The Concept and Role of Culture in Socioscientific Systems: Some Case Studies

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The term "culture" has two interesting connotations in social thought. Both carry important implications on the kind of social interrelationships that are generated by the preferences formed at the level of the individual. Since culture is an intermediate course for generating interrelationships, which in turn reinforce and continue the very meaning of culture, a cause-effect relationship must exist between social transformation and culture. In this, the formative basis of culture, the individual and groups must play a determining role. Such a social–political–institutional approach to the study of culture, though not prevalent in common literature, has played a central role in two opposing schools. The first school was generated from Ibn Khaldun's concept of the "science of culture."[1] The second was given life by the ontological status given to culture by Hegel in his definition of the "world spirit," which he associated with the heart of western civilization.[2] (Weber, too, saw in culture the same characteristic.[3]) These two perspectives have recently been invoked by Fukuyama to expound his own theory of the "end of history."[4] He sees the Hegelian dialectical process to be at the heart of an atomism of culture—the "isothymia," as he calls it—and governing individualism.

When viewed in light of a transmitting medium for social change against the perspectives of different worldviews, the role of culture has been construed in terms of "cultural pluralism." But when this is taken up in the light of its transforming and cause-effect impact on social transformation, cultural pluralism is nothing less than the consequence of a particular political philosophy. Thus, an important causal nexus of "global" interactions emerges: First, there is a worldview that establishes a meaning of culture. Second, the meaning of culture so formed creates a

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social–political–institutional context that is externalized. Third, the emerging social–political–institutional relations involving culture become a circular system of cause-effect flows reinforcing each other.[5]

The cultural dynamics, however its cause-effect interrelationship is understood, must thereby define a criterion of social well-being. This social well-being function is defined in terms of the epistemology of cultural dynamics and is taken up at the level of the ensuing social–political–institutional cause-effect interrelations. Such a criterion function is then both the effect and the cause of the circular interrelationships that exist between cultural dynamics and the social–political–institutional interrelationships. This is also the essence of constrained simulation of the social well-being function and assumes a meaning quite opposite to that of optimality and steady-state equilibrium of economic, social, historical, and political processes in whose evolution culture plays so central a role.[6]

Objective

Our objectives are the following: to establish the nature and show the consequences of the set of circular cause-effect interrelationships between culture and the social–political–institutional order; and to formulate a social well-being function to explain the dynamics that exist between culture and the social–political–institutional order.

In formalizing the system of circular cause-effect interrelationships, we will using the following three epistemological premises to expound our ideas. Our social well-being function will then correspond with these respective cause-effect interrelationships.

The first type of cause-effect interrelationship is based on the meaning of the science of culture as defined by Ibn Khaldun. We will show that this conception has a particular relevance in understanding the ethics underlying the social–political–institutional interrelationships but runs into methodological problems.

The second type of cause-effect interrelationship derives from the Hegelian dialectical approach, recently used by Fukuyama in developing a science of culture in the framework of isothymia—disintegration of large systems into small ones. The dialectical process is also seen as a groundwork of political philosophy in which cultural plurality becomes an embedding epiphenomenon. This causal approach between the plurality of culture and the "isothymotic" states is referred to as "cultural pluralism."[7]

The third type of cause-effect interrelationship is what I will show as a social–political–institutional process of unification in cultural dynamics. I will formulate this thesis on the premise of divine unity from which ensues a universally complementary process of socioscientific becom-

ing. Now the ontology of cultural pluralism is negated in favor of the ontology and epistemology of divine unity, and this assumes a definitive explanatory dynamic in the socioscientific domain. Consequently, the concept of cultural pluralism is replaced by a world convergence toward a unique and inescapable reality, that of unity and unification. This will be shown as the consequence of complementing diversity premised on the self-same epistemology of unity and unification.[8] Here, too, the circular-cultural dynamic with the socioscientific order will be shown as essentially circular and reinforcing in continuum. This approach will be the focus of this paper.

Definitions of Terms

The terms "culture" and "cultural pluralism" need to be understood in the context of our thesis. The thesis is to establish the arguments behind the circular cause-effect process of individual and socioscientific transformation and to establish a social well-being upon this.

Culture

Here "culture" means a certain preference as ethic in individuals and groups based on a referential text that determines behavior. This determining premise is also the epistemology of the encompassing ethical order. The externalizing of the preferences to the level of social, political, and institutional activities causes socio-scientific transformation to occur. Among the many activities that arise, we will consider here some of the socioeconomic characteristics. In this we will take the example of the Mi'kmak people on Cape Breton Island. The Mi'kmak are a historic race of Canadian Indians.

Cultural Pluralism

By "cultural pluralism" we mean the atomism of the epistemological base explaining the individual and group and hence the social relevance of cultural dynamics. The cultural atomism, when structural and abiding as a consequence of the epistemological premises, will be referred to as "methodological individualism." This is then as much a characteristic of individual as of collective (agency, group, institutional, political, etc.) preferences. Such a cultural atomism in the framework of methodological individualism is reinforced by the circular cause-effect between the nature of the individuated cultural epistemologies and their consequences on preference formation.

A Social Well-Being Function

A social well-being function is an objective criterion of the socio-scientific order existing, first, as a result of the underlying set of cause-effect interrelationships between a science of culture and the social–political–institutional order. Here we have the causality arising

from interrelationships pertaining to the social well-being goal. Second, the attained levels of the social well-being function in turn regenerates a new set of socioscientific interrelationships. This assumes the nature of "effects" in the total set of cause-effect interrelationships. Because of continuous evolution between these two sides in a simulative scale, we refer to the generic interrelationships as cause-effect.

