design, where the design process as based on landscape architectural models has been refined to incorporate a wide range of objectives, including visual quality but especially aspects of applied landscape ecology.

The advent of GIS, computer aided design, sophisticated visualization methods (*see* **Landscape and Planning**: The Role of Visualization in Forest Planning), and computer modeling has enabled designers and managers to plan and design the visual resource far more effectively. While many studies of public perceptions and preferences for forest landscapes have been undertaken over the years, recent public preference studies have been used to calibrate design guidance (see above) but more such studies need to be done.

The use of landscape character criteria to develop local design guidance also means that visual landscape issues can be demonstrated to be important and that they can be incorporated into forest planning without serious conflict with other resources, without practical problems, or at unrealistic cost. With the increasing importance of community participation in forest planning, visual quality issues come to the fore once more, but this time require understanding of locally perceived landscape and aesthetic values and expectations for the forest.

See also: **Landscape and Planning**: Perceptions of Forest Landscapes; The Role of Visualization in Forest Planning; Visual Analysis of Forest Landscapes.

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Perceptions of Nature by Indigenous Communities

P Maiteny, South Bank University, London, UK

Introduction

The purpose of this article is to provide an overview of how indigenous communities perceive and relate to the bio-ecological contexts of which they are part and on which they depend. The main message is that there is much more to learn from them than information about plant resources or methods to enhance Western-style conservation management. The forest is only one such context and it is possible to discern principles that also apply in others.

There are two possible approaches to take in this article. The first is to compare and contrast particular beliefs, values, and meanings that different peoples ascribe to their surroundings. This is analogous to drawing up inventories of species or habitat types that can then be used as resources to further existing purposes – be they commercial or for conservation – and management methods. However, this approach does little to challenge underlying assumptions or encourage learning from primary cultural perspectives. Einstein once said that problems cannot be solved through the same type of thinking as caused them in the first place. He was referring not to a need to accumulate greater quantities of information but to the need to see and analyze the situation in a

qualitatively different way. This entails bringing different meanings, values, beliefs, and theoretical perspectives to bear on the problem rather than assuming that more data applied in essentially the same ways will resolve it.

Evidence of continuing failures in stemming the tide of ecological disintegration in forested and other environments suggests that Einstein was right. It therefore becomes necessary to ask what it is about humans that seems to make us unwilling or unable to act in a way that regulates rather than damages the ecological systems on which we depend. This article argues that the root causes are less to do with quantity of factual knowledge – this will always be incomplete. More significant are the underlying meanings, interests, purposes, and priorities that shape what we decide about the relevance of those facts and how we use them. Understanding our own cultural assumptions and their flow-on effects is therefore as important as gathering indigenous knowledge – perhaps even more so.

For these reasons, this article goes a step further than providing accounts of values and perceptions. Instead it offers a framework developed in ecological anthropology for comparing different cultural views and logics on a level playing field – particularly Western and indigenous – on the basis of whether the behaviors they generate are more or less likely to result in sustaining the ecological contexts on which they depend. Such an approach requires that we step back from the beliefs, assumptions, and cultural interpretations of mainstream science to ask what benefits for forest management might be learned from longer-established indigenous world-views and beliefs. Although the latter inevitably differ in their details, an underlying shared orientation to nature is discernible as expressed through the different beliefs and practices.

There is often a temptation to idealize indigenous peoples as 'noble savages.' That is not the intention here. This article does, however, echo indigenous peoples' views of the world in recognizing that cultural beliefs, values, and meanings are intrinsic parts of ecological systems, not separate from them. This is necessary for a truly holistic approach to ecology. It is also logical, especially now that humans have a more powerful ecological influence than any other species. This influence is shaped by the cultural meanings we ascribe to our relationship with nature, as expressed through decisions and behavior.

The article describes how different types of meaning underpin different orientations to nature and how, in turn, these take the form of human choices and actions that may be adaptive or maladaptive in relation to the ecological processes on which humans depend. It articulates the dynamics of how this occurs. Aspects of Western tradition that retain perspectives more akin to 'indigenous' perspectives are also described. Finally, implications and potential learning for forestry management are considered.

Definitions

Homo sapiens is a species that necessarily lives according to meanings that it itself must invent. Culture is the name we give to the 'screens,' or 'lenses,' of beliefs, knowledge, values, and meanings that are shared by any given group of people, and through which they see and interpret the world. It is the domain of meaning-making. As such, it informs human behavior, interactions, and relationships – social, economic, and ecological. Other terms used more or less synonymously with culture are 'world-view' and 'cosmovision.'

