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ANALYSIS

Valuation of the ecosystem services: A psycho-cultural perspective[☆]

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ABSTRACT

Valuation of ecosystems services has been a challenging issue for economists. There is a growing concern to capture the total and incremental changes in services of different types of ecosystems, mainly, due to perturbations arising from anthropogenic activities. Market-based valuation techniques have long been declared inadequate and a constructed market method such as the contingent valuation method albeit a robust tool does not seem to capture the expanse, nuances, and intricacies of many of the ecosystem services. The paper attempts to address the lacunae in valuation of ecosystem services from a psychological perspective by arguing that the common person's perception of the ecosystem is quite different from what is conceptualized by conventional economists. The paper shows how the ecological identity of individuals is revealed at various levels of the decision-making hierarchy that is, from local to regional and further onto a global level. The paper builds upon insights from psychoanalytic psychology and environmental-psychology. Further, it outlines recent research findings from experimental psychology to redefine concepts such as ecological identity, self-other dichotomy, and the fostering of identification with nature, as issues that must be embraced in the valuation of ecosystem services. Extending the idea of relational goods and reciprocity, the paper offers a deconstructed view of market forces and furthers the idea of interdisciplinary collaboration and cooperation in the valuation of ecosystem services. In this perspective the dichotomy and schism between markets, missing markets and non-markets, gets renovated and reconstructed beyond a utilitarian discourse.

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1. Introduction

One of the main reasons scientists and decision-makers are worried about the loss of ecosystems is that they provide valuable services which may be lost as they get degraded. Questions then arise. How valuable are these services? How robust are the estimated values of ecosystem services? Do these values take into

account the multidimensional attributes of ecosystems? How plausible are the assumptions on which valuation methodologies are based? Are the features of ecosystem services distinct from those of normal goods and services that economists usually handle? Answers to these questions can lead to informed choices towards better management of ecosystems. One can also wonder that if the ecosystems are providing services valuable to the

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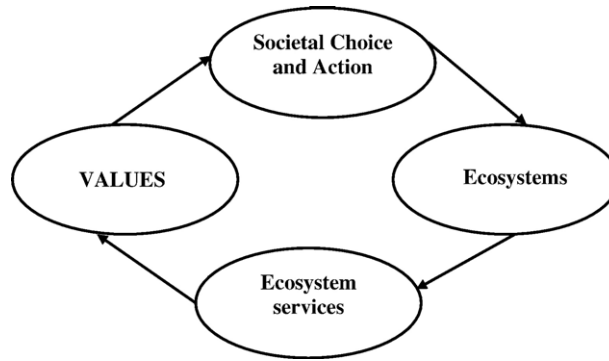


Fig. 1 – Circular links of ecosystems health and economic values.

society then how come society is allowing it to degrade and lost. The answers to this might run along several tracks ranging from legal, technocentric to social and institutional aspects of ecosystem management options. One of the central points of the answer always remains the inadequacy in capturing the values of ecosystem services to the society. The inadequacy also emerges from the notion of value perceived by the stakeholders of the ecosystems. Our brief review suggests that valuation of ecosystem services is yet to evolve in a way, it could claim to capture the socio-psychological dimension of value and the exercise of valuation. We make an attempt to highlight this aspect of ecosystem services in this paper. Our observations could be true for economics science in general but we intend to keep it in the light of valuation of ecosystem services. We intend to organize the complexities of valuation of ecosystem services rather than just ignoring them.

The paper is divided into four sections. Section 1 begins with introduction. Section 2 offers the rationale for economic valuation of ecosystem services and evaluates the challenges economists face in the process. Section 3 presents a critical assessment of the assumptions behind valuation techniques frequently adopted for estimation of different ecosystems and

their services. Psycho-social and cultural perspectives which raise concerns regarding the prevalent outlook and practices of economic sciences provide the backdrop for most of these criticisms. Finally, Section 4 synthesizes the criticism to provide the necessary roadmap towards a valuation of ecological services that could be acceptable to both theoreticians and the development practitioners.

2. Economic valuation of ecosystem services: underlying challenges

2.1. Valuation of ecosystem services

Ecosystems are defined as the existence of biotic and abiotic resources and their complex interactions. It is a complex fabric of plant, animal, and other microscopic life and its interactions with the non-living environment. So, one can easily think of a system dominated by woody biomass as forest ecosystem, freshwater ecosystem, marine ecosystem, coastal ecosystem, cultivated ecosystem etc. The ecosystems, if in a good condition perform functions which are of bio-geophysical in nature. These functions result in the flow of various services and benefits for humans and their society. Millennium Ecosystem Assessment defines ecosystem services as the benefits people obtain from ecosystems. It includes provisioning services such as food and water, regulating services such as flood and disease control, cultural services such as spiritual, recreational and cultural benefits, and supporting services such as nutrient cycling that maintains the conditions for life on earth (MA, 2003). Thus the ecosystems yield ecological functions which in turn provide various types of benefits easily understood by the public policy maker and planner. A less disturbed (degraded) ecosystem would provide better ecosystem services and benefits than a greater disturbed ecosystem. One can see that ecosystem generates what is called ecosystem functions also known as ecological production function. The ecological production function would depend upon the initial condition of the ecosystems. Forces both natural and man made usually create perturbations and cause changes in the flow of these services. Economic valuation method would capture the output of ecological production function to arrive at economic values. These values would be used by the social planners to design responses to better manage the ecosystems and related human well being. Clearly, the way economic values

Table 1 – A compilation of meanings of the word ‘value’ (adapted from Gilipin, 2000)

Meanings of the word ‘value’

Market value — the exchange value or price of a commodity or service in the open market
Intrinsic value — the value of entities that may have little or no market value, but have use value
Intrinsic, non-use — the value attached to the environment and life forms for their own sake
Existence value — the value attached to the knowledge that species, natural environments and other ecosystem services exist, even if the individual does not contemplate ever making active use of them
Bequest/vicarious values — a willingness to pay to preserve the environment for the benefit of other people, intra- and intergenerationally
Present value — the value today of a future asset, discounted to the present
Option value — a willingness to pay a certain sum today for the future use of an asset
Quasi-option value — the value of preserving options for future use assuming an expectation of increasing knowledge about the functioning of the natural environment

are obtained would not only influence response but also critically determine it. Fig. 1 shows the interrelationship of ecosystem, ecosystem functions, economic values and its impact on ecosystem through incentive/disincentive.