Socioscientific Order

Finally, the reader will note my use of the term socioscientific order that transcends the limited domain of the social–political–institutional order underlying cultural dynamics. The meaning here, once again arising from the underlying set of cause-effect interrelationships, is taken up at the level of invoking a definite epistemology that becomes pervasive in the entire system of interrelationships. Such a universal explanatory power thus does not differentiate between systems. It remains uniquely analytical in all of them.

Rejecting Pluralism in the Study of Cultural Dynamics

Since our major focus in this paper is to study the unity-based category of formalism in the dynamics of culture, we will now quickly negate the approaches of the science of culture according to Ibn Khaldun (*umran*) and atomism according to Hegel and others.

Ibn Khaldun's Science of Culture

Ibn Khaldun, a fourteenth-century historiographer and sociologist living in North Africa, studied the changing facet of Arab civilizations of his time and phased out this study of change in terms of social behavior. He then tried to extend this ontological analysis to all categories of historiography.[9]

Ibn Khaldun starts from the early stage of any civilization whose integrity and prosperity he discerns in terms of religious and tribal solidarity found in simple primitive social context (*'asabiyya*). The science of culture for Ibn Khaldun becomes the human propensity toward frugal living and solidarity gained from religious and tribal habits. Ibn Khaldun then traces the subsequent development of Arab civilization and finds that as prosperity grows and the pamper of life increases with growing complexity of social, economic, and political structures, the solidarity disappears and cultural disintegration takes place. This is reflected in wasteful consumption habits and in social ills and weaknesses arising from corrupt administration and evasion of holy wars.

Ibn Khaldun associates rationalism with the decline of civilization and social corruption. He argues that a rationalist regime cannot lead to honesty and social integrity because it is motivated by personal gains and is premised on knowledge devoid of Godly knowledge. Ibn Khaldun thus associates the good cultural life with the interrelationship that must be

established between God, the world, and the Hereafter. Although this is seen to be the best path for human progress, Ibn Khaldun finds that most regimes remain rationalist and not Godly. Hence, Ibn Khaldun focuses principally on the study of historiography based on rationalist forces.

Several problems can be associated with Ibn Khaldun's cultural analysis of causally integrated social–political–institutional dynamics. We take up a few here.

First, Ibn Khaldun's cultural analysis is not methodologically circular toward establishing a cause-effect interrelationship. Hence, while studying historiography he cannot find either abiding or reversible ethical factors that can continue to abide in the most technologically advanced societies and at all stages of social transformation. Ibn Khaldun's historiography is thereby based on one-directional causality—from cultural disintegration to civilizational decadence.

Second, Ibn Khaldun's emphasis on the causality between God (*Allah*), the Hereafter (*al-ākhira*), and the world (*al-dunyā*)—one that is found in Islamic scholasticism and religious scholarship[10]—cannot be explained at a methodological level. The cause-effect interrelationship among these domains remains unexplained; it is simply stated as fact. Hence, the endogenous role of morality and ethics as epistemological forces remains unexplained.

The last observation leads to the third problem in Ibn Khaldun's science of culture. Methodology remains subservient to the epistemological conception of perfection developed by Plato and Aristotle, and thus the world is seen from this perspective. Consequently, for Ibn Khaldun as for the Greek thinkers, the meaning of ethics and morality remains numinous and outside human explanation. The central meaning of ethics and morality as endogenous knowledge in all systems of human action cannot be invoked. However, the Islamic religious thinkers called the *mutakallimun*. have a much different approach to such issues.

Consequently, we find that it is the exogenous nature of ethics and morality, and hence the distancing of God and Unity in "systemic" studies, that makes Ibn Khaldun's science of culture incapable of explaining the cultural dynamics of a social–political–institutional, socioeconomic whole. The result is the failure in conceptualizing a social well-being functional in the milieu of the ethical and moral interrelationships with the social–political–institutional entirety. This latter case again is left to the Islamic scholars, particularly Imam Ghazzali, Imam Malik, and Imam Shatibi.[11]

Hegelian Cultural Dynamics

In Hegelian dialectics the place of God is negated; in Kantian ontology, on which Hegel's philosophy of history rests,[12] God remains numinous and unconnected with the world. This is the pervasive assumption

of rationalism per se. Thus, God (unity) and rationalism (pluralism) remain permanently opposed epistemologies in human thought.[13]

With the rise of rationalism in the dialectical process underlying western historiography, human behavior was molded and fed into the self-same type of preference formation, which then affected the whole gamut of individual, social–political–institutional, economic, and scientific perceptions. Rationalism, being premised on an endless bundle of differentiated categories of knowledge, becomes individualistic simply by the similarly enforcing forces of individual, social–political–institutional, economic, and scientific preferences. One such social system governed thoroughly by rationalism is capitalism. It is defined as a political economy in which individual and intersystemic organizational behavior are fused together by the underlying preferences formed and the control generated over capital and property rights by the self-same nature of methodological individualism.[14] In this perspective, the interactions among all such intra- and intersystemic entities lead to an enforcement and enhancement of the rationalistic process characterized by methodological individualism.[15] Thus, while a circular causation between culture (methodological individualism) and organization is perpetuated in capitalism, this simply reinforces the rationalist regimes as they are methodologically characterized.[16]

Hegelian dialectics in both its capitalistic nature and in its Marxist nature has thus contributed significant groundwork to western civilization. We conclude that western civilization is the circularly reinforcing product of rationalism seen as a form of culture playing itself out in both capitalism and socialism.[17]

Inference Drawn From the Science of Culture and Cultural Pluralism

While Ibn Khaldun's science of culture attends to the ethical and moral issues of the world in connection with God and the Hereafter, and Hegel's philosophy of history addresses rationalistic dynamics in the building of western civilization, both of these remain methodologically un-unified on the premise of divine unity. If our aim is to discover a sense of "global" (extensive) complementarity among interacting agents for the common social well-being, then such complementary processes do not exist in either of these two approaches. In Ibn Khaldun's science of culture it does not exist because of the exogenous nature of ethical and moral elements (culture). In western social–political–institutional, economic, and scientific constructs, it does not exist because of methodological individualism.

