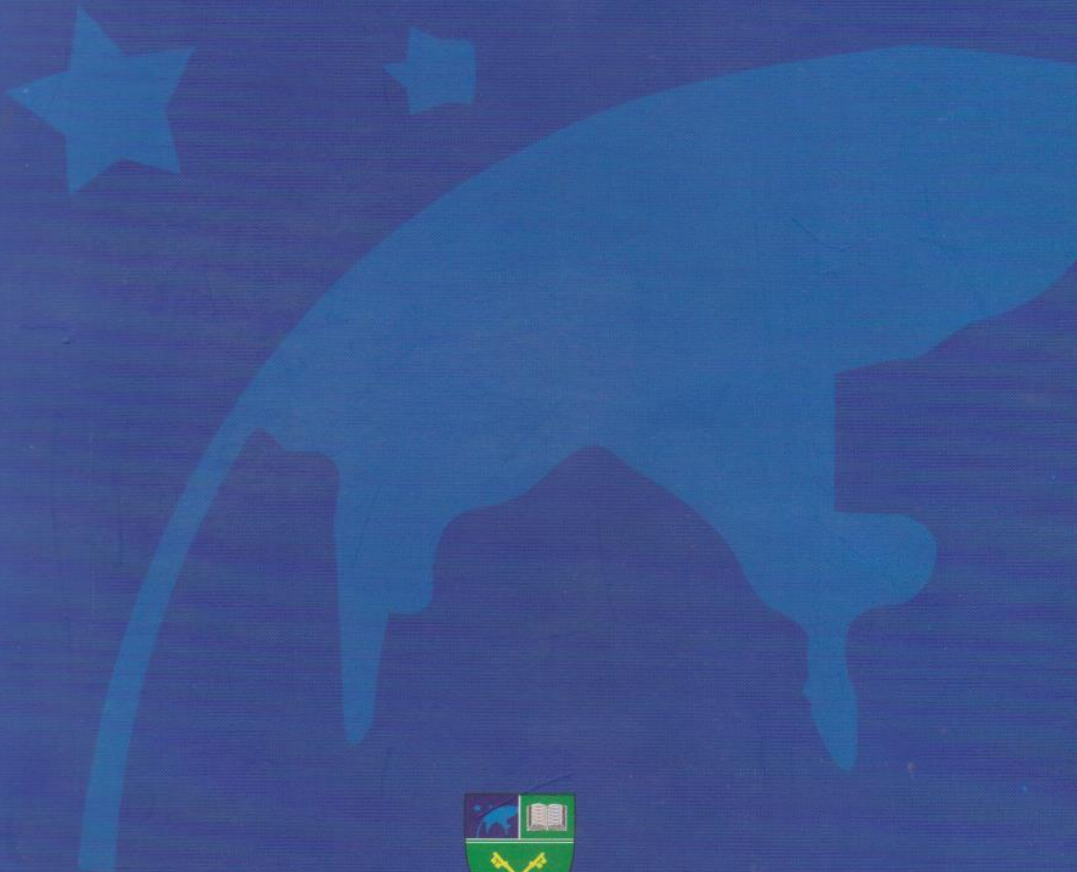


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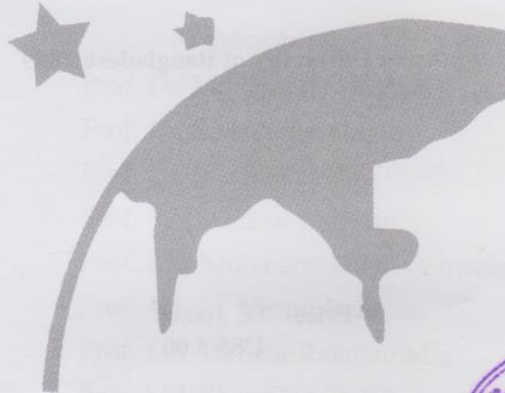


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WHICH OF THE TWO? KNOWLEDGE OR TIME

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Abstract

Knowledge versus Time, Truth versus Falsehood, Unity versus Dualism, these and the like are the subjects for philosophical discourse in the light of the two contrasting worldviews of unity of knowledge versus rationalism. The emerging formalism also leads to practical considerations in the circular causation model of unity of knowledge. The Qur'an is invoked in this formalism to build the arguments and the analysis underlying the analysis. Conception of time in the recursive causality, time seen as the recorder of particular states of the knowledge flows and of the knowledge-induced forms focusing on knowledge and time, the Qur'an brings out the contrast between these two entities in constructing a frame work of reality. Human conception of time as a temporal flow is replaced by the conception of transcendental time as equivalent to the divine knowledge. Time is therefore an endogenous event that is simultaneously determined by knowledge flows within the content recursion between values. Two sides of expression are therefore consistent with each other. The paper discussed two types of distinct aggregation in two kinds of realities, namely, unity of knowledge and methodological independence. In the light of the recursive circular causation model of endogenously complementary interrelationships that emanate from the epistemological model of unity; here considered a developed social wellbeing functioning according to the variables like, Human Development Index(HDI), Human Poverty Index (HPI), Gross Domestic Product(GDP) and Gender Development Index(GDI). The contrast between two worldviews is thus shown by the pervasively unifying nature of the principle of complementariness across diversity of complementing entities versus the competing and rationalistic nature of methodological individualism and independence.

We make a contrast between opposing precepts of knowledge versus time; unity of knowledge versus pluralism emanating from rationalism. We then pose the question, which of the two opposing categories truly constitutes total reality in explaining epiphenomena. The concept of epiphenomenon is meant in the sense of Husserl (trans. Lauer, 1965) as the merging together of Kant's noumena with phenomena, thereby constituting an integrative and inseparable precept of reality. Such an attribute of unity of knowledge and its influence on the experiential

world is our definition of reality. In the context of this meaning of epiphenomenon, if God is explainable in the concrescent human agency, then He is the true reality (Whitehead trans. Griffin & Sherburne, 1978), although we do not perceive God. Likewise, if the divine law is the indispensable foundation of any and all episteme then it becomes a universal (Foucault, trans. Dreyfus & Rabinow, 1983). In regards to such implications writes Palan (2000, p. 218): "..... certain social categories, such as the 'nation' the 'people', 'God', which are admittedly hypothetical entities in the sense that no one has seen them, are matters of faith rather than fact. And yet, it is impossible to deny that such hypothetical entities shape our social world to a considerable extent".

Focusing on knowledge and time, the Qur'an brings out the contrast between these two entities in constructing the framework of reality. The divine knowledge and the law are set primal in reality. (Qur'an 6:59). In contrast, the human conception of time as a temporal flow is replaced by the conception of transcendental time as equivalent to the divine knowledge. Its impact on world-systems existed even before man was a recorded entity. (Qur'an 76:1). But this universal attribute is not shared by the temporal time flow. Besides, the human dependence on time as a primal and singular deterministic factor is equated with ignorance (Qur'an 45:24).

Objective

The objective of this paper is to attempt an answer to the following question: which of the two-knowledge or time-explains the dynamic processes of world-systems in which the human agency reasons, cognizes and constructs inferences from?

We will proffer the answer to this question by investigating the two functional relations given below. From them we will deduce which one of the two representations constitutes the foundation of true reality. Note that we mean by true reality that reality which supersedes in the universal explanatory wholeness. Apart from the precept of the true reality, both truth and falsehood form opposite realities in universal explanations.

Initial Questions to Consider

We pose the question. Is the true reality represented by the relation, $t=F(\theta \in \Omega)$? Here t denotes the flow of time θ denotes the flow of knowledge as unity derived from the epistemic foundation, Ω ; F is an explainable function denoting an explanation of specific problems within the domain of epiphenomena. Or is the true reality represented by $\theta \in \Omega H(t)$? H denotes a functional relation explaining a construct of the same reality within the epiphenomena. Other questions pertaining to these fundamental ones are the following: Can the two functions be recursively embedded in the context of experience? If so, then in what ways do these recursive relations explain reality in terms of the concrescent

epiphenomena? The latter is the ontological question of 'be-ing'. It rests on the merging of the epistemic with the evidential. Imam Ghazzali (trans. Marmura, 1997, p. 158) remarked on this continuity in the unity of knowledge in the following words: "In brief, every event has a temporal cause, until the chain of causes terminates with the eternal celestial motion, where each part is a cause for another. Hence, the causes and effects in their chain terminate with the particular celestial motions. Thus, that which has a representation of the movements has a representation of their consequences and the consequences of their consequences to the end of the chain".

Analyzing the Questions

In the context of economic theory, Shackle (1972) investigated such a question of primacy of episteme as novelty caused by continuous learning. His emphasis on knowledge instead of time as the ultimate determiner of events can be noted by his criticism of the neoclassical economic objectives of optimization and general steady-state equilibrium as opposed to the method of innovation and learning. Shackle argues that novelty, as the attribute of social dynamics, ends where optimization and steady-state equilibrium are assumed, as opposed to whether they exist. Shackle (op. cit, p. 97) writes: "Equilibrium is a solution, and there is, in the most general frame of thought, no guarantee that a problem which presents itself, unchosen and undersigned by us will have any solution, or that it will not have infinity of solutions. In either case, there is no prescription of conduct".

Knowledge as Process

Likewise, Choudhury and Korvin (2002) have argued that the time-dynamic solution of the optimal control theorem breaks down in the context of treating the following tuple, $\{\theta, X(\theta)\}$ across overarching and evolutionary domains denoted by $\{\cdot\}$, with $\theta = \lim_{i,j,k \dots} \{\theta_{i,j,k \dots}\} \in \Omega$ i denoting interaction; j denoting variables, k denoting systems, etc. Ω is treated as a 'complete' topology (Maddox, 1970) in the large-scale universe, which is denoted by the open domain extension of fixed point mapping, $\Omega \rightarrow \Omega$ (Choudhury, 1995; Nikaido, 1989). $X(\theta)$ is a vector of socio-scientific and instrumental variables and their relations. While $X(\theta)$ is defined over complex spaces of $i,j,k \dots$. Yet in the limiting case it is a convergent function of $\theta = \lim_{i,j,k \dots} \{\theta_{i,j,k \dots}\} \in \Omega$. This mapping is the cumulative result of all interactively integrated and evolutionary relations of the type $\cup_i \cup_{j,k \dots} f_{i,j,k \dots}(\{\theta, X(\theta)\})$. While each of the component $f_{i,j,k \dots}(\{\theta, X(\theta)\}) \in [\Omega \rightarrow \Omega]$ has a finite cardinality, $\cup_i \cup_{j,k \dots} f_{i,j,k \dots}(\{\theta, X(\theta)\}) \subseteq \Omega$ is said to have super-cardinality rather than an infinite cardinality (Choudhury, 2002). This is for the reason that being a topology, it must necessarily establish the relations that remain well defined by each and all of $f_{i,j,k \dots}(\{\theta, X(\theta)\}) \in [\Omega \rightarrow \Omega]$. This characteristic of the relational order could not be obtained in infinite cardinal structures (trans. Bauer-Mangelburg, 1967).

Which of the Two? Knowledge or Time

It now needs to be proved which of the following cases is the fundamental one from which the remaining ones and itself can be derived and explained as a functional structure to make the emerging methodology and results applicable to an expanding class of problems of world-systems. The three cases are formally configured as follows:

- | | | | |
|----|--|-----------------|--|
| 1. | t
\downarrow
$X(t)$
Does not lead to time flow, say $t' > t$. That is t is exogenously related to $X(t)$ | $\rightarrow H$ | $\theta: \theta = H(t)$
\downarrow
$X(\theta)$
can lead to knowledge flow, say θ' in monotonic value greater, equal to or less than. θ . Thus θ and $X(\theta)$ are recursive and endogenously interrelated
Thus we generate $\{\theta', X'(\theta')\}$ recursively and endogenously. |
|----|--|-----------------|--|

If expression (1) was to be true then we would have,

$$t \rightarrow H_1 \theta : \theta = H_1(t); \text{ and independently, } t \rightarrow H_2 X(\theta): X(\theta) = H_2(t).$$

But since θ and $X(\theta)$ are interrelated, t would have to be solved as a dependent variable between H_1 and H_2 to establish the relationship between θ and $X(\theta)$. Hence a contradiction arises between the same t -value being once an independent variable and then again a dependent variable without a process between this recursion. Thus the representations H_1 and H_2 are not valid in expression (1).

Next we consider the reverse order:

- | | | | |
|----|--|-----------------|--|
| 2. | $\theta \in \Omega$
\downarrow
$X(\theta)$
Can lead to θ -flow, say θ' recursively related to θ .
Therefore,
\downarrow
θ'
\downarrow
$X'(\theta')$
\downarrow
etc. as continuous endogenous recursion | $\rightarrow H$ | $t:$
\downarrow
$X(\theta)$
Since t is of the category of $X(\theta)$, we can
define,
$t = F_1(\theta)$, which
\downarrow
θ'
\downarrow
$t' = F_2(\theta')$
\downarrow
Thus we generate $\{\theta', t'(\theta')\}$ recursively and endogenously. |
|----|--|-----------------|--|

Time is therefore, an endogenous event that is simultaneously determined by knowledge flows within the context of recursion between θ and $X(\theta)$ values. The two sides of expression (2) are therefore consistent with each other.

Since t is a member of $X(\theta)$ vector, the elements of which are also interrelated by endogenous recursion, therefore, t is also endogenously recursive with such elements of the vector as also with θ -values. Hence in this continuously recursive sense the following causality shown by two directional arrows in Figure 1 is true:

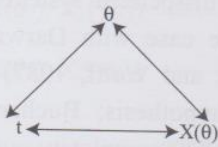


Figure 1: Causality in the Knowledge-Induced Domain

Figure 1: Causality in the Knowledge-Induced Domain

Time Conception

What grounds the conception of time in the recursive causality as shown? Time is seen as the recorder of particular states of the knowledge flows and of the knowledge-induced forms. The vector, $\{\theta, t, X(\theta)\}$ as shown Figure 1 then recursively determines the time-flow as an entity. Such a recursive relationship may be linear, in which case θ and t have the same trend and $X(\theta)$ is simultaneously recorded by the co-existing time flow. Otherwise too, in the case of non-linearity between time and knowledge flows the above mentioned causality of Figure 1 becomes complex. Examples of such time concepts are relativistic and quantum time (Hawking, 1988) and the arrow of time (Prigogine, 1955).

The *Qur'an* refers to both of these kinds of times inseparably with knowledge values as created entities emanating from the divine roots of Ω , the perfectly unified worldview of the divine laws. (*Qur'an*, 103; *Qur'an*, 76:1).⁷⁵ In the inspired saying of the Prophet Muhammad Allah equates Himself with Time (Sahih Bukhari).⁷⁶ But since Allah is the perfection of all knowledge, therefore only at this primordial level are time and knowledge synonymous. No process is possible at this level of the divine perfection. However, since $\theta \in \Omega$ is an incomplete knowledge flow though it carries with it the essence of unity by complementarities between the diverse things, which is the *Qur'anic* principle of creation in pairs,⁷⁷ therefore the relations between time and such knowledge flows and their induced variables remain complex (Choudhury, 2003).

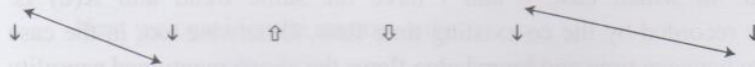
Another Possibility for Knowledge Time Relationship

Next we examine the third possibility of the time-knowledge relationship. The following question needs attention: Can the epistemology of unity of knowledge be premised on any other than the divinely unified most perfect 'super-cardinal' domain of knowledge, Ω ? If not, then what is the nature of the emanating relational orders that spring from the domain of rationalism and pluralism signified by the time and knowledge domain being premised on individuated Ω_s , for $s=1,2,\dots$? Competing and dissociated systems with their own independent episteme emerge. This is the case with Darwin's (1936) natural selection evolutionism; Marx's Resnick and Wolff, (1987) over-determination problem; Popper's (1988) refutation hypothesis; Buchanan's (1971) methodological individualism; Wallerstein's (1998) complexity out of chaos, etc. The evaluation of the pluralism of Ω_s , for $s=1,2,\dots$ is still done by the exogenous criterion of unity of knowledge Ω against the rationalistic pluralism of knowledge domains.

