Chapter 5

How to Make IAs More Rational

5.1 HIGHLIGHTS

This chapter addresses the question of how IA processes, documents, and methods can become more rational. The suggestions to make IA more rational are informed and tempered by the debate surrounding rationality both within and external to IA.

- The analysis begins with three applied anecdotes. The stories describe applied experiences associated with efforts to draw upon the strengths and temper the weaknesses of rationality. The analysis in Section 5.3 then defines the problem, which is either (depending on one's perspective) an IA process that is insufficiently rational, consistent, and systematic or an IA process that is too technical, rational, and autocratic. We raise the possibility that both positions are overstated and that there might be some fertile "middle ground."
- In Section 5.4 we provide a context for the rational IA process. We define rationality and identify various rationality forms. We describe the major characteristics of a typical rational planning process. We highlight attributed strengths and limitations. We briefly describe various adaptations to and alternatives to the typical process. We summarize how the debate has played out in IA literature.
- In Section 5.5 we detail how a rational IA process could be implemented at the regulatory and applied levels. In Section 5.5.1 we address how rational IA processes can be facilitated and structured at the regulatory level. In Section 5.5.2 we demonstrate how a rational IA process might be expressed at the applied level. We provide, in Section 5.5.3, examples of applied level rationality good practices for various IA types (SEA, project-level EIA, EcIA, SIA, HIA, and SA).
- In Section 5.6 we address the contemporary challenge of siting locally unwanted land uses (LULUs). We provide an overview of generic approaches, provide examples of good practices, and describe an example of a LULU siting process.
- In Section 5.7 we highlight the major insights and lessons derived from the analysis.

5.2 INSIGHTS FROM PRACTICE

5.2.1 The Willing Host Approach to Siting LULUs: a Reasonable Alternative to Technical Rationality

There is an emerging "reasonable" approach to the siting of locally unwanted land uses, which is not driven exclusively by technical and scientific rational analysis. The approach entails seeking out a Willing Host. Often these controversial facilities are beset with well-known historical examples of poor management as well as being rooted in misinformation perpetuated by opponents. Particular examples include waste management facilities, prisons, and nuclear waste facilities. There are examples of all three of these types of facilities being addressed through "willing host" processes in North America.

The Willing Host approach raises a number of issues. Individuals wonder about the extent of the environmental review that occurs when a Willing Host comes forward. Other issues focus on equity and fairness. However, it has been our observation that the Willing Host approach is definitely not a shortcut as a rigorous, fully detailed, thorough environmental assessment is still carried out. The approval agencies have no choice but to ensure that all environmental requirements are met for the location of the facility, whether or not it is a Willing Host. Indeed, one can argue that the Willing Host approach is another way of achieving the social license to operate once the environmental requirements are met.

If a Willing Host is identified and can meet all environmental assessment requirements, there are still potential problems. The problems may not relate specifically to the Willing Host community but to neighboring communities, the broad regional area, and all of the communities that are along any transportation routes.

In terms of the Willing Host approach, there are three examples to consider.

1. NWMO (Nuclear Waste Management Organization), a federal Canadian government agency, is charged with the responsibility to find one or more disposal sites for high-level nuclear waste. The NWMO Willing Host approach is a systematic six-step process as shown below.

Impact Assessment: Practical Solutions to Recurrent Problems and Contemporary Challenges, Second Edition. David P. Lawrence.

Step 1: The NWMO initiates the siting process with a broad program to provide information, answer questions, and build awareness.

Step 2: Communities identify their interest in learning more, and the NWMO provides detailed briefing.

Step 3: For interested communities, a preliminary assessment of potential suitability is conducted.

Step 4: For interested communities, potentially affected surrounding communities are engaged and detailed site evaluations are completed.

Step 5: Communities with confirmed suitable sites decide whether they are willing to accept the project, and propose the terms and conditions on which they would have the project proceed.

Step 6: The NWMO and the community with the preferred site enter into a formal agreement to host the project.

The completion of Step 6 then initiates the formal regulatory review process.

A community that embarks on this process can drop out at any point in time. A successful Willing Host must meet the basic geological requirements as well as have a thorough review of the overall social, economic, and environmental impacts and benefits. Currently there are 10 communities in Canada (7 in Ontario and 3 in Saskatchewan) that are going through the NWMO Willing Host process. A similar Willing Host process was very successful in finding a long-term, high-level nuclear disposal facility in Sweden.

2. The government of British Columbia (BC) recently had a competition for siting a medium security prison in Central BC The successful community was the Osoyoos Indian Band.

   The BC government invited 15 local governments to provide bids for the new prison facility to be built somewhere in the Central Okanagan. The facility would provide 500 construction jobs and 240 permanent, full-time jobs. A number of criteria were set out, including a large enough piece of serviced land near major highways and no more than 70 min from the various courthouses.

   Of the 15 local communities, only five took up the challenge and one eventually dropped out due to residents' opposition.

   The successful site is in a fully serviced industrial park owned and managed by the Osoyoos First Nation. The key to being successful in this competition is that Chief Clarence Louie provided the BC government with the results of a community referendum showing that the band members were supportive of the proposal.

3. The third example is that of a private entrepreneur to partner with a community or First Nation to develop municipal waste and/or construction waste sites in Ontario. This proponent of these waste facilities is looking for communities that are willing to consider entering into an agreement to provide such facilities. Basic requirements include access to a rail line and major highways. Although the technology for such waste sites is proven, there are still public concerns and a public stigma to such facilities. As a result, a Willing Host community provides the best opportunity for a successful siting and approval.

There are really two levels of activities with the Willing Host process.

First level is the full range of environmental assessment work and consultation that occurs with the Willing Host community. In most cases, Willing Hosts are small communities who are either stagnating or experiencing declining population and are looking to restart or regenerate their economies.

The second level is at the regional scale where neighboring communities, particularly those along transportation routes, believe that they will bear some of the burden but not necessarily get any of the benefits. This raises an issue in terms of ultimately making a choice between finding a Willing Host that meets the EA requirements and accepting the facilities while having to deal with transportation route for communities and/or nearby adjacent communities who for various reasons are opposed to the facility. This raises questions as to the weights one ultimately gives to the various positions in making the decision. Is it enough to find an acceptable Willing Host community to host a controversial facility? How far beyond the Willing Host community should you consider in decision making?

As the Willing Host approach is tested more and more, these questions will be challenges to address, and it is expected that they will be resolved through the application of the "reasonable man/woman approach."

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5.2.2 Collaborative Community-Based Reasoning

It has been suggested that solutions to some of the problems with strategic environmental assessment (SEA) practice may, in fact, depend on how it is implemented. As Connelly and Richardson (2005, p. 397) note, there are evident weaknesses in the technocratic approach to SEA and they contend that perhaps "good SEA is participative."

They point out that participatory, deliberative approaches to EA are asserted as the new orthodoxy. The social learning that occurs through such approaches helps in the shared understanding of values and reflects the greater underlying need for open deliberation in SEA as compared to EIA (Partidário, 2006). Given these points, the purpose of our work was to consider whether a community-based participative approach to strategic assessment could work and, if so, what lessons might be gained from using this approach in the development context (Sinclair et al., 2009).

Our starting point was community-based environmental assessment (CBEA), which has been adapted in an innovative way to smaller, community-based projects that utilize natural resources for basic livelihood needs (Spaling, 2003; also CIDA, 2005). Typical projects include boreholes, gravity water systems, small reservoirs, agroforestry, fishponds, and construction of latrines, clinics, schools, and small bridges.

Since these projects interact directly with biophysical systems, many already stressed, there is potential for resource degradation through over-extraction, land clearing, soil erosion, contamination, and other forms of exploitation. Application of EA to these projects is emerging as a way to facilitate management of local resources and ensure continued project benefits (Spaling, 2003, p. 152).

In community-based approaches to EA, a participatory forum facilitates a process of communal dialogue and collective decision making that includes the development of goals, the sharing of knowledge, negotiation and compromise, problem posing and problem solving, the evaluation of needs, and the definition of goals (Pallen, 1996; Neefjes, 2001; Spaling, 2003). This process helps communities clarify values, be more adaptive and proactive, respond to change, develop an appreciation for the human-/ecological interface, set personal and communal goals, and participate in a process where they are heard (Keen and Mahanty, 2006; Meredith, 1992).

Using a qualitative research design, we applied a CBEA approach to the strategic assessment of the the *Instituto Costarricense de Electricidad* (ICE) (Costa-Rica's publicly-owned electrical and telecommunications company) watershed management agricultural program (WMAP). This program addresses erosion and contamination problems caused by conventional farming practices (i.e., planting homogeneous crops, heavy reliance on chemicals, and regular tilling) in watersheds where ICE has hydro projects. We worked with farmers from two watersheds, Reventazón and Sarapiquí, who are collaborating with two different ICE WMAP teams.

The design of the community-based strategic environmental assessment (CBSEA) was highly participatory, utilizing common participatory rural appraisal tools, which promoted dialogue and sharing in a safe environment, focused on a single, small community program, and involved locals in event planning. The CBSEA process itself was broken down into four components that captured the common elements of SEA frameworks defined in the literature (Thérivel and Brown, 1999):

1. *Determining the purpose and presenting the program.* In the first workshop, the CBSEA process was explained to participants and ICE explained their proposed WMAP Phase II.
2. *Assessing the program and identifying alternatives.* In the second workshop, community participants collaboratively assessed the potential effects of the proposed ICE WMAP Phase II.
3. *Identifying real and potential impacts of the proposed program components including the identified alternatives.* In the third workshop, community participants identified real and potential social, economic, and environmental impacts that the components within the new modified proposed program would have if they were implemented.
4. *Sharing CBSEA results with the proponent.* In the fourth workshop, communities and related institutions [e.g., MAG, Ministry of the Environment and Natural Resources (MINAE), National Institute for Learning (INA)] came together to discuss the CBSEA process and the results from the process.

The case study revealed that people with little to no experience with EA were able to effectively participate in a participatory and structured SEA process. They were able to articulate preferred options, potential effects, and mitigation approaches with relative ease, especially those for the physical works components of the proposed program. The results also revealed that through this process participants were able to think more critically, even about some of the impacts of activities they were already undertaking on their farms. In the end, they learned and a more robust preferred program was the outcome.

The case study also revealed that a participatory CBSEA approach can accrue many benefits including meaningfully engaging community members in a natural resources management decision-making process, facilitating a more comprehensive assessment of incoming programs, individual and social learning outcomes, and facilitating a transition toward sustainability. These conclusions indicate that there can be great value in doing a SEA at the community level, at least in relation to programs.

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5.2.3 A Role for Rational Analysis in Providing SEA Technical Support

A SEA was carried out for a spatial plan in Italy. One of the main tasks of the SEA was to contribute to the identification of possible locations for new urban development areas. A structured process was undertaken based on two main stages. First, a preliminary screening of possible locations was performed. Subsequently, these locations were compared to select the most suitable ones.

The first stage was conducted by spatial multicriteria analysis (SMCA). A criteria tree was developed that

contained four main categories of criteria: ecosystems, water resources, quality of the urban environment, and energy and climate. Additionally, constraints based on existing laws and regulations were applied to rule out areas that could not be considered for urban development. Specific criteria were then linked to each category, and relevant maps were constructed in a Geographic Information System (GIS) environment. These criteria included, among others, ecological networks and ecosystem fragmentation, potential water pollution loads, accessibility to urban green areas and parks, landscape quality, noise, electromagnetic radiation, solar electricity potential, and availability of public transport. Some of the criterion maps were based on existing data, whereas others required GIS modeling that was performed in the preliminary stages of SEA. The maps were then normalized and aggregated, leading to an overall land suitability map for urban expansion. This map was used to extract a preliminary set of potential sites. This was done by applying two types of thresholds: one related to the suitability value, and the other related to the overall size of contiguous and suitable cells. Potential sites were those characterized by high suitability and by a relatively large area (the area threshold was provided by plan's regulations aimed at preventing excessive urban sprawl and fragmentation).

This process resulted in the preliminary selection of 15 sites. For each of these sites, the average performance value of the criteria previously listed were computed and used to run a set of additional multicriteria analyses, by changing the importance weight assigned to the four criteria categories. As a result, different perspectives were generated, each showing the ranking of the 15 sites, obtained by assuming different level of importance attached to criteria related to ecosystems, water resources, quality of the urban environment, and energy and climate, respectively. A final analysis was conducted to assess the sensitivity of the sites to changes in the criteria weights.

About a third of the sites ranked stably at the top of the rankings, regardless of the weights. The remaining sites had a performance more strongly connected with the weights. All these analyses were summarized in a short executive report, and detailed in a more technical appendix. The report was then provided to planners and policy makers who used it to interact with the general public according to the required steps of the planning procedure, and to select the final location of urban expansion areas. In this study, SEA played a very technical role, mainly consisting of providing evidence and a structured and documented process to support planning decisions.

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5.3 DEFINING THE PROBLEM AND DECIDING ON A DIRECTION

The three stories offer different perspectives on the potential roles of reasoning and technical analysis in the IA process. The first story shows how the Willing Host approach to siting LULUs offers a potentially creative procedure for introducing reason into complex and contentious IA problem solving. The second story describes a CBSEA reasoning approach that adheres to the major rational planning steps while still being highly collaborative, and able to effectively draw upon sound rational–technical analysis. The third story describes an IA process, which relied heavily upon technical quantitative analysis and was undertaken in a manner that supported and informed rather than supplanted the decision-making role of planners, policy makers and the public working together.

The three stories demonstrate that technical–rational analysis and collaborative reasoning have the potential to be complementary in an appropriately structured, dynamic, and inclusive IA process. They illustrate that rationality can be either a positive or a negative force in an IA process, depending on how it is applied, the rationality perspectives that it represents, and the fit between process and context. They suggest that there is a potential role for rationality in the IA process but that role tends to be more effective when it assumes a support role (rather than driving the process), when there is a high degree of community collaboration and influence, when procedural and substantive equity issues are explicitly addressed, and when proactive steps are taken to offset the negative propensities of rational IA processes.

If IA processes are "rational" they clearly define the problem. They explicitly identify goals and objectives. Alternatives are systematically identified and evaluated against goals and objectives. The planning process is integrated, from early on, into organizational planning and decision making. The preferred alternative is implemented. The achievement of goals and unintended consequences is monitored and managed. Up-to-date and appropriate technical methods are systematically integrated into the process. Formal checks of document quality are instituted.

Historically, IA theory and practice, for much of its existence, has been structured around a rational, information provision model (i.e., better information leads to better decisions) (Bond and Pope, 2012). Notwithstanding the rational assumptions and aspirations of IA requirements and processes, there is widespread doubt regarding whether IA is or should be rational. IA effectiveness analyses provide the first clues as to whether IA processes are rational. The environmental aspirations expressed in IA legislative goals are not being realized to the extent hoped for (Clark, 1997). Effectiveness ratings for problem definitions, objectives formulation, and preparing adequate terms of reference are low (Sadler, 1996; Spooner, 1998). Problems, root causes, and high and low objectives are often not satisfactorily identified (Lee and Kirkpatrick, 2006). The identification and evaluation of reasonable alternatives is a recurrent weakness in IA guidelines and documents (Barker and Wood, 1999; Eales and Sheate, 2011; ERM, 2000; Sadler, 1996; Sadler and Jurkeviciute, 2011; Spooner, 1998). Options tend to be too narrowly defined, option analysis

is often problematic, and choices tend to be poorly justified (Galbraith et al., 2007; Lee and Kirkpatrick, 2006). The general tendency is to treat the alternatives analysis as a *pro forma* exercise (Sadler and Jurkeviciute, 2011). Methods selection and application could be greatly improved as could document quality (Sadler, 1996; ERM, 2000).

IA processes, documents, and methods in practice fall well short of rationality ideals. Most IA texts and much of IA literature seek to correct this "deficiency" (Canter, 1996; Gilpin, 1995; Glasson et al., 2005; Hanna, 2009b; Morris and Thérivel, 2009; Morgan, 1998; Noble, 2009b; Smith, 1993; Westman, 1985). IA requirements, they suggest, should include objectives. Proposals and alternatives, they argue, should be systematically evaluated against objectives. Specific measures are described to facilitate more effective procedural guidance and control, especially regarding the treatment of alternatives (Ortolano, 1993). Explanations are provided concerning how environmental considerations can be integrated into project management and into organizational decision making.

These commentators see value in a rational, systematic, normative approach, albeit one that is more environmentally substantive, that is tailored to the decision-making level and other contextual considerations, and that proactively seeks to effectively influence decision making (Fischer, 2003, 2005). These commentators worry that a flexible, adaptive IA approach will be worse for the environment. They stress the value of an explicit substantive, interconnected hierarchy of environmental/sustainability ends (both ultimate and milestone) to guide the IA process and to provide the basis for evaluating options (Donnelly et al., 2006, 2007; Fischer, 2003; Hacking and Guthrie, 2006).

A diversity of largely technical and scientific methods are identified, described, and compared. The methods apply to different IA activities, impact types, and environmental components. They also address interdisciplinary analysis and study team coordination. Quantitative and computer-based systems and multicriteria decision aids often receive particular attention (Geneletti, 2005; Bruner and Starkl, 2004; Hassan, 2008; Julien, 1995; Kain and Söderberg, 2008). The net result is assumed to be a more rational, environmentally substantive, scientifically and technically sound, comprehensive, and objective decision-making basis (Culhane et al., 1987; Fischer, 2003). Rational decisions and the achievement of the environmental objectives of IA requirements are assumed to flow naturally from the greater and more effective application of the recommended procedures and methods.