To understand culture entails understanding symbols which, in simple terms, are signs that represent and are associated with something else according to the conventions of the culture concerned. Humans live in cultural – and therefore symbolic – environments. It is in and through symbols that meaning is encapsulated, expressed, and conveyed. Words are relatively simple symbols but they are still symbols. Others are more complex and abstract – for example, notions of the 'invisible hand' of economics, the 'superego' of psychoanalysis, or 'the divine,' conceived in some way by most cultures that have existed. Symbols – meanings – do not only reflect or approximate those aspects of the world that exist independently of humans. Humans, through their symbolic meanings and corresponding actions, also participate in its construction. Humans are physically made of the physical elements of nature. However, we also make ourselves through symbols and cultural meanings that we ourselves conceive – cosmologies, customs and norms, institutions, values, rules, and so forth. In turn, this also contributes to constructing the outside world – to the 'state' of the world. The extent to which nonhuman dimensions of the world – such as ecological 'life-support systems' – are incorporated into representations of them differs from one set of cultural meanings to another.

A key distinction – and relationship – to make in understanding culture in an ecological context is between physical phenomena and the meaningfulness that is ascribed to them. The two are frequently conflated. As anyone involved in participatory decision-making will know, the same external situation is actually many situations when perceived (and felt) through the cultural screens of various stakeholders. A forest, for example, is a source of timber

or of other commercial products, an ecological life-support system, a wilderness or collection of species to conserve, a home, a tourist playground, and as many other things as there are interests in it. The same goes for something as simple as the color red. Individual and group insistence that they see a particular external situation in the 'truest' possible way results in conflicts with others who are equally convinced of their versions of the situation, their 'realities.' This has less to do with the facts of the situation than their interpretation by interested parties. It can be painful to admit that others' perspectives on a situation are as valid as one's own. Yet it is impossible to enter into the logic of other outlooks, such as those of indigenous cultures, without doing so.

Another difficulty Westerners face in entering into other cultural logics concerns the whole subject of religion. All societies are shaped by cultural belief, and most have had some form of religious belief at their foundations. This need not be a worry, especially if we think about religion simply as belief that articulates how a given people see themselves as embedded within a bigger context than themselves alone. Other philosophies and ideologies serve the same purpose. 'Secular religions' such as humanism, Marxism, nationalism, capitalism and, as some would include, scientism provide overarching frameworks that provide a context within which adherents can find a sense of purpose and belonging. The key difference is that, unlike spiritual religions, these secular religions do not conceive of anything beyond the human. It is often argued that they are more rational. However, one of the fundamental lessons of anthropology is that all cultures have an internal logic and that they may well seem illogical and erroneous to each other when viewed from outside.

The cultures of so-called indigenous peoples are generally contrasted with those of Western economistic, industrialized society. Other equivalent terms, such as 'vernacular,' 'first,' and 'primary' refer to the fact that these peoples were living successfully in their ecological contexts long before contact with Westerners. Literally, they were there first. The fact that these peoples have lived for so long in these places suggests that their cultures served them well in adaptive survival terms. In this very practical sense, 'primary cultures' are part and parcel of local ecology as, of course, all human culture is part of global ecology. Humans could not exist without it and we have a profound impact upon it. To distinguish the meaningful and the physical does not mean that they are separate or separable. On the contrary, it is to articulate more clearly how, and through what medium, humans interact with the physical realities they depend on. Although all humans perceive nature through cultural lenses and act in terms of these, we do nevertheless act on physical nature, manipulating, using, and managing it. In turn, physical nature acts upon us 'responding' ecologically and reflecting back the consequences of what we do to it. There is a feedback relationship between culture and nature in any given ecological situation. Anthropologists have used the terms 'cultural ecology' and 'human ecology' to emphasize this systemic interrelatedness.

Some Western scientists, foresters included, often assert that their work is value-free; that their aim is simply to understand forest dynamics and processes in objective terms. So long as this work remains purely descriptive, this is a valid claim. However, there is a fine line between objective description and a values-based assessment. Any assessment, and subsequent decision about a desirable course of action, is inevitably based on values, interests, and purposes that are deemed to be desirable from a particular perspective. The purpose of a forest, for example, might be construed to be timber or non-timber production, natural heritage, conservation of species, habitat, genes, or indigenous cultures amongst others. Such purposes are rooted in foresters' perspectives, beliefs, values, and norms that express their professional and/or societal culture or subculture. Furthermore, choices about what is important to research are also culturally influenced.