In this context, the term 'value' needs to be elaborated and understood further. It can refer to economic value or nutritional value or moral/immoral value depending upon the context. We are referring to this term as an entity which improves the well-being of the society—directly or indirectly. Gilpin (2000) summarises the meaning of value as follows (Table 1):

Ecosystem can provide all these values to the society however no one should expect that every ecosystem would provide all kinds of values.

Economic valuation can be defined as the attempt to assign quantitative values to the goods and services provided by ecosystems. The economic value of any good or service is generally measured in terms of what we are willing to pay for the commodity less what it costs to supply it. Where an environmental resource simply exists and provides us with products and services at no cost, then it is our willingness to pay alone that describes the value of the resource in providing such commodities, whether or not we actually make any payment.

Many environmental resources are complex and multifunctional, and it is not obvious how the myriad of goods and services provided by them affect human welfare. In some cases, it may be worthwhile to deplete or degrade environmental resources; in others, it may be necessary to 'hold on' to these resources. Economic valuation does provide us with a tool to assist with the difficult decisions involved. Economic valuation helps in assessing the alternate course of actions impacting ecosystems. It also provides guidance on losers and gainers of inevitable forces of change. Loss of environmental resources is an economic problem because important values are lost, some perhaps irreversibly, when these resources are degraded or destroyed. Each choice or option – to leave a resource in its natural state, to allow it to degrade or convert into another use – has implications in terms of values gained and lost. This requires that all the values that are gained and lost under each resource use options be carefully considered. There has been a good deal of progress in understanding value, and valuation methods for ecosystem services in the last two decades (Hufschmidt et al., 1983; Goulder and Kennedy, 1997; Costanza et al., 1997; Bishop, 1999; Barbier, 2000; Chee, 2004; Dasgupta et al., 2000; Spash, 2000; O'Neill and Spash, 2000; Howarth and Farber, 2000; McCracken and Abza, 2001; Spash, 2002; Freeman, 2003; Pagiola et al., 2004; Farber et al., 2006; Spash and Vatn, 2006). Journal like Ecological Economics did a special issue on Valuation of Ecosystem Services in 2000. It clearly showed the importance of this theme and the scholarly work done in this area. In this paper, however, we do not intend to create another review of valuation of ecosystem services but to provide a flavour of the kind of work that exists on this issue.

Valuation is only one element in the effort to improve the management of ecosystems and their services. Economic valuation may help inform management decisions, but only if decision-makers are aware of the overall objectives and limitations of valuation. The main objective of valuation of ecosystem services is to generally indicate the overall economic efficiency of the various competing uses of functions of a particular ecosystem. That is, the underlying assumption is

Table 2 – Techniques used for valuation of ecosystem services

Market based	Basis of approach	Main techniques
Market based	Production approach	Production function analysis
Surrogate market	Revealed preference	replacement or restoration cost Travel cost method hedonic pricing.
Simulated market	Stated preference	Contingent valuation

ecosystem resources should be allocated to those uses that yield an overall net gain to society, as measured through valuation in terms of the economic benefit of each use adjusted by its costs.

2.2. Underlying assumptions in valuation of ecosystem services

Valuation of ecosystem services relies on some very bold assumptions like centrality of market, utilitarian framework, substitutability and resource fungibility and technological optimism (Chee, 2004). While technological capability and robustness of market is relatively better understood, the utilitarian framework transcending into psycho-culture space, needs to be elaborated here. The utility that an individual derives from a given ecosystem service depends on that individual's preferences. The utilitarian approach, therefore, bases its notion of value on attempts to measure the specific utility that individual members of society derive from a given service, and then aggregates across all individuals, weighting them all equally. Utility cannot be measured directly. In order to provide a common metric in which to express the benefits of diverse services provided by ecosystems, the utilitarian approach usually attempts to measure all services in monetary terms. It does not mean that only services that generate monetary benefits are taken into consideration in the valuation process. On the contrary, practically all work on valuation of environmental and natural resources has been, in essence, to find ways to measure benefits which do not enter markets and so have no directly observable monetary benefits. The issue of valuation is inseparable from the choices and decisions people make about ecological systems. We will come back to this important issue in Section 3 again.

2.3. Brief overview of valuation methodologies

While ecosystem valuation is certainly difficult, it has become essential for the decision-makers who face the tradeoffs among different functions of ecosystems on the one hand and the competing demand on the resources at their disposal, on the other. The valuations are simply the relative weights one gives to the various aspects of the decision-making problem. When we value the services of ecosystems and decision-makers take these values into account when making policies, a framework for distinguishing and grouping these values is also required. The concept of Total Economic Value (TEV) provides such a framework and there is an increasing consensus that it is the most appropriate framework to use. Total economic valuation distinguishes between use values

and non-use values, the latter referring to those current or future (potential) values that are unrelated to use (Pearce et al., 1989; Pearce and Warford, 1993). Harvesting of fish, collection of fuel wood and use of the wetlands for recreation purposes are examples of use values while the functions like bioremediation and nutrient cycling could be the example of indirect use values. Generally speaking the value of marketed products (and services) of different ecosystems is easier to measure than the value of non-commercial and subsistence direct uses. As noted above, this is one reason why policy makers often fail to consider these non-marketed uses of ecosystems in many development decisions. The non-existence of markets for many biological resources and the public good nature of ecosystems make the valuation far from trivial. These issues imply that the social value of biological resources can't be derived from simple aggregation of their values to individuals in society, the sum of their private values.

Generally, economists follow one of two alternate strategies to obtain behavioral observations directly from markets for environmental resources. The first referred to as stated preference method avoids conventional markets and searches simulated markets (Carson, 1991). The second strategy is to infer values from data on behavioral changes in actual markets related in some way to the missing markets for environmental resources. Travel cost, hedonic valuation, and production function approaches are some examples. Here for instance, though there may be no market value for a wilderness area providing aesthetic value to the society/individual, its value can still be derived by analyzing the demand for trips to the area, by those who face different costs per trip. Table 2 shows a summary of the valuation methods:

There exist a whole range of examples where one or several components of the ecological systems like forest; wetlands, coastal ecosystems and their contributions have been estimated by using some of these techniques. In the past there have been several attempts to value the contributions of the world's ecosystem. Costanza et al. (1997) estimate the current economic value of 17 ecosystem services for 16 biomes. They do it on the basis of already published research and find that the value comes to be around USD 33 trillion. Of course their estimate relies upon some simplified assumptions and thumb rule approximations; this value not only created a furor among ecologists but also invited very sharp criticism from the fellow economists (Daily et al., 2000) as well.