Cultural pluralism is the result of both of the above approaches. In Ibn Khaldun it stems from his preoccupation with the study of rationalist systems in social transformation. In Hegelian dialectics it exists as an

axiom. Cultural pluralism as a product of political philosophy is thus seen as a product of rationalism. It has nothing in common with the principle of complementarity among cultural diversities that can unify people under a commonly perceived epistemological premise of social well-being. Thus, in order to discover a unifying system of knowledge and thereby to establish "global" complementarity among the interacting elements of systems, we must look at a system that is "systemically" unified by dint of its epistemology of unity.

We now turn toward examining such a knowledge-centered, unified system of circular causation of unified reality. We will then apply this model of the unified worldview to the social well-being of Canadian Indians. On the Island of Cape Breton these are the Mi'kmak people. The cultural dynamics for the Mi'kmak people will comprise their preferences toward a particular way of arranging the sociopolitical and economic life centered around a divine creator. We will show that the emerging social well-being based on such a perspective of the cultural dynamics can be effectively explained by the knowledge-centered circular causation worldview of unified reality.

The Nature of Knowledge in Our Epistemological Study of Culture

While writing on an epistemological concept of culture as a medium for generating socioscientific interrelationships, we will invoke the meaning of "systemic knowledge." One cannot ignore its pervasive existence and real consequences on human resource development, and thus, on the entire system of socioeconomic development. We will briefly take up this topic now to explore the idea of "global" interlinkages that emanate from the knowledge-based worldview and that carry with them human resource development and planning as important "systemic variables" of the nature of socio-economic developmental variables. It is thereby noted that a simple concept of human resource is seen in this framework of the interactive knowledge model[18] as an instrumental variable that cannot fundamentally bring about social change in the absence of its primal induction by the knowledge premise itself. Likewise, by the circular causation and continuity model of unified reality, phases of human resource development so formed in the interactive knowledge model must become engines of further evolution of knowledge, carrying along with these dynamics the entire gamut of social–political–institutional and economic interrelationships.

The concept of knowledge in the epistemological sense is a series of cause-effect interactions between the premise of a worldview and the socioeconomic variables. A greater extension of the socioeconomic domain is to the socioscientific domain. In this context there exists a rig-

orous interrelationship between social well-being and the technological-scientific process. Indeed, the epistemological basis of the interactive knowledge model invokes a unique theory that applies uniformily to the social and scientific domains so as to unify them in this methodological context. The objective of the socioscientific inquiry, the attaining and not maximizing of social well-being as the human criterion, subject to the causal interrelationships between the social and scientific constraints, is now characterized by its epistemology of unity and unification as a process studied within the socioscientific domain. This implies an ecologically pervasive interactive worldview and a vigorously active human agency within and between systems.

A Technical Formulation of the Interactive Knowledge-Based Model

Now in light of the criterion of a social well-being function, the knowledge variable is determined by the ever-increasing levels of ordinal values of the attributes as they arise from the intensity of impact of the primal epistemological source on the practical texts, instruments, references and political–economic order. Hence, a flow of knowledge, θ, is determined by the primal impact of T (epistemology), as this generates the attributes A. Thereby, $T - A - \theta$, or $\theta = \theta(A(T))$. This level of knowledge formation as flows of learning is developed by normative discourse, such as the historical reference and justifiable claims on self-governance and distinct society status by the Canadian natives. The normative claims then bring about the rights and privileges for actual positivistic realization of the sociopolitical and economic order. We denote the latter by X. Hence, $\theta - X$ gives $X = X(\theta)$, with $\theta = \theta(A(T))$. Finally, the circular causation and continuity worldview of the process order in this knowledge-based model gives,

$$T \rightarrow A \rightarrow \theta \rightarrow X \rightarrow \text{new values of } \theta \text{ and hence of levels of A.}$$

In Figure 1 these relations are shown by the returning and interacting arrows.

The concept of knowledge in the circular causation and continuity model is thus intrinsic at both the normative level of discourse and the positivistic level of actions followed by response between the knowledge plane and the cognitive world of social–political–institutional and economic realities.

The end result of such discourse is simulation of the social well-being function given by

$$W = W(\theta, X(\theta)),$$

subject to the iterative relations between θ and X through hierarchies of formations and reinforcements of the A-values.

Figure 1: Interrelationships Among Attributes and Hierarchies of Socio-Psychological, Sociopolitical and Socioeconomic Futures for the Mi'kmak People: Reflections from Survey Results.