All this is not to say that the research, interpretations findings or implications for action are inherently wrong – that would itself be a cultural value judgment. It is simply to illustrate the often fuzzy boundary between science – as a descriptive, explanatory activity – and culturally defined prescriptions about the implications of findings for decision making. Assessments of indigenous cultural views of forests as being 'unrealistic' or 'counterproductive' must be seen in the light of various, and often conflicting sets of values and interests. Conversely, so must indigenous assessments of the appropriateness of modern methods of managing forests or other ecosystems. Each perspective may have much to learn from the other. If mutually respectful dialogue can be achieved, new synthesis could emerge that provide benefits for all stakeholders groups concerned.

As ecological anthropologist Roy Rappaport emphasizes, the logical – and critical – bottom-line test for human ecological sustainability is not so much whether any particular cultural approach is

good or bad in its own terms but the extent to which the practices and behaviors it generates support or undermine physical life-sustaining processes, without which all human futures are jeopardized. This perspective is critical of cultural relativist positions that emphasize the equal legitimacy of world-views in their own terms without taking into account their impacts on ecological life-support systems.

As should now be clear, an underlying theme of this article is the role of culture in adaptation and sustainability. A definition of adaptation in relation to human ecology is therefore warranted. A particularly apt one has been formulated by Rappaport:

> The processes through which living systems of all sorts – organisms, populations, societies, possibly ecosystems or even the biosphere as a whole – maintain themselves in the face of perturbations continuously threatening them with disruption, death or extinction.

Successful adaptation ensures sustainability and, in human systems, cultural beliefs and practices are pivotal to adaptive processes.

Cultural Meaningfulness and Physical Law

As mentioned already, it is salutary to remember that before modern industrial–economistic culture arose, primary societies had existed successfully for thousands of years. Though small scale, this suggests that they were rather good at regulating their ecological relations. Logically, it also suggests that the cultural lenses through which they mediated these relationships were resonant with – or at least not overly antagonistic to – physical life-support necessities. By contrast, the scale of ecological problems precipitated by Western industrial society suggests such a degree of dissonance between our culturally mediated behavior and sustainability of ecological necessities that we are now feeling its consequences at a global level. This global predicament is, of course, the cumulative result of the smaller-scale activities of individuals, collectives, and professions of all sorts.

Dissonances between physical laws on which humans depend and the maps of meaning that we live by inevitably give rise to behavior that, in the long term, is damaging both to those physical systems and to ourselves. Furthermore, as technological power increases, so does the impact of these context-destroying meanings. Rappaport has warned that humanity's 'most profound problems flow from discontinuities between law and meaning... There is nothing in the nature of human thought to prevent it from constructing self-destructive or even world-destroying errors' – except, that is, the choices, priorities, and values that human thoughts and feelings produce. This, in a nutshell, describes a root cause of ecological problems and the source of their possible resolution.

There are always exceptions, but a certain resonance between the meaningful and physical necessity does seem to characterize many primary cultures. It may be argued that this is illusory and due to the fact that populations were too small and/or their technology too simple to put any great pressure on ecological processes, biodiversity, and so forth. Perhaps, given their populations and technologies, these peoples would have acted in analogous ways to Euro-Americans. Such a perspective neglects the possibility, however, that different cultural meanings themselves bring different priorities to bear on the development and use of technology.

Behaviors that support, or at least do not undermine, physical ecological necessities are not always consciously planned and, as such, can appear irrational in Western scientific terms. Though not based on precise understandings of ecological processes, the traditional beliefs and ritual cycle of the Maring people in the forests of New Guinea, for example, have been shown to generate behaviors that effectively constrain human activities from putting ecologically unsustainable pressures on the environment. Such matching between cultural practices and ecological sustainability is by no means inevitable, however, as illustrated in various Western contexts.

Decisions and behavior, then, are never wholly rational but generated by meaningful beliefs and purposes that are always emotionally charged. Meaningfulness is, after all, a felt experience and the more experiential and emotional it is, the more meaningful. This applies as much in Western contexts, including the meanings we apply to science, as in indigenous contexts. In both cases, it is meaningfulness, and therefore emotional attachment, that drives behavior more than purely descriptive scientifically derived information. This is the main reason for focusing this article on types of meaning: so as to shed light on the motivations underlying human impacts on nature in different cultures, and whether they are contextually adaptive or maladaptive.

The rest of this article describes three basic types of meaning that humans experience. They are described with reference to examples of beliefs from both primary and Western cultures. Their

significance to the peoples concerned in terms of how they view human–nature relations is described, as are their implications for ecologically adaptive behavior.