2.4. Challenges to economic valuation

New developments have led to advancement in the state of knowledge in areas such as valuation methodology, human decision making science and debates heated on question of philosophical discussion of values. However, the relevance of the state of ecosystem functioning has not been given adequate emphasis in derivation of ecosystem values, thereby rendering the values of little worth, when one is examining issues, especially related to sustainability.

In order to provide a true and meaningful scarcity indicator of ecosystem values and functions, economic valuation should account for the state of ecosystem. Though, ecosystems can recuperate from some shocks and disturbances through an inherent property of resilience, there are several

circumstances under which the ecosystem shifts to an entirely new state of equilibrium (Holling, 2001). Therefore, another challenge in valuation of ecosystem services is a growing need for interdisciplinarity in order to better comprehend the role ecosystems serve. Economists need to understand the ecological production function and related queries in a deeper sense. For example, what condition of ecosystem is responsible for how much flow of ecosystem services and many other similar issues? Ecologists, on the other need to know the essence of tradeoff, competing demand on the resources and conflicting choices over temporal and spatial scale. Ecosystem goods and services, by definition, are public in nature, meaning thereby that several benefits accrue to society as a whole, apart from the benefits provided to individuals (Daily, 1997; Wilson and Howarth, 2002). The theoretical fundamentals of development of economic valuation methodology rest on the axiomatic approaches of individual preferences and individual utility maximization, which does not justify the public good characteristic of ecosystem services. Valuation methodologies, viz contingent valuation utilize individual preferences as basis of deriving values subsequently used for resource allocation of goods largely public by character. A considerable body of recent literature therefore favors adoption of a discourse-based valuation (Wilson and Howarth, 2002). The primary focus of these approaches is to utilize a discourse-based valuation approach to come up with a consensus societal value of scarcity indicator, derived through a participatory process, to be used for allocation of ecological services, largely falling into the public domain.

Application of conventional fundamentals of economic valuation becomes further constrained when sustainability and social equity are also included as goals along with economic efficiency for ecosystem management (Costanza and Folke, 1997). While the methodologies for deriving values with economic efficiency as goals is comparatively well developed, integrating equity and sustainability requires a better understanding of functional relationships between various parameters and phenomena responsible for provisioning of the services in the first place and the social processes governing the mechanism of value formation (discourse-based valuation being one such approach).

In the whole discussion of valuation of ecosystem services useful for human well-being and societal welfare, the assumptions of rational economic agents, well functioning markets, consistent preference, straighten choice, learning about the services of ecosystems, and speculations about future seem to be critical. However these assumptions are far from resolved and need serious attention if the value is to be comprehensive and acceptable to all types of specialists. In the past, assumptions of economic theory have maintained some distance from behavioral sciences such as psychology. Economists whether dealing with the issues of valuation or forecasting seem to be functioning independent of the psychological dimension, which is quintessential to the entire exercise of economic analysis of ecosystems. Sen (1973) highlights this 'paradox' where assumptions of rationality and optimum choice based on individual's behavior are maintained but the genesis and basis of the behavior is not addressed by economists. In fact, the motive behind these

behaviors are either ignored or treated perfunctorily in the analysis. The fixed preanalytic vision prevents from assessing the psychological foundation of behavior. The following section highlights the lacunae in approaches of conventional environmental economics and its approach to valuation. It offers a fresh perspective on some of the fundamental assumptions of economic sciences that are applied in the valuation of ecosystem services.

3. Psycho-cultural dimension of valuation

The proneness to decay of all that is beautiful and perfect can, as we know, give rise to two different impulses in the mind. The one leads to aching despondency.... While the other leads to the rebellion against the facts asserted. No! It is impossible that all this loveliness of Nature and Art, of the world of our sensations and of the world outside, will really fade away into nothing. But this demand for immortality is a product of our wishes too unmistakable to lay claim to reality: what is painful may none the less be true. What spoils the enjoyment of beauty must have been a revolt in their minds against mourning. The idea that all this beauty was transient was giving the sensitive minds a foretaste of mourning over its decrease; and since the mind instinctively recoils from anything that is painful, they felt their enjoyment of beauty interfered with by thoughts of its transience¹

—Sigmund Freud, 1916 from *On Transience*.

3.1. Missing link of psychological dimension in valuation exercise

Here we offer a collage of ideas that represent cross-fertilization between domains of inquiry of psychological and economic science by critically evaluating their contributions in furthering our understanding of valuation of ecosystem services. Our attempt is to offer a useful critique on valuation of ecosystem services even though it runs the risk of

¹ The following quote from Freud's (1916) paper alludes to dilemmas and schism encountered while addressing the question of transient nature of natural environment. People by and large have two broad reactions towards nature. One is the feeling of anxiety and unhappiness at the transitoriness of natural world and a need to conserve it. The other reaction is the exact opposite feeling of being in control and in the center of order of life, and therefore, any lack of gratitude or attachment with the nature. According to Freud, both attitudes are unhelpful as the first reaction generates unnecessary apathy and unhappiness and the other, unnecessary narcissism. Behind both these reactions, Freud suspects, there is an equal resistance in accepting not only the transitory nature of human life but also a healthy internalization of mourning necessary to move on with newer goals and greater appreciation for nature. In the context of this paper, the quote is helpful in pointing to the heated debate: whether economic valuation of ecosystem services is the only way to value nature. Perhaps conventional economists need to mourn for all the relational goods they have not yet evolved a medium to assess and value.

appearing so generic that it can sweepingly be applied to valuation of anything like cultural heritage, historical monument etc. We are not arguing for either a position in favor of or one against valuation of ecosystem services. Rather the focus here is to problematize and deconstruct these binary oppositions in order to tap the complexities and multiplicity of issues inherent in the question of valuation of ecosystem services. In this, both economists and ecologists have yet to begin identifying all the interdependencies in the system they proclaim they best understand (Norton, 1988). The utilitarian framework on which the valuation is based suffers from several limitations. Individuals are not merely utility maximizer; several other conflicting goals enter into his/her objectives (Simon, 1957). Researches also suggest that the state of knowledge about this utility maximizing behavior is in flux and has not been addressed by the proponents of the theory seriously (Gowdy and Mayumi, 2001). On the one hand ecosystems are dynamic where thresholds, discontinuity and irreversibility are commonly found, individual's preferences (so critical for valuation) are constantly evolving, they are dynamic and are heavily influenced by prevailing social and cultural practices. Individual's preferences are also determined by the changes in outcome relative to person's reference level (Tversky and Kahneman, 1991).