	Attributes of the Knowledge-Based Model in the Relational Worldview
Acceptance of Divine Creator as Unity	Epistemology
↓	↓
Laws so derived for the social, political and economic order.	Justice as Pervasive Essence
↓	↓
Concept of social well-being thus derived: Concept of happiness, freedom, community life, political change, economic self-reliance	Purposive way to realize justice
↓	↓
Corresponding types of political, social and economic activities required to attain the concept of social well-being so comprehended: basic needs, human resource development, self-reliance and self-government, land rights, fiscal rights, governance under varied models for greater degree of purposive cooperation, types of technology and microenterprises for increasing employment, ownership, incomes and expertise.	Policy variables instrumental variables, texts and socio-economic variables: Ethico-economic choices leading to certainty and social well-being
	↓
↓	↓
Personal motivations and capacity toward attaining the type of happiness, freedom, socio-political and economic rights for defining their own concept of social well-being and	Confirmation and affirmation of the processual change: Creative politico-economic futures.
	Creative evolution
	↓ ↑
Interaction-Integration ⇆	Creative Evolution

Applying the Knowledge-Centered Model to the Case of the Mi'kmak People in Cape Breton

A summary of the focus on which a survey was conducted is provided below:[19]

1. *Personal Attributes of the Interviewee:* In this section of the survey questionnaire, information is gathered regarding familial characteristics, type of employment, and income or financial assistance earned of any kind.

2. *Sociopsychological Perspectives:* This section, asks about personal belief in a divine creator, assumed to be at the center of creation and the meaning of life. The section then goes on to pose questions about personal beliefs—whether the divine creator (if believed by the interviewee), plays a significant role in governance of the self, the society, the community, the political order, the environmental order, or the global order.

Other questions in this section are on the importance of particular values in the person's conception of happiness, e.g., motivation to work, self-esteem, health, employment, economic security, personal security, family, friends, community life, belief in the divine being, basic needs fulfilment. Likewise, the interviewee is asked about certain values signifying his/her conception of freedom: social justice/social equity, economic justice/economic equality, self-esteem, love and respect, harmony between self and other, harmony between self and environment, harmony between self and supreme being, harmony within community and social life, an individualistic conception of well-being, a familial conception of well-being.

3. *Politicoeconomic Perspectives:* Questions in this section have to do with the importance the interviewee attaches to issues such as Indian people's self-government (top-down authority vs. bottom-up authority); limited participation of selected groups of the Indian people, such as elders and band councils; full participation of the Indian community; joint governance between the Canadian government and Indian people, the Canadian government's decentralization of political and economic powers to the Indian people, as is supposed to be the long-term perspective of the federal government; and the government of British Columbia and the Nisga'a people in the case of the Nisga'a land settlement in British Columbia.[20]

Other questions ask about the degree of the individual's contentment and sense of security with the political and economic arrangements under the existing federal and provincial government jurisdictions of the Indian people, as under the Department of Indian Affairs and the Charter of Rights and Freedoms of the 1982 Repatriated Canadian Constitution.[21]

Proceeding from the above types of questions, other questions in this section of the survey deal with the interviewee's sense of urgency for constitutional reform regarding self-determination in economic and political matters, government transfer of incomes in return for taxes and royalties to be paid by the Indian people to the Canadian government, simple representation by the Indian people in the Canadian government thus shaping their political futures, partial jurisdiction of Indian lands to

the Canadian government, and assumption by the Indian people of full political and economic powers of land rights.

4. *Economic Perspectives:* The interviewee is asked about his/her feeling about economic woes, or otherwise; namely, inability to adapt to Canadian ways; Indian people's different attitude to economic well-being; absence of economic self-reliance and hightened dependency; importance of health, welfare, and housing improvements; the inability of the Canadian government to respond to Indian people's economic aspirations.

Other questions in this section are aimed at determining the level of importance the interviewee assigns to factors of economic well-being, such as employment, wages and incomes; economic microenterprises in the Indian community with appropriate types of technology; ownership of assets; human resource development differentiated by technical and university training; physical and mental health; improved housing and basic amenities; access to funds for investment; decentralization of social security and income transfers within the Indian self-governments; other special programs for rehabilitating the Indian people.

Integrating the Various Parts of the Questionnaire

There is a logical sequence of interconnection among the responses to the various questions in the four sections. Figure 1 tracks the first set of responses.

The knowledge-based model given above helps one infer certain facts regarding the social well-being of the Canadian Indian people. Figure 2 represents a view that can emerge from the responses of the questionnaire survey.

Figure 2: Interactions in the Knowledge-Based Model In Relation to the Mi'kmak Sample Survey.

Divine relevance is replaced by human relevance alone.	Absence of epistemology
↓	↓
Knowledge is of the rationalistic type with power reigning over any unique epistemology.	Multiplicity of conflicting views caused by individualism or hegemony
↓	↓
A differentiated view of reality is formed that translates itself to the socio-political and economic order.	The pervasiveness of methodological individualism
↓	↓
Conflict over consensus abides.	Breakdown in interaction-integration-evolution

Relational Concept of Knowledge and Human Resource Development in Survey Results

We have shown that human resource development for Canadian Indians at the levels of university degrees and vocational training is low.[22] At the same time, there are good signs of a better educational future as a high percentage of the young are attending secondary schools. We have also introduced the idea of indigenous technology for developing ecologically oriented microenterprises by and for the Native People. Thus, the idea of technological change among the Native Indians was severed from the traditional concept of economic efficiency in human capital investment. Instead, the idea of adaptation and progressive enhancement of skills and learning on the job with appropriate technology was introduced. Appropriateness of technological change, being of an indigenous nature, is a matter of one's own way of viewing the ideology and function of what technology means.

