Plurality of Values

in

Environmental Decision Making

by

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Abstract

The paper tries to demonstrate that we can acknowledge the environment as a site of conflicting values and, at the same time, we can hold the *strong comparability* assumption in the form of *weak commensurability* that leads to *algorithmic solution* of complex and multifaceted environmental decision problems. *Responsibility* is at the heart of such an approach.

The principle of responsibility developed by *Hans Jonas* requires caring for the beings affected by our decisions and actions. *Responsible decision making* is best viewed as a synthesis of reverence for the ethical norms, rationality in goal achievement, and respect for the stakeholders. Decision makers should develop *critical sensitivity* for and *empathy* toward human and non-human beings with which they share a common environment.

A provoking case concerning the *World Bank environmental policy* is provided to illustrate the complexity and ethical implications of solving multicriteria environmental problems.

Keywords:

comparability of values, responsibility, deontology, rationality & respect, maximin decision rule,

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Cost-benefit analysis often leads to perverse decisions and misleading policy directions in multicriteria environmental problems. A provoking case concerning the *World Bank environmental policy* can illustrate the point.

In the early 1990s, some economist advisors of the World Bank were considering that the World Bank should encourage *more migration* of *dirty industries* to *less developed countries*. The argument was as follows:

"The measurement of the costs of health-impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health-impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages. (...) The costs of pollution are likely to be non-linear as the initial increments of pollution probably have very low cost. (...) The demand for a clean environment for aesthetic and health reasons is likely to have very high income-elasticity. The concern over an agent that causes a one-in-a-million in the odds of the prostate cancer is obviously going to be much higher in a country where people survive to get prostate cancer than in a country where under-5 mortality is 200 per thousand. Also, much of the concern over industrial atmospheric discharge is about visibility-impairing particulates. These discharges may have very little health impact. Clearly, trade in goods that embody aesthetic pollution concerns could be welfare enchanting." (*The Economist,* February 8, 1992)

I.   Comparability of Values?

Juan Martinez-Allier, *Giuseppe Munda*, and *John O'Neill* propose to distinguish between *strong comparability* of values and *weak comparability* of values. The former means that there exist a single comparative term by which all different actions can be ranked and the latter means that irreducible value conflict is unavoidable but compatible with rational choice employing practical judgement. Strong comparability implies *strong commensurability* (common measure of the different consequences of an action based on cardinal scale of measurement) or *weak commensurability* (common measure based on an ordinal scale of measurement). (Martinez-Allier et. al. 1998)

If we accept weak comparability then we should arrive at the methodological conclusion that there is *no algorithmic solution* to multicriteria environmental problems. The basic problem with non-algorithmic approaches is that they are *indeterminate* in the sense that they may permit solutions, which are *incompatible* with *strong sustainability*.

In this paper I try to demonstrate that we can acknowledge the environment as a site of conflicting values and, at the same time, we can hold the *strong comparability* assumption in the form of *weak commensurability* that leads to *algorithmic solution* of complex and multifaceted environmental decision problems. *Responsibility* is at the heart of such an approach.

II.   The Principle of Responsibility

Hans Jonas, the outstanding German-American philosopher has injected the problem of moral responsibility in the contemporary moral discourse. Jonas published the German version of his theory of responsibility in 1979 under the title "*Das Prinzip Verantwortung. Versuch einer Ethic fur die Technologische Zivilization*". The re-written and enlarged English edition was published in 1984 under the title "*The Imperative of Responsibility: In Search of an Ethics for the Technological Age*". (Jonas, H. 1979, 1984)

Jonas argues that the nature of human action has changed so dramatically in our times that this changed nature of human action calls for a radical *change* in *ethics* as well. He emphasises that in previous ethics "all dealing with the nonhuman world, that is, the whole realm of techne was ethically neutral. Ethical significance belonged to the direct dealing of man with man, including man dealing with himself: all traditional ethics is *anthropocentric*. The entity of 'man' and his basic condition was considered constant in essence and not itself an object of reshaping techne. The effective range of action was small, the time span of foresight, goal-setting, and accountability was short, control of circumstances limited." (Jonas, H. 1984. pp. 4-5.)