Some Contrasting Structures Relating to Knowledge and Time

Expression (1) shows that if Ω is not the epistemological premise than t and θ are disjoint categories. Consequently, the following relations will yield the results as shown, which is contradictory in respect to determining the causality as shown by \leftrightarrow , Inter-systemic causality and relationship is denoted by \updownarrow .

$$t_1 \rightarrow H_1 \theta_1 : \theta_1 = H_1(t_1); \text{ and independently, } t_1 \rightarrow H_2 X_1(\theta_1) : X(\theta_1) = H_2(t_1).$$



$$t_2 \rightarrow H_1 \theta_2 : \theta_2 = H_1(t_2); \text{ and independently, } t_2 \rightarrow H_2 X_2(\theta_2) : X(\theta_2) = H_2(t_2).$$

Yet the above causality is true in the case of the knowledge-centered recursive methodology only, with processes of complementary relations being determined by the law of unity of knowledge governing $\{\theta, t, X(\theta)\}$.

Corresponding to expression (1) vectors such as $\{t, \theta(t), X(t)\}$ will move along independent time-dependent relations. Each of these relations will be premised on independent Ω_s , for $s=1, 2,\dots$ is evaluated by Ω .

We delineate this bifurcation process of methodological independence between sequences as follows and refer to it as the intra-systemic endogenous property of independently distributed systems (Choudhury, 2000).

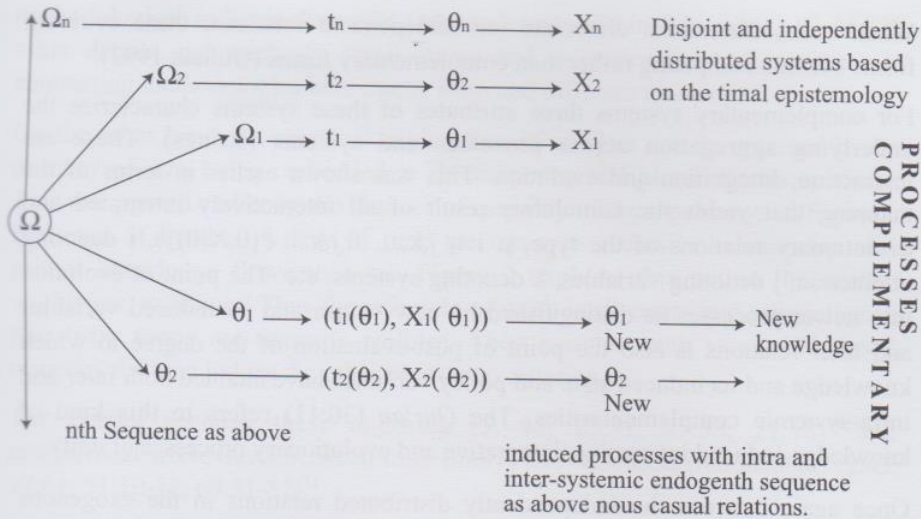


Figure 2: Unity of Knowledge-Induced Processes Versus Methodological Independence of Timal Relations

Between each of the strings of the complementary processes there are intricate and extensive casual interrelation ($\theta \leftrightarrow$) showing the evolution of processes from one chain of the string to another as indicated by the emergence of $\{(\theta_{new}, t_{new}, X_{new}, \theta_{new})\}$ and also by the inter-systemic complementarities. These are of the type depicted in Figure 1.

Aggregation Problem

We note the following types of distinct aggregation in the two kinds of realities, namely, unity of knowledge and methodologically independence.

For methodologically independent systems aggregation over processes is given by the independent summation of series. This is reflected as in the case of Harsanyi's (1989) fundamental utilitarianism in social choice making. Even when ethical considerations are given to decision-making using the utility functions, it is found that classical and neoclassical economic theories have continued to rely upon such independently distributed utility criterion functions (Hammond, op. cit).

Non-linear functions have also been used to explain complex behavior. But our methodological results here point out that such complex models eventually bifurcate into competing and independently distributed relations of the type shown in Figure 2 with respect to the time-dependent strings (systems). Bifurcations are usual properties of repetitive forms in chaos and fractal model.

When such bifurcations dissociate into independent relations, these evolving forms become competing rather than complementary forms (Gulick, 1992).

For complementary systems three attributes of these systems characterize the underlying aggregation across processes and systems (strings). These are interaction, integration and evolution. This was shown earlier in terms of the mapping that yields the cumulative result of all interactively integrated and evolutionary relations of the type, $\mu_i \eta_{j,k}, \dots f_{i,j,k}, \dots (\{\theta, X(\theta)\})$, i denoting interaction; j denoting variables, k denoting systems, etc. The point of evolution into newer processes as distinguished by new values and its induced variables and their relations is also the point of post-evaluation of the degree to which knowledge and its induced state and policy variables have attained both inter and intra-systemic complementarities. The *Qur'an* (30:11) refers to this kind of knowledge-induced interactive, integrative and evolutionary processes of unity.

Once again between the independently distributed relations in the exogenous t-frame and the complementary recursive relations generated by circular causation across processes and systems, there are divergent forms of the evaluation criteria. In the case of methodological independence the wellbeing criterion is an additive linear or non-linear social welfare function, as mentioned above. In the case of pervasive complementarities and circular causation the interactive, integrative and evolutionary attributes of the knowledge-centered systems and processes lead to complex aggregations that are sensitive to institutional simulation in concert with the state variables. Thus a policy market interaction is established as an endogenous transformation process.

Ω Episteme as Universal

The string of unity of knowledge in Figure 2 proves that the Ω episteme is a universal that can explain both the unified and complementary worldview out of diversity of entities and also the worldview of methodological independence and individualism. This universal way of explaining all systems is shown by the same type of methodology of recursive evolution and intra-systemic coherence that every system imitates from the nature of Ω episteme. The difference though is that the Ω s episteme are independently and temporarily coherent intra-systemically. This temporary organism of its class is followed by continuous bifurcations into independent systems as time carries independent processes along. Such is the case of evolutionism by natural selection of the selfish gene (Dawkins, 1976).

The contrast between the two worldviews is thus shown by the pervasively unifying nature of the principle of complementarities across diversity of complementing entities versus the competing and rationalistic nature of

methodological individualism and independence. Within this parting divide all other details and methods, implications and inferences underlying the two contrasting methodologies take shape, form and different meanings.

On the other hand, no universal explanation of realities can be obtained by the primacy of time being embedded in its competing and pluralistic Ω s episteme. This was proved earlier by the absence of causality of the type shown in Figure 1. However, if by the mystery of time we mean its recursive relationship with primal knowledge flows then too Figure 2 explains this within the unified worldview, as shown. Thus the principle of unity in diversity and rationalism in pluralistic forms are opposite realities. They exist as truth versus falsehood, respectively. One judges the other by its own criterion.

The Qur'an declares these opposing (5: 48; 23:71; 25:33; 21:18)¹⁰ and unequivocal worldviews between truth (unity) and falsehood (rationalism) (2:42; 17:81; 51:10-11; 69:51-52)¹¹.

Partial Application of the Circular Causation Model

In the light of the recursive circular causation model of endogenously complementary interrelationships that emanate from the epistemological model of unity, we consider here a developmental social wellbeing function in the following variables: Human Development Index (HDI), Human Poverty Index (HPI), Gross Domestic Product (GDP) and Gender Development Index (GDI). If there are to be complementarities between these as the sign of systemic unity between the variables then there must exist circular causation between them by virtue of the underlying endogenous processes. In estimating the presence of causality we use log-linear regression equations between rates of changes in HPI, GDP, HDI and GDI variables in order to explain the elasticity coefficients of the dependent variables in terms of the remaining independent variables by means of the coefficients of the log-linear regression equations.

Let, y denote HPI_k/HPI_{k-1} , HDI_k/HDI_{k-1} , and GDI_k/GDI_{k-1} ,

x denotes GDP_k/GDP_{k-1}

$k=1, 2, \dots$ Being the sequential values of the countries in the selected group as they appear in the Human Development Report (UNDP, 1997-2000)

The following results were obtained on estimating by multiple-OLS method the log-linear regression equations shown, using data on HPI, GDP, HDI and GDI (UNDP, 1997-2000). The data are for the 'medium-HDI countries'. This particular selection was prompted by the need for having sufficient data. The sample size comprised 50 selected countries in the entire group comprising industrialized, middle income and low-income countries.

The circularly interrelated estimated equations are given by,

1. **HPI-GDP-HDI-GDI** relationship

$$\text{Log (HPI}_k/\text{HPI}_{k-1}) = 5.210\text{E-}02 + 2.709.\text{log (HDI}_k/\text{HDI}_{k-1}) - 1.655.\text{log(GDI}_k/\text{GDI}_{k-1})$$

t-statistics (0.921) (0.583) (-0.619)

Significance levels (0.362) (0.563) (0.539)

$$+ 4.966\text{E-}02.\text{log (GDP}_k/\text{GDP}_{k-1}) \quad (1)$$

t-statistics (0.753)

Significance levels (0.455)

R-square = 0.033

F-value = 0.517; Significance level= 0.672

2. **HDI-HPI-GDI-GDP** relationship

$$\text{Log (HDI}_k/\text{HDI}_{k-1}) = -6.630\text{E-}03 + 2.706\text{E-}03.\text{log ((HPI}_k/\text{HPI}_{k-1}) + 0.271.\text{log(GDI}_k/\text{GDI}_{k-1})$$

t-statistics (-4.367) 0.583 (3.619)

Significance levels (0.000) (0.563) (0.001)

$$+ 2.148\text{E-}03.\text{log (GDP}_k/\text{GDP}_{k-1}) \quad (2)$$

t-statistics (1.031)

Significance levels (0.308)

R-square = 0.223

F-value = 4.412; Significance level= 0.008

3. **GDI-HPI-HDI-GDP** relationship

$$\text{Log (GDI}_k/\text{GDI}_{k-1}) = -1.75\text{E-}03 - 4.990\text{E-}03.\text{log ((HPI}_k/\text{HPI}_{k-1}) - 8.200\text{E-}03.\text{log(GDP}_k/\text{GDP}_{k-1})$$

t-statistics (-0.561) (-0.619) (-2.370)

Significance levels (0.578) (0.539) (0.022)

$$+ 0.818.\text{log (HDI}_k/\text{HDI}_{k-1}) \quad (3)$$

t-statistics (3.619)

Significance levels (0.001)

R-square = 0.297

F-value = 6.491; Significance level= 0.001

4. **GDP-HPI-HDI-GDI** relationship

$$\text{log(GDP}_k/\text{GDP}_{k-1}) = -6.120\text{E-}02 + 0.244.\text{log(HPI}_k/\text{HPI}_{k-1}) + 10.504.\text{log(HDI}_k/\text{HDI}_{k-1})$$

t-statistics (-0.486) (0.753) (1.031)

Significance levels (0.629) (0.455) (0.308)

	-13.269.log (GDIk/GDIk-1) (4)
t-statistics	(-2.370)
Significance levels	(0.0220)
	R-square = 0.129
	F-value = 2.265; Significance level= 0.094

The above estimated results reveal that the relationships among social factors and among growth related factors are of a complementary nature individually taken in these groups. But the relations between growth-related variables and social variables are either too weakly positive to be accounted for any significant complementary relationship or are straight tradeoffs. The debate around the neoclassical tradeoff and thus the inability of such a premise to explain the human development perspective along with poverty alleviation, gender empowerment, entitlement and gender development through a complementary relationship between markets and institutions, is seen to appear for the medium human development countries.

We note from the structural equation (1) that there exists complementary relationship between the rate of change in GDI (same as $\log(\text{HPIk}/\text{HPIk-1})$) and poverty reduction indicated by a negative coefficient of the rate of change in GDI. As GDI increases (decreases) HPI decreases (increases). We obtain similar interrelationships from the structural equations of the circular processes (2) and (3). We note that the social variables (rate of change in HDI, rate of change in GDI) are complementary to each other.

Complementarities among the growth-related variables are also found between the rates of change in HDI (as a function of GDP) and GDP but are very weak in equation (1). The same implication also holds for equation (2).

Tradeoff or weak relationship is shown to exist between the rate of change in HPI and the rates of change in HDI and GDP per capita in expression (1). In expression (2) the relationship between the rates of change in HDI and the rates of change in HPI and GDP per capita is very weak. In expression (3) the rate of change in GDI is weakly related with the rate of change in GDP per capita, whereas the relationship with HPI is weak. In expression (4) the rate of change of GDP per capita has a tradeoff with the rates of change in HPI and GDI.

The reason for complementary relations between HDI, GDI and GDP per capita is the functional interrelationships among these variables, which all have the common variable, GDP per capita in them. When converted into rates of change, GDP per capita has the highest value among these variables. Thus a complementary relationship among these variables can be expected. Yet in the estimated equation (2) we note that the relationship between the rates of change in HDI and GDP per capita is weak. Likewise, similar relations are found to be weak in equation (3). In equation (4) there a tradeoff appears between the rates of change in GDP per capita and HPI and GDI. Equation (4), which is

the most reliable one in the relationship between the rates of change in the variables, shows a tradeoff between the rates of change in GDP per capita and of HPI and GDI, and a complementary relation between the rates of change of GDP and HDI. The last result can be explained by the significant role of GDP per capita in the composite measure of HDI.

We also note that in all cases the results are accepted at high levels of significance, above 40 per cent, according to t-statistic. The circular relations among the variables are well specified in terms of the variables included. However, the low values of R-square reflect that the log-linear form of the compound index model may not have been adequately specified in this form. This is a valid reason for circular causation according to the model of complementarities that negates marginal substitution among variables in favor of complex phenomenon better amenable to estimation by simulation methods.

The above empirical results establish our case that, the economic growth agenda of medium HDI countries being of the neoclassical type, there exists significant tradeoffs or weak relations between economic growth and the social variables. The efficiency and equity tradeoff or independence of relationship is thus confirmed. The structural relations of circular causation in the composite index form a social wellbeing index, establishing thus the importance of such a system that can bring out the developmental tradeoffs and complementarities, as the case may be.

Conclusion

Thus, which of the two is the primal reality-knowledge or time? Substantively they are different and opposite realities in the context of the divide between the epistemology of unity of knowledge and the epistemology of methodological individualism and independence. We have shown in this paper that by virtue of the methodological universality of the epistemology of unity of knowledge, this becomes the ultimate foundations of true reality. In this context all other realities, as of dualism and independence, are unsustainable in the scheme of things. Such realities are apparent yet not the essence of the true reality.

The final validity of the above statements can be seen in terms of the argument of Godel and Tarski's theorem (Smullyan, 1992) on the incompleteness of the arithmetical system. In contradistinction to the inference of the incompleteness theorem, the Qur'anic precept of truth for both true and false domains implies that the improbability of the norm of the statement X does not imply the probability of a false statement. For instance the domain of the unseen is 'improvable' by observed inferences. Nevertheless, such an implication is profoundly real in Islamic belief. It therefore cannot be 'provable' as a false statement.

This inference once again establishes the primacy of the epistemology of unity of knowledge over time in answer to the question, which of the two - knowledge or time?

References

1. Whitehead (trans. Griffin & Sherburne, (1978) refers to the concrescent also as 'conrescent unison', 'unison of becoming' (p.124).
"This community of concrescent occasions, forming M's immediate present, thus establishes a principle of common relatedness, a principle realized as an element of M's datum. This is the principle of mutual relatedness in the 'unison of becoming'."