Ecologically related technology is one such orientation among people who base their epistemological origins on a concept of coexistence with the environment and who derive meaning for sustainability from such a premise. Education then is epistemologically rooted in this same ecologically coexisting view of self, society, and the other. The technology, fueled by such a natural tendency among the Native Indians, would mean also the development of microenterprises; their control, management and, ownership of such specific projects; and a degree of uniqueness that is distinct from enterprises specializing in capital goods. Such aspects of the microenterprises can insulate such projects from global competition. Together these factors are signs of the cost-effectiveness of ecologically friendly microenterprises.

Human resource development in the traditional economic sense is an efficiency concept, not a concept on labor market adaptation to skills, abilities, and technology. The concept of labor market adaptation, wherever used in the neoclassical economic literature, is meant to imply technical adaptation of labor to exogenously targeted technology and to make adaptation subject to substitution between skills, goods and goals in the process, which too is considered to be a long-term phenomenon. Thus, the groundwork of human resource development is based on the assumptions of economic efficiency seen as a marginalist substitution of factors, goods, and goals and of exogeneity of technological change made to affect workers by decisions that remain foreign to the latter's control.

In the case of Native Indians in Canada, their history of relationships with the federal and provincial governments' programs and the various political–economic arrangements these required to entrench foreign technologies, policies, hegemony, and ignorance of the Indian people, is

a glaring example of the emptiness of neoclassical concepts of exogenous technology. They have never worked for the betterment of Native Indian peoples, just as they have traditionally alienated blacks, minorities, and the disadvantaged of the urban West.[23]

The ecological concept of technology is a relational one, wherein the human world is tied to the physical environment by treating the latter merely as an instrument, such as a good or a service (capital or consumption), for attaining the greater common wealth of social well-being. The latter has been defined earlier as a function of knowledge values in terms of the epistemology and measurement of interrelating primacy of knowledge to cognitive forms as instruments. Environment and, hence, the technology revolving around environment are included in the latter category; its interrelationship with the human world is included in the former category.[24]

What then is the view of human resource development that we derive from the ecological concept of technology in an age that is at the mercy of global capitalism and market competition? To answer this question, we note that globalization of markets and competition is arising from the special character assumed by markets. Competition is always found to alienate goods when they have no diversification and linkages, for it is then easy to substitute the good without cost. Costs increase when substitution is exercised on goods existing in linkages across diverse chains of production. The ecological world provides a distinct market with its own goods that are increasingly entering the caring purview of the world consumer community. It is also an extensively interlinked world of transformation and diversification of goods and alternatives. This feature renders ecological goods less prone to substitution; hence, costs are controlled. Human resources become a factor in this menu of transformation, production, institutions, and preferences that, altogether, underlie the formation of ecological goods and services. Besides, the continuity in this process of transformation is multidimensional. First, knowledge formation through interactions and integration enables creative evolution to occur.[25] Second, extensive interlinkages among goods, services, factors, agents, institutions, agents, and the global environment occur over this plane of knowledge formation. Third, there is the intertemporal advance of the same processual order, causing sustainability. Such a totality across knowledge-based systems and over time may be called a political–economic nexus.

Hence, the answer to the above-mentioned question is afforded on the basis of the treatment of factors of production, such as human resource, in the same context of sustainability and cost-effectiveness that occurs to ecologically friendly goods in global markets. Ownership of capital now becomes a grassroots-driven dynamic evolution of ownership, because of the dynamic basic needs regime of development intrinsic to such a

socio-economic change. In all these the essence of interactions, integration, and evolution epistemologically defines the conduct of affairs at every level. It assumes an extensively participatory form.

When transacting in goods and services with the aggressive capitalist markets, the social well-being goal of sustainability for communities attained by means of ecologically friendly goods must itself include those alternatives that protect the communities and must negate the alienating aggression of sheer global capitalism. One then realizes how important it is for such an order to perpetually function on participation, cooperation, and knowledge induction of the agents at work.

Human resource development for the Native Indian communities would then mean specialization in all modern techniques and academics for purposes of using them for a goal that is understandable to them both by background and acceptance. This is ecologically comprehensive. This alone is the substantive issue of the human resource development project. All other means are instrumental in nature.

It is therefore not so important to become top-notch scientists, computer scientists, and mathematicians in such a community, for its goals are primarily that of a caring civil society—not of material or personal superiority. Its microenterprises emanate from and serve common interests, not the interests of a special group, although the latter is upheld when derived from and mobilized toward subsequently heightened advancement of the ecological worldview.

The Relational Concept of Knowledge and Property Rights

Property rights or entitlements are ownership of rights and privileges that enable an individual and community to be functional in their positive actions. In the intra- and intergenerational sense of resource allocation for sustainability, we mean by the knowledge model that each generation would adapt to its consumption, production, and ownership menus on a common framework of preferences. Such a set of unique values ties down the relational worldview across generations for their common well-being. In the language of the knowledge-based worldview, the intertemporal version of the social well-being function is understood as the nexus between polity and socioeconomic variables that evolve according to the circular causation and continuity model of unified reality. Within this social well-being function, we interpret property rights in the relational worldview of knowledge-based intertemporality, in which private property becomes a claim only on the basis of its humanly ecological relevance to the social whole.