According to Jonas new dimensions of responsibility emerged because *nature* became a subject of human responsibility. This is underlined by the fact of the irreversibility and cumulative character of human impact on the living world. *Knowledge,* under these circumstances, is a prime duty of man, and must be commensurate with the causal scale of human action. We should seek "not only the human good but also the good of things

extrahuman, that is, to extend the recognition of 'ends in themselves' beyond the sphere of man and make the human good include the care of them." (Jonas, H. 1984. pp. 7-8.)

For Jonas an imperative that is responding to the new type of human action might run like this. "*Act so that the effects of your action are compatible with the permanence of genuine human life*". Or expressed negatively: "*Act so that the effects of your action are not destructive of the future possibility of such life*". (Jonas, H. 1984. p. 11.)

Jonas argues that our duties to the *future generations* and to *nature* are independent of any idea of a right or reciprocity. Human responsibility is basically a *non-reciprocal duty* to *guarding beings*.

Jonas states that the necessary conditions of moral responsibility are as follows. "The first and most general condition of responsibility is causal power, that is, that acting makes an impact on the world; the second, that such acting is under the agent's control; and the third, that he can foresee its consequences to some extent." (Jonas, H. 1984. p. 90)

Jonas underlines the fact that prospective responsibility is never formal but always *substantive*. "I feel responsible, not in the first place for my conduct and its consequences but for the *matter* that has a claim on my acting." For example "the well-being, the interest, the fate of others has, by circumstance or by agreement, come to my care, which means that my control *over* it involves at the same time my obligation *for* it." (Jonas, H. 1984: p. 92. & p. 93.)

Jonas differentiates between *natural responsibility* on the one hand and *contractual responsibility* on the other hand. "It is the distinction between natural responsibility, where the immanent 'ought-to-be' of the object claims its agent *a priori* and quite unilaterally, and contracted or appointed responsibility, which is conditional *a posteriori* upon the fact and the terms of the relationship actually entered into." (Jonas, H. 1984: p. 95.)

The *parent* and the *statesman* are presented as ideal types of natural responsibility and contractual responsibility, respectively. The parent is responsible for his or her child not because of the child's own will or even contrary to it. However, the responsibility of the statesman comes from the political contract that he or she has established with his or her constituencies.

III.   Responsible Decision Making

In an economic context *Kenneth E. Goodpaster* presented the most operationalised model of moral responsibility. (Goodpaster, K. E. 1983)

Goodpaster proposes to understand moral responsibility as a combination of two basic components, namely rationality and respect.

Rationality involves the following attributes:

(i)   lack of impulsiveness;

(ii)   care in mapping out alternatives and consequences;

(iii)   clarity about goals and purposes;

(iv)   attention to details of implementation.

Rationality described by attributes (i),...,(iv) greatly differs from the rationality postulate of mainstream economics that requires consistent utility maximisation. The rationality concept used here is *process-oriented* and does not require to maximise anything. *Max Weber*'s concept of 'zveckrationalitat" and *Herbert Simon*'s notion of procedural rationality are closely related to it. (Weber, M. 1921-1922, Simon, H.A. 1978)

Respect is the other component of moral responsibility. For Goodpaster respect means a special awareness of and concern for the effects of one's decisions and policies on others, beyond seeing others merely as instrumental to accomplishing one's own purposes. This is respect for the lives of others and involves taking their needs and interests seriously, not simply as resources in one's own decision making but as limiting conditions which change the very definition of one's habitat from a self-centred to a shared environment. (Goodpaster, K.E. & Matthews, J.B. 1982. p. 134.)

Respect described in this way has a basic similarity to the *altruistic behaviour* that is widely discussed in psychology, economics, and sociology. The prominent Italian economist, *Stefano Zamagni* offers a clear conceptualisation of altruistic behaviour. He defines individuals as altruistic when they feel and act as if the welfare of others were an end in itself; that is, as something of relevance independently of its effects on their own well-being. If your concern for the welfare of others is merely instrumental for promoting your own longer-term ends and ceases once these ends can more easily be pursued in some other way, you are an enlightened self-interest person, not a genuine altruist. (Zamagni, S. 1992)

The model of moral responsibility proposed by Goodpaster is basically a *consequentialist* model of choice. Consequentialism primarily refers to moral views or theories that base the evaluations of acts solely on the consequences of the acts.

Consequentialist models can be criticised on consequentialist as well as on non-consequentialist grounds.