Meaningfulness and Traditional Ecological Knowledge in Primary Cultures

The term 'culture' refers to the way of life of the people of a given social grouping, to the foundations of that way of life in experience and to the frameworks of belief that give meaning to it. When scientists extract and build into databanks information about the distinctiveness of plant uses, habitat management techniques, and so on, they are harnessing only one of the benefits to be derived from primary peoples' knowledge. It is the tip of the iceberg of what could be learned from them. This, however, is bound to be the case so long as the information extracted is interpreted solely in terms of their own cultural meanings and applied to their predefined purposes. The legitimacy of other possible meanings and purposes can be obscured, or actively rejected, when they do not correspond with Western goals and priorities.

Compared with Western culture, primary peoples tend to see the particular 'parts' of, for example, a forest in the broader context of the forest (or other environment), perceiving, making sense of, and therefore experiencing them as dimensions of a whole system. A systematic analysis of a forest or other ecosystem must recognize human cultures as intrinsic dimensions of these ecosystems. In acknowledging this, the typology of meaning described below can help us to expand our cultural perception of indigenous cultural knowledge as merely sources of 'useful information' for our databanks. It can thereby help us expand the range of what we could learn from people about environments as whole systems, in the process learning more about ourselves and our human–nature relations.

The typology describes meanings that range from the descriptive, quantitative, and analytical – where the emphasis is on discerning differences and creating categories – through more qualitative, conceptual, inclusive, and experiential forms of meaning through which humans discern the similarities and connections underlying distinctions. These more synthesizing forms of meaning are necessary to begin answering questions such as 'What does it all mean?' It is these forms, therefore, that are more influential in shaping behavior. Analysis is necessary for this but not sufficient on its own.

Logically, qualitative meaning always encompasses and forms the context for the quantitative. To quantify is to translate qualitative values into measurable criteria. Qualitative appreciation of value is always prior to quantitative measurement of it. Analogic sound exists before its digitized equivalents, not vice versa. Meaning is always prior to evaluation.

On the other hand, the existence of quantitative criteria of value always implies a qualitative context of value and meaning in the background that is assumed and often remains unstated. Hence, economic criteria such as growth in gross domestic product are used as measurements of increasing human development and well-being. This assumes and indicates a cultural world-view that increases in material consumption and accumulation are the most important factors in enhancing quality of life and developing a fairer, more fulfilling and generally better society.

The suggestion in this article is that, by entering empathically into the logic of other cultures, improving our understanding of them and comparing their logics with our own, Western natural scientists could interpret the data they collect in a more meaningful, contextualized way, and potentially learn new ways of perceiving ourselves and our purposes that are more adaptive in relation to how we engage with our own and others' environments.

Type 1 Meaning: Distinction and Classification

The first type of meaning emphasizes the need to make distinctions between one thing and another. It is the sort of meaning that classifies and categorizes, a process that is necessary to all people in order to function. Types of tree must be distinguished and defined as being useful in different ways. Human needs are distinguished from those of other species and villages from the surrounding forest or other ecosystems.

In Mali, as elsewhere, different ethnic groups have specialized in complementary subsistence strategies corresponding with particular ecosystem types. The Bozo live by rivers and their main traditional activity is fishing. The Bambara and Songay cultivate the more fertile land and forests. The Fulani pastoralists graze their animals on the lowlands. The Tuareg are traditionally more nomadic transhumant pastoralists, traveling great distances with their livestock to make the most of what vegetation is available in the more arid regions. None of this would have been possible without the essentially quasiscientific capacities of observation and discrimination.

Similarly, the Mende people in the Gola forest, Sierra Leone, traditionally distinguish between the 'red' forest which is wild and uncontrollable, 'white'

homes and villages that are tame, and transitional areas such as ruined villages and farmland.

This type of meaning is often focused on identifying what is necessary to serve particular human interests. It is essentially self-orientated, be it towards the person, family, community, or ethnic group. Awareness of the impact of one's actions on other people and wider contexts is of relatively minor importance at this level of meaning. Such awareness comes into the picture with the meaning types 2 and 3.

Much professional interest in forestry is focused on tapping into this type of meaningfulness through building up inventories of species, identification of food, medicines and other materials, cultivation of plants with commercial, consumeristic potential, and biodiversity surveys to assess conservation value. Such activities must be seen in the context of Western society's prevailing norms, interests, and priorities, as expressed, for example, by commercial desires to patent plant material and ancient knowledge as intellectual property. Traditionally, such knowledge has not been seen in Western terms of ownership. Recent threats to limit access have started to change this.