Native Indian Ethics, Values and Religion

For the Native People a rationalistic approach to religion as pronounced in the western world would convey a perspective moral and ethical future that is derived from the background of the old church order that was imposed upon them. This would mean a return to the coercive early days of the Canadian confederation and the Christian fathers. On the other hand, an assimilation of the Native People with the hub of capitalist society and market economies in the name of the utilitarian philosophy of materialism and self-seeking, pursuing Weberian Catholic Protestantism, would mean their utter social, political, and economic marginalization. In neither of these orders is the moral and ethical vision of happiness and freedom realized. However, with the growing discontent among the Native People with the Catholic Church (which began to surface in the eighteenth century), the old hierarchy of the Church has fallen into utter disrepute. Its moral high ground has been rejected for a return to a more traditional approach to unitary religion among the Native People.[26]

In the ethicoeconomic order with endogeneity of ethics and morality as explained by the causality of the interactive knowledge model, the rationalistic foundation of religion is replaced by an irreducibility concept of divine unity. This functional unity is seen to be universal. From it—by human learning—a social, economic, and political order emerges.

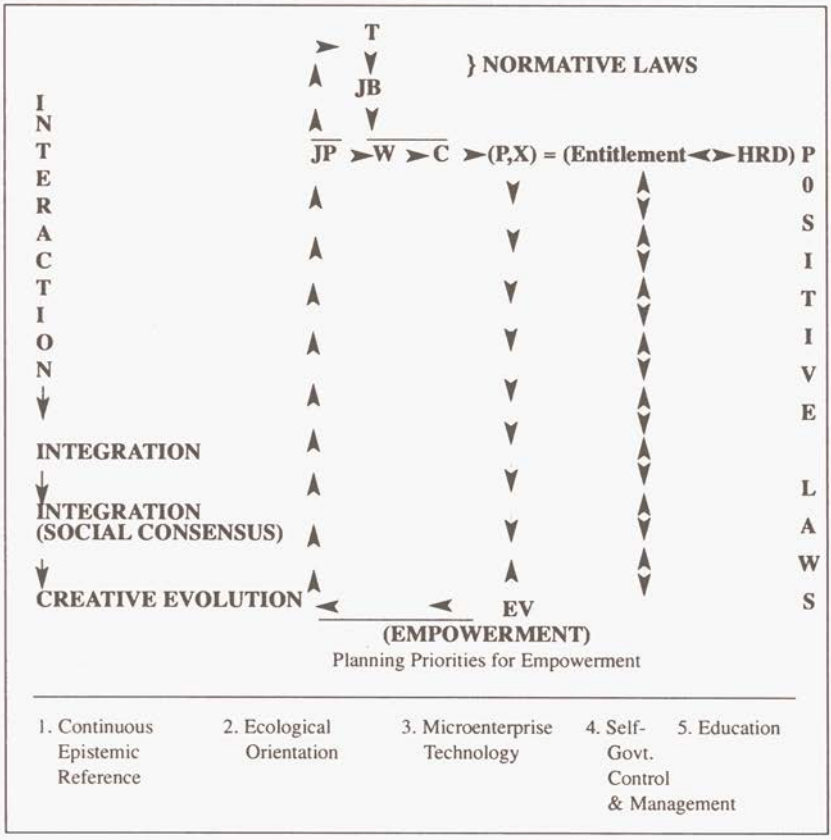
The Relational Worldview of Freedom, Happiness, and Ecology for Human Resource and Entitlement

Figure 3 shows the attributes derived from the *praxis* of divine unity. These attributes in turn cause the instruments of entitlement and human resource development to reinforce further evolution of the attributes. The latter, arising from just balance, purpose, certainty, well-being, and creative evolution (that is, by confirmation leading to affirmation of the sociopolitical and economic process), passes through the functional instruments to generate increasingly better regimes of a just and prosperous sociopolitical and economic order.

T, the unitary order as the irreducible episteme is made to determine the attributes, just balance (JB). These two together ground the normative level of the emergent sociopolitical and economic processes. The interlinked attributes of just purpose (JP) (i.e., the positivistic translation of just balance in terms of legal codes, while the just balance exists as the moral code), well-being (W), and certainty (C) are the positivistic level of determining the instruments (e.g., texts and policy variables), P. These together have an impact upon the sociopolitical and economic domain and generate appropriate X values (state variables). The polity-market

(ecological) relationships at the positivistic level are simultaneous, as X-values are both determined by and then cause the determination of the social well-being function. This joint determination leads to evolution (Ev). The domains of interactions and integration (social consensus) leading to evolution are shown.

Figure 3: Relational View of Human Resource Development in the Human Ecological Sense.



Entitlement is shown to be linked to human resource development not by the primacy of the latter affecting the former, although this becomes circular as the process ensues. Rather, in the direction of causality, as found for the Canadian Native People, many kinds of entitlement will be sought by resorting to their own ways of life and thinking rather than to neoclassical notions of human resource development to principally serve economically efficient markets. The important entitlement in this regard is participation in one's own self-reliant forms of decision making for charting the future. Human resource development is then taken up in this

epistemic worldview as an instrument to reinforce and recreate itself from the same processual order. Only such a reinforcement can cause creative evolution to occur in the circular causation and continuity model.

The bases for realizing the entitlement-human resource development interactions to feed into the other echelons of the sociopolitical and economic transformation are as follows: (i) continuous epistemic (hence knowledge-based) simulation of the learning process; (ii) human-ecological orientation to the development process and planning; (iii) supporting microenterprises, appropriate technologies, and educational capital; (iv) self-government strengthened by indigenous control and management; (v) educational planning in accordance with and focused upon attaining the above goals. The net result is empowerment.