In complex economic and political decision situations such phenomena can emerge that make the consequentialist account of an act very difficult, if not impossible. The most important of these phenomena are *marginal contributions, uncertain consequences*, and *distant effects.*

There are cases where the agent's choice produces only marginal negative contribution to the stakeholders but the cumulative and/or aggregate effect of this kind of behaviour is detrimental to them. The ecologist *Garret Hardin*'s famous "*tragedy of the commons*" model describes such situations. (Hardin, G. 1968)

If some consequences of an act are rather *uncertain* then the decision-makers tend to *neglect* them in their consequentialist considerations. This may lead to inadequate accounting. Similarly, if the consequences of an act are *distant* in space and /or time then the decision-makers discount them at a positive (and sometimes very high) rate. Hence consequences beyond the normal space and time reference of the decision-makers are usually *overdiscounted*.

The phenomena of marginal contributions, uncertain consequences, and distant effects present *decision traps* from that there is no way to escape within the consequentialist framework.

Consequentialist models are also criticised from a deontological point of view. The essence of *deontology* is that an act is morally right when it conforms to the relevant principles or duties. Deontology uses as the criterion for judging the morality of an act the *moral duties* it discharges or disregards, and not the consequences or the ends it aspires to achieve. For example, if preserving biodiversity is a moral duty of a community then environmental decisions and policies should not be based on cost-benefit calculations. They should be based on biodiversity measures.

Deontological ethicists developed strong cases in which *deontological reasons* overwrite consequentialist considerations. The decision-maker may have deontological reason not to do certain things contrary to the fact that they would lead to good overall consequences. Deontological reasons *limit* what we *may do* to others or how we *may treat* them. (Nagel, T. 1986)

It is better to define respect by referring exclusively to altruistic orientation toward the affected parties. Also, we can introduce deontological considerations as a separate component into the model of responsibility. In this way a more robust model of moral responsibility is gained by characterising responsible choice as the making of a *synthesis* of *deontological considerations, rationality* in *goal-achievement*, and *respect* for the *stakeholders*. This model of moral responsibility can be called the *3 R model*, since responsibility = reverence + rationality + respect. (Zsolnai, L. 1997) (Figure 1)

Figure 1   <u>The 3 R Model of Responsibility</u>

Responsibility =

reverence + rationality + respect

The following features can characterise complex decision situations. First, at least two *decision alternatives* are available for the decision-maker, that is, she or he can choose among different courses of action. Second, in the decision situation *ethical norms* apply which represent duties of the decision-maker. Third, the decision-maker has *goals* that she or he wants to achieve in the decision situation. Finally, different *stakeholders* are present that can be affected by the outcome of the decision.

We can formalise the above listed elements of complex decision situations as follows:

(1)   **A1,...,Ai,...,Am**   **(m ≥ 2)**

This means that at least two decision alternatives are feasible for the decision-maker.

(2)   **D1,...,Dk,...,Dp**   **(p ≥ 1)**

This means that at least one ethical norm apply in the choice situation.

(3)   **G1,...,Gj,...,Gn**   **(n ≥ 1)**

This means that the decision-maker has at least one goal that she or he wants to achieve.

(4)   **S1,...,Sq,...,Sr**   **(r ≥ 1)**

This means that at least one stakeholder is present in the choice situation.

Responsible decision making involves finding and implementing the decision alternative that best corresponds to the idea of moral responsibility in the given context.

Earlier we review *Hans Jonas'* idea of responsibility whose essential message is the demand of caring for the beings in the agent's environment. Later on a more analytic idea of moral responsibility was introduced: responsibility was defined as making a synthesis of reverence for the applying ethical norms, rationality in goal-achievement, and respect for the affected parties. Now we are in the position to pose the question: which is the appropriate decision rule for making a responsible choice?

(5) $A^* = \Omega (A1,...,Ai,...,Am)$

where **A*** refers to the selected alternative.

Deontological value can be defined as the value of a decision alternative seen from the perspective of the applying ethical norms.

The deontological values of the decision alternatives **A1,...,Ai,...,Am** can be represented by a vector as follows:

(6) $\underline{d} = [D(A1),...,D(Ak),...,D(Am)]$

D(Ai) is measured on the *ordinal scale* **[1, 0, -2]**. This means that **D(Ai) = 1** if **Ai** is *right* regarding the ethical norms. **D(Ai) = 0** if **Ai** is *neutral* regarding the ethical norms and **D(Ai) = -2** if **Ai** is *wrong* regarding the ethical norms.

The deontological values of decision alternatives depend on two things.

(i)   Which are the considered ethical norms?