Some critics, in contrast, maintain that IA practice either is or strives to be too rational. Rational processes are seen as politically naïve and ineffective in their failure to appreciate how decisions are made within organizations and how power is wielded. As a consequence, they tend to have limited success in influencing decision making (Bond and Morrison-Saunders, 2011; Weston, 2010). They are considered impractical because of their inability to recognize cognitive and decision-making limitations and to effectively operate across disciplines and professions. They are considered inflexible and poorly equipped to deal with uncertainty and conflict (Boothroyd and Rees, 1985). They are viewed as oblivious to the implications of operating in a multiactor, multi-interest sociopolitical environment (Greer-Wooten, 1997). They are characterized as reductionist (Bond and Morrison-Saunders, 2011). They are described as not appreciating the ubiquitous role of competing values and interests in decision-making (Weston, 2010). They are described as failing to change social values or to facilitate social learning (Weston, 2010). They are condemned for excluding extrarational forms of knowledge and for being biased against the qualitative (Hodge, 2004). They are labeled as technocratic, autocratic, and antidemocratic on the grounds that they tend to be "top-down" and marginalize the public's role in the decision-making process (Binder et al., 2010). These critics argue that the rational IA process should be abandoned and replaced with more political, interpretative, intuitive, contextual, dynamic, holistic, iterative, collaborative, transdisciplinary and value-full planning and decision-making models and procedures (Bond and Morrison-Saunders, 2011; Binder et al., 2010; Boothroyd and Rees, 1985; Craig, 1990; Greer-Wooten, 1997; Torgerson, 1981; Weston, 2010).

Another group of commentators focus on how rationality is defined and how it is applied. They suggest that ecological, practical, and communicative rationality forms are more directly relevant to IA practice than are analytical rationality forms (Bartlett, 1997; Craik, 2008; Stoeglehner et al., 2010). They maintain that rationality tenets and assumptions should be relaxed and replaced with a more practical, political, social, adaptive, precautionary, substantive, and collaborative "reasoning" process (Barrow, 1997; Doberstein, 2004; Greer-Wooten, 1997; Kørnøv and Thissen, 2000). They argue for greater attention to and understanding of how decisions are actually made (Bond and Pope, 2012). They suggest viewing IA as an expression of discursive and democratic democracy (e.g., planning as a form of persuasive storytelling) (Richardson, 2005). They advocate the increased use of inclusive and dialogue-based participatory tools and a broadened conception of rationality to encompass, for example, indigenous perspectives (Crawford et al., 2010; Wikland, 2005). They argue for placing rationality in a broader context (i.e., vary rationality standards to match contextual conditions, constraints, and uncertainties) for bringing together the best of the qualitative and the quantitative, and for adjusting the level of detail to suit the scale and type of proposal (Dalal-Clayton and Sadler, 1998; Hodge, 2004). They suggest that IA practice should encompass, at each stage, multiple rationalities, consistent with the multiple values and value conflicts that permeate IA practice (Richardson, 2005). They acknowledge that the rational model can work well when goals are shared (i.e., a persuasive basis for justifying actions) (Craik, 2008). But they suggest that a more overtly political pluralist model is more appropriate when goals and interests conflict (Craik, 2008;

Richardson, 2005). They recommend selectively applying rationality.

Rationality is considered especially appropriate when there is a high degree of certainty and control and a low degree of conflict (Kørnøv, 1998). Commentators favor modifying and adapting rationality to accommodate knowledge and insights derived from experience, intuition, emotion, and imagination. They point to the need for decision-making to combine the objective and analytical with the subjective and integrative (Kørnøv and Thissen, 2000). These commentators see value in rationality for IA, but only a form of rationality that is carefully defined, tightly circumscribed, selectively applied, and integrated both with other forms of knowledge and into pragmatic, sociopolitical planning, and decision-making processes (Craik, 2008; Culhane, et al. 1987; Partidário, 1996).

As is evident from the above, there are at least three definitions of both the problem and the preferred direction. Applying valid rationality strengths, minimizing legitimate rationality deficiencies, and drawing upon alternative rationality definitions and applications can help integrate these problem definitions.

5.4 SELECTING THE MOST APPROPRIATE ROUTE

5.4.1 Definitions and Distinctions

Rationality has been a central theme of Western thinking since the Renaissance (Alexander, 1986). Definitions of rationality encompass many elements, as illustrated in Figure 5.1. Ideally, a rational IA process displays such *attributes* as purposeful, sensible, orderly, lucid, logical, coherent, transparent, explicit, replicable, consistent, reflective, reasoned, verifiable, and objective. It strives for accuracy, reliability, and accountability. It is technically sound and scientifically rigorous (see Chapter 4). It seeks to minimize such *irrational* factors as errors, falsehoods, contradictions, and incoherence. It tries to avoid nonsensical, irrelevant, ad hoc, illogical, unreflective, and inadequately supported arguments. Emotions, feelings, experiences, intuition, imagination, wisdom, habits, traditions, faith, and subjectivity are excluded or downplayed because they are nonrational or *extrarational.*

Rational attributes are *expressed* in thoughts, actions, opinions, judgments, interpretations, criticisms, reflections, decisions, conclusions, and recommendations. They are evident in deliberations and dialogue. Rational expressions are *supported* by reasoned intellectual analysis, logic, and argumentation. They are *informed* and *guided* by ideas, information, knowledge, and evidence. They are *justified* by sound and systematic application of technical and scientific methods, as conducted by qualified specialists. The expression of rationality in an IA process occurs more fully when such *preconditions* as openness, honesty, and trust prevail. Also essential is a nonoppressive environment where interested and affected parties are willing to participate in the process, engage in reasoned dialogue, and commit to a broader human or ecological purpose.

Rational expressions are *fulfilled* in problem solving, in opportunity seeking, in planning and in decision making. They also are *applied* in management, in lawmaking, in organizational design, and in communications and public involvement procedures. The expression and application of rationality is dependent on *context*. It varies for individuals, groups, and organizations. It operates differently at the multiorganizational and societal levels.

As indicated in Table 5.1, there are many rational *forms* relevant to IA practice. Purpose, need, and objectives are often defined before the IA commences, consistent with instrumental or technical rationality. IA requirements and practices are structured around a process, in accordance with procedural rationality. Sometimes IA legislation and practice identify and explore purpose and direction questions, as is the case with purposive (or value or normative) rationality. Occasionally IA, in common with substantive rationality, considers both alternative ends and means. IA both integrates individual effects (analytical rationality) and considers systems levels concerns and impacts (systems rationality). IA addresses and adopts social (social rationality), economic (economic rationality), political (political rationality), and ecological (ecological rationality) perspectives. IA is generally an "action-forcing" legal environmental management instrument (legal rationality). IA considers market implications (market rationality). It involves a highly participative process (communicative rationality). IA is constrained, focused, and pragmatic consistent with bounded, practical, and strategic rationality forms, respectively.

5.4.2 Core Characteristics

The rational planning and decision-making process, drawing heavily upon utility theory, began (at least in the postwar period) with the suggestion that decision-makers agree on goals, identify available alternatives for achieving goals, evaluate the consequences of alternatives, and select the alternative that comes closest to achieving the goals (Banfield, 1955; Nilsson and Dalkmann, 2010; Simon, 1976). Implementation of the preferred alternative was assumed. This process was refined through the 1960s and 1970s, as illustrated in Figure 5.2. The revised process begins with a problem, need, or opportunity to be addressed. An appropriate constellation of values (the public interest) was determined (Davidoff and Reiner, 1962). General values were distilled into goals, principles, objectives, and criteria—progressively more precise measures of progress toward the public interest. Goals, objectives, and criteria were ranked (Boyce, 1971). Methods for assembling and analyzing data, operating within resources, responding to pertinent constraints and opportunities, determining present and predicting future conditions, and deriving, screening, and comparing alternatives were formulated (Alexander, 1986; Friedmann, 1987). Uncertainties and variations in

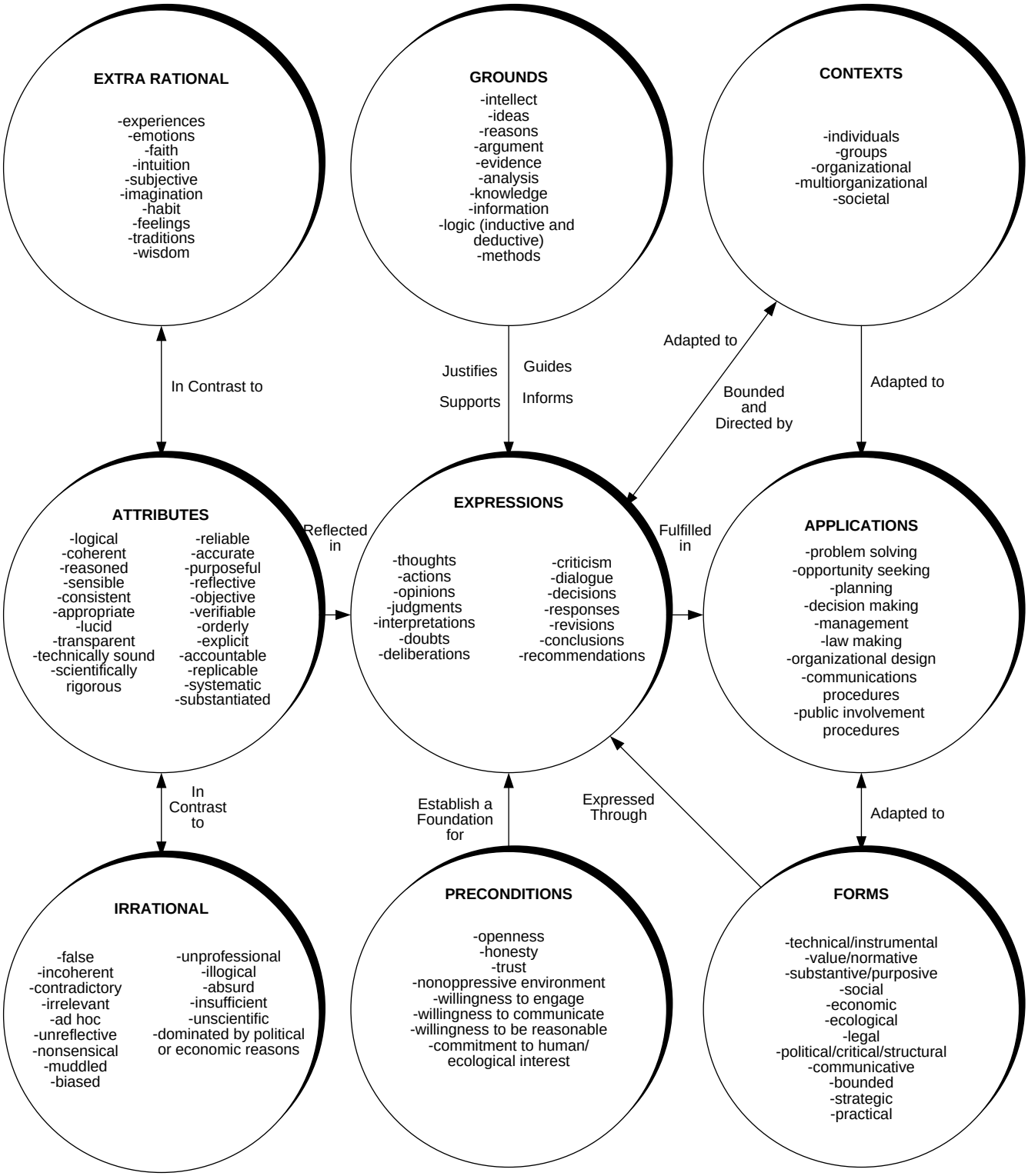

Figure 5.1 Rationality definition.

preferences were taken into account. More details were subsequently added concerning how the preferred alternative would be implemented. Allowance was made for interactions among process steps (scanning forward and feedback loops) (McLoughlin, 1969). Provision was also made for public and agency involvement, often prior to decision making and occasionally as inputs to each stage in the process.

Table 5.1 Potentially Relevant Forms of Rationality

Forms	Key Characteristics
Instrumental/technical/scientific rationality	Search for the best possible means (how to do things) for given ends (what could be achieved) Stress on efficient, logical and systematic goals achievement Based on causal explanations In accordance with scientific rules of assessment Emphasis on efficiency, measurement, and analysis Goals and objectives determined externally (teleological)
Procedural rationality	Rationality of the process The procedures used to choose actions Acceptance or rejection of a claim based on procedures or rules followed
Purposive/value/normative rationality	Rationality of ends Based on moral judgments Synthetic Evaluation and choice among goals
Functional rationality	Rationality inherent in the functioning of systems, societies, or organizations Clearly defined and calculable goals
Substantive rationality	Rationality of ends and means (deontological) Rationality of the outcome of the process Applies to individual decisions or actions
Analytical rationality	Understanding by breaking things into parts and by studying differences and links Additive (sum of parts)
Systems rationality	Understanding in terms of purpose and relevance Order flows from sense of whole
Social rationality	Seeks integration in social relations and social systems Makes social action possible and meaningful Assumes social formation prior to individual; identity from group; reason exercised for group
Economic rationality	Utilitarian Entails the maximum achievement of plurality of goals Underlain by principle of efficiency Assumes orderly measurement and aggregation
Political/critical/structural rationality	Rationality of decision-making structures In accordance with political rules of democratic decision making Preserves and improves decision structures Emphasis on practical capability for facing societal problems Requires an open, honest, informed debate Concerned with identifying and redressing structural inequities
Legal/administrative rationality	Reason inherent in clear, consistent, and detailed formal rules for preventing disputes and for providing solutions In accordance with administrative rules of policy preparation and implementation Reason inherent within context of organizational and institutional structures and procedures
Market rationality	Unconstrained pursuit of self-interest by individuals and organizations
Ecological rationality	A rationality of living systems An order of relationships among living systems and their environment
Communicative rationality	Organized dialogue to promote democracy and personal growth Concerned with the quality of the communications Stress on mutual understanding and counteracting of communications barriers and distortions
Bounded/limited/instrumental rationality	Search for satisfactory solution (good enough) Not all alternatives known or consequences considered; alternatives considered sequentially Not all preferences evoked Procedural Criterion—effectiveness; limited to understanding the impacts cognitively Contingent on environmental conditions
Aesthetic/expressive rationality	Criterion—truthfulness With an art system
Ethical/moral rationality	Criterion—rightness Within a moral system
Practical rationality	Starts with real, everyday life Pragmatic
Strategic rationality	Selective and contingent Adapted to local context and specific situation

Sources: Alexander (1986, 2000), Bartlett (1989), Becker et al. (2005), Braybrooke and Lindblom (1963), Elling (2011), Etzioni (1967), Forester (1999), Friedmann (1987), Habermas (1993), Healey (1997), Jiliberto (2011), Kørnøv (1998), Richardson (2005), Sager (1994), Verma (1998).

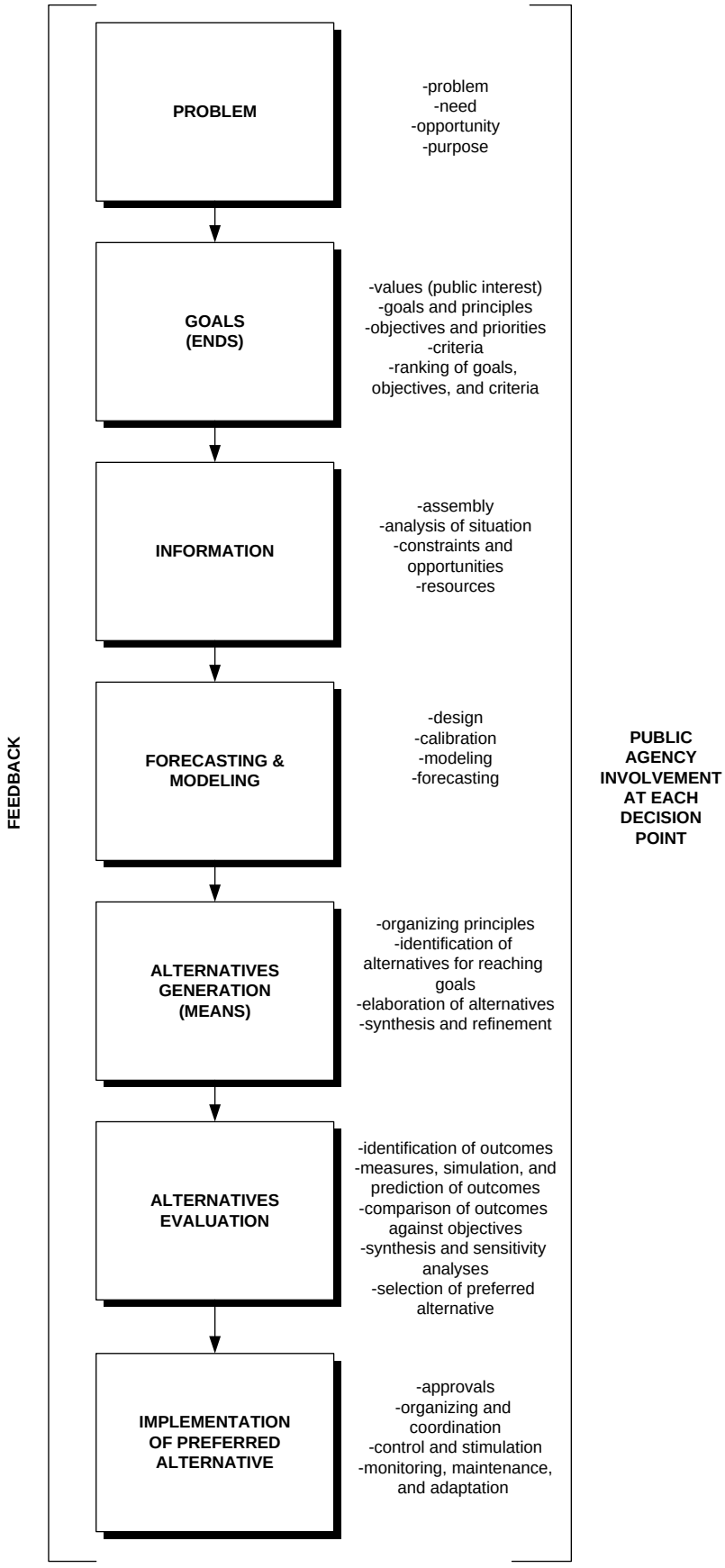

Figure 5.2 Rational process.