Market as an economic institution is more than a mechanism driven by the forces of demand and supply, cost and benefit. As a social institution, it embodies specific rules, the product of cultural matrices, conventions and established practices. That is why it does not make sense to raise the question as to the choice between the reciprocity principle² and the equivalent-exchange principle³ (Zamagni, 2004, p.21). Any attempt at valuation would not be fair to its purpose if it actively evades the whole question of 'value' that is inherent in the very term—*valuation*. Invariably, people tend to place on the table two contending systems of values: positional values marked by equivalent-exchange transaction centered on increasing efficiency and relational ones emanating from reciprocal transaction centered on the notion of human happiness. The valuation exercises aim to tackle the question of efficiency and maximizing economic growth which are many times at the cost of appreciating social capital and other relational goods and moral values. Recent research findings have added to the issue of valuation of ecosystem services an increasing recognition that environmental degradation and the issue of ecosystem management is not purely a technological question, but is partly behavioral and attitudinal as well (Clayton and Opatow, 2003, p.3). Such a finding substantiates the recent critique offered by other social scientists that complexities that lie in human attitudes, motivational systems and their behavioral manifestations are not adequately addressed by economic valuation methods and techniques. Economic research has estimated the value of ecosystem services and natural environment mainly in terms of the financial sacrifices people would have to make for it or

² Reciprocity principle refers to the relational conception of human (economic) transaction that is not only driven by a definitive exchange relationship; it is also contingent upon social relations, moral dispositions and individual idiosyncrasies.

³ One typically represented in by the *quid pro quid* transaction.

in terms of economic and physical concrete tradeoffs. However these values though necessary are far from comprehensive. In order to initiate long-term management policies or social change for sustainable development, these approaches provide an incomplete picture. Akin to the *dilemma of the commons*, environmentally destructive behavior may be a short term rational choice for an individual, even when in the long term and for the larger collective it might entail counterproductive outcomes. Such outcomes can neither be tapped nor elucidated by the standard valuation theories or methods. Researches on intuition and on ecological identity have indicated that the natural environment has value beyond its immediate and potential utility. There are plenty of research findings on how people do not calculate the utility of ecosystem services in an economically logical way. Instead, people make statements about their personal and collective values—to define who they are through the causes they support (Ritov and Kahnman, 1997). Therefore, processes such as reciprocity, relational, ecological identity etc. will also have to be considered as gestures, values, attitudes, modes of behavior that people engage with in voicing their concern and dependence on ecosystem services alongside the more utilitarian and anthropocentric reductionism employed by economists in valuation of ecosystem services. The mainstream economics' *culture of contract* which holds contractual basis of all transactions as its core feature, usurps all possibilities of developing the economic institution such as a market into a social forum; it is only in introducing a *culture of reciprocity* that social transactions and values which play a critical role in the institution of market can be understood better.

A psycho-cultural perspective of valuation would argue for the initiation of not only an interdisciplinary rather a 'transdisciplinary'⁴ dialogue aiming at reciprocal alliance and cooperation between natural and social science research through debates on environmental ethics, tools and methods of social inquiry and socio-economic development as well as empowerment. It would be good here to consider some points that indicate the hazards of oversimplification (as seen in valuation techniques trenchant in reductive and deterministic quantification) and value-loaded assumptions (under the guise of offering value-and-culture-free assumptions) of mainstream economics. The very model of scientific analysis is what economics as a social science has sought to emulate. The strategy this model adopts for assessing ecosystem functions is to analytically dissect component parts of the whole into sub-components and functions rather than viewing them as mutually defining and interdependent (Moran, 1990; O'Hara, 1996). Economic valuation of ecosystem services becomes a normative process in which people are increasingly de-linked and estranged from the commonsensical and local ways of thinking, relating and interacting with their natural environment. In this sense the discourse of economics, requires 'methodological plurality' (Norgaard,

1984) so that structured arguments of evolved disciplines can also encompass complex psycho-social interactions in their purview.

3.2. Human rationality questioned

Invariably all valuation methods assume rationality on part of different agents. The core assumption of rational choice entails a utilitarian and instrumental view of economic interaction where the moral question of recognizing the other as a human subject (person) has never been given its due regard. It is precisely this reductionist character of contemporary economic theory that has run into troubled waters in dealing with the issue of ecosystem management, accounting for uncertainty and risk behavior and on the vicissitudes of human intuition, and notions of morality and rationality. All of these themes have one thing in common that is they ask important questions about the human mind and it's functioning. Recent attempts at interdisciplinary integration in the area of valuation of ecosystem services, have tried to undo the damage of this self-aggrandizing collaboration by behavioral psychologists and mainstream economists by subverting the notions of market and rationality and juxtaposing conscious rational choices with unconscious (or if one gets too ruffled by this, consider instead, not-so-conscious factors) motivations, feelings, attitudes etc. and a deep human need for reciprocity.⁵ Environment in this context is usually seen to be a non-marketed good of concern to people in its own right. Through questioning the basic scientific assumption of rationality or rational choice principle of economics a realization emerges that "conscious pursuit of one's self-interest may not be compatible with its attainment" (Zamagni, 2004 p.23). This has a direct bearing upon the way economic sciences look at the question of human value and rationality. The presumptuous outlook of economic science can partly be explained through reviewing the psychological researches on human decision-making processes and subsequent negligence in incorporating these human cognitive-emotional considerations in the way valuation methods and experiments are structured and conducted. The assumption of economic rationality could be inconsistent and partial if the revelation of preference by the economic agents are based upon partial articulation of the whole experience as memory eclipses and gets convoluted with the passage of time. The presence of a gap in appraising human cognitive and emotional capacities such as memory, thinking and relating etc. in rational choice paradigm theorization can be illustrated in terms of the discrepancy in the context of individual's memory and the actual experience. In studies on 'remembered utility' by Kahneman et al. (Varey and Kahneman, 1992;

⁴ S. Rist (2004) maps the contours of the growing field of *transdisciplinary* research. He suggests that *transdisciplinarity* stresses the need to project scientific knowledge production beyond its discipline. The term is alluded to in the context of the challenge of re-conceptualization of relations between science and society.