Primary knowledge is therefore not only of value in identifying or extracting commercial or other benefits, outside the original ecological and cultural contexts. Beyond methods, knowledge, and management practice, there is also much to be learned about how relations between humans and nature are construed. This, too, is primary knowledge that has served people well for thousands of years. Evidence is emerging, for example, of conceptual understanding and application of sustainable principles, indicators, environmental education, and other practices that would be recognizable to ecological, forestry and other natural resource professionals. Such practices, however, are framed by, emerge from and are still embedded within traditional beliefs and worldviews. These have been termed 'traditional (i.e., primary) ecological knowledge' (TEK) and have been found to add to Western professional knowledge. To understand the contexts of belief and world-view in which knowledge and practices are grounded is itself of great benefit to management and policy, especially when it is recognized that these, and not information and practices *per se*, have a far greater regulating influence on behavior. This leads on to considering the next type of meaning.

Type 2 Meaning: Synthesis and Continuity

This type of meaning-making is about synthesizing and theorizing. People develop their understanding by creating frameworks, discerning similarities, patterns, and relationships between facts and information to form a bigger picture. This constitutes the cultural worldview or 'cosmovision' of the more technical type 1 meaning. It is through type 2 meaning that the world and everything in it becomes emotionally meaningful and therefore a greater influence on behavior. Human existence comes to be seen – and experienced – not only in a self-interested way but also in the context of a 'wider scheme of things.' This may extend to experiencing being part of this larger whole – of a sense of place – and of having a role to play within it. *Homo sapiens* becomes just one species amongst many, all of which have their place within the larger 'being.' Individuals feel a belongingness, connectedness, and purpose within their various contexts – family, community, society, and nation, forest and nature in general and, beyond that, the biggest possible context that is described in terms of sacred Ancestor Spirits, the Divine Creator and Sustainer, and other abstract concepts. The Islamic prayer, 'Allah-u-akbar' gives a flavor of this, when translated as 'God is Big' (to avoid the coercive connotations of the usual translation 'God is Great').

In more familiar terms, the emotional satisfaction when an understanding or discovery falls into place for a scientist gives a flavor of how type 2 meaning is experienced. The scientist feels they have contributed something to their professional context and will be recognized for this. They feel they have fulfilled part of their role in their professional community and, perhaps, in society generally. Some have even described a sense of awe in tapping into something that is much greater than themselves of which their particular discovery is a tiny part.

Primary worldviews warn against seeing the world solely in terms of dichotomies (i.e., distinctions) between, for example, nature and culture or mind and matter, whilst recognizing the need for them in day-to-day life. More often than not ecosystems are seen as encompassing humans in a way that informs the meaning of human life. This links with another feature of type 2 meaning: the meaning that comes from a sense of continuity between human generations, and between humans and nature. Understanding of ecological and other cycles is, for example, often expressed in traditional myths.

The Mende classification of the forest into wild, tame, and transitional areas was mentioned earlier. These distinctions are related aspects of a wider symbolic view of forest–human relations whereby different qualities of the forest are symbolized by spirits. The two transitional areas – ruined villages

and farmland – are respectively associated with the dominance of nature over people and the control of nature by people. Since the latter always requires effort, nature is ultimately dominant, encompasses humans and is, therefore, to be respected. Forest spirits are uncontrollable and dangerous, though under certain conditions, they can proffer powers on people who are then also feared by others. Spirits symbolizing the village–forest boundaries such as Ancestors and the original forest people ('pygmies') who pre-dated the Mende also command respect. They are both of nature and of culture and, in some sense, represent the relationship and continuity between the two.

In Zimbabwe, Ndebele people – and they are by no means unique in this – actually define culture as continuity that is essential to survival and well-being; continuity of identity, belief, knowledge, skills, and trades passed from one generation to the next. There is a special power in its continuity which, if lost, will also result in loss of cohesiveness and an inability to survive in the long term, especially in times of hardship.

This continuity is often construed as being 'intended and approved by God and the ancestral Forebears.' Problems will arise if it is lost because 'you have done something against God's will.' Losing it will bring benefits in the short term but great problems later which 'you will not know how to deal with because the solutions are embedded in your culture.'

Similar thinking applies to the importance of continuity between humans and nature. An old Malozi belief is that 'without nature there'll be nothing.' Many elders there, as in other cultures, understand that society is nested within and dependent upon nature, and this is given as meaningful a place as human well-being, *per se*. All cultures have it embedded in their beliefs in different ways. Cultural ecologists point out that the mere fact that traditional cultures have sustained societies and ways of life for thousands of years – longer than any urban-based civilization – suggests that they are ecologically (and socially) adaptive. Such ways of thinking are, however, becoming less significant under the influence of Western beliefs.