Table 5.2 Ascribed Rational Process Assumptions

General

- Reason is systematically applied (central to problem)
- The process is independent of the problem and of the context (process can be universally applied)
- Adequate time, skill, and resources
- Comprehensiveness—complete information
- Unitary actors
- Individual is purposeful and intentional
- Collective choices guided by aggregated individual preferences
- IA specialist as technician (objective, apolitical, unbiased)
- Sequential, analytical process
- Hierarchical decision-making structure
- People act rationally; their actions make sense with respect to the aims and the means they select to achieve their ends
- A pluralistic society (all competing interests have access to power)
- Collective rationality is the aggregation of individual rationality (utilitarian)
- Downward direction of control

Goals (Problems, Goals, Objectives)

- A well-defined and independent problem (susceptible to analysis and diagnosis)
- People have preferences and act in accordance with them
- Goals and objectives can be identified and articulated
- There is unitary public interest (value, goal, and objective consensus is possible)
- Goals and objectives guide process (also basis for evaluating alternatives)
- Specialists are value-neutral and can determine the public interest

Information

- Supremacy of technical and scientific knowledge (as determined by independent specialists)
- Complete and fully accessible baseline information
- Manageable uncertainties

Forecasting and Modeling

- Well defined action space (all relevant variables)
- Probability of occurrence can be predicted based on available data
- Predictable and controllable environment
- Stable society

Alternatives Generation (Alternatives, Plans, Strategies)

- Well-defined alternatives
- All reasonable alternatives available
- All alternatives examined
- Best alternative can be identified

Evaluation of Alternatives

- Well-defined and known outcome space
- All relevant consequences of each alternative can be determined
- Preferences are transitive (goals and objectives can be ranked)
- Alternatives can be assessed against goals, objectives, and criteria
- Predicted consequences and value preference differences can be amalgamated to select a preferred alternative (using formal evaluation methods)
- Action chosen is based on hierarchy of preferences that gives the greatest benefit
- Uncertainties in predictions and value preferences can be addressed (e.g., using sensitivity analyses)
- Decisions based on evaluation of alternatives conducted by specialists

Implementation

- Full approval is obtained
- Proposed decision and decision implementation is unambiguous
- Rational information will improve decision making
- The environment is controllable and is controlled
- Possible to monitor all key variables and to make appropriate adaptations

Interrelationships

- Facts and values can be separated (objective from subjective)
- Ends and means can be separated and interrelationships between ends and means are clearly defined
- Independence of probabilities and utilities (what is expected is unaffected by what is wanted)
- Independence of analysis and evaluation
- Emphasis on consistency, transparency, and transitivity
- Separation of analysis/evaluation from implementation (technical from political)

Sources: Arts et al. (2011), Alexander (1986), Banfield (1955), Boyce (1971), Boyer (1983), Damasio (1994), Davidoff and Reiner (1962), Feldman and Khademian (2008), Forester (1984), Friedmann (1987), Harper and Stein (1992), Healey (1997), Kørnøv and Thissen (2000), Mintzberg (1994), Nilsson and Dalkmann (2010), Sager (1994), Simon (1976), Smith (1993).

Numerous assumptions have been ascribed to the rational process, as detailed in Table 5.2. It tends, for example, to be assumed that problems are well defined, that the environment and available choices are predictable and controllable, that a unitary public interest can be defined, and that decision makers are rational. It is expected that they will select and implement preferred alternatives based on the comprehensive and objective analyses of technical and scientific specialists. The rational process is seen as systematic, largely sequential, and optimizing (i.e., all alternatives considered and best alternative selected). These assumptions should be approached with caution. A part of the procedure for formulating a rational IA process involves determining which ascribed assumptions are intrinsic to the rational process and which either apply only to specific rationality forms or could be relaxed, adjusted, or abandoned.

5.4.3 Attributed Strengths and Limitations

The rational process has been described as simple, explicit, logical, consistent, systematic, and adaptable (Caldwell, 1991; Sager, 1994). It helps to clarify future directions, establish priorities, and explore potential courses of action (Faludi, 1986). It provides a clear, coherent, comprehensive,

unbiased, and defensible basis for decision making (Briassoulis, 1989; Caldwell, 1991; Healey, 1997). It systematically integrates scientific and technical knowledge. The role of specialists in the process is clearly defined and legitimized (Benveniste, 1989). Although the process objectives may not be fully realized, it is still considered beneficial to seek to be unbiased, comprehensive, consistent, and systematic (Briassoulis, 1989; Faludi, 1986).

The rational process has been attacked on a host of fronts. It is labeled as unrealistic, ineffective, incomplete, and inappropriate. It is considered *unrealistic* because human cognitive limits are not adequately considered (Webber, 1983). It fallaciously assumes that problems are well structured; goals and beliefs are clear and unambiguous; adequate, largely quantitative, environmental information is available; existing environmental conditions can be extrapolated into the future; all alternatives are available; all consequences can be determined; decision making is rational; and the preferred alternative can and will be implemented (Bond and Morrison-Saunders, 2011; Forester, 1989; Mintzberg, 1994; Healey, 1997; Webber, 1983). It incorrectly assumes that all actors in the process are rational and that adequate resources are available to support a comprehensive analysis (Briassoulis, 1989; Forester, 1989). It fallaciously assumes complete information, unitary actors, well-defined problems, consistent objectives, interests and values, minimal and manageable uncertainties, and clearly defined hierarchical decision-making mechanisms (Arts et al., 2011; Feldman and Khademian, 2008). It fails to recognize the extent to which ends and means, reason and emotion, and analysis, evaluation, and implementation are necessarily interwoven (Damasio, 1994). It makes the impossible assumptions that all possible alternatives can be identified and compared, and that the "best" alternative can be selected (Morgan, 2012).

The rational process tends to be *ineffective* because it does not consider practical, "common sense" considerations and solutions (Saul, 1992). It fails to focus the limited, available resources (Benveniste, 1989). The rational process concentrates on internal analyses, assuming that external environmental conditions are stable and can be controlled (Benveniste, 1989). As a result, it is not well adapted to contextual characteristics and does not respond promptly to changing circumstances (Mintzberg, 1994). It is especially ineffective on the political front (Richardson, 2005). It fails to take into account the nonrational, politically driven world in which it operates (Jay et al., 2007; Thérivel, 2010). It has difficulty in explaining such issues as power, conflict, trust, solidarity, inequality, communications, and legitimacy (Nilsson and Dalkmann, 2010; Richardson, 2005). It fails to take into account cognitive and resource limits, behavioral biases, ambiguity, variable preferences and norms, and the distribution of decision making among actors (Kørnøv and Thissen, 2000). Sometimes it is used to rationalize and legitimize political decisions (Nilsson and Dalkmann, 2010). Instead of grappling with these issues, it simply assumes implementation. Consequently, it fails to consider and address bureaucratic, political, and structural implementation obstacles and opportunities (Alexander, 1986; Thérivel, 2010).

The rational process is *incomplete*. It lacks social and environmental content or substance (Boyer, 1983). It seeks to attain goals (as a generic concept) but it is not driven, guided, and bounded by specific tangible social and environmental values, preferences, ethical principles, and imperatives (Beauregard, 1987; Nilsson and Dalkmann, 2010). Although it is inherently value-laden, it masks value-based decisions by portraying decision making as value free and objective (Nilsson and Dalkmann, 2010). It is conducive to systematic analysis but lacks a holistic perspective (Mintzberg, 1994). The image of people as rational decision makers is especially constraining. No provision is made for the contributions of extrarational insights, knowledge, experiences, wisdom, and methods (Alexander, 2000; Friedmann, 1987; Healey, 1997). The implications for process design and management of the subjective, social, and political nature of decision making are not addressed (Saul, 1992; Webber, 1983). The likelihood that perspectives and interests will clash is not considered (Boyer, 1983). The net result is a highly circumscribed and artificial view of people, how they reason, how they interact, and how, collectively, they reach and implement decisions.

The rational process is *abstract*. No effort is made to fit the process to the context. Consequently, process and context are often poorly matched. The rational process is especially *inappropriate* in situations characterized by high levels of complexity, uncertainty and conflict (Briassoulis, 1989; Damasio, 1994; Healey, 1997). The rational process and the technical and scientific "experts" who support the process are presumed to be objective, unbiased, and value-free. In truth, both the experts and the process are prone to numerous, often hidden, biases (Boyer, 1983; Mintzberg, 1994). "Objective" technical and scientific knowledge and methods are valued over subjective knowledge (Poulton, 1990). Analysis is favored over synthesis. Efficiency takes precedence over effectiveness. The process is more mechanistic than humanistic or ecocentric. Experts are the primary custodians of knowledge. Professional "mystifications" and rationalizations can inhibit public understanding and involvement (Forester, 1989; Saul, 1992). They also can lead to contempt by the specialists for the people (Saul, 1992). Often "depoliticized," expert-driven processes become autocratic. They can mask political purposes. They tend to reinforce the existing distribution of power (Benveniste, 1989). Sometimes they compound existing or even create new inequities. They are of little value in identifying or resolving fundamental value disputes (Campbell, 2003). The rational process, according to many of its critics, has a propensity to be highly undemocratic.

The foregoing ascribed strengths and limitations are not necessarily inherent to the rational process. They could

simply be tendencies. Positive tendencies can be reinforced. Negative tendencies can be offset. Still, it is prudent to take these tendencies into account when designing and managing IA processes with rational elements.

5.4.4 The Response

Several responses to the identified shortcomings seek to make the rational process more realistic and effective. Incrementalism advocates a bounded or limited rational process where satisfactory (rather than ideal) decisions are made in a continuous, sequential, informal, and interactive bargaining process in a highly constrained and uncertain environment (Braybrooke and Lindblom, 1963; Feldman and Khademian, 2008; Lindblom, 1965). A few alternatives are sequentially assessed based on the test of agreement. Bounded rationality entails a rational decision-making process within the boundaries of the limited capacity of people to be value free and objective (Nilsson and Dalkmann, 2010; Simon, 1957). People satisfice rather than maximize (Simon, 1976). Mixed scanning envisions a two-tier planning process with incremental problem solving at the operational level and strategic level policy making to address major changes and issues (Etzioni, 1967, 1986; Nilsson and Dalkmann, 2010).

Effective planning concentrates on building and applying practical political skills to facilitate implementation and to manage uncertainties (Benveniste, 1989). Strategic planning is selective and issue, action, and implementation oriented. It is bounded within real decisions (Nilsson and Dalkmann, 2010). It systematically scans external and internal environmental conditions to maximize opportunities and minimize threats (Mintzberg, 1994). Contingency planning seeks to match procedural characteristics and environmental conditions (Alexander, 1986). The organizational behavior model focuses on understanding and progressively reforming organizational and institutional behavioral patterns (Feldman and Khademian, 2008). Theory-in-action and reflection-in-action explore how practitioners pragmatically design, reflect on, reframe, and implement policies in practice (Schön and Rein, 1994; Schön, 1983). Strategic choice involves a collaborative, highly iterative problem-structuring process that continuously manages uncertainties (Friend and Hickling, 1997).

Other responses make the rational process more deliberative, substantive, collaborative, and democratic (Morgan, 2012). Advocacy planning, extending from the legal model (legal rationality), focuses on the needs of the poor in a pluralistic society (Davidoff, 1965). Social learning and related organizational development and societal guidance concepts offer more humanistic, organic, interactive, and adaptive planning and organizational models (Friedmann, 1987). Critical planning and related concepts such as social justice, social mobilization, equity planning, progressive planning, radical planning, and structural planning seek to identify and redress social injustices and power inequities (Forester, 1989; Friedmann, 1987; Harper and Stein, 1992; Morgan, 2012; Rawls, 2001). Substantive planning processes attempt to realize and operate within tangible humanistic, ecological, communitarian, and sustainability principles, limits, and imperatives (Beatley, 1995; Etzioni, 1995; Friedmann, 1987). Communicative and collaborative approaches integrate reasoned, ethical, and practical discourse and argumentation into interactive and value-full collaborative forums (Goldstein, 1984; Forester, 1999; Healey, 1997). They also minimize communication distortions; facilitate participation, consensus building and conflict resolution; and justify moral norms (Campbell, 2003; Habermas, 1993; Innes, 1995; Sager, 1994).

The debate surrounding the rational process has cycled through multiple iterations. No consensus has emerged nor is likely to given the clash of perspectives and interests. Many of these perspectives are integrated into the rational IA process presented in this chapter. Approaches that cannot be fully incorporated into a rational IA process are integrated into other IA processes presented in subsequent chapters.

5.4.5 IA and Rationality

Some IA literature, especially the sources that advocate the wider application of scientific and technical methods, are either oblivious to the debates surrounding rationality or come down firmly in the technical analytical camp (Canter, 1996; Gilpin, 1995; Morris and Thérivel, 2009). They tend to maintain that the process should be comprehensive, scientific, rational, and objective. They generally focus on the appropriate application of technical, often quantitative, methods by specialists (Geneletti, 2005; Julien, 1995).

Many IA process characterizations (as described in Chapter 2) truncate, perhaps not consciously, the rational process by moving directly to criteria application to a proposed action and to "reasonable" alternatives. This tends to occur because the process is triggered only after a proposal is well defined. Project-level EIA, in particular, tends to be reactive, focusing on the negative, rather than on consistency with values (i.e., a value-rational view) and on the achievement of aspirational objectives (Hansen and Kørnøv, 2010; Pope et al., 2005). Some SEA forms, especially objectives-led integrated assessment, are less prone to this flaw. Greater attention could be devoted to problem structuring, to formulating goals and objectives (substantive rationality), to formulating alternative goals and objectives (purposive or value rationality), and to procedures for generating alternatives. SEA process depictions give more attention to "front-end" activities such as problem definition, goal setting, and alternatives formulation.

IA has partially benefited from rationality positive features and avoided some rationality limitations. IA, in common with social and ecological rationality, is driven and shaped by an environmental and social ethic (Bartlett, 1997; Craik, 2008). Process and substance are married, increasingly

in an effort to further both sustainability and social/ecological justice (Doberstein, 2004; Sadler, 1996). Frameworks have been developed and applied for linking and integrating substantive IA concerns (Hacking and Guthrie, 2008). IA operates within limits (scoping), is focused (reasonable alternatives that satisfy need, significant effects), appreciates the needs for synthesis (cumulative effects), adaptively manages risks and uncertainties, and extends beyond decision making (monitoring and auditing) (Barrow, 1997; Craik, 2008; Glasson et al., 1999; Holling, 1978; Schmidt, 2011a). IA requirements and process descriptions demonstrate that it is impractical to identify all alternatives, to select the "best" alternative and to assess all consequences (Bartlett, 1997; Culhane et al., 1987; Kørnøv and Thissen, 2000). They appreciate the potential contributions of the extrarational (traditional knowledge, for example). They also recognize the value-full, social, collaborative, and political nature of the IA process (Interorganizational Committee, 1994).

SEA has tended to move the farthest from the rational–technical ideal (i.e., from positivism to postpositivism) (Bond and Pope, 2012). Early SEA procedural characterizations often mirrored rational-positivistic project-level EIA processes (Tetlow and Hanusch, 2012). Over time, the emphasis on consequences and environmental impacts has been replaced with vaguer concepts such as environmental issues and aspects. Instead of simply informing decision making with technical–rational information, SEA now seeks to broaden (to redefine problems and to include environmental aspects), and to directly interact with, and influence decision making (i.e., SEA as a social struggle over problem definition and future choices) (Jiliberto, 2011; McCluskey and João, 2011). The postpositive SEA perspective presumes many actors with multiple, often conflicting, goals (Adelle and Weiland, 2012). SEA has become increasingly more strategic (more policy based and plan-shaping), integrative (with planning and decision making), proactive, decision-centered, continuous, adaptive, collaborative, learning oriented, creative, and overtly political (Lobos and Partidário, 2010; McCluskey and João, 2011; Partidário, 2007; Tetlow and Hanusch, 2012). SEA purposes (especially sustainability); contextual adaptations; the role of participation, collaboration, and negotiation activities (especially during scoping); and the facilitation of social learning and institutional reform are now stressed to a greater degree than prediction and evaluation techniques (Bina, 2007; Tetlow and Hanusch, 2012). At the same time, as these orientation changes, there continue to be calls for more technical-quantitative (often using multicriteria analysis) analyses for assessing and ranking alternatives and for conducting cumulative effects assessment (Geneletti, 2005). These changes, at the conceptual level, are more evident at the policy level. At planning and program levels, SEA practice tends to be strongly influenced by the rational EIA model (Lobos and Partidário, 2010).