2. Foucault defines the term 'episteme' in the following way (author's editing): "By episteme we mean ... the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems... The episteme is not a form of knowledge (connaissance) or type of rationality which, crossing boundaries of the most varied sciences, manifests the sovereign unity of a subject, a spirit, or a period; it is the totality of relations that can be discovered, for a given period, between the sciences when one analyses them at the level of discursive regularities". (Dreyfus H.L. & P. Rabinow (trans). pp. 16-43, 1983).
3. Qur'an, 6:59: "And with Him are the keys of the Ghaib (all that is hidden), none knows them but He. And He knows whatever there is in the land and in the sea; not a leaf falls, but he knows it. There is not a grain in the darkness of the earth or anything fresh or dry, but is written in a Clear Record".
4. Qur'an, 76:1: "Has there not been over man a period of time, when he was not a thing worth mentioning"?
5. Qur'an, 45:24: "And they say: There is nothing but our life of this world, we die and we live and nothing destroys us except Ad-Dhar (time). And they have no knowledge of it: they only conjecture".
6. Qur'an, 103: "By Al-Asr (time). Verily, man is in loss, except those who have Faith, and do righteous deeds, and (join together) in the mutual teaching of Truth, and of Patience and Constancy".
Qur'an, 76:1: as above.
7. Sahih Bukhari, hadith Al Qudsi No. 4: "Sons of Adam inveigh against [the vicissitudes of] Time and I am Time, in My hand in the night and day".
8. Qur'an, 36:36: "Glory is to Him Who has created all the pairs of that which the earth produces, as well as of their own kind, and of that which they know not".
9. Qur'an, 30:11: "It is Allah Who begins (the process of) creation; then repeats it; then shall you be brought back to Him".
10. Qur'an, 5:48: "And We have sent down to you (O Muhammad) the Book (the Qur'an) in truth, confirming the Scripture that came before it and Muhaymin (trustworthiness in highness and a witness) over it (old Scriptures). So judge among them by what Allah has revealed, and follow not their vain desires, diverging away from the truth that has come to you..."
Qur'an, 23:71: "And if the truth had been in accordance with their desires, verily, the heaven and the earth, and whosoever is therein would have been corrupted! Nay, We have brought them their reminder, but they turn away from their reminder".
Qur'an, 25:33: "And no example or similitude do they bring, but We reveal to you the truth, and the better explanation thereof".
Qur'an, 21:18: "Nay, We hurl the truth against their falsehood, so it destroys it, and behold it (falsehood) is vanished..."

11. Qur'an, 2:42: "And mix not truth with falsehood, nor conceal the truth while you know the truth".

Qur'an, 17:81: "And say: Truth has come and falsehood has vanished. Surely, falsehood is ever bound to vanish".

Qur'an, 51:10-11: "Cursed be the liars, who are under a cover of heedlessness".

Qur'an, 69:51-52: "And verily, it (the Qur'an) is an absolute truth with certainty. So glorify the Name of your Lord, the Most Great".

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Microfinance, Poverty Alleviation and Economic Development: Theory and Practice

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Abstract

Microfinance (MF) has recently been viewed to effectively contribute to poverty alleviation. This paper seeks to present an evaluation of MF with respect to economic as well as socio-ethical perspective based on secondary resources. In short the economic effects do not seem to be as encouraging as expected and the ways the concept of MF is being applied seem to have adverse socio-ethical implications. An alternative method of delivery seems to reduce or eliminate the negative effects and hence deserves serious attention. The unified value system that integrates all human and natural disciplines covers the field of economics that aims at human welfare by strategies, among other things to alleviate poverty. MF activities are expected to lead to substantial socio-economics development for the poor. The experience of Bangladesh which is the birthplace of MF as well as the largest experimentation case in the world shows positive results of MF activities. Although the outcome is not as impressive, some have serious doubts about any positive income effects. Besides the way the MF activities are being undertaken seem to raise serious socio-ethical concerns. A characteristic of the existing studies on MF is that they seem to be more or less one sided. They deal with economic implications of MF, merely its ethical and socio-cultural effects. The studies that discuss economic impacts of MF usually highlight positive income effects of MF activities. Whereas those that deal with socio-cultural effects express concern about undesirable effects of MF which have been reflected in the sentiments of the people of value orientations including a complain of religious conversion leading to social tension, unrest and conflict. An alternative example of MF activities is available, which seems to be free from the alleged undesirable ethical and socio-cultural effects. In fact the Islamic Micro financial Institutions (IMFI) came into being with an objective to free MF activities from the alleged undesirable normative and socio-cultural implications. The MFIs even the largest ones including Grameen Bank and BRAC still depend on external sources of finance. The author suggested to undertake further studies on the out come of MF activities, socio-cultural effects of MF activities that hunt the religious feelings of the people, to reach the poorest of the poor, changes on the loans, remove the people from perpetual dependence on credit, external defense for finance and formation of a body to oversee the activities of the MFIs.

The paper was presented at the International Conference on a Universal Paradigm of Socio-Scientific Reasoning organized by Asian University of Bangladesh.

1. Introduction

Unity of the single divine source of knowledge and the knowledge itself provides the normative foundation of a universal paradigm that integrates all the human and natural sciences, including the discipline of economics, which aims, among other things, at poverty alleviation as a prerequisite for human welfare. Poverty alleviation has multi-dimensional strategies, whereby microfinance has recently been viewed as an effective means towards poverty alleviation in developing countries. Thus microfinance should be evaluated by not only its efficacy of poverty alleviation, but also with respect to the unified value system on which the economic discipline is founded. Such a notion has been a motivational source and analytical framework for this paper.

Of late, a general notion in the rural development literature is that microfinance (MF) has been playing an important role in income growth of the rural poor and thus in poverty eradication and economic development. As a result, it is gaining wide coverage in development literature and, accordingly, it is receiving attention of the policy makers, international financial institutions, donor and philanthropic organizations, NGOs, academic seminars and workshops.

Since its inception in Bangladesh, many countries have introduced micro credit as well as MF, including Malaysia, where it has been introduced by the name of Amanah Ikhtiar. Several countries have established specialized banks merely for MF, including Grameen Bank of Bangladesh, and the planned *Microfinance Bank in Pakistan*.¹ The Asian Development Bank (ADB) formed a Task Force on MF to prepare its MF development strategy. The proposed strategy had then been approved by ADB on June 6, 2000.² A few thousand NGOs are engaged in the provision of micro credit in the developing world, too.³ The Microfinance Summit 1997 held in the USA speaks further about the kind of attention that MF is receiving from the world.⁴

MF is provided by specialized banks created for the purpose, commercial banks, and NGOs, which are popularly called Microfinance Institutions (MFIs). A typical MF activity has the following key characteristics.⁵ First, MF is normally provided to the rural poor.⁶ Second, for MF, the poor households are mobilized into groups, ranging from 5 to 30 members per group, which takes collective responsibility of any loan taken by any group members. Third, MF is free from formal financial collateral.⁷ Fourth, small loans amounting from US\$ 25 to US\$ 75 are extended usually for one

¹ Credit Development Forum (2000, p. 9).

² CDF (2000, p. 9).

³ Credit and Development Forum (CDF) of Bangladesh reports microfinancial statistics on 533 NGOs. See CDF (1999), pp. 16-87. The growth rate of their membership is quite high as well (see Table A.2 in the Appendix).

⁴ Microfinance Newsletter (2000), p. 10.

⁵ Alamgir (1993), Alamgir (1997a), Alamgir (1999), CDF (2000), Hakim (2000), Hassan (2000), Hossain (1988), Hulme (1996).

⁶ Unfortunately though, the MFIs could not reach the poorest of the poor in the rural areas (see Alamgir 1999, p. 77). Recently, a few NGOs have started MF activities with the urban poor as well, for example the NGO by the name of PROSHIKA (see Alamgir (1997d)).

⁷ However, MF is not really free from collateral. Informal financial collateral exists in the form of forced un-withdrawable savings and, besides, strong peer pressure works as a collateral.

⁸ See Appendix 1 for the sector-wise distribution of loans by 369 NGOs.

⁹ Only some NGOs are trying to achieve self reliance, for example, ASA. See Alamgir (1997b).

year and are recovered in weekly installments. Fifth, loans are provided normally for petty trades, food processing, cottage industries, transport, livestock, etc.⁸ Sixth, the field staffs of MFIs supervise the use of loans. Seventh, the members meet once a week, make payments of weekly installments, and also make weekly savings deposits with the respective MFIs. Eighth, the majority (as high as 90%) of members (borrowers) are women. Ninth, the MFIs depend heavily on external assistance for their operations.⁹ Tenth, the loans are based on interest, which is usually about 30% per annum. However, recently, a few efforts can be noticed that are emerging in the field of MF with interest-free Islamic products, offered by the Islamic MF institutions (IMFIs). Their emergence is late, and also small in number and size.

Literature in the area of MF is mushrooming; many assessment studies have been conducted; and many seminars and workshops are being organized to discuss the effects of MF. The assessment studies are however one-sided. The formal mainstream studies concentrate mainly on the positive implications of micro credit, especially on its economic implications. They rarely give any attention to socio-cultural effects of MF in the rural areas, except for the issue of 'women empowerment' through MF. On the other hand, some other studies highlight only the socio-cultural effects of MF. In fact, some socio-cultural implications of MF seem to be creating serious concerns in many minds, especially in the minds of those who are interested in the preservation of faith based values and culture with income growth and economic development. Their studies highlight the socio-cultural effects of MF, which are not really considered as impact studies of MF, although they raise important social concerns related to MF activities. An attempt will be made here to bring together the two streams of assessments of MF.

The objective of this paper is to provide an analysis of the theory and practice of MF with special reference to the context referred to above, concentrating more on the application side. In doing so, we would like to start with a brief exposure to a theoretical relationship between MF, poverty alleviation and economic development in general, followed by an analysis of its application from an economic and socio-cultural perspective. As the nature and application of MF may vary from place to place, a generalized analysis of MF's economic and socio-cultural implications may be misleading and hence it may be appropriate to make reference to a particular case. Accordingly, the paper has chosen the experience of Bangladesh as a case, which is really the birthplace of the concept of MF and is the first as well as the largest case of experimentation. The paper will also cover the IMFIs in brevity.

The paper has the following schematic framework: (1) Introduction; (2) Microfinance, Poverty Alleviation and Economic Development; (3) Economic Implications of Microfinance; (4) Socio-cultural Implications of Microfinance; (5) Islamic Microfinance and its Implications; and (6) Concluding Remarks and Recommendations.

Sections 3 through 4 of the paper will be based on information collected from secondary sources: published materials including reports and publications of MFIs, seminar and workshop papers, journal papers, assessment reports, and also some informal interviews.

2. MICROFINANCE, POVERTY ALLEVIATION AND ECONOMIC DEVELOPMENT

The poor are poor because they are poor. Their income is low and hence they are unable to meet even the basic needs, and thus the question of invisible surpluses does not arise at all. They cannot afford to send their children to schools. They remain un-educated and unskilled, without innovative ideas. The natural and obvious outcome is that they suffer from low productivity and low income. The un-educated poor keep on producing unskilled people generation after generation with low productivity and low income. Poverty perpetuates due to poverty. The children remain poor because their parents were poor, leading to the vicious circle of poverty.

Investible resources are important for development of agriculture as well as non-farm activities in order to increase their income level, and thus for reduction of poverty and achievement of economic development.

The production function approach of growth may be denoted as follows:

$$G = f(L, D, K, E)$$

Where G = Economic growth; L = Labor; D = Land; K = Capital and E = Entrepreneurship.

The size of capital, K, is again determined by investment, I.

$$K = g(I) \dots\dots\dots \text{with } g > 0.$$

That is, investment contributes positively to the stock of K, which in turn contributes positively to economic growth. The poor, however, do not have access to investible resources to make investment, since they neither have investible surpluses of their own nor access to credit. The former is obviously due to their low income, which is often not enough to satisfy even their basic needs. The latter is due to the fact that the formal commercial banks are normally urban-based and, moreover, the poor lack collateral that is necessary to obtain credit from commercial banks. Thus, the lack of both investible resources and access to credit makes the poor quite vulnerable and trapped in the vicious circle of poverty.

The poor lack not only the investible resources; they lack as well ideas, confidence and basic skills of business. In this scenario, MFIs come to the rescue. The rescue comes from different dimensions.

2.1 The Ideas: MFIs come to the doorsteps of the poor with ideas. Their officers and field workers visit the poor households and provide them with ideas about small non-farm activities and enterprises, which may be attempted with the help of small loans, and give them some consultancy services. They try to assess their entrepreneurial potentials, and give them venture ideas in non-farm activities.

2.2 The Confidence Building and Training: The poor lack confidence in doing anything. With venture ideas, the MFIs try to develop the confidence in them that they are able to start non-farm activities and thus alleviate poverty. Not only this, the MFIs train them about some basics in business which they lack.¹⁰

2.3 Loans: With the ideas, confidence building and training, the MFIs extend loans,¹¹ which are really quite small, and are provided for one year.¹² This fills the resource gap partially.

An important characteristic of MF is that it is without any formal collateral that is normally needed by commercial banks. There are, however, non-formal collaterals. For example, in Bangladesh, there are several informal collaterals. First, borrowers of MFIs have to deposit a specified amount of weekly savings with the respective MFIs, which they cannot withdraw until the entire loan is repaid. This works as a financial collateral. Second, the peer pressure works as strong collateral. In order to be eligible to get MF, the poor have to form groups of five to thirty members each, and a member may get a loan only if no other member has any overdue loan. Thus, each and every member works as a watch dog against any overdue loan. This peer pressure is a very powerful collateral indeed.¹³ Third, personal guarantees from relatives, friends, and other respectable persons of the locality are also accepted by MFIs as an informal kind of collateral.¹⁴

2.4 Generation of Investible Resources: The MFIs help generate investible resources from internal sources. As already mentioned, the borrowers are forced to save a small amount every week and deposit this with the creditor organizations. This mini-savings generates the needed investible resources from within.

Thus, MFIs provide investible resources, venture capital, business ideas, and training that the poor lack in their efforts to go forward. With these, they can start new income generating activities (IGAs), expand the existing IGAs, and also invest in farming activities. This in turn provides self-employment, especially that of women, leading to income growth, food security, and capability to meet basic needs, which will increase adult literacy, education of the children, and social mobility and development. Thus, theoretically speaking, such MF activities are expected to lead to substantial socio-economic development in the project areas, especially of the MF borrowers, which in turn is expected to contribute to poverty alleviation and economic development in general.

¹⁰ Alamgir (1997b, p. 2).

¹¹ For example, in Bangladesh, MF varies from US\$25 to US\$ 75 in size. See Alamgir (1999, p. 13).

¹² Alamgir (1999, p. 4).

¹³ See (Rahman et al, pp. 2, 7-9).

¹⁴ Hassan (2000, p. 13).

3. Economic Implications of Microfinance

The economic effects include income growth and poverty alleviation, self-employment, asset ownership, food security, female participation in the labor force, and riba-based interest rural economy.¹⁵ As the farming activities in most developing countries depend heavily on the generosity of nature, and hence are subjected frequently to natural calamities, MFIs tend to concentrate on non-farm activities for their credit facilities.¹⁶ Although some reservations have been expressed, the economic effects of MF have been more or less accepted to be in the positive direction. Let us look into this.

3.1 Micro credit, Income Growth, and Poverty Alleviation

The prime objective of MF is to increase income of the poor, especially the rural poor, and thus alleviate poverty.¹⁷ The general belief is that MF has been doing this all the while.

"The evidences presented in various studies provide a strong basis to conclude that microfinance programs lead to an increase in household income/expenditure and results in poverty alleviation".¹⁸

"... (MFIs) have contributed to improving the quality of life of millions of people".¹⁹

However, the income effect varies quite significantly from study to study and case to case. Rahman has provided the summary of 9 major studies and found that the positive income effects in these cases ranges from 8% to 40%.²⁰ This is quite impressive, but it is not clear if the income increase is in real terms or nominal.

¹⁵ As indicated earlier, we shall refer to the experience of Bangladesh with respect to the economic implications of MF.

¹⁶ For example, in Bangladesh, microcredit is given for non-farm activities like petty trade, poultry and livestock, weaving, etc. See Alamgir (1999, p. 4).

¹⁷ Hakim (2000, p. 7).

¹⁸ Hakim (2000, p. 7).

¹⁹ Hassan (2000, p. 2). Parentheses added.

²⁰ Rahman (2000), quoted by Hakim (2000, p. 7).