⁵ Reciprocity or a reciprocal relation in this context can be defined as a series of bidirectional transfers, independent of one another yet interconnected. Since independence here implies that each transfer is in itself voluntary; thus a transfer from one side is reciprocated by another from the opposite side. Therefore by analogy a reciprocal relation is one that takes "an intermediate position between market exchange and pure altruism" (Zamagni, 2004, p.19).

Fredrickson and Kahneman, 1993; Kahneman et al., 1993) found that the consequences or results of a particular choice extend, over a specific period, so that the evaluation of a sequence of results is retrospective. Such a finding shows that the discrepancies between ‘remembered and momentary utility’ need to be critically appraised. While doing an overall evaluation of ‘remembered utility’ at the end of an experience, the experimenters found that in the memory of the subject, the duration of the experience vanishes with time to give way to two nodal experiences. What is remembered are the momentary highest peak of the experience and the terminal phase of experience, rest is lost to memory. If such is the difference in the memory of the moment-by-moment utility and remembered utility, then the calculated value becomes questionable. This problem pertains to the complex types of preferences involved when one is dealing with uncertain and intertemporal outcomes. The extensive researches by Kahneman et al. (Varey and Kahneman, 1992; Fredrickson and Kahneman, 1993; Kahneman et al., 1993) views with skepticism whether individuals have consistent risk or intertemporal preferences at all. It also indicates the sheer difficulty of dealing with futurity in the area of ecosystem services. It would not be an exaggeration to say that these experimental psychologists consider the assumption of human rationality (central to mainstream neo-classical economics) quite a misplaced one and point to complexities of human mind and decision making process. Besides this, there exists already-burdening issues of how to aggregate preferences or values across individuals and cultures; the problem of identifying appropriate choice and appropriate measurement technique or indeed the question of extrapolating preferences revealed by one type of choice to the valuation of another, these remain far from being solved (Hanemann, 1988). This is just a peek into the operative valuation biases and conditions, which need critical discussion and methodological and epistemological reassessment.

3.3. *Is rationale choice the only option for humans?*

The discussion above argues that the traditional economists need to enlarge the purview of the phenomenon they define as rationality. Personalized interactions and subsequent social networking can also give rise to the visible outcomes that may not be less valuable than pure economic transactions (Gui, 2004 p.7). This suggests a need to deconstruct common valuation concepts and problematize methodological assumptions of valuation of ecosystem in order to identify more comprehensive ways of reconstructing these techniques. There are two issues that psychologists feel most strongly about in the context of valuation of ecosystem services. First, it is the intrinsic value (aesthetic, moral, cultural values etc.) of ecosystem services that is of direct interest to psychologists. The second concern is to map the ways in which the interactions between man and his natural environment have a bearing upon his psychological well being. These are issues that transcend the domain of rational choice and lie more in the discourse of culture, memory, and language. Culture, memory, and language focus on the emergent properties of co-evolving human social potential. The restricted valuation methods of ecosystem services make

it difficult to assess or evaluate them scrutinizing them under the rational choice paradigm. Moving away from the rational choice model, when we focus on cultural, memory, and linguistic variables we are appraising not only the intrinsic value of ecosystem services, but also their effects on human health or social structures, their aesthetic contributions, and their significance for future generations (O’Hara, 1996).

Under rational choice lenses, the political question of hegemonization of relational and reciprocal outlook and discursive methodologies of valuation of ecosystem services get thrown away. Articulations of similar social-structural discontents are also found in feminist economics, qualitative research in psychology, discursive ethics, critical sociology, and cultural anthropology as also in psychoanalysis. In all of these disciplines there has begun a movement where severe critique of dominance of male, educated, logico-positivist structures of thought and reasoning over voices of weaker and marginalized sections, less rational and articulate and empathetic have been reintroduced and taken for scrutiny in the mainstream discourse. One example of the inequality alluded to above be how one always finds a hiatus between the language in which the preference of the people for ecosystem services is elicited and the language in which people feel more at home. The more the discourse moves away from the common lives and real life concerns to abstruse quantification and reductionism, the more people are likely to give preferences that are fudged and confused as much as these are confusing, merely because the choices we offer are far from adequate.

However, a careful look at the evidence of limits of human rationality provides us with a new perception and perspective towards the whole valuation exercise. *Sen’s paradox* (Lewin, 1996) indicates precisely this quandary where human rational and irrational, psychological and anti-psychological ideas exist in a dissected manner whereas these need to be integrated together in liberal doses when working in an area such as valuation of ecosystem services. Here it would necessary to mention that in recent years, interdisciplinary works like behavioral economics and experimental economics do take care some of the psychological dimension in the economic analysis including valuation. However they have strong penchant for the cognitive behavior theory and the whole analysis of behavior is couched in that framework. Cognitive, behavioral, and experimental psychologies have actively contributed to the field of economics and environmental science. But on the question of rationality, cognitive-experimental-behavioral psychology runs into the same methodological biases of reductionism, excessive determinism as well as overwhelming bouts of theorization propagating at best, utilitarianism.

In the next section we took a closer look at the psychoanalytical paradigm to being a new dimension to the economic analysis of valuation of ecosystems.