Some rationality strengths are evident in rationality-based IA practice. Rational approaches are especially effective during information gathering and analysis and in structuring follow-up (Morrison-Saunders and Sadler, 2010; Noble and Birk, 2011). Systematic rational procedures can help to transparently compare alternatives (Geneletti, 2005). They can, when they take the form of a joint and inclusive reasoning process that systematically explores both ends and means, ameliorate and transcend value-based political debates (Lemonick, 2010). Such approaches can effectively integrate varying stakeholder values, perspectives, and preferences (Hansen and Kørnøv, 2010). Different evaluation parameters and methods, uncertainty factors, and procedures for systematically exploring indirect and cumulative effects can be included in such analyses (Geneletti, 2005). Rational IA approaches have been credited with enhancing project design, informing decision making, and contributing to institutional involvement and public involvement (Jay et al., 2007; Noble, 2009b). The rational approach still reflects much of IA practice (Noble, 2009b).

Some rationality limitations also are evident in rationality-based IA practice. Rational IA approaches tend to be at odds with the realities of decision making (Jay et al., 2007). Technical–rational IA approaches have little to offer when decisions involve value-based trade-offs and conflicts among competing interests (Craik, 2008; Richardson, 2005). They fail to consider social, political, or cultural ambiguities and rarely lead to organizational behavior improvements (Ebrahim, 2008). The reductionist, analytic nature of rational IA practice tends to inhibit the consideration of cumulative and transboundary effects (Devlin and Yap, 2008). Rational IA approaches tend to inhibit two-way communications and dialogue-based participation (Wikland, 2005).

Many rationality debates are mirrored in IA literature (Morgan, 2012). There are lively discussions concerning whether SIA should be technical, political, or collaborative (Bartlett, 1997; Craig, 1990; Greer-Wooten, 1997; Lockie, 2001; Wikland, 2005). Rational–technical and adaptive/ecological approaches are compared and contrasted (Boothroyd and Rees, 1985). There are debates regarding whether reason and rationality should guide the process or be replaced by a more transformative approach directed toward raising political awareness and changing values, world views, and institutional behavior (Bina et al., 2011; Torgerson, 1981). There are discussions regarding whether IA practice should be apolitical or should allow political considerations to enter into decision making from the outset (Craik, 2008; Richardson, 2005). The validity of emotions and experiences as a decision-making basis is raised as an issue. There are discussions regarding whether IA should be comprehensive and rigorous or is necessarily practical and constrained (Kørnøv, 1998). Efforts have been made to integrate additional rationality types (e.g., aesthetic, ethical) into IA practice (Elling, 2007). SEA characterizations range from a close parallel to the rational process to processes that share many of the characteristics of strategic planning, the strategic choice method, mixed scanning and effective planning (Glasson et al., 1999; Partidário, 1996; Kørnøv and Thissen, 2000).

IA literature and practice could benefit from a closer scrutiny of the rationality debates in other fields (e.g., critical theory) (Elling, 2007; Richardson, 2005; Weston, 2010; Wikland, 2005). Particular consideration could be given to the potential benefits associated with a broader definition of rationality (see Table 5.1). IA practitioners could assess whether the assumptions and limitations ascribed to rational processes apply to current and proposed IA processes. The systematic integration of different rationality forms into the IA process could help guard against some of the excesses of technical–analytical rationality. Practitioners and other process participants could reflect on how they individually and collectively apply reason to build theory in practice. The efforts to foster reasoned, practical, and ethical discourse and discourse reflection could be especially appropriate for collaborative IA processes (Runhaar et al., 2010). Practitioners could consider the role of the extrarational in planning and decision making. They could seek a better match between process and context by appreciating the contingent nature of rationality. SEA practitioners could learn from the experiences of strategic planning and the strategic choice method.

The preceding overview suggests that the uncritical application of a rational IA process is bound to be problematic. Some measure of reform in the marriage of IA and rationality is essential. What remains to be determined is the nature of the reforms and whether those reforms should involve modest adjustments or a more fundamental reformulation. Figure 5.3 identifies some of the major perspectives regarding both more modest and more fundamental reforms to the rational IA process model. At the modest change end of the spectrum, the rational IA process is sufficiently flexible that it can be made more practical, participative, substantive, influential, value-full, and integrative. It also can be adjusted to be less absolute and certain. At the major change end of the spectrum, technical–rational analysis is shifted "to the sidelines," assuming, at best, a support role. Reason is fundamentally redefined and reoriented to be compatible with and supportive of various alternative perspectives regarding the rationale for and nature of IA-related decision making. Arguably, an IA process is "reasonable" to the extent that it, for example, facilitates fundamental political/economic reform, contributes to an environmental transformation, influences and shapes decision making, is context-based, embraces and embeds a precautionary perspective, is shaped by holistic perspectives rather than analytic methods, and contributes to a collaborative, "bottom-up" planning approach. Chapters 6–11 address many of these themes in greater detail.

As illustrated conceptually in Figure 5.3, there is some potential for combining elements of both modest and major reforms. The outcome from these debates, in terms of the nature and role of IA practice at both the regulatory and applied levels, is far from clear. Based on historical experience, rationality will continue to assume a prominent role in IA practice, especially at the project level, albeit partially reformed. The extent to which the conceptual debates regarding reason and rationality will percolate down to the applied level is yet to be determined.

5.5 INSTITUTING A RATIONAL IA PROCESS

5.5.1 Management at the Regulatory Level

The four jurisdictions all include elements of rational planning in their IA requirements and guidelines, as highlighted in Table 5.3. An overview of the four jurisdictional approaches to the treatment of alternatives points to the value of a clear set of substantive and procedural policies, objectives, and principles, embedded in the IA legislation, to serve as a basis for identifying, screening, and comparing alternatives. It illustrates the need for clear requirements and guidelines concerning the treatment of purpose and need, the range and type of alternatives to consider for various classes of proposed actions and settings (refined through proposal-specific guidance), the criteria to employ when screening alternatives, and the range of factors to consider when comparing alternatives. It underscores the need to explain and substantiate the methods used to evaluate alternatives, the need to integrate mitigation into the alternatives analysis, and the critical role that agencies and the public should assume in identifying, screening, and comparing alternatives. It demonstrates the importance of substantiating the basis for decisions related to alternatives, and the need to extend the assessment of alternatives into impact management activities.

Experience in the four jurisdictions illustrates the importance of ensuring that the evaluation and the preferred alternative(s) are consistent with the realization of the IA legislation objectives and principles, are supportive of other substantive environmental requirements and policies, and provide for the tiering of IA levels (such that strategic options are fully considered and frame the consideration of project-level options). It demonstrates the need to fully consider the implications of uncertainties, fully assess distributional differences among alternatives (over time, over space, among population groups—especially the most vulnerable), and require the consideration of an environmentally preferred alternative. It points to the need to fully explore alternatives when environmental sensitivity, risks to human health, the potential for catastrophic consequences, resource depletion, severe climate change impacts, and other environmental policy priorities are significant issues. It demonstrates the importance of requiring and facilitating public and agency involvement in option evaluation, and of clearly documenting the contribution and roles of agencies and the public in the evaluation process.

The approaches adopted by the four jurisdictions to address alternatives also illustrate a range of potential pitfalls in the treatment of alternatives. Examples include the problems that arise when the proponent alone determines the alternatives, when the public and agencies are excluded from

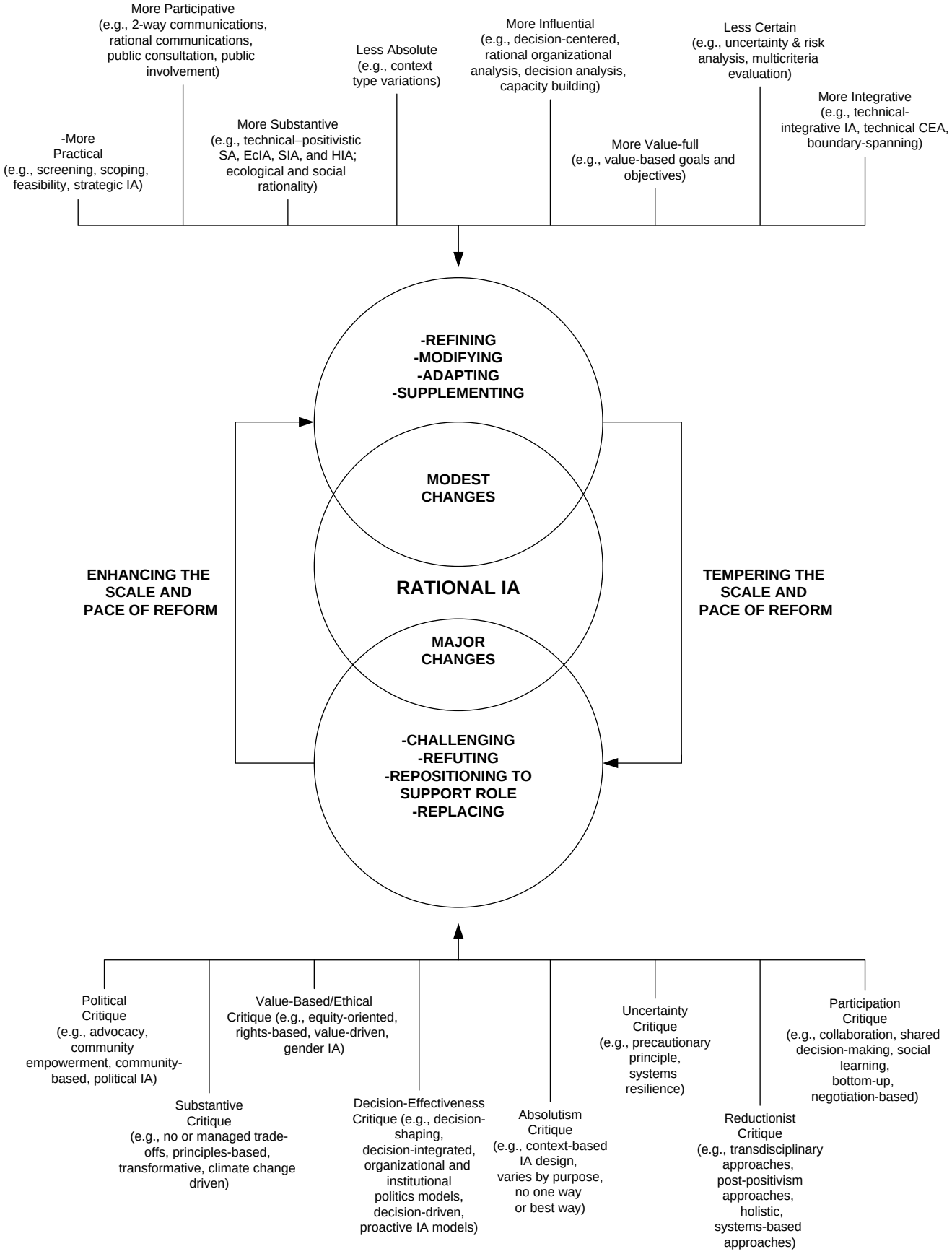

Figure 5.3 Rationalism in IA—choices for reform.

Table 5.3 Positive and Negative Regulatory Level IA Examples Regarding Rationality

United States	Canada	Europe	Australia
(+) NEPA refers to overall environmental purpose and national environmental policy (+) Required to address purpose (condition change desired) and need (if purpose met, existing conditions that call for improvement) (+) The purpose and need should not inappropriately narrow the range of reasonable alternatives (+) CEQ guidance on purpose and need and on selection and evaluation of alternatives, in various sectors and for various proposal types (+) All reasonable alternatives must be examined for EAs (at a lower level of detail) and EISs, including the no-action alternative (mandatory for EISs), the agency's preferred alternative, the environmentally preferred alternative, and all reasonable alternatives (including those not within the jurisdiction of the lead agency, which would avoid and minimize adverse environmental effects) (+) A particular need to assess reasonable alternatives is indicated when there are resource conflicts (+) The no-action alternative is generally viewed as current management practices and includes the actions of others (+) The environmentally preferred alternative is expected to promote NEPA's national environmental policy (+) Reference is made to the careful consideration of alternatives requested by groups and the public (+) Particular need to explain rationale when there is only one reasonable alternative (+) References made to a broad array of possible alternatives (e.g., alternative locations, alternative technologies, alternative transportation means, environmental release choices, cost-effective waste minimization and pollution prevention activities, economically beneficial landscape practices)	(+) Identifies substantive purposes for Act (e.g., sustainability, encourage study of cumulative effects, precautionary approach) (+) Identifies procedural purposes for Act (e.g., cooperation and communications with other governments and with aboriginal peoples) (+) CEA Agency objectives include promoting EA in a manner consistent with purposes of Act and promoting and monitoring EA quality (+) History of panel use of purposes of Act to evaluate proposed undertakings (e.g., sustainability test) (+) Factors to consider include purpose of designated project and alternative means of carrying out project (technically and economically feasible) (CEAA 1998a) (±) Guidance for alternatives analysis; question of continuing validity under new Act (+) Enhanced monitoring requirements could facilitate consideration of management options during implementation (+) SEA requirements—evaluation of alternatives and principal environmental considerations should be fully integrated into option analysis (−) New Act eliminates reference to alternatives to proposed action (−) Narrow, selective, and discretionary definition of environment and effects likely to inhibit systematic generation and evaluation of alternatives	(+) Proposed EIA Project Directive (PPD)—required to assess reasonable alternatives; includes baseline scenario (likely evolution of existing state of the environment) (+) PPD—views assessment of reasonable alternatives as a means of improving process quality and of allowing integration of environmental considerations early in project design (+) PPD—required to consider alternatives to the proposed project and extent considered (+) PPD—required to justify choice of preferred alternative (+) PPD—scoping requirements provide for agency and public input before decisions made on preferred alternative (+) PPD—cross-references to substantive environmental requirements (e.g., biodiversity, climate change, disaster risks) facilitate consideration in analysis of alternatives (+) PPD—broad definition of effects and environmental sensitivity facilitates alternatives evaluation (+) PPD—mandatory monitoring could facilitate consideration of management options during implementation (+) SEA Directive—refers to main objective and relationship to other plans and programs; can be applied in alternatives analysis	(+) Legislation includes specific environmental, social, sustainability, and cultural objectives and ecologically sustainable development (ESD) principles (+) Detailed requirements and guidance focused on matters of national environmental significance (+) Project-specific guidelines refer to compliance with objectives of legislation and with ESD principles (+) Requires the identification of alternatives, the assessment of impacts, the determination of mitigation measures and a clear basis for the preferred alternative (+) Reference (draft PERs and EISs) to consequences of not proceeding, complete description of impacts, and sufficient clarity regarding basis for preferred alternative; more detail in project-specific guidelines (+) Project guidelines refer to comparing short, medium and long-term advantages and disadvantages, reasons for preference and compliance with legislative objectives and ESD principles (±) Reference to alternative locations and feasible alternatives to the proposed action considered but not proposed (including no action if relevant); leaves choice of alternatives at discretion of proponent and provides minimal guidance

(*continued*)

Table 5.3 (*Continued*)

United States	Canada	Europe	Australia
(+) Requirements to rigorously explore and objectively evaluate all reasonable alternatives—required to specify how it will achieve NEPA's goals, consider mitigation, provide a clear rationale for choice, use analytic rather than encyclopedic approach (in comparative form), include relevant information (including data gap implications), ensure scientific and professional integrity when selecting methods, provide substantial treatment to alternatives considered in detail, include unavoidable adverse impacts and irreversible and unavoidable resource commitments, and avoid post hoc rationalizations (±) Not necessary to develop alternatives when no significant impacts anticipated; could be problematic if basis for significance determination flawed (±) Screening role of limitation to reasonable, technically, and economically practical and feasible alternatives; reasons for alternatives screened and basis for choice required; issue of how systematically undertaken and substantiated (−) There is no requirement to specify project goals or objectives (−) The NEPA national environmental policy and objectives are very general (−) Compliance with NEPA in practice has been predominantly procedural	(−) Issue of whether EAs undertaken under substitution/equivalency provisions will systematically generate and evaluate alternatives (−) Closed evaluation of alternatives; decisions regarding preferred alternative already made by the time that project is designated (−) Limitation of application of Act to major projects excludes consideration of strategic alternatives and means no IA requirements related to consideration of alternatives for moderate and small projects	(+) SEA Directive—required to consider reasonable alternatives and document in environmental report reasons for selecting preferred alternative and how assessment is undertaken (−) PPD—reference to consideration of reasonable alternatives early in project design suggests that project is predetermined and choices only relate to implementation choices (−) PPD—general nature of purposes of legislation inhibits systematic test of and extent to which alternatives contribute to the realization of substantive environmental goals (−) PPD—focus on major projects could inhibit systematic consideration of alternatives for small projects (±) SEA Directive—no-action alternative to be considered, where appropriate	(±) Recent review recommends that Minister be given power to request information on alternatives; government agreed to change and indicated would encourage early consideration of options and produce guidelines on prudent and feasible alternatives; encouraging is not the same as requiring (+) Accepted recommendation; Minister to provide reasons for all significant decisions (e.g., approval or not)

the process until after the alternatives evaluation has been completed, if the substantive mandate of IA legislation is too weak or general to serve as a test of proposal and option acceptability, and if adequate links are not made to related substantive environmental requirements. Other potential pitfalls include not requiring the assessment of the no-action and strategic alternatives (facilitated through tiering); unduly restricting the range of potential alternatives (e.g., alternative means only, only alternatives within the agency's jurisdiction); leaving open the possibility that the basis for screening alternatives is so general that options can be summarily dismissed with a negligible rationale; not insisting that proposals and options that run counter to environmental policies, standards, and limits be screened out; artificially constraining the comparison of alternatives by narrow definitions of the environment and effects; not requiring that the methods used to screen and compare alternatives are transparent, substantiated, systematic, and inclusive; not requiring that the implications of mitigation and uncertainties for the alternatives analysis be considered; not extending the alternatives analysis into the follow-up phase; and not requiring substantiation for political approval steps.