We may usefully have a quick look into some impact studies of MF, choosing a major MFI and a small MFI as a sample. A summary of an impact study on BRAC, one of the top few NGOs that provide MF in Bangladesh, is given below in Table 1.²¹

Table 1
Monthly income changes 'before and after
the last loan' and at the time of interview

Borrower group	Average monthly income 'before' (Taka)	Average monthly income 'now' (Taka)	Percentage increase (nominal)	% increase adjusted by rural consumer price index	% increase adjusted by retail rice price index
First-time borrowers	1,575	1,792	13.8	6.6	1.1
Third-time borrowers	1,401	1,679	19.8	12.3	6.4
All borrowers	1,513	1,752	15.8	8.6	2.8

As is obvious from Table 1, income of the borrowers' nominal income has increased from 13.8% to 19.8% depending on how many times the borrower had access to credit. This seems to be quite an impressive income effect of MF. But if one looks at the income effect adjusted for retail rice price index, which is more relevant for the poor, the income effect is not very encouraging. As one can see, when adjusted for the retail rice price index, borrowers' monthly income changes 'before and after the last loan' were only 1.1% for the first-time borrowers and those of all borrowers were only 2.8%. The income effects are still positive but not very impressive.

²¹ Source: Prepared from Tables 12.16 and 12.17 from Hulme (1996, p. 134).

Now let us refer to a sample study of ASHRAI, a small NGO providing MF, which is provided in Table 2.

Table 2
Economic Effects of Microfinance

Serial No.	Issues	Decreased/ Worsened	Same as before	Increased/ Improved
1	Family income	-	35 (21%)*	132 (79%)
2	Food and nutrition	-	59 (35%)	108 (65%)
3	Clothes	-	93 (56%)	74 (44%)
4	Health condition	-	94 (56%)	73 (44%)
5	Child education	-	63 (38%)	104 (62%)
6	Housing Conditions	-	128 (77%)	39 (23%)
7	Productive employment of members	-	33 (20%)	134 (80%)
8	Overall quality of life	-	21 (13%)	146 (87%)

Source: Alamgir (1997c), p. 63.

* Percentages and parentheses added.

The study shows some positive impact of MF, but it is not very impressive, either. A sizeable percentage of borrowers are still in the status 'same as before', meaning no change in their economic conditions. The conditions of the remaining borrowers have improved, but the degree of improvement is not clear.

Thus, the two studies reported above provide testimony to some positive impact of MF, which is not however as encouraging as expected theoretically.

Accordingly, some authors have clearly mentioned that the effects of MF have been marginal.

*"However, while beneficiaries have registered improvement, the evidence on large-scale household-level economic graduation out of poverty is yet quite limited."*²²

On the other hand, we find that claims of positive income effects of MF did not go unchallenged. Some have cast doubt to such positive effects of MF. For example, a reputed economist of Bangladesh, Dr. Kholiquzzaman, may be quoted here.

²² BIDS (1994), cited in World Bank (1996, p. 14).

"...these fashionably named projects- poverty elimination project and the project to augment the production ability of the poor, etc.- have not brought about any change in the economic structure in Bangladesh".²³

Another author in MF, Adity Chowdhury, has also challenged the well-celebrated positive effects of MF. According to Chowdhury, nowhere has BRAC been successful in changing the socio-economic conditions of the poor. Instead,

"With its superior resources, BRAC has become new elite in the village, taking the place of political parties without a strong program to defend its activities."²⁴

Thus the positive income effect of MF has been challenged by a number of researchers, analysts and economists.

An issue deserves attention in this area. Although poverty alleviation is a declared agenda of micro credit, it rarely reaches the poorest of the poor in the country. Ironically, micro credit reaches the better-off section of the poor, and not the poorest of the poor. Sometimes the programs include as high as 20%-30% non-target group members.²⁵

"NGO programs have also shown a general inability to reach the extreme poor who constitute between 20 and 25 per cent of the rural population."²⁶

It is not very clear why the poorest of the poor are excluded from MF. The reason is not expected to be non-availability of collateral, since MF is provided mostly with non-material collateral, which is even stronger than material collateral and is equally accessible to the poorest of the poor.

Thus, the income effect of MF does not seem to be as obvious as it is generally perceived. However, whatever is the magnitude of the effect; we may probably take MF as a contributor to income growth and poverty alleviation.

3.2 Self-employment and Wages

MF programs have been found to have increased self-employment, especially the self-employment of women. Access to MF enables the poor to increase the scale of their existing income generating activities (IGAs), initiate new non-farm IGAs, and rent in land for farming. Thus the MF borrowers have been found to have both higher and better employment than others among the rural poor with higher wages in non-farm activities.²⁷

MF activities have significant effects on women participation in the labor force. MF is normally provided to women²⁸ and thus they get involved in economic activities in the non-formal sector (mostly self-employed activities).

²³ Islam (1998, p. 64).

²⁴ Chowdhury (p. 109).

²⁵ Hassan (2000, p. 8).

²⁶ World Bank (1994, p. 14)

²⁷ Hakim (2000, p. 7). Also see Zohir (2000) quoted in Hakim (2000, 7).

²⁸ About 90%-95% members of the MF groups are women. See Khan (2000, p. 10).

3.3 Ownership or Possession of Assets

Pro-MF studies show that MF has positive effects on asset ownership or possession.²⁹ These assets are of several kinds. First, the MF borrowers mortgage-in and rent-in more land than non-borrowers. Second, they have been observed to own more livestock assets, for example, poultry, goat, sheep and cows, as compared to non-borrowers. Third, they have been found to own more bicycles, wooden non-mechanized boats, and rickshaws, as compared to non-borrowers.

3.4 Food Security

MF borrowers are said to enjoy better food security. Food security comes from two sources. In the first place, with greater access to landed property, either by renting-in or mortgage made possible by access to credit, they have grown marginally more rice (the staple food) as compared to those who are not in the MF programs.³⁰ Besides, higher income from non-farm activities increases their accessibility to food market. They can afford to buy food from the market with their non-farm income.

Per capita expenditure on food for borrowers was 8% larger than that of non-borrowers of MF in the project villages of Grameen Bank, and 35% larger than of the target groups in the control villages.³¹ A study of three MFIs shows that 77% of their targeted people in rural areas meet minimum calorie requirements, whereas only 59% of the hardcore poor meet only 80% of calorie requirements.³²

Another study shows per capita calorie consumption of the poorest members in the BRAC area as 2335 Kcal as compared to 2133 Kcal for the non-member poor, an increase of 10% in calorie consumption.³³

These studies show positive effect of MF on food consumption, which in turn bears witness to the degree of food security achieved by MF. This effect is appreciable, too, although it is not very substantial.

3.5 Women Participation in the Labor Force

Traditionally, women remain as housewives in Bangladesh, especially in the rural areas. They do household work, raise children, and so on. They are seldom employed in IGAs. However, as indicated earlier, most of the members of MFIs are women. About 549 NGOs restrict their membership to women alone for MF activities.³⁴ Another study shows that about 90% to 95% members of the MF groups are women.³⁵

²⁹ Hakim (2000, p. 7); Zohir (2000)

³⁰ Zohir (2000), Hakim (2000).

³¹ Hossain (1988)

³² Chowdhury (1996)

³³ Hader (1998)

³⁴ World Bank (1996, p. 12).

³⁵ Khan (2000, p. 10).

Women get loans, which are meant for mostly non-farm activities, and are directly supervised by the MFI officers. MFIs want the women to engage themselves in economic activities, and attend office meetings, and they are the ones who are made responsible for repayment of loans. Therefore, it is rarely possible to transfer the loans to their male partners. Accordingly, the whole system requires that the women do the work, although their male partners may help them, even if some male partners do not like this. Thus, MF has undoubtedly increased women participation rate in the labor force.

Some authors, however, question the wisdom of preferring women for MF for creating jobs for women when unemployment rate of men is very high in the country.³⁶ They ask: "if the NGOs are interested sincerely in increasing the income of women, why do they not create a situation where the women could work together with their husbands"?³⁷ To them, preference to women will mean women's access to credit for economic activity when men are sitting idle at home unemployed. Besides, some housewives may be inefficient to run any activity, having so far been confined to houses as housewives. Probably this is the reason why in some cases women are used to getting the loans, which are actually spent by men.³⁸

This is probably one reason why the Islamic Microfinance Institutions (IMFIs) do not give any preferential treatment to any sexes in the provision of MF³⁹. In any case, MF increases female participation in the labor force.

3.6 Interest-based Rural Economy

MFIs operate mostly in rural areas.⁴⁰ The basis of their financing is interest.⁴¹ They charge 25% to 30% rates of interest on their loans.⁴² Except for a very small minority, the rural population has so far been avoiding interest, since it is prohibited in their religion⁴³ and, in addition, the rural areas are generally outside the coverage of commercial banking system. MFIs have covered a large part of rural Bangladesh by interest-based financing and thus the traditionally interest-free villages of MFIs projects have been turned into a interest-based rural economies.

This has created concern in the faith-based religious population of the country. Interest produces many socio-economic evils and hence it has been prohibited in all the divine books, including Al-Qur'an,

³⁶ Nuruzzaman (1997, p. 40).

³⁷ Ibid. p. 40

³⁸ This is based on informal interviews of the present author (the discussant) with a cross-section of the people in the society.

³⁹ This is with the exception of one MFI, which deals only with men.

⁴⁰ Recently, one or two NGOs have covered urban slums, too. For example, the Shakti Foundation is an urban replication of rural based MFIs. See Rahman (1999).

⁴¹ Recently, some Islamic NGOs started operations without interest at a limited scale, for example, Muslim Aid Bangladesh, and Al-Falah (Dinajpur) See Hassan (2000).

⁴² See Alamgir (1999, p. 4).

⁴³ More than 85% of the population of Bangladesh is Muslim, traditionally religious in their lifestyle, practicing the Islamic injunctions and rituals. Interest on loans, which is called *riba* in Islamic language, has been declared prohibited in this religion, and this ruling is quite strictly followed in rural Bangladesh. Besides, rural areas are outside the coverage of banking services. As a result, rural Bangladesh has so far been free from *riba*. It does not mean that the rural Bangladesh is totally free from this. In the absence of banking services, some of the very poor inhabitants, who are in dire need of money due to natural calamities or to meet the ceremonial expenses of some social functions such as wedding of their children, borrow money from friends and relatives free of charge. When this source is not available, some of them resort sometimes to the village moneylenders for loans. They charge exorbitant rates of interest, sometimes ranging from 100% to 200% per annum. Such loans, however, are rarely used. Thus, the rural areas are more or less free from interest.

which contradicts the unified value system that is supposed to integrate socio-scientific reasoning.⁴⁴ As a result, some Islamic NGO's have come up with interest-free financial products in the form of IMFIS.⁴⁵

4. SOCIO-CULTURAL IMPLICATIONS OF MICROFINANCE

The socio-cultural implications include women empowerment, literacy and school enrolment, social mobility, fertility and contraceptive use, family relation, social conflict, political impact, westernization of lifestyle, neutralization and secularization of local faith and culture.

4.1 Women Empowerment, Implications and Concerns

MFIs have adopted a strategy of women empowerment in a man-dominated family structure,⁴⁶ and thus give preferential treatment to women for providing credit facilities, since about 90% to 95% members of the MF groups are women, and 549 NGOs deal only with women for micro credit.

Access to credit, income generation and the resulting economic role and power have improved the role and status of women in the family and society. Studies show that MF has, among other things,

*"Helped raising income of the family thereby raising status of the women; created self-employment opportunities for women; helped establish women's control on income and asset of the family; helped women to enhance their own standard of living; and accorded power to and greater control over family decision making."*⁴⁷

But women empowerment seems to be quite costly for women, too.

*"She has to make time to attend weekly group meetings adjusting the usual domestic works. Sometimes the group meeting venues are quite far away from her residence and she has to undertake arduous travel on foot. In case of the loans being used by the male members, she has to run into scuffle with the dominating male member to slice out provision for repaying installments to save face in the weekly meetings. In case of her inability to fetch fresh loans as per expected date and amount, she has to face wrath of the male counterpart on return from the meeting. She has to face wrath of and humiliation from the field functionaries of MFIs in case of default for reasons of non-cooperation of the male counterpart."*⁴⁸

⁴⁴ The socio-economic effects of interest have been well celebrated, and an alternative financial system has been provided, in the contemporary literature of economics, banking, and finance, which has been put into practice world-wide with commendable success.

⁴⁵ See below for IMFIS.

⁴⁶ Rural Bangladesh has a man-dominated family structure, which is more or less true everywhere in the world. However, illiteracy and poverty make the women even more vulnerable in rural Bangladesh.

⁴⁷ Khan (2000, p. 11). Some Islamic banks are also providing interest-free small loans without interest, for example, Islami Bangladesh Ltd.

⁴⁸ Ibid, pp. 11-2

Some authors have also raised some other socio-economic concerns about women involvement in MF activities. Let us start with an observation by some pro-MF authors. In a recent paper Wahid and Maxwell expressed concern in the following statement:

*"Nonetheless, the Grameen Bank has also to show caution and care in its operation in the countryside. In some sporadic incidences Bank staff and borrowers were found to be involved in activities that could potentially hurt the religious feelings and social values of still largely conservative rural population."*⁴⁹

Some others are more critical of women empowerment agenda due to its socio-cultural implications. First, it is claimed to have affected the family relations and family power structure by weakening the dominance of man in the family. The reversal of family dominance or, at least, installation of women power in the family has been alleged to affect family relations, leading to family problems in some cases.

*"In these (microcredit) project areas, the husbands often complain that their wives disobey them. They go to meet the NGO officers against their will. As a result, family disputes arise, leading finally to divorces... The NGOs provide free legal aid to women to facilitate divorce. Thus, the divorced women get into western lifestyle. Needless to say, women thus fall into the trap of Christians and get converted to Christianity."*⁵⁰

Second, women empowerment through microcredit is also alleged to have produced an effect of westernization and cultural de-Islamization. The requirement of members' attendance to weekly meetings and participation in them, trips to health centers and MFI offices have affected the adherence to the traditional Muslim culture and values of strict dress code (hijab) and non-interaction with men other than the husbands.⁵¹

Empowerment of women to raise their social status is appreciable. But the situation does not seem to be as simple. The way it is practiced through MF seems to have produced social and ethical concerns worthy of investigation. Therefore, the MFIs as well as the MF researchers should look into the socio-cultural effects of this strategy carefully and look for remedies.

⁴⁹ Wahid (2000)

⁵⁰ Nuruzzaman (1997, pp. 40-41).

⁵¹ Rural people are traditionally religious, women wear hijab (Islamic way of covering body), and they avoid free-mixing with the opposite sexes. MFIs require the members (mostly women) to attend weekly meetings with the officers of MFIs and male members. "The Grameen Bank (the largest provider of microcredit) has made physical training and parade compulsory" (Jallabadi 1997, 41) The women, who have so far been confined to only one male partner (husband), come suddenly in contact and company of other men. The sudden exposure to other men, their close proximity and interaction in the frequent (weekly) meetings may naturally turn on the biological feelings to the opposite sex which, coupled with the affected family relations indicated above, is alleged to create serious complications in family relations, and to damage Islamic socio-cultural values related to dress code and extra-marital relationship. Some of the NGOs distribute condoms and other easily applicable birth control pills free of cost in the name of family planning and female health (Jallabadi 1997, p. 94), which can obviously facilitate a type of relationship that is socially unacceptable in rural Bangladesh.

4.2 The Alleged Hidden Agenda and the Social Conflict

It is alleged that some NGOs, who are involved in MF, have the hidden agenda of missionary activities and neutralization of local faith, to convert the poor to Christianity, both non-Muslims and Muslims. They are alleged to use MF as an instrument of such hidden agendas.⁵² It has been reported that literature on the superiority of Christianity over Islam is distributed to the members of the NGOs⁵³, which distort Islamic beliefs. According to them, many people have already been converted to Christianity, including some Muslims.⁵⁴

According to some authors, such missionary activities, along with the alleged faith-neutralizing effects of women participation (westernization, free-mixing, abandonment of hijab, family relation problem, etc.), created concerns among the Muslim population, which have been reflected in writings (media statements and features, booklets and books), anti-NGO demonstrations, protest meetings and gatherings, strikes and conflicts.⁵⁵

The World Bank has indicated about religio-cultural effects of some NGO activities, which are financed by foreign sources. "Government officials are sometimes worried that foreign funds may be used for "anti-national" and/or "anti-social" activities. These worries span the spectrum from armed insurgency to religious proselytization."⁵⁶

Some expressed concern that NGOs promotes secularism and atheism.