As mentioned, a lesson from primary cultures is that human–nature relations are influenced more by world-views and beliefs than by facts and information. In any culture, the latter are necessarily framed, interpreted, and applied in line with meanings, values, beliefs, and priorities. If these are only instrumental and utilitarian, without practical regard for ecological contexts – or traditional cultures that so often express understandings of them – the trajectory set is likely to be detrimental to those contexts. Later in the article we return to this problem. At this point it is worth mentioning that conceiving of oneself as one element in a wider context on which one also depends – familial, tribal, societal, ecological, and spiritual – is more likely than type 1 meaning to constrain behavior against excesses that would threaten that context. Some anthropologists have also convincingly demonstrated that the wider, more encompassing and, in some sense intangible and irrefutable is the contextual belief (as with strong beliefs in spirits and the divine), the more effective will they be in constraining damaging behavior. It is, of course, people themselves, acting according to the beliefs, who constrain their own behavior or that of others who are, as it were, overstepping the mark. Even when constraining mechanisms are conscious and deliberate, they are still belief-based. This is the case in Western societies too, except that social pressures here tend to have positive economic effects that are detrimental ecologically.

In sum, type 2 meaning extends beyond merely instrumental interest in what 'use' things are to 'me' or 'my community.' Rather, it is about feeling I have a meaningful place, and perhaps a role to play, within a bigger context. To live and take my role, I need to use resources from my environment. However, they are not seen as 'mine' and 'my interests' are not solely my own. In these senses, type 2 meaning is of more religious and philosophical than type 1 meaning. Indeed, it is often expressed through religious practice, ritual, metaphors, art, storytelling, and poetry.

Type 3 Meaning: Identification and 'Unification' with Context

Type 3 meaning deepens type 2 meaning but is much less widespread, especially in Western, scientistic cultures. It is also the type that provokes the most scepticism in Western society, although it is recognized by psychoanalysts and the mystical traditions of Western religions. All these may be reasons why it is so rarely written about even in the literature on indigenous culture. It cannot, however, be ignored because, first, it is a feature of most, if not all, primary cultures. Second, those who experience it carry a great deal of legitimizing weight in the cultures concerned. In this sense, it constitutes the strongest evidence for the truth or validity of the type 2 world-views that inform attitudes and behavior in the cultures concerned.

It is difficult to describe this type of meaning in intellectual terms, as it is not referential like the

other two, is less intellectual, and more emotional and experiential. The experience results in 'esoteric' knowledge and is therefore associated with certain respected members of society, such as priests, holy men and women, shamans, and healers. It is grounded in profound all-encompassing feelings of identification, absorption or unification with context and, as such, might better be described as a state of meaning. This often occurs through the practice of religious ritual or devotion. The distinction between subject (person) and object (context) is blurred. It is the sort of experience depicted in feature films as possession by, for example, a totemic animal or a forest spirit. It can engender fear and awe in spectators as well as great respect for the 'object' of identification. In both these senses, it is taken as first-hand experiential evidence of the human–context relationship, a relationship that, in type 2 meaning, is construed more in terms of faith and belief. Those who can experience it directly in type 3 meaning are, for this reason, also held in particular esteem as they are deemed to have a direct link to the contextual 'forces,' and as being agents or vehicles through which they communicate. This, for example, is the case for those special people in the Gola forest who are proffered powers by the forest and transitional spirits.

All three types of meaning are interrelated but any one of them may be more evident at different times. All of them are also necessary. Although types 2 and 3 increase experience of meaningfulness, to see the world only in terms of synthesis or identification would obscure crucial distinctions, making it impossible for a person to live a normal life. On the other hand, a world seen only in terms of type 1 meaning (which is equivalent to uncontextualized information) encourages fragmentation, lack of relationship with and alienation from necessary social and natural contexts, with resulting tendencies towards divisiveness. Values, purposes, and action founded on types 2 and 3 are more inclusive, relational, and demanding of reflection than type 1 meaning. They are more likely to take wider systemic issues into account and to generate attitudes and behavior that are more conducive to ecological sustainability. The ultimate expression of the synthesis and relational wholeness to which they refer is often expressed in terms of sanctity and divinity. Particular behaviors deemed to be excessive or destructive are seen not only as corrupting or disrespectful to that divinity but also self-destructive, given that actors are themselves part of the wholeness it represents. Persons who live according to meanings and values of this sort, who are not motivated solely by instrumental and self-orientated interests, are therefore likely to be more conscious of the impacts of their actions on the wider, more tangible systems of which they are parts and on which they depend.