In terms of future directions, IA requirements and guidelines, drawing upon the rationality debates, could seek to foster the conditions necessary for reasoned, ethical, and practical procedures for formulating and evaluating alternatives. More attention could be devoted to problem and goal definition activities (value and substantive rationality), to matching process and context (contingency planning), and to facilitating and accommodating ecological, social, political, and communicative forms of rationality. Allowance should be made for alternative goals and objectives when there are value conflicts. A range of specific environmental goals and principles within IA legislation can provide a consistent litmus test for proposal acceptability, providing the loop is closed by stipulating that each alternative must be assessed against the goals and comply with

the principles. Such provisions also could facilitate alternatives comparison. Care should be taken not to prescribe particular evaluation methods at the regulatory levels (e.g., the propensity to insist that only quantitative evaluation procedures are appropriate). It is, however, reasonable to emphasize that the evaluation be unbiased, include performance criteria that evaluation methods must satisfy, and provide guidance regarding good practice standards for generating, screening, and comparing alternatives (Lawrence, 1993). IA requirements could be reviewed to determine if they exhibit the ascribed rational process assumptions and could potentially be conducive (however unwittingly) to the ascribed rational process negative tendencies. Requirements should be sufficiently flexible to retain and foster reasoning in IA processes without precluding the potential contributions of variations of and alternatives to rationality.

5.5.2 Management at the Applied Level

Figure 5.4 is an example of a rational IA process. Figure 5.4 and the process description that follows integrates and is built upon suggested rational process elements as advanced in IA and related literature. IA process managers and participants can "pick and choose" the relevant and appropriate elements.

Start-up The process begins by characterizing the problems and opportunities and analyzing the need to solve the problems and take advantage of the opportunities. These analyses make it possible to identify the purpose for the process and the purpose for any proposed actions. A study design is then prepared to describe how the purpose is to be realized and the needs met. Management and specialist teams are assembled to fulfill the study requirements. Broad goals, objectives, principles, and priorities are formulated to guide the process. They also provide a preliminary vision of conditions, as they might exist, if the problems are solved and the opportunities met. The goals flow directly from the problems and opportunities. The objectives refine the goals. The principles are broad performance standards. The priorities are system characteristics most directly and immediately relevant to problem resolution and opportunity realization. The goals and objectives are specific and substantive. They address such concerns as sustainability, environmental quality, social and environmental justice, biodiversity, heritage, resource conservation, and energy efficiency.

A public scoping program, a form of practical rationality, focuses the process on key public and agency concerns and issues, major stakeholders, potentially significant impacts, shared interests, potential perspective, value and interest differences, and likely alternatives. Alternative goals, objectives, and principles are formulated, where necessary, to address major perspective, value and interest differences (i.e., purposive or value rationality). A preliminary list of potentially applicable methods is compiled. These methods could support such activities as alternatives formulation and evaluation, data collection and analysis, impact prediction and interpretation, and public communications and participation. Both quantitative and qualitative methods could be identified. An environmental overview ensures that the goals, methods, and scoping activities are relevant and appropriate to the situation (i.e., the matching of process and context). The basic characteristics of the proposed action are identified. The proposed action is shaped to meet the need, fulfill the goals and objectives and be consistent with the principles and priorities. Temporal, spatial, and jurisdictional boundaries for the IA are established. Consistent with strategic rationality, the external and internal environments are scanned to determine constraints, opportunities, and limits.

Alternatives to the Proposed Action The major proposed action characteristics are described. Potential impact sources, stemming from the action, are identified. Aspects of the action, where choices exist, are highlighted. Potentially reasonable alternative ways of meeting the objectives and satisfying the principles are identified. If, for example, the need is transportation related, consideration might be given to such alternatives as no change, deferment, land-use planning changes, demand control procedures, growth management, and alternative modes. Clearly defined and fully substantiated exclusionary criteria are formulated to ensure a consistent basis for rejecting unacceptable alternatives. A screening procedure is formulated. Data are collected and complied to support the screening analysis. The exclusionary criteria are applied to the alternatives to the proposal. Alternatives are only rejected if they clearly meet or exceed exclusionary criteria, taking into account mitigation potential and uncertainties.

The alternatives to the proposed action, remaining after the screening analysis, are compared. This analysis is undertaken at a broad level of detail consistent with the diverse nature of the alternatives. Supplementary data collection occurs to support the comparative analysis. Where practical, impacts are scaled. This ensures a consistent approach to impact magnitude. Comparative evaluation methods are formulated appropriate to the available data, the level of detail, and the nature of the alternatives. Comparative evaluation criteria are formulated. Care is taken to ensure that the criteria make it possible to address whether and the extent to which the alternatives contribute to the achievement of the goals and objectives and are consistent with the principles and priorities. Objectives and criteria are ranked and, where necessary to support the evaluation methods, weighted. Alternative rankings address value, interest, and objective variations. Both qualitative and quantitative evaluation methods are employed to combine the criteria rankings and the scaled impact data. Multiple sensitivity analyses address areas of uncertainty, the implications of mitigation and enhancement measures, and variations in criteria rankings. Carefully reasoned arguments justify the selected

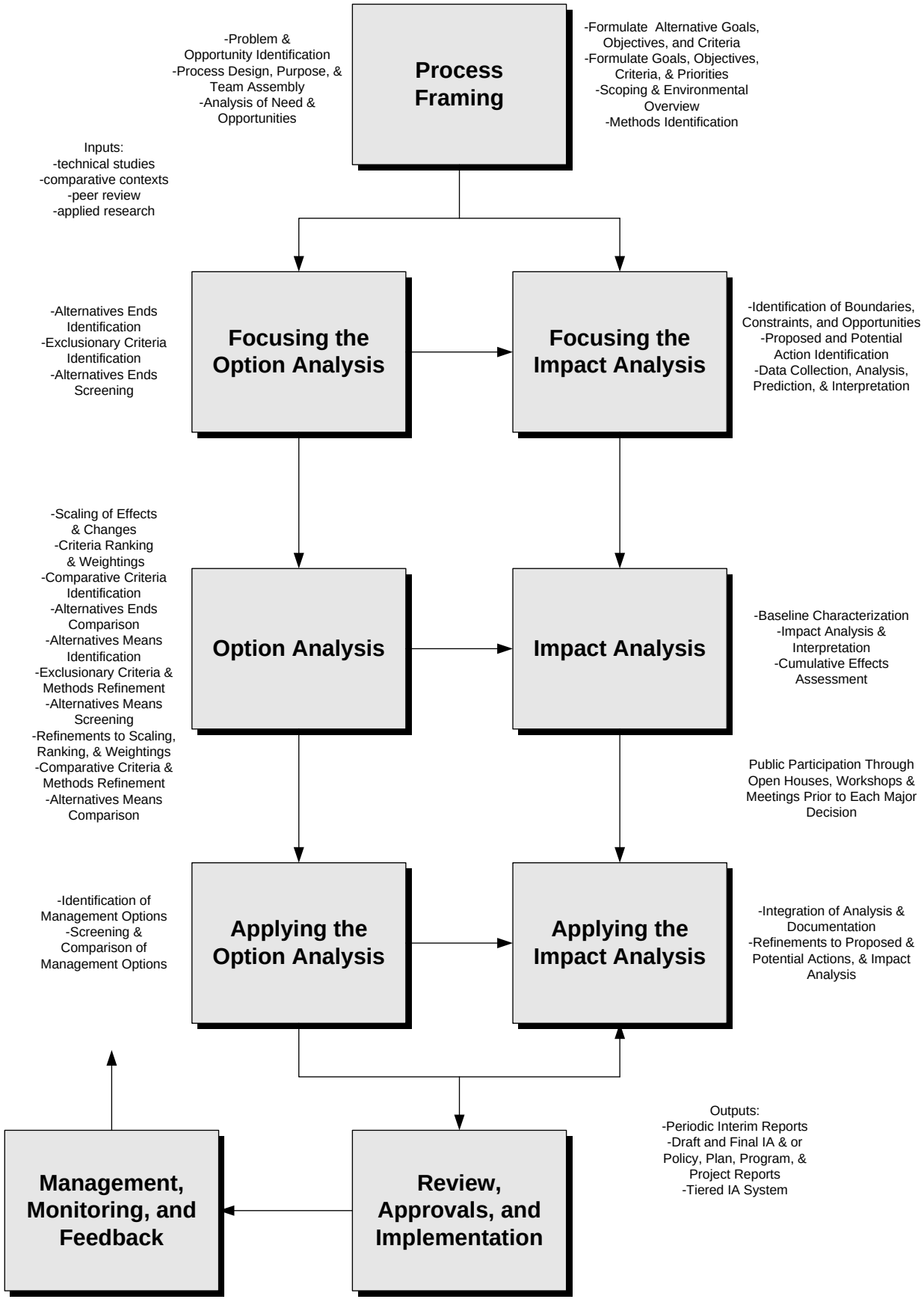

Figure 5.4 Example of a rational IA process. Adapted from Lawrence (2005a).

alternative. The implications of any residual uncertainties are explored and explained.

A further data collection and analysis round provides the basis for identifying, analyzing, predicting, and interpreting impacts potentially associated with the selected alternatives. Both technical and nontechnical forms of knowledge and experience are considered. Baseline environmental conditions are characterized. Likely future environmental conditions, assuming no proposed actions, are predicted. Sensitive and significant social and ecological components, processes, interactions, and systems are identified. The characteristics of the proposed action are refined. Potential individual impacts are identified and then predicted. Criteria are applied to ensure a consistent approach to characterizing the magnitude and distribution (over time, over space, and among social groups) of potential impacts. Quantitative (e.g., quantitative models), semiquantitative, and qualitative methods (e.g., conceptual models, scenarios) characterize baseline conditions and potential future impacts. Impact predictions are refined after incorporating mitigation and enhancement measures into proposed action characteristics. Key environmental interrelationships and patterns of direct and indirect impacts are determined. Uncertainties associated with both baseline conditions and predicted impacts are identified and their implications explored. Criteria are applied to ensure the consistent treatment of impact significance. The impact significance criteria take into account such matters as impact magnitude, impact distribution, public and agency priorities, mitigation potential, and the levels and types of risks and uncertainties. A thorough rationale is prepared for all findings, interpretations, and conclusions.

Alternative Means of Carrying Out the Proposed Actions The "alternative means analysis" employs the same steps and methods as the alternatives to analysis but at a greater level of detail. If the preferred alternative, emerging from the alternatives to analysis, for example, is a highway system, alternative means could include route alternatives, alternative vertical and horizontal alignments, alternative intersection locations, and alternative intersection designs. Supplementary data collection and analysis are undertaken during this stage to support the cumulative effects analyses. Refinements are first made to the individual impact analysis to take into account changes to the proposed action characteristics. The cumulative effects analysis then addresses multiple additive and nonadditive effects on individual environmental components and on broader social, economic, and ecological systems. The effects result from the proposed action in conjunction with other historical, current and likely future actions and activities. The cumulative effects analysis focuses on such concerns as temporal and spatial crowding and discontinuities; indirect, growth inducing, and threshold effects; biomagnification; and feedback effects. As with the individual impact analysis, effects are quantified to the extent practical. Explicit criteria are applied to ensure the consistent treatment of impact magnitude and significance. Areas of uncertainty and related implications are highlighted. Adjustments are made to proposed action characteristics to avoid and minimize potentially significant cumulative effects and uncertainties. Actions with other parties are coordinated. A clear rationale is provided for all findings, interpretations, and conclusions.

Approvals and Postapprovals A management program is prepared once the proposed action characteristics are largely determined. The management program integrates and coordinates mitigation, enhancement, monitoring, feedback, contingency, and auditing procedures and methods. There are likely to be some options concerning management program elements. Management options are screened and compared using methods comparable to those associated with the alternatives analyses. Responsibilities and commitments are detailed. Some fine-tuning of the proposed actions occurs to further enhance benefits and to minimize adverse effects.

The analyses are integrated, refined, and consolidated into draft and final IA documents. Points of confusion are clarified. Concerns and objections are thoroughly considered and addressed. Further refinements are made to the proposed actions based on inputs received during review and approval and (if the proposed action is approved) as a result of monitoring and feedback. Obstacles to implementation are anticipated. Once and if approval occurs, a systematic effort is made to facilitate implementation. Methodological improvements are made for subsequent application based on the auditing of the IA process.

Inputs, Outputs, and Interactions The IA process is supported by technical studies, reviews of comparable proposals and environments, peer reviews, and applied research. The public is involved in identifying concerns and preferences; in reviewing analyses and preliminary findings and conclusions; in identifying alternatives; in expressing opinions regarding criteria rankings, acceptable and preferred alternatives, significant impacts, and conclusions; and in responding to interim and draft documents. The public participates through open houses, workshops, and meetings prior to major decisions. The communications and consultation methods are jointly formulated and adapted with interested and affected parties. A proactive effort (e.g., participant funding, additional resources) is made to involve groups and organizations less likely or able to participate in the process. Care is taken to minimize communications and involvement distortions and inequities, consistent with communicative rationality principles. Close and frequent contact is maintained with regulatory review agencies.

Periodic interim reports are released as the process unfolds. Draft and final IA summary and detailed reports are broadly circulated. All documents are designed to be lucid, unbiased, traceable, technically sound, scientifically rigorous, accurate, and consistent. Inputs received from

agencies and the public are recorded and addressed. Changes made to documents as a result of inputs received are clearly specified. A clear rationale is provided for suggested changes not made.

5.5.3 Applied Rationality Good Practices by IA Type

Section 5.5.2 presents a generic description of a rational IA process. However, a rational IA process, at a strategic level, as compared to a project EIA level, and a rational IA process for various substantive IA types (e.g., EcIA, SIA, HIA, SA) can be quite different. It, therefore, follows that rationality good practices also would vary by level and IA type. Table 5.4 summarizes suggested rationality regulatory and applied good practices by decision-making level and type. The general rationality good practices exhibit a broad definition of ends, alternatives and effects, a close connection to decision making, a high degree of stakeholder involvement, the

Table 5.4 Rational IA Practice Characteristics by IA Type

Rational SA Practice	Rational SEA Practice	Rational EIA Practice
Includes sustainability as basic purpose of IA legislation; provides guidance for integrating sustainability concerns in IA purpose and need	Requires identification of purpose, need, and opportunities to be served by proposed policy, plan, or program	Requires consideration of need for undertaking (public interest)
Requires that sustainability concerns be explicitly addressed in procedures for identifying alternatives	Requires identification of objectives for proposed policy, plan, or program	Requires explicit identification of purpose and objectives for proposed undertaking
Requires the identification of sustainable alternatives	Requires identification of links to other policies, plans, and programs	Requires identification of links to other projects
Provides guidance for generating environmentally sustainable alternatives	Provides guidance for addressing purpose and need for policies, plans, and program	Provides guidance for addressing purpose and need for project-level EIAs
Requires explicit criteria, procedures, and reasons for screening out unsustainable alternatives	Requires the consideration of alternatives including the "no change" alternative	Requires the consideration of alternatives to the proposed action for major or complex projects or projects with potentially significant adverse effects, including the "no-action" alternative, alternative locations, and variations in the pace and scale of the proposed project
Requires that evaluation procedures for comparing alternatives include sustainability criteria	Requires that alternatives considered include all reasonable means for achieving purpose and need for proposed policy, plan, or program	Requires the consideration of alternative means for all proposed projects
Requires that reasons for selecting preferred alternative(s) take into account sustainability criteria	Identifies alternatives or alternative types that must be considered for specific policy, plan, or program types	Requires that alternatives analysis address choices most likely to prevent and reduce the likelihood and severity of significant adverse individual and cumulative environmental effects
Provides guidance for integrating substantive environmental concerns, including sustainability, into alternatives analysis	Provides guidance for generating alternatives for policies, plans, and programs (e.g., typical sector and plan type alternatives)	Identifies alternatives or alternative types that must be considered for various classes of projects
Clearly defines sustainability meaning (preferably strong sustainability)	Requires explicit reasons for policy, plan, and program choices rejected and preferred	Provides guidance for generating alternatives (e.g., typical project type alternatives)
Defines need and purpose in light of explicit sustainability objectives, principles, criteria, and indicators/targets	Requires consistent and explicit evaluation criteria and procedures for screening and comparing policy, plan, and program choices	Requires explicit reasons for project alternatives rejected and preferred
Addresses interactions among objectives	Requires that alternatives analysis addresses differences in contribution to achievement of environmental (broadly defined) and sustainability objectives	Requires that alternatives analysis, including criteria, is consistent with definition of environment and effects in EIA legislation
Considers systems as a whole; integrates economic, environmental, and social aspects; requires multi to inter to transdisciplinary approach	Requires that alternatives analysis address differences in potentially significant positive and negative environmental consequences including cumulative effects	Requires evaluation of consistency with pertinent public policies, plans, programs, and standards
Engages community in developing sustainability vision	Requires the integration of mitigation into the alternatives analysis when there is potential for significant adverse effects	Requires that alternatives comparison analysis explicitly consider mitigation and enhancement potential
Challenges entrenched policy beliefs and traditions	Provides guidance for screening and comparing alternatives for various policy, plan, and program types	
Seeks to build desirable and resilient future	Treats role of SEA as mainstreaming environmental considerations into decision making	
Includes global, regional, and local sustainability	Emphasizes SEA role in facilitating innovative and creative strategic decision making	
Seeks creative opportunities and positive contributions		
Seeks to maximize environmental, social, and economic objectives		
Seeks mutually reinforcing gains and greatest overall benefit rather than balancing		