*"The NGOs are making people secular and atheists. They advise people in different ways not to pray Friday prayers and five prayers a day. They are dead against hijab; they tell the people that hijab is against modernization."*⁵⁷

⁵² Quite a number of NGOs are said to be involved in missionary activities in the name of relief, poverty alleviation and microcredit activities. Among those which are directly involved in such activities include CARITAS, Baptist Missionary Society, Baptist Aid Mission, Christian Reformed Relief Committee, Mennonite Central Committee, Missionaries of Charity, Rangpur-Dinajpur Rural Service, Bangladesh Lutheran Mission, Finish, and so on. See: Jallabadi (1999, p. 263). See also-Ali, Mohar (1965) P. 156-74

⁵³ For example, raising such question as this: when Islam's Prophet is unable to save even his daughter, Fatimah, then he cannot do intercession for believers to save them in the Day of Judgment See Nuruzzaman (1997, p. 44).

⁵⁴ Statements of several Christian converts, who were Muslims (including some Haji Muslims) earlier, have been published to the effects that they have gained a lot spiritually (reaching closer to God) by converting to Christianity after leaving Islam. Essence of some other statements by some Christian converts from Islam are as follows: Islam's claim of peace and its bloody wars are inconsistent. There is no life in Islamic rituals, but they are merely some mechanical forms without any substance, and hence these have been abandoned by them. Prayer is performed in such a language that is not understood, and so on. See Nuruzzaman (1997, p. 41-45).

⁵⁵ For example, a huge gathering of people was held in Manik Mia Avenue, and was addressed by many national figures. See the Daily Sangram, 1 May, 1996, cited in Jallabadi (1999, pp. 475-476). The report of converting 25 Muslims into Christianity in the Cox's Bazar area led to serious tension and unrest in the area, including protest meetings, strikes, street demonstrations, and clashes with police, arrests and so on. See the Daily Sangram, 24 October, 1992, cited in Jallabadi (1999, pp. 442-443).

⁵⁶ See World Bank (1996, p. 46). Accordingly, the government of Bangladesh was said to be forced to investigate the activities of the NGOs, which led to the banning of some NGOs. But the government was forced to reinstate them within a short period of time due to outside pressure. See Islam (1998), pp. 65-66).

⁵⁷ Daily Inqilab, 13 February, 1993, cited in Nuruzzaman (1997, p. 39).

As a consequence, the religious groups and the concerned people of the country have been naturally against the missionary activities of NGOs,⁵⁸ which created a cold war between them and such NGOs who have established strong bases and power in the rural areas by group formation for micro credit. This enmity has been transmitted to national politics as well.⁵⁹

4.3 Literacy and School Enrollment

Higher income, outside exposure, and appreciation of the value of education through outside interaction are expected to motivate the rural poor to go for education. Accordingly, it has been found that adult literacy rate is higher among the borrowers as compared to non-borrowers. It has also been found that the chance of both boys and girls (aged 5-9 and 10-14) to get enrolled in schools is higher among MF borrowers, which is an encouraging effect of MF.

4.4 Social Mobility

Although MF does not increase social mobility of women significantly, it is nonetheless observed that their visits to health centers and NGO offices are much higher than the non-borrowing women.⁶⁰ Obviously, their attendance in the weekly meetings, interaction with MFI officers and other members (both women and men), lead to higher social interactions, which might eventually lead to higher social mobility.

4.5 Fertility and Contraceptive Use

Zohir studied the impact of MF on family planning and found positive effect of MF on contraceptive use for birth control.⁶¹ Women borrowers are busy in economic activities and get access to ideas about birth control methods through outside interaction. Some of the NGOs are said to encourage contraceptive use, and some of them even supply means of birth control. All these lead to higher use of contraceptives as compared to non-borrower women. Zohir's studies also show that female methods dominate, which is expected since most rural male partners are reluctant to use contraceptives, and because the women get exposed to birth control ideas and means and also to men other than their husbands.

⁵⁸ The degree of such concerns may be understood from the fact that several books and booklets have been written to expose such missionary activities of the relevant NGOs, for example, Jallabadi (1999) and Nuruzzaman (1997). Many features have been published in some concerned national dailies, for example, (1) Daily Inqilab 5 August 1996; (2) Daily Sangram, 9, 13, 14, and 28 April 1994, 16 May 1998, 28 November 1997, October 1995, 23 July 1998; (3) Daily Bhorer Kagaj, 7 July 1992; (4) Daily Dinkal, 25 October 1996; (5) Daily Millat, 30 July 1997, cited in Jallabadi (1999, pp. 140-486).

⁵⁹ According to some political analysts, the NGOs played an important role in causing poor performance of the Islamic parties in the last election. The campaign and propaganda by dominant NGOs that "loan facilities will cease if the Islamist group came to power," and that "the Islamic groups will stop women from coming out of their homes", etc., worked against Islamic groups (see Jallabadi (1999, pp. 356-361)). In particular, the NGOs have been alleged to have tactfully, and sometimes forcefully, manipulated the women voters to cast their votes in favor of secularist candidates in the last election, who would support their de-Islamising activities (see Jallabadi (1999, p. 279)).

⁶⁰ Hakim (2000).

⁶¹ Zohir (2000).

The vast majority of conservative rural poor and the religious conservatives are critical of the use of contraceptives since, firstly, it is considered inconsistent with the religious faith and, secondly, the accessibility of contraceptives facilitates undesirable extramarital relationship in a situation when women are suddenly exposed to other men after being confined to one partner all the while, or being unmarried and divorced/widowed.

5. ISLAMIC MICROFINANCE AND ITS IMPLICATIONS

The negative effects of social as well as economic⁶² nature attracted the critics to provide alternatives, which will be free from the negative effects. Some of them have come up with faith based microfinancial services, and are categorized as Islamic Microfinance Institutions (IMFIs). They and their services are different from their secular counterparts in a number of ways. Some major differences are as follows:

First, the IMFIs provide microfinancial products, which are free from interest. Their products are based on mark-up pricing, profit sharing and so on.

Second, the IMFIs provide microfinancial services to both men and women, without any differential treatment.⁶³

Third, the IMFIs require Muslim dress code for the women to attend the group meetings, and discourage free mixing and unnecessary interaction with men other than their husbands.

Fourth, the IMFIs do not promote or encourage contraceptive use, nor do they provide such birth control devices.

Besides overcoming the alleged negative effects of secular styles of microfinance services, the IMFIs seem to produce positive effects that are quite similar to the secular MFIs. This is evident from the study conducted by Hassan.⁶⁴ The comparison between MFIs and IMFIs may be seen in Table 3.

As it may be seen from Table 3, the MFIs and IMFIs are not very different in terms of target groups, criteria applied for selection of members, area of operation, programs, group size, frequency of meeting, terms and conditions of savings, and terms and conditions of loan. It is interesting to note that IMFIs can provide similar services with similar effects minus the alleged elements of negative effects of secular MFIs. Besides, unlike the MFIs, the IMFIs are self reliant and are not dependent on external sources of finance.

⁶² Especially the concern related to the spread of riba in the overwhelmingly riba-free rural economy.

⁶³ Although, one IMFi limits its membership to men only

⁶⁴ Hassan (2000)

In particular, we may look into the Islami Bank Bangladesh Limited, which has recently embarked on its MF activities. As of September 1998, IBBL already had 12115 members, with 7980 members taking investment from IBBL (see Table A.3 in the Appendix). IBBL's investment in the MF areas is larger in size (US\$60 - US\$500)⁶⁵ and is meant for a longer duration of up to 3 years⁶⁶ (see Table A.4 in the Appendix), which are beneficial for the members. Unlike other MFIs, IBBL invests in agriculture as well as petty manufacturing in rural areas, which should contribute to rural development (see Table A.5 in the Appendix).

In short, although the emergence of IMFs is late, they have marked their presence with appreciable provisions and results, but they do not have the kinds of undesirable socio-cultural implications that exist in the case of MFIs.

Issues	Islamic NGOs	Secular NGOs
Target group of NGOs	Generally rural poor are the target population. Members can own maximum of 0.5 acres of land. Islami Bank also includes marginal farmers having maximum of 1.5 acres of land.	Generally rural poor are the target population. Members can own maximum of 0.5 acres of land.
Criteria applied for selection of members	Land ownership criteria	Land ownership criteria
Area of Operation	Rural area	Rural area
Gender	Both men and women are included in the groups. One NGO within the sample work only for men. Clear bias is to accept men but Islami Bank prefers women.	Normally, women are preferred by NGOs to form groups, although a small percent (5-10%) of members are men. One NGO within the present sample of NGOs work only for women.
Programs	Mainly micro-investment	<ul style="list-style-type: none"> ♦ Mainly microcredit ♦ Non-formal Education ♦ Water and sanitation
Group size	5 to 30 members per group/society	5 to 30 members per group/society
Terms and Conditions of Savings		
Frequency of meeting	Weekly/monthly	weekly/monthly
Savings of members	Taka 5-10 per week	Taka 5-10 per week
Interest/profit paid on savings	Variable: 5-6% per annum	5-6% per annum
Other savings instruments	None	None
Withdrawal of savings by members	Members are allowed to withdraw certain percent of savings.	Members are allowed to withdraw certain percent of savings.

⁶⁵ The relevant size for MFIs varies from US\$25 to US\$75.

⁶⁶ MFIs extend loans for one year.

Issues	Islamic NGOs	Secular NGOs
Terms and Conditions for Loan		
Amount of loan		
Minimum	Taka 3000	Taka 3000
Maximum	Taka 15,000 (Islami Bank)	Taka 10,000
Duration of loan	One year	One year
Rate of interest/mark-up	12-15.5% mark-up	30% rate of interest per annum
Mode of repayment	Weekly installments	Weekly installments
Type of loan	Islamic mode of investment is used - mainly bai' muazzal (sale on credit.)	Loan is provided in cash.
Activities financed	Common activities available in rural areas especially petty trading, rearing poultry and live stock, agricultural input, shop-keeping, rural vehicles	Common activities available in rural areas especially petty trading, rearing poultry and live stock, agricultural input, shop-keeping, rural vehicles
Multiple loan	Only one loan at a time	Only one loan at a time
Sources of Fund	<ul style="list-style-type: none"> ♦ Members' Savings (in case of Islami Bank - depositors' savings) ♦ PKSF 	<ul style="list-style-type: none"> ♦ Members' savings ♦ PKSF ♦ International donors
Future Trends	Expansion Financial viability Institutional strengthening	Expansion Financial viability Institutional strengthening

Source: Survey of 12 Secular and Islamic NGOs, quoted from Hassan (2000, pp. 37 - 38).

6. Concluding Remarks

- (1) The unified value system that integrates all human and natural disciplines covers the field of economics that aims at human welfare by strategies, among other things, to alleviate poverty. Microfinance (MF) has recently been viewed to effectively contribute to poverty alleviation. This paper seeks to present an evaluation of MF with respect to economic as well as socio-ethical perspective based on secondary resources. In short, the economic effects do not seem to be as encouraging as expected, and the way the concept of MF is being applied seems to have adverse socio-ethical implications. An alternative method of delivery.
- (2) In theory, MF activities are expected to lead to substantial socio-economic development for the poor. The experience of Bangladesh, which is the birthplace of MF as well as the largest experimentation case in the world, shows positive results of MF activities, although the outcome is not as impressive, and even if some have serious doubts about any positive income effects. Besides, the way the MF activities are being undertaken seem to raise serious social concerns, which seem to have affected religious feelings of the people by affecting local faith and culture, leading to social unrest and conflicts, transmitting the effect even to the national elections.

- (3) A characteristic of the existing studies on MF is that they seem to be more-or-less one-sided. They either deal with economic implications of MF, or merely its ethical and socio-cultural effects. It is an irony that the formal assessment studies on MF do not cover the normative and socio-cultural effects of MF. In our view, they should be taken into consideration, since there should not be any trade-off between values and economics and, especially, when any human discipline is supposed to be based on the universal value system, leading to concerns of a large number of affected people in the society and faith based social as well as political leaders.
- (4) The studies that discuss economic impacts of MF usually highlight positive income effects of MF activities, whereas those that deal with socio-cultural effects express concern about undesirable effects of MF which have been reflected in the sentiments of the people of value orientations, including a complain of religious conversion, leading to social tension, unrest and conflict, protest demonstrations and gatherings, booklets, books, and media coverage. Some important concerns have to do with 'interest' and that originating from pre-dominantly 'female membership' in group based financing, affecting norms and values of the people such as dress code, free mixing leading to extra-marital relationships, divorces, and so on.
- (5) An alternative example of MF activities is available, however, which seems to be free from the alleged undesirable socio-cultural effects. In fact, the Islamic Microfinancial Institutions (IMFIs) came into being with an objective to free MF activities from the alleged undesirable normative and socio-cultural implications, including 'interest' dress code, free mixing and the resulting outcome as well social sentiments. Interestingly, their economic outcomes seem to be similar minus the alleged negative socio-cultural effects. It will be very interesting if the existing large MFIs try at least one small project along the line of IMFIs.
- (6) The MFIs, even the largest ones including Grameen Bank and BRAC, still depend on external sources of finance. They should find ways to minimize such dependence to be self-sufficient gradually.
- (7) Any new thing is expected to have repercussions. MF is definitely a welcome effort, which is needed in Bangladesh, especially in rural Bangladesh, and which has been producing positive results. However, we should not deny the fact that there is room for improvement. We should probably appreciate the Japanese corporate culture of kaizen, a policy and tradition of continuous improvement even in the field of microfinance, and obviously the priority areas of improvement lie in the socio-cultural dimensions.

Recommendations

With respect to extending finance for poverty alleviation through MF activities, several suggestions and recommendations may be made.

- ♦ First, the MFIs and the MF researchers should study why the economic outcome of MF Activities is not as sizeable as expected.
- ♦ Second, the MFIs and the MF researchers should study the ethical and socio-cultural effects of MF and should take care of them as soon as possible.
- ♦ Third, those MFIs that are alleged to have hidden agenda should review their activities, and refrain from such activities, if any, that include the religious feelings of the people.
- ♦ Fourth, efforts should be made to reach the poorest of the poor for microfinance, who seem presently to be left out.
- ♦ Fifth, the MFIs should see whether they could reduce the charge on their loans, which is about double the rate charged by commercial banks at present.
- ♦ Sixth, an effort should be made to make the borrowers self-sufficient in a gradual manner, instead of their perpetual dependence on credit that seems to be the phenomenon at the moment.
- ♦ Seventh, the MFIs should try to be self reliant to be free from the influence of foreign donors.
- ♦ Eighth, a consultative body may usefully be formed consisting of social leaders, both secular and faith based, to sort out issues of concerns. It would also be useful to have dialogues with people of different orientations to minimize the concerns and inter-group tensions.

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APPENDIX

Table A. 1

SECTOR-WISE DISTRIBUTION OF LOANS OF 369 NGOS

Sectors	Percentage of disbursement (up to June 1998)
Agriculture	12.19
Fisheries	4.33
Food processing	10.17
Small business	42.13
Cottage industries	2.83
Transport	3.39
Housing	1.49
Health	0.51
Education	0.04
Livestock	17.94
Others	4.81
Total	100

Source: CDF, 1998, quoted from Alamgir (1999, p. 15).