The questionnaire survey of the Mi'kmak people in Cape Breton Island showed the importance of self-government, employment, better living conditions, happiness and freedom based on familial values, and an almost unanimous sense of belief in divine authority having a functional role to play in individual and social life. Educational planning as an engine of change is thus to garner the common aspirations of the Mi'kmak people toward their human development. No nation has realized its own potential without capturing the full power of its educational process and then garnering this to the common well-being, without education being limited to the privileged few.

The sample surveys bring out the aspirations of the Mi'kmak people respecting their futures. We read from these that educational planning and human resource development must cease to be viewed as mere technical exercises in enrolment and manpower forecasting, allocation of educational and training resources, and so on. These approaches have not much to do with social change. Instead, they only reproduce the existing social policies. The new view of educational planning should be to include the ethical and social issues of education as well. Such considerations must then be fused into the total socioeconomic planning process. Only then will it be possible to affect not only the quantity but also the quality of education. These subsequently could promote the greater goals of economic development. Among the major socioeconomic goals of human resource planning must be the attainment of income and social equity; alleviation of unemployment and under-employment, poverty, and squalor; and the promotion of a collective self-reliant growth of the communities.

Summary of Inferences from the Sample Surveys of the Mi'kmak People

The sample survey overwhelmingly acknowledges the existence of a divine creator as a functional being at work in the personal self and social life. As for the sociopsychological question of what determines happiness for the Mi'kmak people, the responses overwhelmingly point to family well-being. On the notion of freedom, the majority response involved family and love and respect, which are interrelated attributes. On the political–economic question, respondents favored of Canadian Indian self-government. However, the type of self-government preferred varied between Canadian Indian self-government with top-down authority, bottom-up authority or some participation, and full participation of all Native Indians.

On the question of Canadian constitutional change for the Native People, the response showed a pressing need for such a change. The majority replied overwhelming that Native self-government and land rights were of the highest importance.

On the question of economic problems for Native people, it was recognized that this was unacceptable and needed to change. Under economic needs, the responses showed preferences for Native self-reliance in their economic functions and housing improvement. The responses show that the Canadian government has failed to understand the needs and approaches to economic betterment for the Native people.

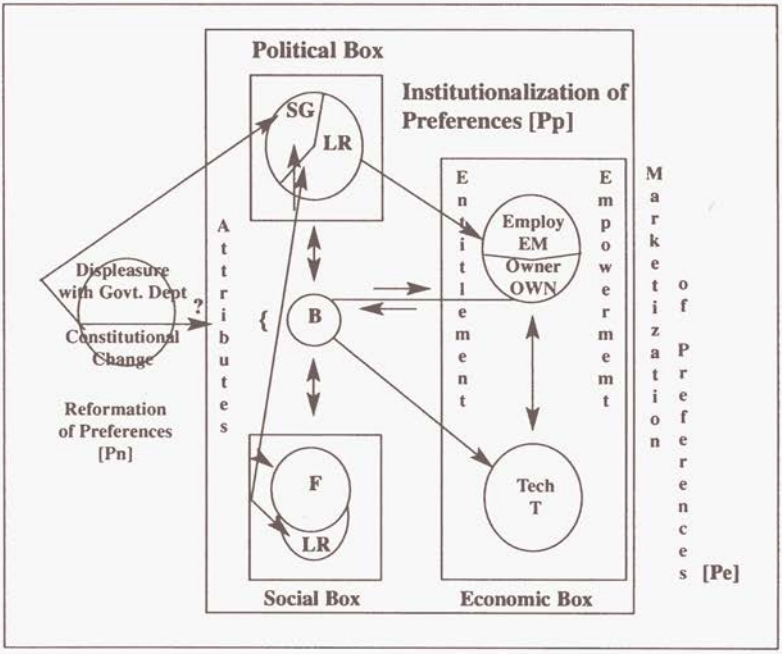
On the question of the economic future, responses indicated the highest importance for ownership of assets and employment. Respondents overwhelmingly recognize that the Native people have sufficient and appropriate technology on which to base their productive capabilities.

Analysis of Responses in Light of the Knowledge-Based Worldview of the Native People: Ecological Relations

The responses as summarized above provide a neat affirmation of the knowledge-based model in terms of its feature of "global" interlinkages. Here we will show how the empowerment problem is addressed by means of suitable interlinkages among the responses for the belief system on the sociopsychological side; family, happiness, and freedom on the sociocultural side; self-government and constitutional change on the political side; and employment-ownership and technological change perspectives on the economic side. In all of these we will also examine the position of the Mi'kmak people with respect to the question of relationship with the federal government on matters of economic and political arrangements for the Native people.

In Figure 4 we show the centricity of the belief system, B (belief in the creator) by the Mi'kmak people. The strong response for family care and source of happiness, plus love and respect as the central source of freedom, are direct consequences of B. The other strong responses are shown by means of the politics box comprising self-government (SG) and land rights (LR). The strong economic responses are shown in the economics box comprising employment (EM), ownership (OWN), and technological change (T). In each of these boxes there are agent-specific preferences characterizing household preferences (P_h), political preferences (P_p), and economic preferences (P_e).

Figure 4: The Ecological Worldview for Attaining Social Well-Being of Canadian Native Indians (as reflected by the Mi'kmak Survey)



Outside the range of possible interactions within the purview of Native life is the box for the Canadian government comprising the Mi'kmak people's displeasure with the government's handling of Native matters and the Mi'kmak people's pressing demand for constitutional change entrenching their rights and privileges in it. Historically, the government is shown to have influenced political matters for the Native people. This in turn has influenced economic matters.