(ii)   How are the importance weights assessed?

The answer to these questions is that an *ideal third party*, the so-called 'impartial spectator' should define the set of applying ethical norms and assess the corresponding weights in the given situation. The fact is, however, that such an ideal third party does not exist. The practical question is how can it be approximately substituted in real world situations. Possibilities include some new institutions of deliberative democracy such as citizens' jury, for example.

The desirable properties that should be satisfied by the set of considered ethical norms are as follows:

(α)   *completeness*, that is, all the relevant ethical norms should be included;

(β)   *discreteness*, that is, double counting should be avoided;

(χ)   *unambiguity*, that is, norms should be clear in their meaning;

(δ)   *strictness*, that is, norms should be defined in narrow rather than broad terms.

It is natural that the decision-maker considers the value of the decision alternatives from the perspective of the achievement of her or his goals. In classical decision theory this was the only dimension in which courses of action were evaluated and decided upon.

Goal-achievement value can be defined as the value of a decision alternative seen from the perspective of the achievement of the decision-maker's goals.

The goal achievement value of the decision alternatives **A1,...,Ai,...,Am** can be represented by a vector.

(7) $\underline{g}$ = **[G(A1),...,G(Ai),...,G(Am)]**

G(Ai) is measured on the *ordinal scale* **[1, 0, -2]**. This means that **G(Ai)** = **1** if **Ai** is *useful* regarding the goals. **G(Ai)** = **0** if **Ai** is *neutral* regarding the goals and **G(Ai)** = **-2** if **Ai** is *unuseful* regarding the goals.

The important question is that to what extent the decision-maker is free to choose her or his goals and the weights she or he attributes to the chosen goals?

The decision-maker is *embedded* in interpersonal relations and the social context. So it is realistic to presuppose that the decision-maker sets her or his goals and assigns weights to them in reference to those communities and organisations in which she or he happens to exist and function.

Stakeholder value can be defined as the value of a decision alternative seen from the perspective of the stakeholders.

The stakeholder values of decision alternatives **A1,...,Ai,...,Am** can be represented by a vector:

(8)   **s** = **[S(A1),...,S(Ai),...,S(Am)]**

S(Ai) is measured on the *ordinal scale* **[1, 0, -2]**. This means that **S(Ai) = 1** if **Ai** is *good* regarding the stakeholders. **S(Ai) = 0** if **Ai** is *neutral* regarding the stakeholders and **S(Ai) = -2** if **Ai** is *bad* regarding the stakeholders.

Weighting of the stakeholders addresses difficult questions. Any distribution of weights generates some form of justice or injustice among the stakeholders. We can agree with *Michael Walzer* that an adequate conception of justice is necessarily *plural*, that is, multidimensional. (Walzer, M. 1993)

Two variables can be considered according to which stakeholders can be weighed against one another. One variable is their *stake* while the other variable is their *size*. The greater the stake and the size of a stakeholder, the greater the weight that should be attributed to it.

Notice that there is no such thing as no weighting if at least two parties are present. If one does not attribute weights to the parties then she or he considers them as being equal. Having no weights means having equal weights.

Holding (6), (7), and (8) together we can get a *multiple evaluation* of the decision alternative **Ai**.

(9)   **v**   =   **[D(Ai), G(Ai), S(Ai)]**

The first component of the vector is the deontological value of the decision alternative; the second component is the goal-achievement value of the decision alternative, while the third component is the stakeholder value of the decision alternative.

The vector **v** represents a simultaneous evaluation of the same course of action from different perspectives. The deontological value is assessed from the perspective of an impartial observer, the goal-achievement value is assessed from the perspective of the agent, and the stakeholder value is assessed from the perspective of the affected parties.

The 'responsibility calculus' advanced here, is very close to *Amartya Sen*'s ideas about the moral evaluation of acts. He wrote in his influential book "*On Ethics & Economics*": "To get an overall assessment of the ethical standing of an activity it is necessary not only to look at its own intrinsic value (if any), but also its instrumental role and its consequences on other things. (...) The advantages of consequential reasoning involving interdependence and instrumental accounting, can then be combined not only with intrinsic valuation, but also with position relativity and agent sensitivity of moral assessment." (Sen, A. 1987. p. 75. and p. 77.) Our moral accounting system tries to do exactly this job.