Table A. 2
LIST OF SOME TOP NGOs IN TERMS OF MEMBERSHIP GROWTH

Name of Organization	Active Membership (in 000)	
	June 1999	December 1999
BRAC	2,711	3,057
PROSHIKA	1,396	1,453
ASA	1,072	1,179
SWANIRVAR BANGLADESH	688	694
THENGAMARA MOHILA SABUJ SANGHA	275	299
RDRS-BANGLADESH	238	232
CARITAS BANGLADESH	217	264
BURO-TANGAL	76	67
SOCIETY FOR SOCIAL SERVICE	60	58
BEES	58	66
HEED BANGLADESH	58	64
BAWPA	53	57
PRODIPAN	51	49
SHAKTI FOUNDATION	44	50
VOSD	43	46
SAMATA	42	42
ARBAN	39	40
JAGORONI CHAKRA	37	37
CODEC	36	38
TOTAL	7,196	7,792 (8%)

Source: Prepared from CDF (1999, 7)

Table A. 3
KEY INDICATORS OF MF ACTIVITIES BY
ISLAMI BANK BANGLADESH LTD. (IBBL)
(September 1998)

Indicators	Achievements
Number of Branches	45
Number of Villages Covered	148
Number of Centers	597
Number of Groups	2423
Number of Members	12115
Number of Borrowers	7980
Cumulative Disbursement Since 1996 (Taka Million)	105.3
Loan Outstanding (Taka Million)	36.5
Rate of Recovery	96%

Source: IBBL, 1998, cited in Hassan (2000).

Table A. 4
SECTORS OF INVESTMENT OF IBBL,
INVESTMENT CEILINGS AND ITS DURATION

Sectors	Investment Ceiling (Taka)	Duration of Investment	Other Conditions
Crop production	10,000	One year	21 selected crops
Fisheries	25,000	Three years (max.)	
Irrigation	5,000	One year (max.)	
Agricultural equipments	25,000	Three years (max.)	Equity 10%
Non-farm activities	10,000	One year (max.)	343 items
Rural transport	5,000	Two years (max.)	
Tubewell	3,000	Three years (max.)	At least 2nd time borrower
Housing materials	15,000	Three years (max.)	At least 3rd time borrower

Source: IBBL, 1998. {Exchange rate (approx.) US\$ 1 = Taka 50}.

Table A. 5
SECTOR-WISE MF ACTIVITIES OF IBBL (UNTIL NOVEMBER 1998)

Number	Areas of investment	Cumulative number of clients	Cumulative disbursement (Taka in million)
1	Agriculture	2385	15.09
2	Manufacturing	551	3.95
3	Services	1572	9.69
4	Trade	6674	42.40
5	Shops	2012	13.75
6	Feri	191	1.26
7	Nursery	75	0.51
8	Livestock	5413	35.98
	Total	18,879	122.63

Source: IBBL, November 1998. {Exchange rate (approx.) US\$ 1 = Taka 50}.

Search for a Universal Paradigm: Making Justice Live for All

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Abstract

This paper deals with the natural sciences complexity theory, which forms their basis, leads the readers to understand the great interconnectivity in all living systems and the network pattern which is common to all life-forms. Dynamic role of metabolism, which ceaselessly maintains an organism, provides energy flow and reproduces. The adaptability and versatility of life are characteristic of the metabolic system. Emergence or self-organization is also characteristic of all life. Mind and consciousness are discussed as the link between the natural sciences and social sciences. The centrality of culture, which provides identity and a sense of belonging to humankind, and of technology, which is intertwined with human life from its origin in Homo habilis is discussed.. The collapse of the Soviet Union and globalization of the criminal economy, as examples of the failure of the present paradigm to respond to the needs of humankind. Impact of economic-corporate globalization on world poverty shows that there is increasing poverty and social differentiation throughout the world since the early 1990s. The need for a new and universal paradigm for humanity to move the world from the path of growing political, social and economic cleavages and polarization is also discussed. There are then three proposals for re-structuring the global system, presented in some detail. The present economic system has undercut this achievement leading to a host of problems. He proposes that there must be the reconstruction of a mixed economy either through nation states reclaiming power to control economic forces or through establishment of new international institutions. He gives many practical suggestions of what specifically needs to be done. The International Forum on Globalization (IFG) stresses that resolving the present ills of the world must begin by promoting economic democracy. The third source for new proposals is George Monbiot in his Manifesto for a New World Order

The paper was presented at the International Conference on a Universal Paradigm of Socio-Scientific Reasoning organized by Asian University of Bangladesh.

1. Complexity Theory and Networking in the Natural Sciences

"Today, chaos theory, catastrophe theory, complexity theory, and the theory of dissipative structures all reflect the new scientific emphasis on contingency, indeterminacy, embedded-ness, and diversity in the natural world. Where modern science looked for ultimate truths and fundamental particles, the new science looks for unexpected possibilities and emerging patterns. Nature is seen more as series of continuously creative acts than an unfolding of reality based on unalterable laws. Nature is full of surprises at every juncture and creates its own reality as it goes."

-Jeremy Rifkin (1993)

Until the 1970s, scientists avoided nonlinear equations because they were almost impossible to solve. However, with the development of powerful, high-speed computers there has been the formulation of a new mathematical theory and consequently scientific theory, which is variously named "complexity theory" or "nonlinear dynamics".

Biology has been shaped by the study of individual organisms. Even today the majority effort in genetics is based upon the concept that the biological form is determined by a blueprint passed on to the next generation through DNA, when a cell divides and its DNA replicates. This false premise is the cause for a huge wastage of scientific effort, but is pushed by commercial interests, such as the pharmaceutical industry.

Rather than genetic determinism, complexity theory reveals a great interconnectivity in all living systems. Even the most minimal cells (mytoplasm), though they have internal simplicity, can only survive in a fairly complex chemical environment; they do not have ecological simplicity. This is why the traditional biological study of individual organisms is now irrelevant. All organisms participate in ecological systems. The organisms themselves may have internal simplicity or complexity. They also may have ecological simplicity or complexity. There is simplicity when the biochemistry of the organism's internal environment is simple or when the organism makes few chemical demands on its external environment.

The first defining characteristic of cellular life is the cell membrane. The second characteristic is the nature of metabolism, which takes place within the cell boundary. Microbiologist Lynn Margulis says, "Metabolism, the incessant chemistry of self-maintenance, is an essential feature of life -- through ceaseless metabolism, through chemical and energy flow, life continuously produces, repairs, and perpetuates itself. Only cells, and organisms composed of cells metabolize" (Capra, 2002, 9).

Processes of metabolism form a chemical network, which is another fundamental characteristic of life. "As ecosystems are understood in terms of food webs (networks of organisms), so organisms are viewed as networks of cells, organs and organ systems, and cells as networks of molecules" (Capra, 2002, 9). The network is pattern which is common to all life.

In other words, a cell is a membrane-bounded, self-generating, and organizationally closed metabolic network. It is materially and energetically open, using a constant flow of matter and energy to produce, repair and perpetuate itself.

A. Emergence

"--- Nature's creative advanced---"

-A. N. Whitehead

When a cell reproduces it passes on its genes, membranes, enzymes, organelles--the whole cellular network. Simple DNA is never passed on, because genes can only function when they are embedded in an epigenetic network. Life has proceeded through this basic pattern of self generating networks in an uninterrupted process over three billion years.

The human body is made up of hundreds of different cell types (bone, blood, muscle, etc). About 75 trillion cells are active in our bodies, with billions of cells dying every few days and being replaced. In spite of this massive change we do not experience that we are so different as persons. We believe we are the same continuous beings.

We all begin life as single celled embryos; seconds after conception, the embryo divides into two sections, a "head" and a "tail". Gradually, the embryo reaches a more complicated stage, when groups of cells begin to form the brain, eyes, legs and so forth. Each cell must decide which of these it will become, as every cell has the full genome in its nucleus.

Somehow the cells know what to become. According to Gerald Edelman, the process by which they do this is called topobiology, "topo" coming from the Greek word topos, meaning place. Cells have an ability to identify what neighboring cells are becoming and they join the process. This process is also called "gene expression". The individual cells, without knowing the overall organism result, are able to create the organism by acting locally with no guide other than their particular neighbors. In *Genome: The Autobiography of a Species*, Matt Ridley says, "The great beauty of embryo development, the bit that human beings find so hard to grasp, is that it is a totally decentralized process. Since every cell in the body carries a complete copy of the genome, no cell need

wait for instructions from authority; every cell can act on its own information and the signals it received from its neighbors" (Johnson, 86).

Emergence is one of the most important concepts in the new understanding of life. Capra recognizes it as the dynamic origin of development, learning and evolution in other words, creativity. Since emergence is integral to the dynamics of open systems, we know that such systems develop and evolve. Life constantly creates new forms, reaching out into novelty.

B. Evolution

"We know what we are, but know not what we may become."

-William Shakespeare.

Cells have multiple paths for producing the structures they need and for promoting their vital metabolic processes. This redundancy gives the evolutionary process stability and reliability, even during major crises. Biodiversity in ecosystems is similarly redundant, as are cultural and civilization forms. They have the ability to persist and rebound in spite of heavy damage to biological systems and efforts to crush cultures and civilizations. In the new understanding of life, based on complexity theory, there are three avenues of evolution. In the old understanding of life's development, mutation was understood to be the only genetic contributor to evolution. Mutation is understood as a random process, caused by an error in the self-replication of DNA.

It is now known that bacteria trade genes; technically referred to as DNA recombination. Lynn Margulis says, "Horizontal genetic transfer among bacteria is as if you jumped into a pool with brown eyes and came out with blue eyes" (Capra, 2002, 9). The process is continual, with up to 15% genetic material changed daily by some bacteria. This genetic flexibility greatly helps bacteria to adapt to environmental changes. Their global communication network should also be a model for human society, as they can rapidly build drug resistance on a global scale.

The third evolutionary path is known as symbiosis. This refers to the tendency of different organisms to live in close associations, sometimes inside one another like bacteria in human intestines. The creation of plant and animal cells are believed to have come from small bacteria merging and living inside larger cells. The plant and animal cells then evolved into living organisms through sexual reproduction. Capra explains that these organisms continued absorbing bacteria, incorporating parts of their genomes to synthesize proteins for new structures and new biological functions. This does not greatly differ from the corporate mergers in commercial life today.

C. Mind and Consciousness

"-- I say that testimony of many has little more value than that of few, since the number of people who reason well in complicated matters is much smaller than that of those who reason badly. If reasoning were like hauling I should agree that several reasoners would be worth more than one, just as several horses can haul more sacks of grain than one can. But reasoning is like racing and not like hauling, and a single Barbary steed can outrun a hundred dray horses."

-Galileo Galilei

In the movement towards development of life-forms, there was dramatic increase in molecular complexity when nitrogen entered the system. Nitrogen proves essential for both catalysis and information storage in cellular life.

Catalysts increase the rates of chemical reactions and also make possible new reactions, but they are not changed in the process. They are central to the chemistry of life. The catalytic reactions would have helped foster many accidental events, pushing the protocells towards increasing complexity, further from equilibrium and closer to life.

In *Emergence*, Steven Johnson suggests that there is a close relationship between development of the brain and demands made on mental skills by social complexity. In a brief period (in evolutionary terms) of two million years, the brain mass of *Homo habilis* at 400 cc grew to the 1350 cc of *Homo sapiens*. *Homo habilis* is known to have traveled in groups of 2 to 150 or so. After *Homo habilis* learned to relate to one of her fellows or analyze the mind of a predator, incremental increases in brain size allowed for the analysis of a dozen and then 150 minds. The brain didn't need to invent anything new "once it figured out how to read a single mind is, just needed to devote more processing power" (Johnson 2003). More neurons gave more power. Anthropologists have not deciphered why *Homo habilis* reached the ceiling of 150 minds but this continues to be the approximate limit of human ability to read the minds of its fellows.

Johnson then suggests that the ability to analyze or read the mind of others, led to self-awareness. In any case, both the skill of relating to others and self-awareness are excellent examples of emergence.

According to a BBC on-line article, published on September 10, 2005 in *The Daily Star*, a Bangladesh English newspaper, titled "Human brain still evolving". A team of Chicago scientists reported that each gene variant emerged close to the same time that major changes in cultural behavior occurred. This has led both the investigators and scientists to wonder whether or not the genetic changes were responsible for the cultural ones.

The microcephalin variant appeared about 50,000 years ago along with such

cultural traits as art and music, religious practices and sophisticated tool-making techniques. It is now present in about 70% of living humans. The ASPM variant coincides with the much more recent spread of agriculture, settled cities and the first record of written language.

D. Language

"He who searches the branch and forgets the root, searches in vain."

M. K. Gandhi

When Roger Fouts began to work with autistic children, doctors explained they had "language problems". From his previous work with chimpanzees, Fouts understood this problem to mean specifically, spoken language. With Fouts's understanding, the children's behavior changed and they overcame their isolation within a few months:

"Even more extraordinary, and at first totally unexpected, was the fact that the autistic children began to speak after several weeks of signing. The signing apparently triggered the capacity for speech. The skill of forming precise signs could be transferred to the skill of forming sounds because both are controlled by the same brain structures. 'In a matter of weeks', Fouts concluded, the children may very well have retraced the evolutionary path of our own ancestors, a six-million-year journey that led from apelike gesture to modern human speech"(Capra, 2002, 60)

The relationship of physical matter and mind, the structure of the brain and the ability to analyze, think, and express through language, are intertwined. Complexity theory helps us understand that the human mind is not separate from the body but comes from it and is shaped by it. Fouts would surely maintain that there should be a radical reassessment of the relationship between humans and other animals. Johnson would, no doubt, extend this to social insects such as the ants.

E. Neurophenomenology

A Native American grandfather was talking to his grandson about how he felt. He said, "I feel as if I have two wolves fighting in my heart. One wolf is the vengeful, angry, violent one. The other wolf is the loving, compassionate one." The grandson asked him "which wolf will win the fight in your heart"? The grandfather answered, "The one I feed."

In the early 20th century, Edmund Husserl founded an important branch of philosophy called phenomenology, which Martin Heidegger and many other European philosophers helped develop. Its central concern is the disciplined examination of experience. Husserl and his followers intended that science of experience would eventually be established in partnership with the natural sciences.

Neurophenomenology is an effort to create such a partnership. The study of consciousness combines the disciplined examination of conscious experience with the analysis of neural patterns and processes. Effort is made to explore how various types of experience emerged from complex neural activities. The premise is that brain physiology and conscious experience be considered independent areas for research with equal status. Maturana and Varela, two main proponents of neurophenomenology, say, "The world everyone sees is not the world but a world, which we bring forth with others" (Capra, 2002, 54). This particular human world includes both abstract thought and self-awareness. Our concepts and ideas become closely interlinked with our emotions and bodily movements.

II. Interconnectivity of Natural and Social Science

"Education is the ability to perceive the hidden connections between phenomena."

-Vaclav Havel

When we extend the understanding of the nature of life to the human social dimension, we find that it is mind and consciousness which create the link. Conceptual thought, values, meaning and purpose, as well as their expression through language, connect nature and society most strongly.

The natural sciences now appreciate that the robustness of life comes from its redundancy and diversity. Even in the evolutionary tri-fold paths of mutation, gene trading and symbiosis, it is the alternatives and diversity which make the process more dynamic. Except for large commercial corporations focused only on profit and the bio-technologists whom they employ, humans now understand that monocultures are not suited to living systems where bio-diversity must be maintained. Monocultures and excess use of chemicals create ecological imbalance, resulting in enormous increase in pests and crop disease. Toxic chemicals then seep through the soil contaminate the water table and enter the human food chain. There are now more than 500 new chemicals in the body of U.S. residents than there were in 1900.

The dynamism of the metabolic system in all living organisms is another key element indicating a close connection to the human and social dimension. The great energy produced covers maintenance of cell structures, repair and reproduction. There is constant change, including death and re-creation of life. Adaptation and flexibility in nature are similarly crucial for society. Rigidity is opposed to life in the same way that monoculture is. As Manuel Castells shows, in his analysis of the sudden and unexpected collapse of the Soviet Union, rigidity of the economic system led to failure to conform to the information technology (IT) revolution.

Another key element in the new understanding from natural sciences, which connects to the social dimension, is emergence of self-organization. Life is a decentralized reality-- a grassroots, bottom-up, rather than a top-down, system.