The Cultural Context of Western Forestry and Sustainability Science

This article has taken an unconventional approach focusing on the internal conceptual logic of indigenous culture. Implicitly, it has also highlighted a key source of difference between indigenous conceptions of the human–nature relationship and Western values that shape the behavior of individuals and collectives, including professions such as forestry. Considering the latter in the light of the typology of meaning, it is necessary to ask what is the most important contextual reference of Western culture. On the basis of observation, answers might include consumer democracy, the Western way of life, economic development or growth, the global market or market forces, the individual (as the basic economic unit whose interests the market is deemed to serve), and the invisible hand. All these 'ultimate' secular meanings share two important features.

First, the object they ultimately serve is human beings themselves. They are anthropocentric beliefs, self-referentially self-serving. There is no sense in any of them of a meaningful context – a bigger whole – from which human beings have emerged, that encompasses us, that would in some sense continue without us and within which we conceive ourselves as playing a role.

Second, the dominant way of assessing and assigning value, and making decisions in all of them is quantitative rather than qualitative – namely, through the metric of money. Money dissolves qualitative distinctions so making everything comparable with everything else on the basis of quantitative measures. In reality, the qualitative world on which the metric is imposed can, logically, never be as simple as the metric itself. The uses or commercial, monetary value of timber cannot ultimately substitute for the ecological processes of the forest. It is almost tautological to say so, but when a people loses touch with the qualitative ecosystemic processes and functions on which they depend, the logical and inevitable consequence is that they come to prioritize the maximization of value purely in quantitative terms – for the 'potential' of these processes once they have been converted into money. Hence, if all value is seen in terms of money then, logically, money itself comes to be seen as the ultimate value. The survival

functions of forests themselves (and of other ecosystems) come a poor second place.

Seen in the light of the typology of meaning, both these features of Western culture elevate type 1 meaning to the status of type 2 meaning and subsume the qualitative, contextual dimensions of type 2 into it. The distinction between humans and the rest of nature has become more meaningful than recognizing ourselves as aspects of one synthesized and integrated system. The practical implications of this are that the interests of a special subsystem (humans and our creations) – and perhaps of other special interests within it (political, economic, commercial or ideological) – are given priority over the more general purpose systems that, in physical fact, do encompass us and on which we are inevitably dependent. Most importantly, decisions about policy, management, evaluation, and behavior are made on this basis.

In the context of the forestry profession, the pressure is always to underpin and justify all proposals and decisions in quantitative terms of monetary costs and monetary benefits, be it for commercial forestry or forest conservation. In the latter, there are pressures to couch arguments in terms of quasiquantitative 'biodiversity' rather than the more qualitative 'nature' or 'ecological processes' and to devise complicated surrogate evaluations of monetary costs and benefits. No amount of quantification will ever be able to provide a full picture of qualitative complexity. It is logically impossible.

All this is in stark contrast to primary worldviews where type 2 meaning remains qualitative and contextualizing of humans in a context that is bigger than them, rather than squeezing everything into a human context for human purposes. Far from devaluing human beings, such perspectives enhance their meaning by giving them a participatory role in the wider system. They also influence decision-making and behavior in such a way as to insure against disintegration of life-supporting contexts. Perhaps paradoxically, such world-views ultimately serve physical human purposes (i.e., ecological sustainability) but by way of emotionally meaningful belief systems that conceive of human lives being about serving something greater than themselves. Such perspectives also seem to provide an expanded sense of meaning and purpose for individuals themselves, one that is rooted in something other than maximizing material gain and consumption. Interestingly, some esteemed Western scientists have, for some years now, been advocating the need for a modern contextualizing world-view of this sort which is also scientifically rigorous and philosophically logical. Edward O. Wilson's 'Evolutionary Epic' and his Pulitzer Prize-winning book, *On Human Nature* (1978), Sir Julian Huxley's *New Bottles for New Wine* (1957 and see quotation below), and the emerging discipline of earth systems science (an alternative name for science informed by James Lovelock's Gaia theory) are important examples.