3.4. *Psychoanalysis of rational choice and its implications for the emergent ecological identity*

Psychoanalysis is known for its unabashed allegiance to the irrational, unintentional and unconscious phenomenon. Freud (1917) in *A difficulty in the path of psychoanalysis* alludes

Freud's model of personality structure

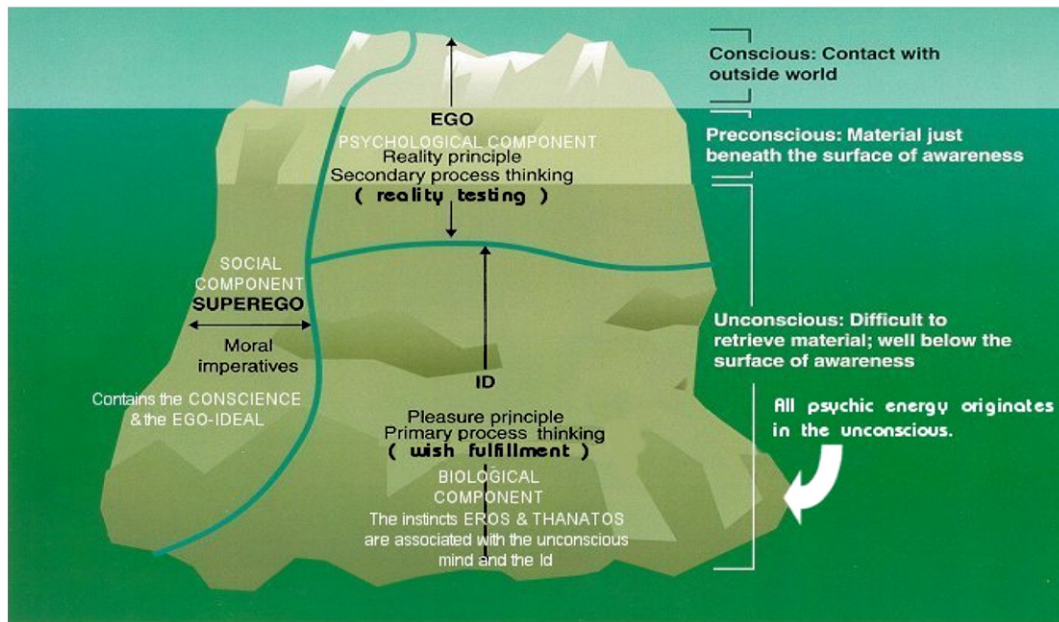


Fig. 2 – Freud's model of the personality structure (Kaplan and Saddock, 1998).

to three momentous blows, which have destroyed human narcissistic illusions. He attributes the third blow to the founding of psychoanalysis. He said that the invisibility of what is beyond the consciousness is brought to light by the fact that “mental processes are in themselves unconscious and can only reach the ego and come under its control through incomplete and untrustworthy perceptions, tantamount to the statement that the ego is not the master in his house” (p.143). Thus, the third blow was to man's narcissism, to his self-love. In his estimation the first two blows to human narcissism were products of revolutionary ideas by both Copernicus and Darwin. From the Copernican revolution the de-centeredness of the earth meant that human life continually revolved around the ‘other’, the Darwinian model gave an evolutionary schema of order of life where humans were one amongst so many others. By virtue of their discoveries, both implicated a serious reconsideration of human narcissism and grandiosity.

In bringing the psychoanalytic perspective, one is highlighting the de-centeredness of human beings and the complex entanglements human collectivity shares with the natural world. Psychoanalysis also has an economic model of the mind that centers on the distribution, circulation of instinctual energy. For our consideration here, we can take the idea of the “economy of the group” as psychoanalysis's rejoinder to economic science. In the “economy of group” the sum of transactions that take place inside the group and across its borders matter (Dalal, 2004, p.43). In fact, both psychoanalysis and economics ask similar questions around the why's and how's of human behavior and both acknowledge the complexity of the human motivational system. It is at this point that psychoanalysis takes one step forward in saying that cost and benefit, or causes and consequences or similar analogies in means and end, stimulus and response

are not as straightforward and clearly linked as one would like to believe. The relationship between the cause and consequence, stimulus and response is mediated by the motivational system and what we call human intentions, which defy conscious, rational modes of functioning.

If valuation of ecosystem services entails an analysis of the decision-making and choice-conflict debate in man, then psychoanalysis can contribute towards discerning the unconscious roots of the decision-making process in its barest form. A new ‘dynamic decision-making theory’ has been in the making and it borrows insights from psychoanalysis, group behavior and social psychology to explain another level of problems encountered in valuation. Decision-making theory has become the domain of workers in a wide range of disciplines, including economists, mathematicians and various behavioral scientists such as sociologists, philosophers, game theorists, statisticians and experimental psychologists have been added to the list. However, thus far the psychoanalytic contribution has not been acknowledged. In fact, in general, until recently “decision theorists looked into the current situation rather than to the past experiences of the decider’ for variables that control the decision” (Rangell, 1969, p.598). With the growth of psychoanalytic theory, the significance of the role of past events and experiences has now become common knowledge. Using the influence of past events and experiences, the ‘new dynamic decision-making theory’ attempts to combine historical with historical explanations of behavior.

A quick note about the functioning of the psychoanalytic model of the human mind that acknowledges the importance of the presence of unconscious mental phenomena would be in order here (see the schematic diagram of the Freudian model (Fig. 2)). The psychoanalytic model considers three agencies namely id, ego and superego to be tangents of the unconscious.

The unconscious is the deepest, inaccessible, and free-flowing structure that lies beneath the conscious and the preconscious structure of the psychic apparatus. The id corresponds to the true nature of unconscious or unconscious in its untamable and pure form. The id stands for all the unfulfilled wishes, thoughts, desire and all those ideas that human mind can imagine without any conscience or any censorship. The two forces id is most governed by are sexual libido and aggression. Another characteristic feature of id is that ideas, thoughts and feelings can exist without any negation or contradiction. Ego corresponds with the filtered thoughts, feelings and emotions that are continually under scrutiny from external reality, and from the superego, which is characterized by the internalized parental authority, social-moral and cultural codes which exert a socializing and civilizing influence on the human mind. Ego in its monitoring and mediating role lies closest to conscious mental phenomena and in any decision-making process it is ego that plays a vital role as a filtering, smoothing, and information-processing agent.

It is in unfolding of the intrapsychic process (emanates from the tussle going on between the id, ego, super-ego and external reality) in the form of the choice-dilemma of the ego, that the importance of ego's capacity for decision-making has become overtly apparent. Given a situation of choice-conflict or any dilemma in decision-making, the unstable internal state of an individual gives rise to anxiety and a consequent striving towards a point of internal stability (or what is called homeostasis), either with or without resort to symptom formation. The history of previous internal 'solutions' lays down facilitating pathways, which guide future choices, to the point of making the latter appear at times to be automatic. All of these result in predictability and become incorporated into enduring and structured character traits (Rangell, 1969).