Johnson shows how there are similar emergent patterns in the organization of ant colonies, cities and software.

Likewise, Jeremy Rifkin describes the importance of access to ordinary people in terms of their freedom and creative potential, as well as, the danger of giant telecommunications corporations gaining control over the Internet and the spectrum for commercial benefit, with the power and ability to manipulate humankind.

De Geus and colleagues studied large corporations that have existed for over a hundred years and successfully survived changes in the world while maintaining their original corporate identities. They analyzed 27 such corporations and found that they had certain characteristics of all life forms. Firstly, there was strong sense of community and identity around common values; all members felt supported for achieving their own goals. Secondly, there was openness to the outside world, tolerance for new individuals and ideas to come into the company, as well as an ability to learn and adapt to changing circumstances.

Social scientists, as well as biologists and ecologists, have shifted their thinking from hierarchies to networks, from individual effort to the impact of partnership. Association, cooperation and maintenance of symbiotic relationships all contribute to networking.

This networking is facilitating individuals and organizations to come together through Internet connectivity in order to pursue common interests more effectively.

Processes of metabolism form a chemical network. Organisms are viewed as networks of cells, organs and organ systems. Cells are networks of molecules. Ecosystems are networks of organisms. Non-governmental organizations (NGOs) and civil society networked in order to combat an undemocratic and unjust World Trade Organization (WTO). The criminal economy is becoming an international, extremely profitable perverse network. The European Union (EU) is a network state. While cities have many top-down structures, bottom-up forces create networks called neighborhoods. Brains are networks of neurons. The Internet networks tens of millions of accessed humans globally.

Another example of the linkage between the natural and social sciences is the central place in both of pattern recognition. The human brain is greatly limited in logical thinking due to the slow speed of human neuron activity. Neurons are capable of only 200 calculations per second, whereas a modern PC can do millions of calculations per second. However, the brain with 100 billion neurons all working at the same time is far more skilled at pattern recognition, which comprises the bulk of its neural circuitry. Digital computers are confounded yet by pattern recognition tasks.

The futurist Ray Kurzweil says: "We don't have time to think too many new thoughts when we are pressed to make a decision. The human brain relies on pre-computing its analyses and storing them for future reference. We then use our pattern-recognition capability to recognize a situation as compatible to one we have thought about and then draw upon our previously considered conclusions" (Johnson, 127) .

Actually, networks are patterns common to all life.

"What a strange machine man is. You fill him with bread, wine, fish, and radishes, and out come sighs, laughter and dreams."

Nikos Kazantzakis

The development of the term "culture" has been explained in detail in the definition section of this paper. However, it may briefly be said to refer to a distinctive way of life of a people. Culture gives a sense of belonging to a group of people, a sense of identity among the members of a particular social network. It is usually so deeply embedded in people's lives and so pervasive that there is little everyday awareness of its impact on our life. Likewise, it sets boundaries between those of the particular culture and those outside it.

Nations are built around culture identification, for example the Chinese or American cultures. In major religions we can similarly refer to the Islamic, Hindu, and Buddhist religious cultures. Ethnic groups include indigenous people of various countries, such as the Slavic peoples of Europe and the Kurds of Iraq and Turkey. Other terms show the further breadth of this concept, as when we speak of traditional modern or post modern cultures.

Rifkin explains how the capitalist system is creating a serious threat to the cultural sphere in his 2000 book, *The Age of Access*, sub-titled, *The New Culture of Hyper capitalism*, where all of Life Is a Paid-for Experience. There is a shift from industrial to cultural production as the more profitable commercial venture. Capitalism demonstrates a progressive intent to make all relations commercial ones-from manufacturing goods to providing basic services to co modifying human relationships and now to selling access to cultural experiences. The threat to civilization, according to Rifkin, is most serious because the monetary relationship is extremely weak compared to traditional relationships based upon such things as kinship, ethnicity, geography and shared spiritual vision. In the latter, people are bound together by strong reciprocal relationships and a sense of a common destiny. Their relationships and communities are regarded as ends, not simply means.

Through the creation of the Internet, culture and technology have become intimately interconnected. In the late 1960s, the U. S. Pentagon created the Internet in order to save money on the costs of providing expensive new super

computers to academic and defense-contracting researchers. The Internet is not a thing, an entity, nor an organization; no one owns it and no one runs it. It is simply everyone's computers connected. In 1998, the Internet economy generated more than \$301 billion in revenue, creating more than 1.2 million jobs and connecting 200 million people globally. Now in 2005, it may connect more than 1 billion human beings. A few years ago, a study at the University of Texas indicated that the Internet economy was growing by over 170% per year, doubling in size every nine months. Perhaps \$1.5 trillion annual business sales are now transacted annually online, which is more than 10% of all business sales.

The rapid development of IT is stunning and part of the reason that the economic giants are fighting over the control of its future. The telecommunications market in 1999 ranked third in the world behind health care and banking and was growing at twice the rate of the global economy. Revenues were expected to exceed \$ 1 trillion by 2010. Ray Kurzweil, in his 1999 book *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* says, "Computers are about one hundred million times more powerful for the same unit cost than they were a half century ago. If the automobile industry had made as much progress in the past fifty years, a car today would cost a hundredth of a cent and go faster than the speed of light."

In 1981, Bill Gates said, "640,000 bytes of memory ought to be enough for anybody".

At the moment, the world's fastest computer, located at the Lawrence Livermore National Laboratory, has reached more than 136 trillion operations a second. However, on the horizon is the Petaflop, which performs over a quadrillion mathematical operations a second, or eight times the speed of today's fastest computer.

There has been much hope that the Internet could be a source of bringing humanity together in free and open communication. However, as commercial interests more and more see its power and potential economic value, they move towards ownership and control of it, even in the spectrum. Spectrum real estates is likely to become the single most important asset in the world. Only a handful of the wealthiest global media corporations will be able to afford to buy large parts of the electromagnetic spectrum. Owning the global frequencies will give these companies control over communication channels over which tens of millions of people conduct their daily lives. This will change the relationship between ordinary people and global commercial enterprises as citizens become dependent on the media companies for access to the means of communicating.

B. Technology

"The Stone Age did not end because people ran out of stones. The Petroleum Age will not end because we will run out of petroleum. It will end because we have developed superior technologies."

-Fritjof Capra (2002, 257)

The first human species has been named *Homo habilis*, which means "skillful human" Technology is intertwined with human life from its origin. Although today's definition of technology refers to scientific knowledge being applied to a given task in a reproducible manner, technology predates science. Microbiology also shows us that technologies, which we consider to be advanced achievements of our civilization-genetic engineering and establishing a global communication network have - existed for billions of years among bacteria, the drivers of evolution. All of life's essential biotechnologies-fermentation, photosynthesis, nitrogen fixation, respiration, and methodologies for rapid motion - have been carried out by the planetary web of bacteria for at least two billion years.

Civilization has always been shaped by technology. We name the different periods of human civilization by their main technologies - the Stone Age, Bronze Age, Iron Age, Industrial Age, and now the Information Age. Technology is not neutral. It has a powerful impact on culture and civilization, on the way we live, behave and grow. Both in the Industrial Age and Information Age, there has been growing criticism of the adverse effects of technology on the environment and on human society. Proposals for giving more sound direction to these technologies have abounded.

Most of the suggestions for new and sustainable technologies call humankind to learn from nature, which has already achieved marvelous results, far superior to human designs. Scientists are trying to learn how mussels produce glue that sticks to anything in water. To learn from spiders how they spin a silk thread that is ounce for ounce 5 times stronger than steel. To learn from abalone how they grow a shell twice as tough as high-tech ceramics. All of these products are manufactured without any toxic byproducts.

Physicists are working with biochemists to study the complex structures and processes of photosynthesis, hoping to use the results in new kinds of solar cells. At the University of Washington, scientists have been able to imitate the success of abalone shells to create a hard, transparent material for use as an ideal coating for windshields.

However, at the same time as the positive learning from nature and new developments are taking place, opposite unsustainable activities are progressing at an even more rapid pace. Forests are being destroyed with only 20-25 percent of the trees being used to extract cellulose from wood to make paper. To make beer, only 8 percent of the nutrients from barley or rice are used for fermentation. Only four percent of the palm tree biomass is used to extract oil. Coffee beans account for only 3.7% of the coffee bush.

To serve the money-making mentality of global capitalism, biotechnology has abandoned all ethical considerations. Genetic engineering is no longer focused on advancing science, curing disease, or feeding the hungry. Geneticists have close

ties to biotech companies and, in some cases, own the companies in order to take part in this area of unprecedented financial gain. The crucial environmental and human problems from the development and use of transgenic and other genetically modified livestock and crops are the result of the narrow conceptual framework of genetic determinism. The same is true concerning the relationship between genes and disease, as well as the use of cloning in medical research.

III. The World in a Mess

"Turning and turning in the widening gyre
The falcon cannot hear the falconer;
Things fall apart; the centre cannot hold;
"Mere anarchy is loosed upon the world".

-W. B. Yeats, "The Second Coming"

The list of serious problems existing in the world today is simply overwhelming. To start with, there is war, terrorism and nuclear proliferation.

On September 27, 2004, James Wolfensohn, then head of the World Bank, commented in 'USA Today' on the wastage of resources on military spending: ... The world is not in great shape. And it's not going to get better unless a few people finally say that spending \$900 billion was being spent globally on military, with the U. S. accounting for about half the amount.

In 1985, US President Ronald Reagan welcomed a group of Afghan Mujahideen to the White House. He announced that they were "the moral equivalent of America's Founding Fathers" (i.e. George Washington, Thomas Jefferson, etc). This was, of course, when the U. S. was using them to fight Soviet force. Somehow, 16 years later these moral Mujahideen who had become rulers of Afghanistan were now worthy of America's great war machine.

Now the U. S. and Russia were united in a common cause, namely to re-destroy one of the poorest countries in the world. Initially, the operation was called Infinite Justice but as Muslims rightly believe that only Allah can dispense infinite justice, the Pentagon thought better and changed the name to Enduring Freedom. As Arundhati Roy, in her essay 'The Algebra of Infinite Justice', points out, the CIA and Pakistan's analogous Inter-Service Intelligence (ISI) combined to help the Mujahideen fight the Soviet Union. When costs of this operation far exceeded expectations, the ISI helped the farmers on the Pakistan-Afghanistan border to become the biggest producers of heroin in the world (with the main market, naturally, U. S. streets).

Roy also addressed in 1996 U. S. National television interview with Madeleine Albright, U. S. Ambassador to the UN. She was asked how she felt about the fact that half a million Iraqi children were killed by the bombardment of the joint forces.

A. Collapse of the Soviet Union

"A bad peace is better than a good war."

-Russian Proverb

In his monumental trilogy, Manuel Castells analyzes major events and present trends in our world. One of the major events - perhaps the most important of the 20th Century - was the disintegration of the Soviet Union.

There have been numerous analyses for the causes of the sudden collapse of the Soviet Union. Castells identifies the following contributing factors:

- i. The centrally planned economy was wasteful.
- ii. A shadow economy put extra burden on the planned economy.
- iii. Agriculture was permanently damaged.
- iv. The military-industrial sector used up creative energy and resources endlessly, without contributing back to its growth.
- v. The Soviet industrialization model, based on exploitation of capital, labor and natural resources reached a stage of exhaustion and slowdown in growth.
- vi. With technological backwardness, industry and agriculture could not compete in the world economy.

In spite of many contributing factors to the Soviet Union's collapse, Castells identifies political mobilization of nationally-based republics (including Russia) against the superstructure of a national federal state as the key lever that caused rapid disintegration. The 70 year experiment to create a Soviet identity was too fragile. Marxism-Leninism failed to fill the ideological void caused by the effort to crush and eliminate national/ethnic identities.

In the estimate of Castells, the most painful failure of the Communist Utopia was the "abduction and distortion of the revolutionary dreams and hopes of so many people." Again he says, "To put it bluntly, all Utopias lead to Terror if there is a serious attempt at implementing them. Theories can be (and have been) useful tools for guiding collective action. But only as tools, always to be rectified and adjusted according to experience. Never as schemata to be reproduced, in their elegant coherence, in the imperfect yet wonderful world of human flesh"(63). The Soviet experiment brought considerable suffering both to the peoples of the Soviet Union, and to the world at large. The caste of cynical bureaucrats, who betrayed the trust of the Soviet Union's peoples, made a mockery of the values of human solidarity. Castells says, "The artificial paradise of theoretically inspired politics should be buried forever with the Soviet Union"(64).

B. Globalization of the Criminal Economy

"It does not do you good to leave a dragon out of your calculations, if you live near him."

J. R. R. Tolkien

The present system of capitalism, with its widespread social exclusion of vast numbers of peoples, helps to spur on the development of the international criminal economy. The exclusionary process is part and parcel of informational capitalism; Castells calls it the Fourth World. It includes much of Sub-Saharan Africa, rural areas of Asia and Latin America, America inner-city ghettos, Spanish enclaves of mass youth unemployment, French banlieues warehousing North Africans, Japanese Yoseba quarters, and the slums of Asian mega-cities. "[The Fourth World] is populated by millions of homeless, incarcerated, prostituted, criminalized, brutalized, stigmatized, sick, and illiterate persons everywhere, they are growing in number, and increasing in visibility" (Castells 168).

Daring, successful criminals have become role models for the socially excluded young generation. They offer a chance of enjoying consumption and living with adventure, activities which are beyond the possibilities of their present life situation. Garcia Marquez, in *Noticia de un secuestro* (1996) describes the fatalism and negativism of young killers in the world of organized crime. Life itself has no meaning, and there is no future. They know they will die soon. Only the moment counts, immediate consumption, good clothing, good life on the run, together with the satisfaction of inducing fear, of feeling powerful with their guns.

Roy describes the seven levels of despair which lead some of the more courageous to offer their own lives in opposing the forces which have pushed the world to where it is. For them, this is the only way of invoking an *all* which is larger than that of the despair. The seven levels of despair, one for each day of the week, are:

"The search each morning
To find the scraps
With which to survive another day

The knowledge on waking
That in their legal wilderness
No rights exist.

The experience over the years
Of nothing getting better
Only worse

The humiliation of being able
To change almost nothing,
And of seizing upon the almost which then leads to another impasse

The listening to a thousand promises
Which pass inexorably?
Beside you and yours

The example of those who resist
Being bombarded to dust

The weight of your own killed
A weight which loses
Innocence forever
Because they are so many"

(Roy, 2002, xxi-xxii)

Drug-trafficking has long been the most important and profitable activity in the criminal economy. Arms deals, trade in radioactive material, human organs, illegal immigrants, prostitution, gambling, kidnapping, extortion, counterfeiting, killers for hire - whatever is prohibited in any society becomes a potential activity of the criminal economy. Many of these activities put a heavy burden on society by increasing social disintegration, as well as requiring costly policing and the use of the judiciary and prison systems.

Money laundering is crucial for the system. Global amounts may now total in the trillions of dollars. The economies of the criminal economy only make business sense if the profits generated can be used and reinvested in the legal economy. With the collapse of the Soviet Union and disorganization in Russia, a huge amount of that country's wealth was appropriated by a few gangsters.

The distorting effects of the unseen criminal economy on monetary policies/economic policies at the national level are becoming more and more difficult to control, due to the global nature of criminality today.

The impact on state institutions is even greater. For example, the illegal drugs traffic relies upon the corruption and intimidation of those meant to control and prevent it. Most cooperate either out of fear of violence to themselves and/or family or due to the wealth they can obtain.

IV. Impact of Economic - Corporate Globalization on World Poverty

"What is globalization? Who is it for? What is it going to do to a country like India in which social inequality has been institutionalized in the caste system for centuries? It is a country in which hundred of millions of people live in rural areas. In which eighty percent of the land holdings are small farms. In which almost half the population cannot read or write.

"Is the corporatization and globalization of agriculture, water supply, electricity and essential commodities going to pull India out of the stagnant morass of poverty, illiteracy and religious bigotry? Is the dismantling and auctioning off of elaborate public sector infrastructure, developed with public money over the last

fifty years, really the way forward? Is corporate globalization going to close the gap between the privileged and the underprivileged, between the upper castes and the lower castes, between the educated and the illiterate? or is it going to give those who already have a centuries-old head start a friendly helping hand?