Table 5.4 (*Continued*)

Rational SA Practice	Rational SEA Practice	Rational EIA Practice
Seeks sustainable outcomes and demonstrated influence on decision making not just sustainability-oriented processes Seeks resilience of socioecological systems Alternatives should be informed by sustainability issues and objectives and consistent with fundamental sustainability requirements Identifies and applies inviolate limits to identify and screen alternatives Protects the future; includes long-term choices Avoids undesirable trade-offs Favors options incorporating adaptive design Contribution to sustainability should be the main test Applies exclusionary sustainability criteria Seeks to make effective use of bottom-up integrative and transdisciplinary evaluation methods Applies explicit sustainability criteria in comparing alternatives; including inter/intragenerational equity Explicitly applies sustainability trade-off rules (e.g., net gains, avoidance of significant adverse effects, protection of future, explicit justification, open process) Factors in long time horizons Seeks multiple, mutually reinforcing, and lasting gains while avoiding significant adverse effects Provides compensation or offsets Interweaves ends and means Assesses overarching consistency of sector targets Employs frameworks and methods that demonstrate progress toward sustainability Employs methods that link and integrate substantive environmental concerns Treats trade-offs as last resort; identifies and applies trade-off rules Preferred alternative should be designed for resilience and adaptability in face of risks and uncertainties (e.g., precautionary approach)	Develops environmental objectives within the planning process Seeks to redefine problems in a manner that encompasses environmental aspects Explicitly identifies links between policy and SEA objectives Views SEA as a form of organizational and social learning Identifies a range of alternative strategic options for meeting the objectives Identifies options that meet general public concerns Draws upon community-based approaches Choice of alternatives takes into account decision context, decision tier, and stakeholder proposals Screens options that threaten critical, irreplaceable, and most vulnerable system elements Structures alternatives on basis of such distinctions as the testing of need/demand, how need to be met (model/process), and location (where) Systematically links objectives, targets, and indicators to environmental receptors Considers multiple temporal (e.g., generational, decisional) and spatial (e.g., global, macroregion, region, municipality, site) scales for various SEA types, and for project-level EIA Focuses on factors that could make a decision-making difference Employs resilience indicators and criteria; favors options that facilitate management resilience Integrates participatory and community-based approaches into SEA evaluation processes	Requires that alternatives analysis address differences in potentially significant negative environmental consequences, including cumulative effects Provides guidance for screening and comparing alternatives for various project types Clearly defines underlying goal or objective Ensures need is not so narrowly defined that excludes reasonable alternatives Identifies values and interests of key parties Identifies values in which IA performance should be anchored (needs) Includes pace and scale of alternatives Includes a range of reasonably foreseeable expansions and future developments Focuses on reasonable alternatives that best satisfy underlying need Seeks alternatives to problematic activities Evaluates options against needs and societal capacities Evaluates options taking into account distribution of effects and consistency with values and interests of key parties; favors most vulnerable Integrates consideration of indirect and cumulative effects Integrates community responses (e.g., social vitality, economic viability, political efficacy) Integrates mitigation potential into alternatives analysis; tracks mitigation implementation Assesses robustness of evaluation (e.g., sensitivity analyses) results; takes risk aversive decisions
Rational EcIA Practice	**Rational SIA Practice**	**Rational HIA Practice**
Includes objectives in IA legislation Provides guidance for integrating ecological environmental concerns into IA purpose and need Requires that ecological concerns be explicitly addressed in procedures for identifying alternatives Requires consideration of alternatives when there are potentially significant ecological effects or resource conflicts	Includes social objectives in IA legislation Provides guidance for integrating social concerns into IA purpose and need Requires that social concerns be explicitly addressed in procedures for identifying alternatives Requires the consideration of alternative when there are potentially significant social effects Requires the identification of the environmentally (including social) preferred alternative	Includes health objectives in IA legislation Provides guidance for integrating health concerns into IA purpose and need Requires that health concerns be explicitly addressed in procedures for identifying alternatives Requires the consideration of alternatives when there are potentially significant health effects

(*continued*)

Table 5.4 (*Continued*)

Rational EcIA Practice	Rational SIA Practice	Rational HIA Practice
Requires the identification of the environmentally (including ecological) preferred alternative	Generates socially substantive alternatives	Requires the identification of the environmentally (including health) preferred alternative
Provides guidance for generating ecologically desirable alternatives	Requires explicit criteria, procedures, and reasons for screening out socially unacceptable alternatives	Provides guidance for generating preferred health alternatives
Requires explicit criteria, procedures, and reasons for screening out unacceptable alternatives from an ecological perspective	Requires that evaluation procedures for comparing alternatives include explicit social criteria	Requires explicit criteria, procedures, and reasons for screening out unacceptable alternatives from a health perspective
Requires that evaluation procedures for comparing alternatives include explicit ecological criteria	Requires that reasons for selecting preferred alternative(s) take into account social criteria	Requires that evaluation procedures for comparing alternatives include explicit health criteria
Requires that reasons for selecting preferred alternative(s) take into account ecological criteria	Provides guidance for integrating social environmental concerns, including social sustainability, into alternatives analysis	Requires that reasons for selecting preferred alternative(s) take into account health criteria
Provides guidance for integrating ecological environmental concerns, including ecological sustainability, into alternatives analysis	Defines rationality to include organizational learning and ability to positively respond to conflict	Provides guidance for integrating health concerns, including health sustainability, into alternatives analysis
Ensures consistency with ecological rationality principles	Designs to overcome tension between political and technical; ensures procedural justice	Recognizes that health-related policy making is generally incremental
Focuses on biodiversity conservation; builds in biodiversity objectives	Integrates SIA principles, good practices, and social performance standards	Explicitly identifies health-related values, objectives, and criteria
Integrates EcIA principles and good practices	Identifies social justice and community cohesion issues	Clearly and broadly defines health
Includes principle of "no net biodiversity loss"	Includes human rights and free, prior, and informed consent principles	Fully engages health professionals and community
Integrates international, national, regional, and local biodiversity priorities and targets	Includes all values and interests of parties in goals	Integrates HIA principles and good practices
Screens alternatives that result in irreversible biodiversity loss	Integrates social scientific and indigenous knowledge	Fully engages health experts and community in alternatives identification
Seeks alternatives that minimize biodiversity loss	Identifies alternatives that go beyond preventing negative (e.g., building social capital, capacity building, good governance, community engagement, social inclusion)	Focuses on alternatives that enhance ability of decision makers to make precautionary decisions
Seeks alternatives that make positive contribution to biodiversity	Links values and interests to proposed alternatives	Gives greater emphasis to broadly defined, alternatives (e.g., knowledge, institutional, and goal alternatives)
Assesses in terms of potential to contribute to biodiversity conservation and ecosystem services	Public acceptance should be a strategic priority	Fully and proactively integrates health concerns into alternatives evaluation
Assesses differences in biodiversity risks and opportunities	SIA and community outreach should contribute to the identification of alternatives	Emphasizes decision-making effectiveness, equity and differences in health outcomes among alternatives and across populations
Assesses differences in degree of threats to species and habitats	Ensures environmental and social justice issues are fully described and analyzed	Provides, in evaluation, for negotiations among interested parties
Integrates uncertainty factors into comparison of biodiversity differences (e.g., sensitivity analyses)	Integrates social risk assessment	Takes into account social and behavioral aspects of health
	Recognize critical role of perceived impacts	
	Clearly identifies who wins and loses; emphasizes vulnerability of underrepresented and disadvantaged populations; and emphasizes enhancement of lives of vulnerable and disadvantaged	
	Seeks consensus with community	
	Seek socially just distributional outcomes	
	Seeks to facilitate poverty alleviation through sustainable development	

Sources: Becker et al. (2005), Binder et al. (2010), Bond (2010), Bond et al. (2012), Burdge (2004), Croal et al. (2010), Dalal-Clayton and Sadler (2004), Desmond (2007), Donnelly et al. (2006, 2007), Donnelly et al. (2008), Dovers (2005), Eales and Sheate (2011), Égré and Senécal (2003), Elling (2007), Esteves et al. (2012), Fischer et al. (2010), Geneletti (2003, 2005), Genter et al. (2008), Gibson (2006a, 2011), Hacking and Guthrie (2008), Hassan (2008), Hansen and Kørnøv (2010), Harris-Roxas et al. (2012), ICPGSIA (2003), Jiliberto (2011), João and Mclauchlan (2011), Karjalainen and Järvikoski (2010), Khera and Kumar (2010), Kobus (2005), Lane et al. (2003), Kemm and Parry (2004a,b), Kolkman et al. (2007), Lemonick (2010), McCluskey and João (2011), Meynell (2005), Partidário (2007), Partidário and Coutinho (2011), Pope and Grace (2006), Pope et al. (2005), Schmidt (2011a,b), Sheate (2011), Sinclair et al. (2009), Steinemann (2001), Stoeglehner et al. (2010), Smith (2007), Slootweg et al. (2010), Slotterback (2008), Thérivel (2010), Thérivel and Partidário (1996), Tickner (2004), Treweek et al. (2011), Vanclay (2006), Youngkin et al. (2003), Wiek and Binder (2005).

reasoned substantiation of all choices, and a proactive effort to making the process more environmentally substantive.

Strategic Environmental Assessment (SEA) At the SEA level, rationality good practice is concerned with mainstreaming environmental concerns into decision making. Increasingly, it is largely about the reasoned marriage of ends and means, within an organizational/social learning, iterative, creative and adaptive, context-dependent, decision/policy oriented, holistic, and participatory framework. In recent years, it has become much less about the systematic application of technical/scientific models and methods, generally borrowed from EIA theory and practice. This pattern is especially evident at the policy level.

Environmental Impact Assessment (EIA) Project-level EIA rationality good practices seek to broadly define ends (e.g., need, goals, objectives, and criteria) and means (e.g., alternatives, mitigation/enhancement measures). This is a departure from earlier process formulations, which tended to downplay ends and focus instead on ameliorating the negative effects of a predefined proposed action. Contemporary EIA-level rationality good practice tends to take the form of reasoned, inclusive, and substantiated argumentation rather than technical, expert-driven analysis, although the latter still assumes an important support role. EIA-level rationality also devotes more attention to such matters as nonstructural alternatives, indirect and cumulative effects, the distribution of consequences (especially with regard to vulnerable populations), risk and uncertainty management, and links between effects and ecological/community capacity.

Ecological Impact Assessment (EcIA) Rationality in EcIA combines the rational model (e.g., objectives, alternatives, support by experts and scientific methods) with substantive ecological knowledge, principles, and priorities. It is especially focused on such themes as maintaining and enhancing biodiversity, and avoiding and minimizing threats to rare and endangered species and habitats. It counterbalances a technical/scientific orientation with a holistic perspective, and an emphasis on uncertainty management and adaptability.

Social Impact Assessment (SIA) SIA is more ambivalent about rationality. It explicitly recognizes the tension between the technical and the political, and the tendency of technical/social scientific SIA approaches to inhibit collaborative public involvement. Nevertheless, SIA rationality good practices explicitly identify ends, suggest alternatives, and screen and compare alternatives in terms of ends achievement. However, SIA rationality good practice tends to ameliorate the negative tendencies of technical–rational analyses by, for example, explicitly integrating social values and ethical procedural and substantive principles (e.g., human rights, social justice); emphasizing options that meet social needs and aspirations (e.g., social capital, good governance, social inclusion); stressing the value of and need for community knowledge, perceptions, involvement, influence, support, and acceptance; and focusing on the distribution of benefits and adverse effects (with particular regard to the vulnerable and disadvantaged).

Health Impact Assessment (HIA) Rationality in HIA wavers between a "health sciences"–technical–quantitative rational model and an inclusive–collaborative–qualitative–social science reasoning model to the integration of health concerns into decision making. The former approach is more top-down, narrowly defined, and expert driven. The latter approach is more bottom-up, broadly defined, and community driven. Some efforts have been made to combine elements of both approaches. Such integrated approaches offer the potential to take advantage of the positive tendencies of rational–technical analysis while offsetting its negative tendencies. Both approaches seek to fully integrate health concerns into the determination of ends (e.g., health-related values, objectives, and criteria) and into the generation and evaluation of means (e.g., health outcomes, the distribution of health effects). They also seek to better engage both health professionals and the community in the process.

Sustainability Assessment (SA) Rational SA practice tends to maintain the positive and negative tendencies of rationality in a sort of dramatic tension. Much is made of the need to explicitly identify sustainability objectives, criteria, and targets, to broadly define alternatives, and to systematically screen (e.g., against sustainability thresholds) and compare (e.g., trade-off rules) alternatives in terms of if, and the extent to which, they support sustainability ends. At the same time, SA good practices seek to offset the negative tendencies of technical–rational approaches (e.g., reductionist, inhibits public involvement, lacking substance, overestimates certainty, limits decision-making influence, value free) by, for example, emphasizing holistic, transdisciplinary synthesis, stressing the need for collaboration among interested and affected parties, pointing to the importance of resilience and precaution, identifying and applying explicit criteria and decision rules that bound and direct decision making, and integrating explicit substantive environmental values, ends, limits, and perspectives.

5.6 CONTEMPORARY CHALLENGE—SITING "LOCALLY UNWANTED LAND USES"

5.6.1 The Challenge

One of the most vexing problems in contemporary IA practice is the siting of locally unwanted land uses (LULUs) (examples include pipelines, power plants, waste treatment/disposal facilities, and mines), where there is a broad public interest (at least from the perspective of most senior governments and proponents); the prospect of increased

local employment, purchases, and payments (although often not equitably distributed); a concentration of negative environmental and social effects and risks in the vicinity of the proposed facilities; and serious doubts (at the local level and from the perspective of broader public interest groups) regarding the long-term sustainability of such undertakings.

The conventional approach to the siting of such facilities has been largely rational and technical. Areas and sites have been systematically analyzed for environmental suitability (both for minimizing constraints and for taking advantage of opportunities), and for the effective and efficient provision of services. Options have been systematically identified, screening, and compared. Ample provision is generally made for public and agency involvement (largely in the form of information and consultation) prior to key decision points in the siting process. This "track record" of rationally driven approaches (highlighted as the environmental suitability siting approach in Table 5.5) has been mixed at best. Intense regional, local, and often and international national opposition has been commonplace. Need is challenged, especially on sustainability grounds. Severe doubts are raised regarding whether the frequency and severity of environmental and social impacts and risks have been underestimated. Fairness, both in a procedural and substantive sense, and in terms of the distribution of facilities and costs and benefits over space and time, tends to be a major area of concern. Another recurrent concern has been the limited influence that other affected and interested parties, especially local communities, have over either the process or its outcomes. These parties argue that they need and deserve much more influence and control over the siting process and regarding if, where, in what form and pace such facilities should be established and operated. These equity and community control concerns have led to the gradual emergence of alternative siting processes (as highlighted in Table 5.6 and as described in Section 5.2.1).

Table 5.5 Major Siting Approaches and Subsets

Environmental Suitability	Social Equity	Community Control
Constraint Minimization • Area screening/identification • Site screening/identification • Site comparison	*Fairness: Distribution of Facilities* • Unfair locations • Fair locations	*Locational Control* • Voluntary communities/local veto • Voluntary site location • Voluntary sites • Voluntary access routes • Combinations of above
Opportunity Maximization • Physical suitability • Existing facilities • Site rehabilitation • Compatible land uses • Available lands • Performance standards—private bids	*Fairness: Distribution of Costs and Benefits* • Avoid imbalances • Redress imbalances • Redistribute to more than redress imbalances	*Procedural Control* • Citizen siting authority • Siting partnerships • Citizen advisors • Use of third parties
Service Maximization • Service to facility • Service from facility	*Procedural Fairness* • Participant/intervenor funding assistance • Conflict resolution/consensus building • Community involvement	*Facility Control* • Needs analysis • Policy/program options • Alternative technologies • System characteristics • Facility characteristics • Facility management
Variations and Combinations • Evaluation methods • Project types • Proponent type • Impact management methods • Environmental context • Siting requirements • Combinations	*Variations and Combinations* • Procedural fairness and location distribution fairness • Location distribution fairness and fairness in distribution of benefits and costs • Procedural fairness and fairness in distribution of benefits and costs	*Variations and Combinations* • Locational/procedural control • Procedural/facility control • Locational/facility control • Locational/procedural and facility control

Source: Adapted from Lawrence (1996).