This article cannot offer recommendations about how to improve the effectiveness of forestry practice, within its existing parameters, assumptions, and priorities – that is, within the disciplinary culture according to which foresters currently operate. Plenty of other articles attempt to do this (*see* **Social and Collaborative Forestry**: Common Property Forest Management; Joint and Collaborative Forest Management; Social and Community Forestry). The purpose here has been to indicate how indigenous cultures, which are rapidly becoming extinct, quietly point to the need for changes to the basic meanings and orientations that inform Western attitudes and practices. It suggests that the existing disciplinary culture of forestry (amongst others) might benefit from being more receptive to learning from the perceptions and values of people who live – or used to live – in the places where foresters work.

It is appropriate to end by showing that perspectives described in this article are not limited to 'indigenous' primary cultures. The following quotations illustrate that, though neglected, they also exist in Western scientific and religious cultures. The final quotation is a contemporary native North American perspective.

First, from Sir Julian Huxley, originator of the International Union for the Conservation of Nature, first Director General of UNESCO and winner of the Royal Society's Darwin Medal:

> The universe is becoming conscious of itself, able to understand something of its past history and its possible future. This cosmic self-awareness is being realized in one tiny fragment of the universe – in a few of us human beings… On this, our planet, it has never happened before… It is thus part of human destiny to be the necessary agent of the cosmos in understanding more of itself, in bearing witness to its wonder, beauty, and interest… Most extraordinary in principle, it (evolution) has generated values… Evolution thus insists on the oneness of man with nature, not merely in respect of biological descent and chemical composition, but because nature is the indispensable basis of his material existence, and also the indispensable partner in his mental and spiritual achievements… For man to fulfil his destiny, he must think of himself as in partnership with the cosmos.

(From Huxley (1957) *New Bottles for New Wine*. London: Collin).

Second, a perspective from twentieth century Kabbalistic Judaism:

> Putting themselves in relation with all things, humans will then remember that in the deepest being of all that exists is hidden the Divinity to which they themselves feel 'connected' and by which they are conscious of being inhabited. They will feel that the *Shekhinah*, the Divine Presence, desires to dwell in them… Humanity and nature. Ecological necessity: Humans, humble in front of their Creator and recognizing Its goodness, regard nature with respect and come close to it without expecting gifts… Always, while contemplating these wonders, humans sense their Creator who reminds them: 'See how beautiful is My work!… Be careful not to corrupt it… because if you corrupt it no one after you will be able to repair it!'

(Author's translation from Safran A (1998) Florence, Italy: Giuntina, *La Saggezza della Kabbalah* transl. P. Maiteny).

Finally, there is a striking similarity of meaning between the above quotations and the following, written by contemporary native North Americans:

> For all the people of the earth, the Creator has planted a *Sacred Tree*… The life of the tree is the life of the people. If the people wander far away, if they forget to seek the nourishment of its fruit, or if they should turn against the Tree and attempt to destroy it, great sorrow will fall upon the people. Many will become sick at heart. The people will lose their power. They will begin to quarrel among themselves over worthless trifles. They will become unable to tell the truth and to deal with each other honestly. They will forget how to survive in their own land. Their lives will become filled with anger and gloom. Little by little they will poison themselves and all they touch. As long as the tree lives, the people will live. It was also foretold that the day would come when the people would awaken. They would begin to search again for the *Sacred Tree*.

(From Bopp J, Bopp M, Brown L, and Lane P Jr (1985) *The Sacred Tree: Reflections on Native American Spirituality*, 2nd edn. Alberta, Canada. Four Worlds International Institute for Human and Community Development.)

See also: **Landscape and Planning**: Perceptions of Forest Landscapes. **Social and Collaborative Forestry**: Common Property Forest Management; Joint and Collaborative Forest Management; Social and Community Forestry; Social Values of Forests.

Further Reading

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Urban Forestry

C C Konijnendijk and T B Randrup, Danish Forest and Landscape Research Institute, Hoersholm, Denmark

Introduction

Urban forestry is an integrated concept, defined as the art, science, and technology of managing trees and forest resources in and around community ecosystems for the psychological, sociological, aesthetic economic, and environmental benefits trees provide society. It emerged as a discipline in North America in response to better ways to deal with the growing importance of tree-dominated urban greenspace, as well as growing pressures on green areas. During recent decades an international urban forestry research community has developed, as has an increasing body of knowledge as well as new approaches and techniques. Urban forestry has close links to forestry, but tends to be more multidisciplinary.

Concept of Urban Forestry

According to the Society of American Foresters' *Dictionary of Forestry* (1998 edition), urban forestry is defined as 'the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society.'

The concept and scope of urban forestry is summarized in **Table 1**. Urban forestry has the urban forest as its domain. An urban forest is defined as