A matrix that contains multiple evaluations of all the decision alternatives available for the decision-maker can provide an overall picture about the choice situation.

$$\text{(10)} \quad \underline{V} \quad = \quad \begin{matrix} D(A1),.....,G(A1),....,S(A1) \\ \cdot \qquad \cdot \qquad \cdot \\ D(Ai),.....,G(Ai),.....,S(Ai) \\ \cdot \qquad \cdot \qquad \cdot \\ D(Am),....,G(Am),...,S(Am) \end{matrix}$$

The matrix $\underline{V}$ may present *value conflict*. The best strategy is to keep the complexity of the decision situation and try to find an *optimal compromise* among diverse value dimensions. Moral philosophers until recently have disfavoured compromise. But inasmuch as the position of *moral pluralism* becomes accepted, the value of compromise becomes more and more clear.

Trying to balance different values against one another is an essential strategy in complex choice situations. The *maximin rule* can do the required job quite well. It implies the maximisation of the minimum pay-off of decision alternatives.

Austrian logician *Earnest Zermello* first described the maximin rule in 1912. In his groundbreaking "Theory of Games and Economic Behaviour" Hungarian-American mathematician, *John von Neuman* developed the rule further. (Von Neuman, J. & Morgenstein, O. 1944)

In complex decision situations the *rule* of *responsible decision* is stated as follows:

(11)   A* = maximin [D(Ai), G(Ai), S(Ai)]

Responsible choice demands the selection of the *least worst alternative* in the decision space of deontological, goal-achievement, and stakeholder values, in the sense that the *minimum value* of the selected alternative is *greater* than the minimum value of any other alternative available for the decision maker in the given situation. The comparability of **D(Ai), G(Ai),** and **S(Ai)** is provided by the fact that they are measured on the same ordinal scale **[1, 0, -2]**.

If there are two decision alternatives **A1** and **A2** then the responsible decision is **A1** if and only if

(12)   **min [D(A1), G(A1), S(A1)]   >   min [D(A2), G(A2), S(A2)]**

The underlying principle of responsible decision making is that the decision maker should find an optimal compromise among the applying ethical norms, her or his own goals, and the interest of the stakeholders.

The responsible choice defined by (11) provides a *Pareto optimal result* in the multidimensional decision space. This means that given the set of decision alternatives it is not possible to increase their value in one value dimension without decreasing their value in at least one other value dimension. In this sense the alternative chosen by the maximin rule dominates all the other alternatives.

IV.   Analysing the World Bank Case

The World Bank case reported earlier is rather instructive for demonstrating how the responsible decision making model can work.

In the case the World Bank has a rich variety of stakeholders because not only citizens of developed and less developed countries can be affected by the World Bank environmental policy but also the natural environment and the future generations.

The *policy options* (alternatives) are as follows:

A1 = *encouraging the migration of dirty industries to LDCs*

A2 = *not encouraging the migration of dirty industries to LDCs*

The most relevant ethical norm that applies here is *fairness*. (**D**) It is formulated by *Hausman* and *McPherson* as the "pay-your-way" principle, which requires that "locate polluting industries so that those who derive the largest benefits from industries endure most of the pollution costs." (Hausman, D.M. & McPherson, M.S. 1996: p. 204.)

The declared goal of the World Bank is to *enhance global welfare*. (**G**)

The most important stakeholders can be identified as *citizens* of the *developed countries* (**S1**), *dirty industries* in the *developed countries* (**S2**), *citizens* of the *less developed countries* (**S3**), the *natural environment* affected by dirty industries in the *developed*

countries (**S4**), the targeted *natural environment* in the *less developed countries* (**S5**), and *future generations* (**S6**).

From a deontological perspective alternative **A1** is certainly *wrong* while alternative **A2** is certainly right because the latter corresponds to the norm of fairness and the former *violates* it. Using the ordinal scale of [1, 0, -2] we can calculate the deontological values of **A1** and **A2** as follows:

D(A1) = **-2**

D(A2) = **1**

Alternative **A1** can be *useful* for the goal of enchanting global welfare with probability **p**. Alternative **A2** might be *unuseful* for the achievement of this goal with probability **q**. Using the ordinal scale of [1, 0, -2] we can calculate the goal-achievement values of **A1** and **A2** as follows:

G(A1) = **1(p) -2 (1-p) = 3p -2**

G(A2) = **1(1-q) -2 (q) = 1 -3q**

Migration of dirty industries to LDCs would be *good* for the citizens of developed countries (**S1**), for the industries themselves (**S2**), and for the natural environment affected by those industries in the developed countries (**S4**). However, it would be *bad* for the citizens of less developed countries (**S3**), for the targeted natural environment in the less developed countries (**S5**), and for future generations (**S6**) since environmental pollution is much more controllable in the developed countries than in the less developed countries.