In order to show the circularity of knowledge-based flows in this system, we begin with the following issue: It is clear that sociopsychological factors, such as strong position of family life and notions of happi-

ness and freedom among the Mi'kmak people, emanate from the belief system. In turn the cohesion of decision-making at the community level centered around tribal and familial environment influences political life. Economic matters are determined by the political–economic arrangements. Thus, B → social → political → economics.

A special case can be made of T in the economic box. (EM,OWN) will be influenced by the choice of technology. Thus, T → (EM,OWN). Such a one-directional relation will not explain the relevance of B on T. T would then be omitted from the circular flow of relations among the subsystems. Consequently, since T would now drop out as a purely exogenous factor in the system of relations, the economic box itself could not be interlinked with the whole system.

It is therefore necessary to endogenize T in the whole system. T is determined by the economic relations as much as it determines the latter. This happens by means of on-the-job training that enables technological change to occur through the medium of adaptation of available skills to higher levels of total productivity. The concept of appropriate technology implies this two-way acceptance of technological change and labor market adaptation to it. Hence, T ⇄ (EM,OWN). Now the following relationship is established via the medium of (EM,OWN): B → (EM,OWN) → T. Likewise, we have now established the one-directional relationship: B o Social o Political o Economic. Here "o" denotes compound interrelationships.

Next we must establish the possible reverse relationship. Here too technology becomes a key factor. Technology was defined in this paper as the comprehensive complex of values that enables coexistence of the agent with the human-ecological environment. It was pointed out that this required permanent interactions and invocation of the epistemological premise that was B. Education and human resource development became functional instruments in this knowledge development process. Most primarily, therefore, B ⇄ social. But since social → political, it must be influenced by B ⇄ social. Hence, also B ⇄ Political. The same argument is extended to the economic box to establish B ⇄ economic. In this way, B ⇄ T and all the subsystems (e.g., SG, LR, F) are influenced by B through a two-way relationship. Hence, a much wider set of interactions is established between B and all subsystems and among the subsystems via B. Such two-way interrelationships convey the meaning of strong interactions and form the totality named in Figure 4 as the B-centered human-ecological interrelationship.[27]

In all these cases, the government box will re-enter the system, now without the continued relevance of B-centricity. That is, a system is dynamically recreated by means of strong actions leading to integration (consensus), followed by further evolution through higher moral and ethical comprehensions in life, thought, and applications.

We have now established the complete set of circular causation and continuity model of the knowledge-based worldview from survey responses of the Mi'kmak in Cape Breton Island. This is the system of relationships, B ⇄ all other systems (and subsystems); and of all systems (and subsystems) among themselves through B.

Conclusion

A unique epistemology of the universe and its systems of life is premised on divine unity. It is explicated in the experiential domains of society, economy, science, and the individual by the process of unification of knowledge. This process is governed by the principle of universal "global" complementarity among interacting possibilities. By unifying and diversifying the avenues of life, the knowledge-centered circular causation of unified reality presents a worldview that is polar to the structure of marginalism and substitution ingrained in all rationalistic systems.

If the social, institutional, and scientific goals are for attaining social well-being, then the rationalist process cannot help out in this. Its resource generation and production assume increasing costs to be associated with complementarity. Thus it must substitute among the life-sustaining possibilities. Conversely, the unified worldview of reality assumes no cost to be associated with complementarity, as this is the cause-effect of knowledge generation that pervasively defines the moral and ethical domains and their social–political–institutional and scientific forms. The two views of nature, man, the cosmic order, and moral essence remain opposed to each other. Based on these opposing precepts of life-functions, is also the evolving but opposing concepts of social well-being.

In rationalist systems, social well-being has been methodologically and practically premised on the idea of social welfare. This has now proved to be demeaning, defunct, and costly—particularly because it has substituted costly agencies for organization of the human spirit. In social well-being function instead, the precept of caring can only arise from complementarity. This in turn must assume process-oriented unification of opportunities. It is solely possible by the epistemology of divine unity alone.

What we have shown, relating to the profound comprehension of divine unity at the normative and applied levels of self and society, is referred to in the Qur'an as the epistemology of *tawhid*. Its model is of the circular causation and continuity type in unification of knowledge emanating from the oneness of God at the ontological-epistemological level. It carries a unique methodology in the perspective of this modular worldview as has been discussed in this article.

The message of unity and unification here is a universal one as social well-being remains to be the common space-time truism of humanity without any cultural pluralism in it. Knowledge generated by "global" interactions, unification, and continuously creative evolution remains the common forum amidst all. Thereby, as we have shown, the worldview of unity and unification of knowledge emanating from the ethical and moral foundations remains consistently explainable, whether we consider the Islamic case or the Canadian Native caring and social well-being and whether we study social, institutional, and economic systems or scientific systems. The message is both social and scientific due to its pervasively explanatory power.

Hence, the same model as we have developed and applied here for the Canadian Natives can be introduced for the Orang Asali Natives in Malaysia .[28] The universality of the *tawhidi* worldview when projected carefully and usefully through an organized agenda of the Malaysian government respecting socioeconomic development at the grassroots can apply the model of the social well-being to the Orang Asali. The result can be a conversion from animist beliefs of the Orang Asali for a greater and more comprehensive picture of existence within a caring social whole in Malaysia.[29] The interlinked nature of the economic, social, political and familial prescriptions must then be thoroughly integrated in the same kind of circular causation and continuity model of *tawhidi* reality for the social well-being of the Orang Asali.

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