The intrapsychic choice-conflict mentioned here is one side of the coin, while the opposite side is the ego function i.e. 'the decision-making function of the ego' which goes hand-in-hand with it and is specifically designed to confront and solve it. The central function of the ego is to decide and chose between the contending and conflicting forces. This point elucidates how the ego does not only have a choice but also an obligation to make one in the intrapsychic scheme and this illustrates a large aspect of human behavior and adds an important dimension to our understanding of a complex and important process. The qualitative and quantitative aspects of the decision-making capacity of the psychic apparatus is an important determinant in character and personality formation, and runs an individual developmental course quite apart from the history of other accompanying psychic functions (Rangell, 1969, p.600).

If the metaphors of self and ego provide a platform for a concept such as identity to take off then, ecological identity in the case of valuation of ecosystem services becomes one of the many indices to be understood and explored for better understanding. Identity theorists define self-concept as a set of identities. The reflective part of 'I' or 'me' in any given individual is also the part that engages with internal dialogue and is referred to as self. The self-concept is the product of this process. There are two ideas that exist in conjunction with the decision-making function of the ego that bolsters or diminishes one's self-concept. These are two interlinked yet distinct issues of "identification with nature" and the idea of

"ecological identity". Identification with nature is as much an automatic process setting in on its own, as it is a psycho-educational concern in the area of valuation of ecosystem services. In the psychoanalytic parlance, identification process comes to us by the civilizing and censoring agency of super-ego. We learn our cultural ethos and imbibe a private and idiosyncratic sense of ethics, social norms and morality through internalizing our parental value systems and moral behavioral patterns. This process, which develops unconsciously, is also in part a conscious process attempting healthy socialization and instilling of socially conscious value systems. Thus, identification could be defined as "the process by which a person either (a) extends his identity into someone else, (b) borrows his identity from someone else, or (c) fuses or confuses his identity with someone else. Identification in psychoanalytic writings never means establishing the identity of oneself or someone else" (Rycroft, 1968, p.76)⁶, it is rather internalization of values, attitudes, thoughts, and personality characteristics or some traits of the other.

A differentiation between the concepts of identity and identification might be called for here in order to steer clear of any confusion of tongues. Identity, a concept championed by, Erik Erikson in the mid 1960s, is "the sense of one's continuous being as an entity distinguishable from all others" (Rycroft, 1968, p.76). Rycroft clarifies that many of the issues and problems about identity center on the part played by identifications in enhancing or diminishing identity. The sense of identity is relatively closer to having self-awareness and can be regarded "as the subjective equivalent of ego", as many aspects of ego development can be formulated in terms of the growth of the sense of identity. Ecological identity differs from a process such as "identification with the nature" as it is grounded in more individualistic basis but is shaped and reified by many of our encounters of identification with our significant others. Ecological identity of individuals can exist at different levels of decision-making hierarchy (for example, local, regional, and global). It is an amalgamation of multiple identities associated with culture, memory, and language acquisition.

The notion of ecological identity leads us to a question: how is it that so many people claim to be concerned about the environment while at the same time making life-style choices that lead to environmental destruction? It is in this context that the Zavestoski (2004) points to the importance of a concept such as 'ecological identity' and this can be considered to be a subset of a larger thematic such as identity. The tenants of symbolic interactionism, point to the fact that our perceptions of social reality and interaction impact choices, decisions, and actions we engage in within our immediate environment⁷. Thus, with reality being defined, understood, and related to as 'socially constructed', a poor social

⁶ See Charles Rycroft's (1968) 'A Critical Dictionary of Psychoanalysis', second edition, London: Penguin Books.

⁷ The term 'environment' here will shift back and forth to connote a general sense of surrounding and setting, which can be social, material, political, psychological (non-natural) and not necessarily a natural one. Even though, one must admit, without the overarching natural setting there can be no other form of human setting imaginable.

construction of a certain kind of reality also deflects a part of our self. In this sense, “if environmental problems are seen as problems of social organization, then organization of the self becomes significant” (Zavestoski, 2004, p. 297). For fostering pro-social behavior, an attempt to forge an ecological identity at individual and collective forum becomes necessary. Here an ecological identity provides an individual with the ability to connect her or his social behavior to its environmental impacts. O’Hara (1996); Zavestoski; Clayton; Clayton and Opatow (2004) attempt to tie-up concepts such as self, identity and self-concept to natural environmental concerns. The attempt is to indicate the setting in of an environmental concern, appreciation, and appraisal within an individual’s psyche through social interaction that occurs throughout an individual’s course of development. This intrapsychic concern which sets in essentially through an interpersonal route albeit has deep bearings on how individuals later as collectivities maintain a profound sense of responsibility and pro-social behavior towards natural environment. A polycentric and multifaceted nature of self (hood) then indicates a diverse, multifaceted view of the world or society as well.

Another question of relevance is how can ecological identities emerge unless we can interact socially with aspects of the natural world? To such a question, Zavestoski (2004) adds “ecological identity can be considered as that part of the self that allows individuals to anticipate the reactions of the environment to their behavior” (p.297). From a psychological point of view this statement offers an etiological as well as diagnostic assessment towards the problem of environmental degradation. Lack of environmental awareness, of environmental friendly actions and policies, and of an informed social consciousness can be attributed to a certain ‘lack of identification with nature’ (ecology/environment). The boundary that is marked between self and other is joined by boundaries between self and culture, self and nature. When the self’s boundaries are experienced as fixed and firm, nature becomes a domain to pass through on the way to where one is going. It becomes a resource to be used (usurped), not a landscape of potential relations. Since our environment cannot directly respond to our actions in socially meaningful ways, we rely on the responses of ‘social others’ to validate the actions guided by our ecological identities. If the functioning of this identity requires social mediation for it to set in, then constructing ecological identity ought to become our new challenge. Qualitative research methodologies informed by social constructionism, eco-psychology, and psychoanalytic psychology offer unique ways to tap, monitor, and foster ecological identity for the purpose of engaging in valuation exercise. Environmental education and introducing the notion of ecological identity and its acceptance in various social institutions provide mediums of assessing the subjective concern people have for ecosystem services.