Table 5.6 Examples of Good Practices—Siting Locally Unwanted Land Uses

Context (framing)	View proponents and proposed actions as proactive, potential catalysts/bridges for lasting, desirable, and resilient social and ecological future through the provision of improved services, infrastructure, building, employment, local development initiatives, and other community and ecological benefits Place within the context of and complement existing policies, plans, and programs (e.g., sector, regional, land use, conservation); supplement, as needed, to fill gaps (e.g., SEA) before process commences Clarify intergovernmental revenue-sharing policies and protocols and proponent and government's social, economic, and ecological responsibilities, policies, and obligations Make effort to address preexisting environmental concerns and relationship difficulties among key parties Ensure appropriate policies, legal framework, approval procedures, and mechanisms in place (e.g., sustainability test, requirement to enhance positive effects, authority to address such issues as cumulative effects, equity issues, legacy and bridging impacts, pace and scale of development); reform as needed Ensure appropriate guidance materials in place (e.g., collaborative consultation, ethical standards) Draw upon lessons and insights regarding other social dilemma situations and intractable environmental disputes Seek enhanced understanding of nature and basis for both social and private determinants of opposition in comparable situations
Start-up	Seek voluntary opportunities (e.g., voluntary communities and routes) Actively seek "buy-in" by all parties of process and outcomes (i.e., free, prior, and informed consent); seek financial and nonfinancial partnership among proponent, government, and communities Undertake comprehensive ecological, social, and economic profile of region; ensure sound understanding of regional and local context and issues Assess baseline ecological and social carrying capacity (focus on enhancing) and cumulative effects (focus on avoiding and ameliorating) Predict a range of potential and likely baseline futures, identify a range of reasonably foreseeable expansions and future developments, and identify all planned, proposed, and likely future activities affecting the same environment Ensure appropriate range of technical/scientific and procedural specialists; ensure good proportion of local staff and sustained involvement of SIA and public involvement practitioners Clearly and, where necessary, legally define all key terms
Scoping	Design approach, jointly with interested and affected parties to suit context (e.g., prior experiences, cumulative effects, local values, and priorities) Embed framing and start-up commitments in scoping Identify and characterize (e.g., nature, distribution, extent shared or conflicting) local concerns, preferences, interests, and values from outset Clearly define meaningful consultation, empowerment, contextually appropriate benefits, and what constitutes success for each party Ensure process is thorough and efficient Ensure early consideration of positive impacts, benefits, and beneficiaries
Guidance	Jointly determine values, goals, objectives, criteria, and limits to guide and bound process Guide by ethical principles (e.g., inter and intragenerational equity, internalization of costs, polluter pay, protection and promotion of health and safety, precautionary, multisectoral integration, duty to consult, integration of human rights—personal, property, indigenous peoples) Maximize sustainability opportunities Seek social, economic, and community development; improved health and well-being; improved biodiversity; restored ecosystem and landscape character; and protected and respected cultural heritage resources Design process to be consistent with IA and environmental management best practice and with social performance standards
Procedural screening (unacceptable)	No infringement of human and indigenous rights No use of violence, intimidation, harassment, or undue force No bias or withheld information (lack of transparency) No use of benefits to "cover up" negative, knowledge gaps, lack of data, political or institutional barriers, or to "win favor" for harmful projects No one-way communications or "token" consultation Insufficient time or resources to meaningfully participate No procedural inequities or unfairness No procedures inappropriate to context

(*continued*)

Table 5.6 (*Continued*)

Substantive screening (unacceptable)	No compromise of health or safety standards No compromise of environmental standards or IA requirements Consistent with government policies and targets (consistent with public interest) No unsustainable options No severe risks to protected areas and species No net significant adverse effects (environmentally unacceptable) No significant uncertainties regarding potential for catastrophic long-term consequences Scale, pace, or location of project not to exceed or threaten to exceed ecological, social, or institutional carrying capacity, including consideration of cumulative effects
Comparative process/IA	Institute collaborative process including early and ongoing involvement and meaningful participation and reassurance Ensure open and transparent process with broad scope of community involvement (e.g., use of interactive community forums) and particular effort to involve underrepresented and disadvantaged populations Ensure procedurally equitable and fair process Search for synergistic, enduring opportunities to meet both proponent goals and broader benefits to community and environment; seek to match project benefits and community needs and aspirations Anticipate and deal with issues before they become problems; seek best possible compromise Give due consideration to all reasonable alternatives (including no action, environmentally preferred, all alternatives proposed by interested and affected parties, scale and pace options, alternative goals, institutional alternatives); interweave ends and means and explicitly justify trade-offs Seek consensus in choice of preferred alternatives, mitigation/enhancement measures, local benefits, and impact management strategy Assess environmental and social sustainability and capital, with and without project and, if practical, against control communities Give full consideration to locally appropriate mitigation and enhancement (enhancement hierarchy—project, local area, wider area) Systematically identify and address uncertainties in a manner consistent with precautionary principle Test robustness of alternatives and effects assessment against varying project and baseline scenarios
Preferred procedural outcomes	Project is acceptable to market, is politically acceptable (at all levels), and is broadly acceptable to and supported by community and public; free, prior, and informed consent (clearly and consistently defined) Complements and consistent with relevant policies, plans, programs, and projects Facilitates critical social learning Political efficacy and participatory democracy strengthened Decision making decentralized (subsidiarity) Shared and collaborative decision making Equitable and fair decision making Communities have capacity and resources to maximize project benefits Facility comanagement (proponent, government, affected communities/publics)
Preferred substantive outcomes	Contributes to ecologically, economically, and socioculturally sustainable environment, with dependencies recognized, mutually reinforcing gains, trade-offs a last resort, trade-off rules, and future protected Net biodiversity benefits or enhancements, restored biodiversity, improved biodiversity security, improved ecosystem services, and improved ecological resilience Contributes to equitable/just environment, over space, over time, and among populations and communities, with emphasis on enhancement of marginalized groups and correction of past injustices Community cohesion, capacity building, empowerment and realization of human and social potential furthered, dependence reduced, and social and ecological diversity and resilience maintained and enhanced Provides catalyst for realization of community aspirations and human potential and helps build social and human capital
Formalizing decisions	Impact management and benefits agreements with affected communities (e.g., employment opportunities, community investment, environmental restrictions, revenue sharing, dispute resolution, social and cultural programs, local content requirements—participation of local people in work force and supply chain) Joint determination, with communities, of community investment opportunities; considerable local discretion in how payments spent

Table 5.6 (*Continued*)

	Transition planning agreements and plans and initiatives to build individual, community and entrepreneurial capacities, sufficient transition funding and post project legacy funding; funding structured to smooth "boom and bust" cycle and extend beyond project life
	Control of SIA by indigenous people, where applicable
	Intergovernmental revenue sharing and implementation responsibility agreements
Implementation and follow-up	Ensure impact management goes well beyond compliance and physical effects management (e.g., cumulative effects management, anticipating and recognizing emerging concerns, socioeconomic positive and negative effects, benefits enhancement)
	Ensure environmental changes, and positive and negative direct, indirect and cumulative effects independently monitored and adjusted as needed
	Seek to extend reach of benefits, ensure equitable sharing, and link socioeconomic IA to sourcing strategies
	Incorporate contingency planning and design adaptive management strategies
	Clearly define follow-up responsibilities by party; hold accountable
	Make provision for interested and affected parties to help select indicators and measures of social and environmental impacts and benefits and determination of appropriate responses
	Integrate impact management objectives identified by community and ensure sufficient resources so that communities can monitor and manage social impacts themselves; provide guidance and assistance as needed
	Incorporate credible and effective grievance mechanisms (principles, process, and resources) (including possible use of ombudsman)
	Ensure sufficient resources for post approval impact management, including provision for independent oversight and full community involvement in monitoring and management
	Work with communities and government to institute, maintain, and enhance necessary institutional and organizational changes
	Ensure all levels of government have institutional and financial capability to undertake follow-up responsibilities; facilitate capacity building as needed
	Undertake independent procedural and substantive effectiveness audits
	Share lessons, best practices, experiences, and insights
Knowledge support	Undertake broad ranging and integrated environmental suitability and impact assessment (ecological; social–psychological; health; sustainability; direct, indirect, and cumulative; positive and negative) analyses
	Assess distribution of costs and benefits, including environmental justice issues
	Assess indirect, cumulative, legacy, and bridging effects; assess impact management preparedness
	Analyze risks and uncertainties from a precautionary perspective
	Fully integrate community and indigenous knowledge
	Fully integrate scientific and technical knowledge
	Undertake social development needs and infrastructure and service capability analyses
	Undertake decision-making effectiveness and community goals achievement analyses
	Systematically draw upon experiences elsewhere and good practices
Procedural/community support	Provide resources for independent review of technical/scientific analyses
	Use a combination of methods (e.g., surveys, literature review, interviews, meetings), appropriate to context, to determine public attitudes, preferences, and environmental perceptions (including perceived risks)
	Integrate local knowledge and experience
	Integrate traditional knowledge and respect intellectual property rights
	Provide for early and ongoing public participation, including community outreach
	Allow for third-party assistance (e.g., facilitation, mediation)
	Provide translation as needed
	Ensure procedural fairness; necessary if process legitimacy is to be accepted
	Provide necessary resources (e.g., funds, training) for meaningful participation, including sufficient time and money to meaningfully participate
	Undertake stakeholder participation effectiveness analysis
	Undertake independent research of effectiveness of impact and benefits agreements

Sources: Ahmadvand and Karami (2009), Armour (1990a), Bond et al. (2012), Booth and Skelton (2011b), Burdge (2004), Campbell (2003), Cavatassi and Atkinson (2003), Edelstein (2003), Égré and Senécal (2003), Esteves and Barclay (2011), Esteves and Vanclay (2009), Esteves et al. (2012), Fischer (2003), Galbraith et al. (2007), Gibson (2006a, 2011), Harris et al. (2003), Harris-Roxas et al. (2012), IAIA (2003, undated b), ICPGSIA (2003), IFC (2009), João et al. (2011), Karjalainen and Järvikoski (2010), Lane et al. (2003), Noble (2009b), O'Faircheallaigh (2009), Orenstein et al. (2010), Rajvanshi et al. (2011), Ross and McGee (2006), Rowan and Streather (2011), SPTF (undated), Storey and Jones (2003), Tamburrini et al. (2011), Vanclay (2003), Walker (2003, 2010), Weaver et al. (2008), Wlodarczyk and Tennyson (2003), Wolsink (2010), Youngkin et al. (2003).

5.6.2 Generic Siting Approaches

As illustrated in Figure 5.5, the subsets within these three major siting processes and the siting processes themselves overlap to a considerable degree. These overlaps are critical inasmuch as any one approach will and has been criticized for ignoring or undervaluing the legitimate concerns that the other approaches represent. The question then becomes which combinations of approaches are best suited to the siting of "locally unwanted land uses". Some recent siting initiatives have tended to retain the rational–technical approach as the core, but then have addressed equity concerns through an increased emphasis on local benefits (often formalized in local benefits agreements) and local control concerns through a greater community role in facility design and operation (often formalized in impact management agreements). Although ameliorating some equity and community influence concerns, intense opposition has tended to continue on the grounds that issues of need and sustainability have been glossed over and many environmental and community concerns have not been addressed or addressed adequately. Positions for and against such facilities have tended to remain polarized. The question that remains then is—are there other approach combinations available that come closer to

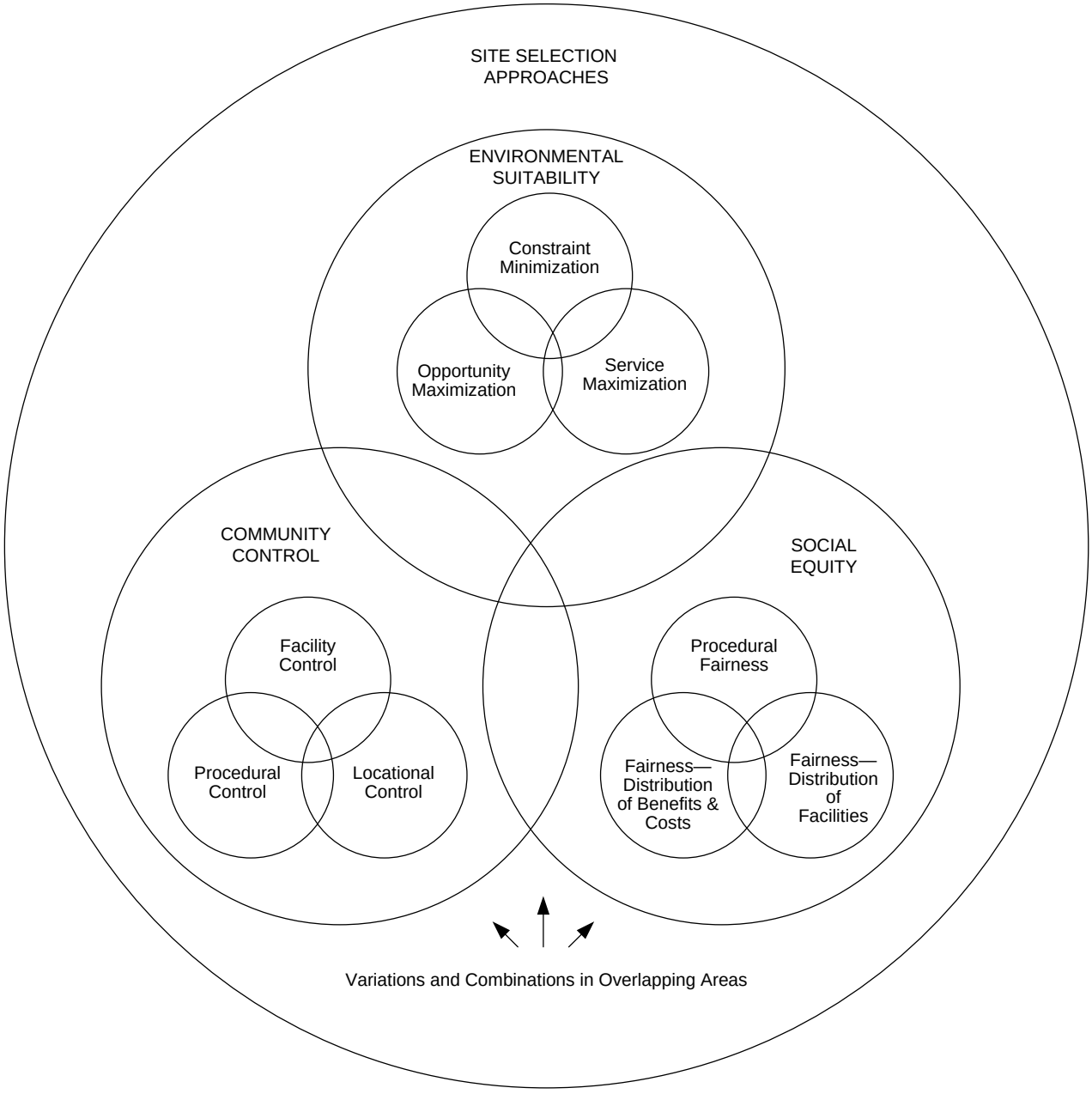

Figure 5.5 Site selection approaches. Adapted from Lawrence (1996).

adequately addressing the concerns and preferences of all interested and affected parties?

5.6.3 An Example of LULU Siting Process

Premises A possible departure point is the good practices suggested in IA literature for siting LULUs. Table 5.6 provides a consolidated list of such practices. An example of a process based on such practices is described below and is highlighted in Figure 5.6. The process begins from four premises: (1) need must be defined broadly (i.e., more than a market opportunity, demonstrably in the long-term public interest); (2) the proposed action is more than a remedy to a need, it also must represent an opportunity and a catalyst for meeting the long term needs and aspirations of a constellation of interested and affected parties, especially the environment; (3) the manner in which the siting process is conducted (i.e., the means) is as important as the needs and aspirations that the undertaking seeks to fulfill; and (4) elements of the community control/social equity approach should drive the process with the rational–technical approach assuming a partial support role, in conjunction with a range of other nontechnical procedural and substantive support mechanisms.

Framing All too often LULU siting processes commence (and often end) before certain framing elements are in place. There should, for example, be a well-defined array of environmental and land use policies, plans, and programs (and related SEAs) in place that establish the strategic context within which the proposed action will be established. The necessary laws, regulations, and guidelines (and related infrastructure) need to be in place. The division of responsibilities and revenues among the key parties needs to be clearly defined. Proactively addressing preexisting environmental problems and inequities in the geographic areas under consideration should be a priority. A concerted effort should be made to draw upon the knowledge base established with comparable projects in comparable environments, with a particular emphasis on understanding and appreciating the basis for opposition to LULUs. The "wheel does not have to be reinvented." Addressing such matters retroactively, through a project-specific EIA, is almost always doomed to failure. Some significant capacity building may be necessary before all parties can actively and fully participate in the process.

Start-up Start-up for a LULU siting process ideally commences with "volunteers" (i.e., areas, communities, and sites potentially willing to "host" a proposed facility). Community acceptance/support always at the end, and preferably from the outset, can go a considerable distance in alleviating the community control concern. Even when a volunteer siting approach is not practical (e.g., fixed pipeline route) or there are no volunteers, the aim always should be to progressively build a financial and nonfinancial partnership among the interested and affected parties, consistent with the "free and informed consent" principle. This may involve formal agreements (e.g., addressing local benefits and impact management)—agreements that are progressively refined through the process, and which are conditional on the final outcomes from the process. Such initial agreements should not be viewed as final, as providing a basis for excluding parties from the process (i.e., uninformed consent), or as a means of compromising substantive or procedural standards. Start-up also entails establishing a comprehensive profile of the region; determining the baseline ecological and social carrying capacity; ensuring a sound understanding of the regional and local context and issues; assessing the implications of preexisting cumulative effects; projecting likely future baseline conditions (preferably with a range of scenarios encompassing varying assumptions); identifying a range of facility-related options, assumptions, and potential future developments (including scale and pace of development choices that the proponent may be reluctant to consider); and identifying other planned, proposed, and likely facilities and activities in the area (to set up the cumulative effects assessment). The necessary range of skills and experiences should be determined, key terms should be defined (to avoid confusion down the line), and an initial study team assembled.