Using the ordinal scale [1, 0, -2] we can calculate the stakeholder values of **A1** can be calculated as follows:

S1(A1) = 1

S2(A1) = 1

S3(A1) = -2

S4(A1) = 1

S5(A1) = -2

S6(A1) = -2

This policy option is *neutral* for all the stakeholders **S1**,...,**S5** since it does not change the present status quo. However, *future generations* (**S6**) could benefit from keeping dirty industries in the developed countries by forcing them to innovate and to become more environmental friendly.

For this reason the stakeholder values of alternative **A2** can be calculated as follows:

S1(A2) = 0

S2(A2) = 0

S3(A2) = 0

S4(A2) = 0

S5(A2) = 0

S6(A1) = 1

The question is how to weight stakeholders **S1,...,S6**.

Let **v1,...,v6** be *importance weights* attributed to the stakeholders. On the basis of inter-species and inter-generation justice we can argue that *equal weights* should be attributed to nature, society, and future generations. This implies that **v1 + v2 + v3 = v4 + v5 = v6**. We do *not discriminate* between citizens of the developed countries and citizens of the less developed countries, consequently **v1 = v3**. Similarly, we do *not discriminate* between the natural environment in the developed countries and the natural environment in the less developed countries, consequently **v4 = v5**. Considering all the parties that are served by dirty industries, they can get *similar weight* as citizens of the developed countries: **v1 = v2**.

It is required that

$$\sum \mathbf{vi} = 1 \quad (\mathbf{i = 1,...,6})$$

Hence we get that

v1 = 1/9; v2 = 1/9; v3 = 1/9; v4 = 1/6; v5 = 1/6; v6 = 1/3

Aggregate stakeholder values of the two alternatives are as follows:

S(A1) = - 5/6 ≈ - 0,83

S(A2) = 1/3 ≈ 0,33

Table 1 shows the different pay-offs of the two policy options.

Table 1 <u>Pays-off in the World Bank Case</u>

	deontological value	Goal-achievement Value	stakeholder value
A1 alternative	**-2**	**3p –2**	**-0,83**
A2 alternative	**1**	**1 – 3q**	**0,33**

Multiple evaluations of the alternatives are provided by the following vectors:

V(A1) = **[-2, 3p -2, - 0,83]**

V(A2) = **[1, 1 -3q, 0,33]**

According to the maximin rule **A2** is *better* than **A1** since **min (V(A2) > min (V(A1)**.

The worst component of **V(A1)** is **–2** while the worst component of **V(A2)** is **1-3q** and the latter is greater than the former holding that **1 > q > 0**.

The World Bank should not encourage migration of dirty industries to less developed countries. Such a policy is unacceptable from the deontological perspective and also negative from the stakeholder perspective, so some questionable welfare improvement cannot compensate for the violation of ethical norms and vital stakeholder interests. The rejection of the policy option is justifiable also in the case if citizens of the less developed countries get full monetary compensation from citizens of the developed countries.

V.   How to Make Responsible Decisions?

The *procedural model* of responsible decision making can be summarised as follows:

(I)   Framing the decision situation by

      (i)   Identifying the applying ethical norms;

      (ii)   Mapping out the affected parties;

      (iii)   Defining goals and generating alternatives**.**

(II)   Multiple evaluation of the available alternatives regarding

      (i)   the ethical norms;

      (ii)   the goals to be achieved;

      (iii)   the affected parties.

(III)   Finding the least worst alternative in the multidimensional space of deontological, goal-achievement, and stakeholder values.

The multidimensional decision making outlined above can demonstrate that we should not throw out the baby with the bath water. The crux of the matter is that how the *evaluative space* of decision making is defined. *Amartya Sen* has consequently argued that we should extend the informational basis of welfare analyses. (Sen, A. 1992)

In the case of environmental decision problems the *informational basis* of project evaluation should be *extended* beyond monetary values to include ethical, ecological, and social values that can not adequately be translated to money terms. The irreducible complexity of environmental problems can be handled by the help of the maximin rule that is highly consistent with the *precautionary principle*.

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