3.5. Valuation positional and relational goods together

In real life many of our exchanges, preferences, and the exercise of making choices are influenced and guided by the considerations bereft of tangible *quid pro quo*. “The bulk of social life consists of interrelated other-oriented behavior, motivations and sentiments which are neither purely self-interested exchanges nor pure unilateral gift-giving”

(Zamagni, 2004 p.20). The whole discussion here enters into the domain of transactions taking place under the urge for reciprocity. “Reciprocity, according to Zamagni, is usually referred to major types of social interactions, innumerable encounters in the form of groups and organizations” (p.20). Family life is the best example of reciprocity where strict exchanges are rare and relationality is found in abundance.

Hirsh developed the concept of positional goods and positional competition in 1976. It consists of all of those goods whose demands cannot be met by economic growth as increase in wealth generates an increased positional demand. One basic difference between the positional and relational goods is of competition and reciprocity respectively. Positional goods and competition are marked by inequality in their distributive criterion. Usually economists come out with their analysis of ecosystem services in terms of private versus public good nature and devote considerable attention to estimating the “externality” of public goods. Since many of the ecosystem services although critical for human well-being have been treated as “externality” by the conventional economists, adopting the taxonomy in terms of positional and relational goods might make the valuation exercise more comprehensive and far more relevant for decision-makers whose goal is to manage ecosystem services for sustained well-being of the society.

One of the major drives behind valuation of ecosystem services is to capture the contribution of ecosystems to social well-being (aggregation of individual’s well-being could be one of the possible ways to arrive at a notion of social well-being). But social well-being is not always made out of productive actions and pleasurable gestures but it is emanates from good social relations as well. Good social relations are essential constituents and determinants of well being (Moran, 1990; MA, 2005). It has been found that people in society always appreciate positive social sentiments, healthy attitudes and pro-social actions. These sentiments, attitudes and actions embody the necessary conditions to address numerous failures and inefficiencies perpetuated by purely self-centered interactions. Even market-failure or government failure in many cases can be explained in terms of absence of these behaviors.

Now the question arises: what is the nature of discourse beyond utilitarianism? The discourse of environmental and resource economics centers on the utilitarian, anthropocentric and instrumental view derived from the ubiquity of market forces. This position assumes control and lack of reciprocity and interaction with non-market agents or ones that can be labeled relational goods ecosystems services and individual behavior have more commonalities and interdependencies than are understood by conventional economists. Both are co-evolutionary as individual’s behavior and social norms evolve jointly in response to perceived societal changes as ecosystems and people adapt to each other in the time-space continuum. Management of various provisioning, regulating and cultural services of forests, mountains, and deserts ecosystems by the local community/indigenous people in various parts of the world are glaring examples of this. For many centuries, the management practices based on traditional knowledge and common wisdom have managed the flow of ecosystem services on a sustainable basis for their livelihood support system. All these considerations point to a need for reconstruction of research agendas, ethics and focus

in the area of valuation of ecosystem services. One way to invite constructive criticism and interdisciplinary theorization in the area of valuation of ecosystem services is by ensuring that economic and environmental sciences both conscientiously engage in a mentation on their epistemological foundations and methodological assumptions and are prepared to 'see these aspects become subjects of social debate' (Rist et al., 2004). Both economic science and ecologists also need to realize that the logico-positivist model of science they both follow is one of the several models of human functioning available to us. There are several other viewpoints; models and philosophies have to be invited with an open-mind to offer their versions of researching the valuation of ecosystem services.

4. Conclusions

Economic valuation of ecosystem services and subsequent benefits is critical for sustainable management of the ecosystems. Since these services accrued to the society are largely public in nature and are intangible bio-geochemical processes, they pose a formidable challenge in valuation. Some of the challenges of valuation emerge from the preanalytical bias of the assumption of neoclassical economics where the behavioral underpinnings of rational choices and subsequent resource allocation is hardly acknowledged, explored and analysed. Our approach in the paper focuses on psycho-cultural angle of valuation exercise and brings the need for the concept of ecological identity, interdisciplinarity in approach and methodological pluralism in outlook.

Valuation method for ecosystem services must identify, acknowledge and embrace the fact that irrespective of the choice of methodology (market, non-market or constructed market method), individual's identification with nature, his capriciously changing preference and dynamic learning, formation and bolstering of ecological identity, play a very important role. The paper attempted to reconcile rather complex and difficult terrains of inquiry on valuation of ecosystem services; we come to infer that the processes of change should now give way to the change of processes. Not only assumptions of valuation methodologies but that of economic science in general must also learn and interact with disciplines like psychology, sociology and other allied social sciences to make the valuation of ecosystem services a comprehensive and wholesome field of inquiry. In the past, many of the critical assumptions of consumer's theory and functioning of markets have been aggressively separated from their psychological foundations and behavioral underpinnings. Such assumptions of valuation that lack scientific validation of human behavior and subsequent decision-making processes of ecosystem management which emanate from partial recognition of human resourcefulness and its complexity, would make economic valuation of ecosystem services more vulnerable to criticism from various corners. Whatever value of ecosystem services we obtain; it would appear unconvincing and unidirectional when we are faced with the question of societal and human well-being. The concept like ecological identity has adequately shown the futility of utilitarian framework. Research on ecological identity shows that natural environment and ecological systems have relevance and usefulness much beyond immediate and potential utility. The interrelationship between

man and nature has strong bearing on the psychological well being of the individual which remains uncaptured by most of the conventional valuation methods.

The psycho-social and cultural perceptions of natural ecosystems and their services reflect a spectrum of attitudes ranging from complete separation of nature from culture to total integration with nature. The concept of ecosystem should essentially reflect the dynamic nature of human-ecosystems interactions while denouncing the fixed notions of static equilibrium, closed cell system where reductionism and mechanical tools are adopted.

Since many of the ecosystem services although critical for human well-being have been treated as "externality" by the conventional economists, adopting the taxonomy in terms of positional and relational goods might make the valuation exercise more comprehensive and far more relevant for decision-makers whose goal is to manage ecosystem services for sustained well-being of the society.

There is no denying that acknowledgement of the co-evolutionary characteristics of people and ecosystems and embracing methodological pluralism in valuation of ecosystem services would pose a considerable challenge to the economists and policy makers. But it would certainly enrich the understanding of man-nature relationships in a wholesome new perspective. Moreover, the interdisciplinary spirit of ecological economics should achieve its goals by organizing and attempting to resolve these complexities rather than ignoring them.

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