Scoping Scoping is a critical activity if resources are to be effectively and efficiently allocated, if the process is to proceed expeditiously, if critical concerns and issues are to receive the attention they deserve, and if the major parties that could be affected by the proposal are to be fully and effectively involved in the process. Consistent with the community control aspects of the approach, the concerns, preferences, interests, and values of all interested and affected parties should be fully identified and characterized. A particular effort should be made to clearly define what constitutes success, meaningful participation, and empowerment for each party. Consistent with the social equity aspects of the approach, early consideration should be given to potential positive effects, current and anticipated inequities, potential and preferred benefits and beneficiaries, and contextually appropriate benefit enhancement choices.

Siting Process Guidance The outputs from the framing, start-up and scoping activities provide the foundation for siting process guidance activities and documents. Guidance directs and bounds the siting process. The direction (e.g., values, goals, objectives, ethical principles, priorities, and criteria) and boundaries (e.g., ethical limits, beyond the mandate of the parties) for the process should be jointly determined by the interested and affected parties. The maximizing of sustainability should be an integrating theme. Consistent with the mutually reinforcing benefits approach to siting, the guidance activities should seek to structure and direct a process that seeks synergistic, enduring opportunities for all parties, encompassing such concerns as social,

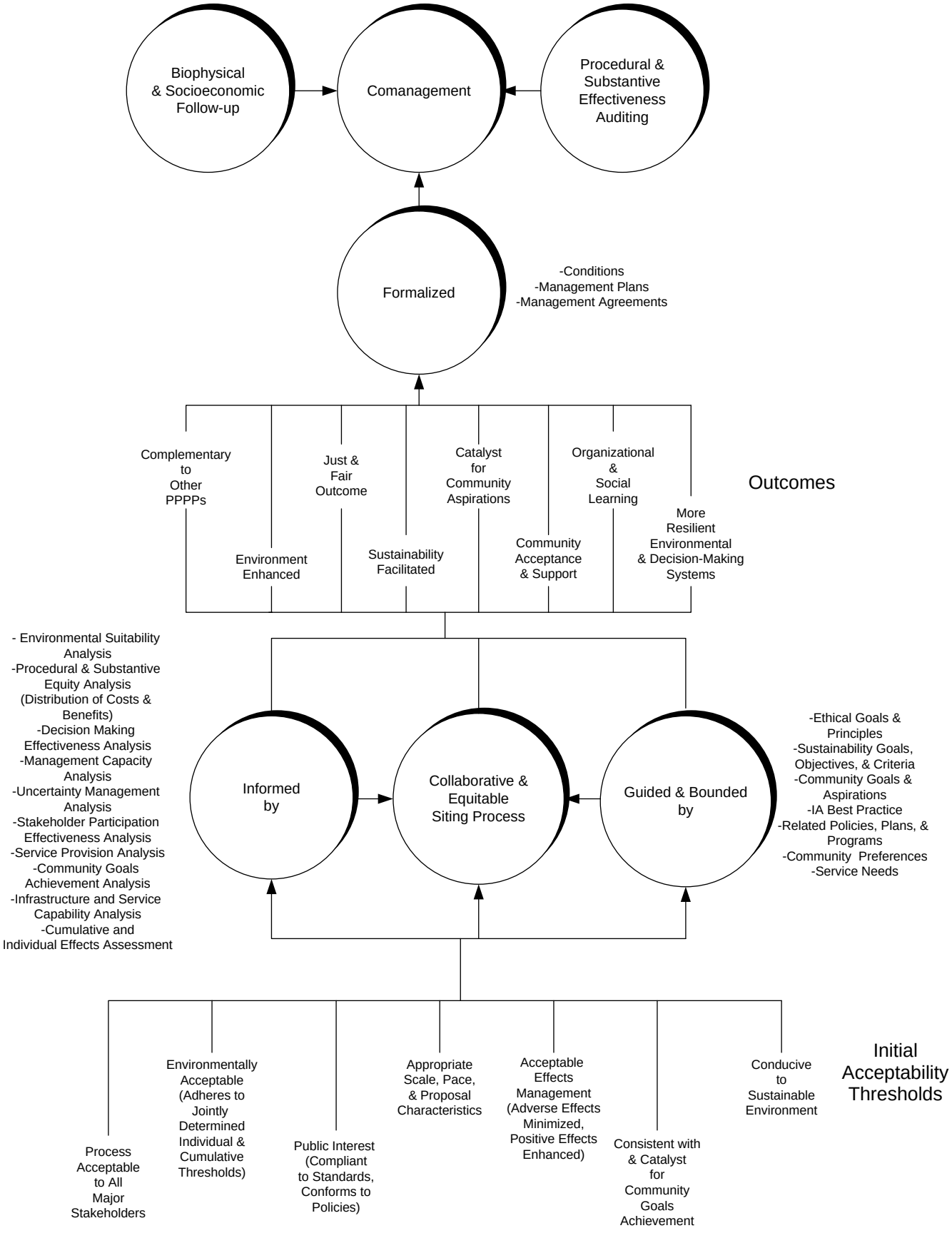

Figure 5.6 A conceptual model for siting LULUs.

economic, and community development; improved health and well-being; improved biodiversity; restored ecosystem and landscape character; and protected and respected cultural heritage resources. Again, recognizing the importance of drawing upon experience elsewhere, particular care should be taken to consider IA and environmental management best practices and social performance standards.

Screening The early and explicit screening of unacceptable procedural and substantive choices is critical to ensuring that the process remains "on track" and potentially acceptable to all the major parties. Clear substantive thresholds of acceptability should be defined and consistently applied. Potential examples include unsustainable options, severe risks to protected areas and species, major uncertainties with the potential for catastrophic consequences, threats to social or ecological carrying capacity, significant adverse individual or cumulative effects, and effects that are likely to contravene or be inconsistent with regulatory standards or public policies. Unacceptable procedural practices (e.g., exclusion from process, insufficient time or resources to participate effectively, intimidation, lack of transparency) also should be explicitly identified. A particular effort should be made to avoid the inappropriate use of benefits to "cover up" negative effects, knowledge gaps, lack of data, or political and institutional barriers, or to "win favor" for harmful projects. Consistent with the community control–social equity thrust of the approach, the line between acceptable and unacceptable procedural and substantive outcomes should be jointly determined by the major parties, and should emphasize avoiding and ameliorating inequities.

Comparative/IA Process The comparative/IA part of the process should focus on identifying and elaborating on a mutually supportive set of enduring benefits that meet both project goals and facilitate the realization of broader community and environmental benefits and aspirations, with a particular emphasis on sustainability. Due consideration should be given to all reasonable alternatives (e.g., no-action, environmentally preferred, alternative goals, all public proposals, institutional alternatives, pace and scale options). Adverse, potentially significant effects should be avoided and mitigated (using locally appropriate measures). Positive effects and benefits should be enhanced (again in a locally appropriate manner). Uncertainties should be systematically identified and addressed in a manner consistent with the precautionary principle. The primary tests of all options and potential mitigation/enhancement measures should be sustainability, community support, outcome fairness, adaptability, consistency with substantive goals, appropriate to context, and supportive of community needs and aspirations. The process should be open, transparent, inclusive, procedural fair, collaborative, and issue-oriented. A special effort should be made to include and address the concerns and interests of disadvantaged and underrepresented populations.

Outcomes The procedural and substantive outcomes from the process should be jointly determined and supported by the major parties. Examples of potentially preferred substantive outcomes include sustainability; net biodiversity benefits; a more equitable and just environment; potential adverse effects prevented, avoided and ameliorated; positive effects generated and enhanced; community aspirations realized; human potential furthered; positive legacy; reduced inequities; greater resilience; and enhanced community capacity, cohesion, and empowerment. Examples of potentially preferred procedural outcomes include market acceptability, community acceptance and support, political support, democracy strengthened, policy consistency, decentralization, and facility comanagement. The outcomes provide the basis for final proposal-related decision making.

Formalizing Outcomes Both procedural and substantive outcomes from the process are formalized in agreements, appreciating that agreement formalization is progressive and parallels the overall siting/IA process. These agreements could address such matters as employment, community investment, revenue sharing, dispute resolution, social and cultural programs, local content, environmental management, division of responsibilities, reporting requirements, capacity building, transitional planning, authority delegation, funding, and comanagement.

Implementation and Follow-up Implementation and follow-up, consistent with the emphasis on community control and social equity, should take the form of comanagement, and should proactively seek to avoid and reduce inequities. It also should be fully informed by technical/scientific analyses and nontechnical knowledge. The parties should work together to select appropriate positive and negative; and direct, indirect, and cumulative measures and thresholds. Independent monitoring and oversight is generally preferred. Responsibilities should be clearly defined. Funding and other resources, organizational reforms, and capacity building will be necessary to ensure the effective participation of all interested and affected parties. Full and ongoing community collaboration is essential, up to and including the delegation and funding, where possible, of SIA monitoring and management. The overall approach to impact management should be guided and directed by sustainability and other substantive environmental imperatives and social equity concerns. It also should be transparent, adaptive, and inclusive. Clearly defined and jointly supported grievance procedures should be instituted. Implementation and follow-up activities should be subject to independent procedural and substantive audits, which, in turn, should contribute to IA, public participation, and environmental management theory building.

Support A LULU siting process, such as the one described above can only be effective if it is fully supported by technical and nontechnical knowledge and by ongoing

public and agency communications, consultation, collaborations, negotiations, and delegation. Technical and scientific analyses, while vital, should not be viewed as the sole or preeminent knowledge source. Community and indigenous knowledge is equally, and in some cases, more important. These knowledge sources should address such matters as options evaluation; environmental suitability and impact assessment (broadly defined); the magnitude and distribution of costs and benefits; risk and uncertainty analysis (from a precautionary perspective); mitigation, enhancement, and impact management; social development needs and infrastructure and service capability and capacity building; decision-making effectiveness; and goals achievement. The knowledge base for the process also should not be limited to the information and knowledge generated within the process. Ample use should be made, with appropriate contextual adjustments, of comparative experiences, knowledge, and good practices. An effective LULU siting process must be inherently collaborative. This necessitates ample and appropriate procedural support encompassing such matters as independent peer review, an extensive array of public participation methods and specialist advice, procedures for integrating community and traditional knowledge, procedures for determining and applying procedural ethical principles, third-party assistance (e.g., facilitation, mediation), and translation services. A particular effort should be made to enable (with appropriate resource and capacity building support) interested and affected parties (especially indigenous peoples and local communities) to undertake their own consultation and knowledge-building activities.

Future Steps The example process represented in Figure 5.6 and described above, and the good practices presented in Table 5.6, are far from a formula for siting LULUs. Some disputes are simply intractable, regardless of how they are approached. Many of the measures are untested in practice. What is successful in one context could be singularly unsuccessful in another. Definitions of success will vary, sometimes dramatically. Individual measures that generally work well may operate at cross-purposes when combined with certain other measures. What is, however, evident is the considerable gulf between good practice performance standards and the current state of practice. What is needed is the systematic effectiveness testing of various combinations of suggested good practice LULU siting approaches in a range of contexts. Rational analyses could assume a worthwhile, albeit partial, support role in such endeavors.

5.7 SUMMING UP

This chapter addresses the question of whether and how IA processes, documents, and methods can become more rational.

The three stories offer different perspectives on the potential roles of reasoning and technical analysis in the IA process. The first story shows how the Willing Host approach, to siting locally unwanted land uses, offers a potentially creative procedure for introducing reason into complex and contentious IA problem solving. The second story describes a community-based SEA reasoning approach that adheres to the major rational planning steps while still being highly collaborative, and able to effectively draw upon sound rational–technical analysis. The third story describes an IA process, which relied heavily upon technical quantitative analysis but also which was undertaken in a manner that supported and informed rather than supplanted the decision-making role of planners, policy makers, and the public working together. The three stories demonstrate that there is a potential role for rationality in the IA process but that role tends to be more effective when it assumes a support role (rather than driving the process), when there is a high degree of community collaboration and influence, when procedural and substantive equity issues are explicitly addressed, and when proactive steps are taken to offset the negative propensities of rational IA processes.

The problem can be posed in three ways: (1) IA processes in practice are insufficiently rational; (2) IA processes in practice are too rational; and (3) the ways in which rationality is defined and applied in IA processes need to be modified. There are valid arguments in support of all three positions. The problems are addressed by exploring the potential to apply rationality strengths, minimize rationality deficiencies, and draw upon alternative rationality definitions and applications.

Rationality attributes (e.g., logical, consistent, systematic) are identified and contrasted with irrational and extrarational decision-making factors. There are many rationality forms relevant to IA process management. Rationality expressions and applications vary depending on context. The rational process, as commonly described, involves defining a problem, identifying goals, collecting and analyzing information, forecasting and modeling future conditions, generating and evaluating alternatives, and implementing the preferred alternative. Public and agency involvement tends to take place prior to major decisions in the process. A great many assumptions have been ascribed to rationality. Ascribed rationality assumptions should be carefully considered because they are often implicit in IA processes.

Many strengths and limitations are attributed to the rational process. These strengths and limitations are tendencies that can be offset or reinforced. Several responses to the identified shortcomings bound and focus the process in an effort to make it more realistic and effective. Others selectively adapt and combine social, political, legal, ecological, and communicative rationality forms to make the process more substantive and democratic.

Rationality strengths and limitations are evident in rationality-based IA practice. IA has avoided some rationality limitations partly because of IA process characteristics (e.g., environmental ethic, scoping, cumulative effects assessment)

and partly through deliberate efforts to offset negative tendencies. This is especially the case for SEA. Many rationality debates are mirrored in IA literature. IA literature and practice could derive additional benefits from a closer examination of the rationality debates both within and external to IA literature and practice.

Each of the four jurisdictions address, in different ways, purpose and need, the generation of alternatives, the screening of alternatives, and the comparison of alternatives. The range of rationality approaches encompassed by the four jurisdictions, while instructive, fall well short of good regulatory practice, in general, for different IA levels (e.g., SEA, project-level EIA), and for various IA types (e.g., EcIA, SIA, HIA, and SA). A greater effort could be made to draw upon these good practices.

The example rational IA process characterizes the problem or opportunity, analyzes need, determines the process and proposal purpose, and assembles a study team. Goals, objectives, principles, and priorities are determined. Alternative goals, objectives, and principles are formulated, where warranted. Methods are identified. An environmental overview is conducted. A scoping program is formulated and applied. Boundaries for the process are identified. Internal and external constraints and opportunities are identified. The proposed actions are described. Potentially reasonable ways of meeting the objectives and satisfying the principles are assessed. Unreasonable alternatives are excluded by applying exclusionary criteria. Reasonable alternatives are compared using evaluation methods, which combine scaled effects with criteria rankings and weightings. Uncertainties and variations in preferences are addressed through sensitivity analyses. Mitigation potential is integrated into the analysis. The analysis is supported by methods refinements and by data collection, analysis, prediction, and interpretation. The alternative means of carrying out of the proposed actions also are assessed. The same basic steps are followed but at a greater level of detail. Baseline conditions are characterized and individual and cumulative impacts, stemming from the proposed action, are identified, predicted, and interpreted, in parallel with the alternatives to and alternatives means analyses.

An impact management program refines and facilitates the implementation of the proposed actions. Options associated with the management program are generated and assessed in a manner comparable to the alternatives analyses. A clear and consistent decision-making basis is established, taking into account agency and public comments and suggestions. If approved, monitoring and auditing programs are undertaken. The monitoring program minimizes adverse impacts and maintains or enhances benefits. The auditing program facilitates methodological refinements. The process is supported by technical studies, reviews of comparable proposals and environments, peer reviews, and applied research. The public identifies concerns and suggestions and responds to analyses and documents. Communications and involvement distortions and inequities are minimized. Periodic interim reports are released. The draft and final report are broadly distributed. The documents provide a clear, unbiased, systematic, and accurate decision-making basis.

Good practice guidance is described for making IA more rational at the SEA and project EIA levels, and for EcIA, SIA, HIA, and SA. Each IA type seeks, albeit in different ways, to draw upon the positive tendencies and offset the negative tendencies of rationalism. There is considerable potential for mutual learning. At the same time, differences in approach, perspectives, and values need to be respected.

The siting of locally unwanted land uses represents one of the most vexing problems in contemporary IA practice. The "track record" of conventional technical rationality-driven approaches has been mixed at best. Intense opposition is commonplace, and is often based on valid procedural and substantive criticisms of the process and its outcomes. A greater effort needs to be made to integrate aspects of social equity and community control siting approaches with the more technical aspects of environmental suitability analysis. Rational–technical analyses tend to be more effective, in the siting of LULUs, when they serve a support role to more social equity–community control approaches. Experience in the field has evolved to the point that important insights, appreciating the need for contextual adjustments, can be gained by drawing upon good practice guidance for framing the process, for individual process activities (e.g., start-up, scoping, screening, comparison, formalizing decisions, implementation, and follow-up), and for supporting the process (both knowledge support and procedural/community support). Sufficient experience also has been acquired to suggest possible procedural and substantive screening thresholds and possible preferred procedural and substantive outcomes. Examples of good practice guidance for siting LULUs are presented. More applied research is needed to determine which combinations of practices are most appropriate to which combination of contextual characteristics.