences that will arise from the array of potential decisions. These will bet the 'price' – environmental or political – of a decision – to grant or refuse respectively – and will be critical factors in determining the positions that will be adopted by senior decision-makers.

ALTERNATIVES

From the outset the evaluation team (and their superiors) must be mindful of the range of options that exist. Failure to do so can distort the process when options appear to be confined to a Yes/No decision. In practice the following options exist:-

- Grant permission as requested
- Grant permission with modifications
- Invite revised project
- Seek additional information
- Refuse permission for project as submitted
- Refuse permission for the concept
- Invite a withdrawal of the project

There are a number of variations to these options and the details vary from jurisdiction to jurisdiction but the basic principle applies - namely to 'funnel proof' the thinking of the team and to keep options open for as long as possible.

UNCERTAIN VERSUS UNKNOWN

In addition to the technical considerations that arise in relation to making decisions on poor or non existent data, a political issue also arises.

Senior decision makers – administrative or political - have an abhorrence of surprises. They will be very reluctant to make a decision where unforeseen or unforeseeable consequences have the potential to rebound.

THE WORST CASE

Where senior advisors are unable to commit the time or attention to become familiar with project details, it can be useful to present a series of brief scenarios that define the best, likely and worst cases that could arise from a proposed project or decision. The preparation of such a note can prove a very useful administrative safeguard to demonstrate 'due diligence' as part of the final decision making process.

POLITICS

It will be clear from the preceedings sections that it is advisable to anticipate and prepare for a higher than usual level of political engagement during the decision-making process for large projects.

EIA ADVISES – POLITICS DECIDES

The central lesson is to ensure a clear separation of documentation, processes and even personnel from the beginning and to maintain the separation for as long as possible. The basis of the separation is to ensure that there is a separate 'free standing' statement of the likely environmental consequences of a decision to approve. Balancing considerations of social and economic betterment and conformity with related policies are best kept as part of a separate decision-making exercise.

ENVIRONMENT = DECISIONS = VALUE SYSTEMS = CULTURES

"People get the politics that they deserve" is a trueism that can also be applied to the environment. It is necessary to acknowledge that most environments are, at least partially, the result of interactions between man and nature. A logical extension of this acceptance is that the environment that results from a decision making process may be regarded as a physical manifestation of the values of the society that produced it.

EXPENDING ENVIRONMENTAL CAPITAL?

Caution is required in relation to judgements and criticisms about decisions that result in high levels of environmental impacts among communities who have decided that the benefits are worth the environmental cost. The call for caution arises from the observation that the "drawing down" of environmental capital appears to be part of a development phase of many communities and territories. It certainly has been in the relatively recent history of industrialised nations and it appears hypocritical and unreasonable to stigmatise places and people who now find themselves at that stage of a development cycle - albeit at a later date.

ENVIRONMENTAL IMPERIALISM?

If self-determination is one of the inalienable rights of an independent place or people and if it is accepted that different environments can result from decision making processes based on different value systems - surely it must follow that there is validity in

the acceptance and tolerance of values and resulting environmental outcomes - that differ from place to place and time to time.

The evaluation of EIA and decision making on large-scale projects is carried out by a relatively small community of individuals from many different countries. Everyone involved has a personal ethical responsibility to ensure that they respect the environmental and social values of other jurisdictions and refrain from the importation or imposition of their own environmental value systems.

FIVE LESSONS ON ASSESSING LARGE EIS'S

1. BIG IS NOT ALWAYS BAD

Sometimes it's just different. Learn to distinguish between large impact - that may provoke subjective opposition out of fear of change - from significant adverse impacts where there is a factual basis for concern.

2. REVERSIBILITY IS THE GOLDEN RULE

"If you can't fix it, it's broke" The amount of time required to reverse an environmental effect is a good means of comparing alternatives. Significant impacts that can never be reversed are unlikely to ever be acceptable.

3. CAN'T DECIDE ABOUT THE UNKNOWN

There is no basis for a decision when the consequences cannot be described.

4. ADVISE POLITICS OF CONSEQUENCES

Don't confuse the evaluation of the EIS with the decision-making process. The critical role of the evaluation team is to advise the decision makers about the likely consequences and risks.

5. KEEP PERSPECTIVES - READ MORE HISTORY

Decisions about large projects and their associated large impacts never take place without a social and cultural context. These factors together with an awareness of historical precedents elsewhere can provide valuable perspectives.

CONCLUSION

These observations on the lessons of preparing and evaluating the EIS's for large projects appear to indicate that a range of qualitative issues are more critical than might be expected from a survey of literature on processes, legislation and methods.

Many of these qualitative issues centre on the interactions with administrative and political systems. It is a mistake to dismiss them as irrelevant or improper considerations in EIA. Society and it's political systems are as integral apart of the environment as the geology and soil on which they stand.