"Is corporate globalization about 'the eradication of world poverty' or is it a mutant variety of colonialism, remote controlled and digitally operated? These are huge, contentious questions. The answers vary depending on whether they come from the villages and fields of rural India, from the slums and shantytowns of urban India, from the living rooms of the burgeoning middle class or from the boardrooms of big business houses".

-Arundhati Roy (2002, 199-200)

According to World Bank statistics, the number of poor people in South Asia rose from 474 million to 522 million in the 1990s. The increase in Latin America and the Caribbean was 20%. In Europe and Central Asia, the number rose from 1 million to 2.4 million. The increase in Sub Saharan Africa was from 217 to 291 million. Although poverty was reduced in China, 20% of the population was living on less than \$1 per day at the end of the 1990s. The dramatic increase in poverty in almost all parts of the world in the 1990s must be directly related to structural deficiencies in the global economy.

The World Bank's Global Poverty Monitoring database, which provides an overview of poverty trends from 1987-1998 concludes "--- in the aggregate, and for some large regions, all--- measures suggest that the 1990s did not see much progress against consumption poverty in the developing world." UNDP's 1996 Human Development Report documents that since 1980, "economic decline or stagnation has affected 100 countries, reducing the incomes of 1.6 billion people. In 70 of these countries, average incomes are less than they were in 1980 and in 43 countries, less than they were in 1970" (1-2). Similarly, income growth was lower in the 1990s than in the 1980s (and substantially below that of the 1960s and 1970s) in the more economically advanced countries.

In its Global Trends 2015 report CIA experts predicted that globalization would create an even wider gap in income than exists today (referring to 2000). They suggested that globalization's "--- evolution will be rocky, marked by chronic volatility and a widening economic gap.

Castells, in his analysis of the process of informationalism (economic globalization's profit-sharing and production-relations-system), gives in great detail the negative results from this process. In terms of social differentiation, the results are inequality, polarization, poverty, and misery; these all pertain to the relationships of distribution/consumption of the wealth generated by collective effort (see definitions section). In terms of relations of production, Castells proposes that four other processes result from the present economic system, all of which are having great negative impact on people. They are the individualization

of work, over-exploitation of workers, social exclusion and perverse integration. A summary explanation of the analysis given by Castells, in regard to the four results in the process of social differentiation, is explained in the three following sub-sections. The sub-sections deal with Sub-Saharan Africa, urban poverty in the U. S. and the impact on children.

A. The impact on Sub-Saharan Africa

"In 1980, the total external debt of all developing countries was \$609 billion; in 2001, after twenty years of structural adjustment, it totaled \$2.4 trillion. In 2001, Sub-Saharan Africa paid \$3.6 billion more in debt service than it received in new long-term loans and credits. Africa spends about four times more on debt-service payments than it does on health care."

-A report of the International Forum on Globalization, 2002

In Manifesto for a New World Order, George Monbiot provides statistics concerning the situation in Africa and the resulting impact. For example, Sierra Leone spends 6.7 times more on servicing its debt than it spends on primary schooling and only 24% of its children go to school. 90% of the government's revenues are used for debt payments. In Kenya, one of the countries worst affected by AIDS, the number of women seeking help/advice on sexually transmitted diseases went down by 65% when fees were introduced. In Ghana, new fees caused 2/3 of rural families to stop sending their children to school. Cuts in health spending, forced upon Zambia by the World Bank (WB) and the International Monetary Fund (IMF), led to the increase in infant mortality from 97 deaths per 1000 births in 1980 to 202 deaths per 1,000 births in 1999.

Certainly, a major part of the disastrous situation in many African countries is the result of weak and predatory states where power and power networks are personalized. Zaire/Congo was looted over 3 decades by its ruler, Sergeant Mobutu, and his associates, with the open complicity of Western power. Zaire/Congo is now the main source of deadly epidemics such as the Ebola virus, which could cause great havoc globally in the 21st century.

In the analysis by Castells, Africa's greatest tragedy has been the failure to build democratic political legitimacy. Atrocious civil wars for grabbing state power and looting, the displacement of millions, disruption of subsistence, agriculture, uprooting of human settlements, and breakdown of social order can all be traced to the lack of success in promoting this democratic political state authority. Leading Africans have been frustrated by the West's role in destroying this legitimacy and have lost faith in it. A growing number of African countries are now basically in a condition of political anarchy, including Sierra Leone, Liberia and Somalia.

In the CIA's Global Trends 2015, it is foreseen that Sub-Saharan Africa's multiple and interconnected problems will be compounded, ethnic and communal tensions

intensified. Health difficulties will continue to reduce the economically productive adult population, generate a huge cohort of orphaned children and contribute to increased levels of dissatisfaction, crime and political volatility. The number of malnourished people is expected to increase by more than 200%.

The economy of the 1990s was in worse shape than in the 1960s, both in terms of production and consumption. A UN-organized conference concluded that "---- adjustment measures have been implemented at high human costs and sacrifices and are rending the fabric of African society" (Castells, 115).

B. Impact on the United States

"If a free society cannot help the many who are poor, it cannot save the few who are rich."

-John F. Kennedy

In the past two decades, there has been an increase in social inequality, polarization, poverty and misery in the U. S. This is a universal trend in developed economies, though more blatant in the U. S., and a likely sign of the future in Europe, Japan and elsewhere.

The ratio of CEO to worker pay rose from 44.8 times in 1973 to 172.5 times in 1995. Growth of income for the wealthiest 1% was 119.7% from 1977 to 1999. Meanwhile median-family income growth was a mere 0.6% per year in the 1970s, 0.4% in the 1980s, and 0.1% in the 1990s. 80% households declined in their share of national income, from 56% in 1977 to below 50 in 1999.

In addition to these social inequalities, there were similar increases in polarization. In 1999, the top 1% in the U. S. received 12.9% of the national income. The top 20% had 50.4%; an increase from 42.2% in 1977. The poorest 20% received only 4.2%. In terms of wealth (household assets minus debts), there was a similar trend from 1983 to 1997. The top 1% increased their share from 33.8% to 39.1%, while the bottom 80% went down from 18.7% to 15.7%. The poorest 20% had more debt than assets both in 1983 and 1997.

The poverty rate also increased, going from 11.1% in 1973 to 13.3% in 1997. The condition of misery-defined as the poor with incomes below 50% of the poverty level-likewise increased from about 30% in 1975 to 41% in 1997. In 1997, 19.9% of all US children were in poverty; 37.2% of black children. For children less than 6 years old, the percentages were 22% and 40.2%. Workers who were receiving wages below the poverty level increased from 23.7% in 1973 to 28.6% in 1997. Homelessness also skyrocketed; in the late 1980s, it was estimated to include 5 to 9 million people.

C. Impact on Children

"No more turning away
From the weak and the weary
No more turning away
From the coldness inside
Just a world that we all must share
It's not enough just to stand and stare
Is it only a dream that there'll be
No more turning away?"

-Pink Floyd, "On the Turning Away"

The main labor issue of the Information Age concerns the condition of workers. The explosion of low-paid child labor has been one of the most striking characteristics of the economic globalization process. A 1996 International Labor Organization (ILO) report indicated that 250 (24%) of domestic workers in Bangladesh were under 10 years old. It was quite usual that they worked 10-15 hours per day. There were many reports in various countries of physical, mental and sexual abuse of adolescents and young women domestics. The surge in child labor was caused by deepening poverty and the globalization of economic activity. Families and their children were forced into survival strategies. A Bangladeshi mother recently received her young son back from Kuwait, where he worked as a camel jockey for a few years. When asked why she allowed her child to be put in such a situation she explained that their family could not feed him and decided it was better to let him work and at least eat in Kuwait rather than starve in Bangladesh.

The networking of small producers in developing countries-with little margin of profit and large firm investment supplying affluent markets - is helping to push more children into the labor force. It gives flexibility and greater profitability to industry. The main factor for growing child employment is the defenselessness of the children. They can be made to work for minimal pay, in atrocious conditions.

The criminal economy is also reaping increasing profits from the exploitation of children. Many children are sexual commodities in a large-scale industry. One of the fastest growing child prostitution markets was in the U. S. and Canada, with 100,000-300,000 children estimated to be involved in 1996.

The criminal networks link supply to demand in the electronic child pornography industry. Poverty and the crisis of the family supply the "raw material". The network society destroys its own children, reducing humans to an inhumane species.

Furthermore, the effect of war on children is another considerable issue. In the past decades, 2 million children have been killed in wars, 4 to 5 million disabled, over 1 million orphaned/separated from parents, 12 million made homeless and over 10 million psychologically traumatized.

The disintegration of traditional societies in today's world is exposing children to unprotected environments in méga-city slums; children are working for exports to affluent markets; mass global tourism is organized around pedophilia and sex with you; there is now electronic child pornography; the disintegration of patriarchalism without a protective system to replace it; and there is a weakening of institutions in support of children's rights. In addition, the supply side is greatly augmented by the weakened family structure, impoverished childhood, disintegration of states and societies, the uprooting of populations by wars, famine, epidemics and banditry. The increase in criminalization and advanced communication technologies with more business networking, spurs on the demand. This is pre-eminently what Castells calls one of the "black holes" of information capitalism.

V. A New Universal Paradigm Needed by Humanity

"[The challenge is] to make the world work for 100% of humanity in the shortest possible time through spontaneous cooperation without ecological offense or the disadvantage of anyone."

-R. Buckminster Fuller

There is a new world for humanity to structure in new ways. This world of humanity is similar to the natural world in that emergence is playing the central role. Chips and computer, ubiquitous mobile telecommunications, genetic engineering, electronically integrated global financial markets and interlinked capitalist economy - all are part of the new world. Similarly the majority of the ideology for the capitalist one, the Cold War has ended, and the Asian-Pacific has become a global economic force. There is a worldwide challenge to patriarchalism, consciousness for ecological preservation has grown widely and a network society has emerged. Environmentalism, feminism, defense of human rights, sexual liberation, ethnic equality, and grassroots democracy are issues which have all spawned strong social movements.

But along with these new realities in the world today are new problems and political, social, and economic cleavages. There has been a takeover of the political and democratic processes from states by corporate interests. Predator states in Africa have caused immense human suffering. Weak states have become the base for the burgeoning global criminal economy. There has been a fragmentation of labor with information producers replacing generic labor. There is a growing gap between the market logic of global networks and the human experience of workers' lives, similar to that of governments and citizens' lives. Large segments of populations everywhere have been socially excluded. Child exploitation has increased dramatically.

Religious fundamentalism, nationalism, localism, ethnic separatism, cultural communes break up society to rebuild its institutions from the inside out. The

power grab by the world's dominant economic powers and privatization of essentials of human life and of nature's common heritage is creating multiform resistance movements. Roy says, "What is happening to our world is almost too colossal for human comprehension to contain. But it is a terrible, terrible thing. To contemplate its girth and circumference, to attempt to define it, to try and fight it all at once, is impossible. The only way to combat it is by fighting specific wars in specific ways". (2002, 183-184)

Fundamentalisms are becoming entrenched. Terrorism has seen a modest beginning, but in the future whole cities will be able to be devastated or strikes could be made at nerve centers of our livelihood, such as energy, water, or transport. There is an extraordinary gap between our technological overdevelopment and our social underdevelopment. Humanity needs desperately a framework, a new and universal paradigm, to guide it out of its present morass-the dead end path along which it is traveling.

A. Components of a New and Universal Paradigm

"Give me a lever and a place on which to rest it, and I will move the world."

-Archimedes of Syracuse

Although there is growing despair and discouragement for those aware of and concerned for the direction in which the globalization process has been leading humanity, there remains a foundational confidence that things can be turned around. The Chinese proverb, "If we do not change our direction, we are likely to end up where we are going," is beautiful in its simplicity and wisdom. It captures the concern that growing numbers of humanity have to change directions. This certainly means resistance as Roy advocates. It also means pursuing creative alternatives as Robert Kuttner, Monbiot, the International Forum on Globalization (IFG), and others described in this paper are advocating.

The new understanding of life provided to us by the natural sciences is the starting point for creating a framework, a new paradigm which will respond to the hopes and desires of all humanity. The new scientific paradigm emphasizes that we no longer simply focus on the individual organism, but we can understand it only in the context of its interconnectivity with all living systems. For this reason, universality is essential to a paradigm for humanity.

This metabolic system/process will take the form of the network, as organisms are networks of cells, organs and organ systems and cells are networks of molecules. Metabolic processes likewise reveal the ability to adapt and give great flexibility to all life-forms.

Thirdly, the new universal paradigm must be centered around a process of emergence, allowing for continuous creativity, unrelenting massive change. This requires that power be radically decentralized, that the local creates the global

and that the global dominates the local. Emergency must be recognized as the "dynamic origin of development, learning and evolution" (Capra, 2002, 14).

Fourthly, from the new understanding of evolution and the knowledge that it is not dependent solely or even mostly on gene mutation, on an occasional, accidental process whereby most mutations are harmful. Rather, evolution has redundancy, giving it stability and reliability, even during major crises. The continual gene trading which takes place among bacteria and the process known as symbiosis enrich our understanding of evolution. Redundancy and diversity are qualities to be included in the universal paradigm for its own stability and reliability.

The interconnectivity of the natural and the social sciences is most clearly evident in the consideration of mind and consciousness. Matter and mind cannot be separated but are in most intimate association. The physical brain structure, with its billions of neurons and neuronal connections, the thinking process, whereby humans can "read the minds" of others and human self-awareness happens all these reveal the inseparability of the physical and non-physical.

The discovery by Fouts, of autistic children learning to speak after several weeks of communicating by signs, may indicate that these children made the six-million year journey from apelike gestures to human speech within those few weeks. The new science of neurophenomenology - the disciplined examination of experience interrelated to the analysis of neural patterns and processes- is a specific example of building a partnership between the natural and social sciences.

Several examples of the interconnectivity of the natural and social sciences have been mentioned above, such as the opposition between nature's diversity and monocultures of the corporate economy; the dynamism, adaptability and flexibility of the metabolic system as opposed to the collapse of the Soviet Union due to rigidity of its economic system (among other causes); and the similarity of emergent patterns in ant colonies, cities and software. The centrality of culture and technology, in both reflecting on the present world situation and in shaping a new paradigm, were also discussed.

Examples of a few major problematic realities and issues were presented to demonstrate the unworkability, unserviceability of the present paradigm for the majority of humanity: war; the collapse of the Soviet Union and the effects of its 70 year appearance on the world stage; globalization of the criminal economy and the impact of economic-corporate globalization on world poverty, with its specific impact on Sub-Saharan Africa, the United States, and on children. There are other critical issues, such as the environmental degradation putting the entire life system at risk, which could not be discussed due to logistical limitations of a paper such as this. However, the sectional title, "The World in a Mess," announces again the need for a new paradigm more responsive to all life.

VI. Issues to be addressed in the New Paradigm

"As soon as in a democracy the few outstrip the many in the matter of wealth, the State must either perish or cease being a democracy".

The long list of ills in the world today may be mostly categorized in terms of three problematic processes. The structure and effects of the economic-corporate globalization process is the first and foremost of these. Secondly, the loss of self-governance and democracy, essential to humankind but co-opted by the powerful, mostly economic elite who formulate and guide the present paradigm. Also related to the above two problem areas is the marginalization of great numbers of peoples and the general impoverishing social trends in the world today.

Anthony Giddens, director of the London School of Economics, maintains that institutions need modernization to include solidarity, social justice, and protection of the vulnerable; active government is needed to achieve these. Will Hutton, author of *The State We're In* and *The State to Come*, says that social justice is a condition of liberty and that it is proper of the democratic will to be asserted over business and private power. In his article "Freedom and Democracy: America's Ultimate Polytheism," Bob Crane, a U. S. scholar, says that we should respect, "--- the wisdom of America's founders who taught that justice is the best cure for chaos and that "freedom" without justice is fraud. The Neo-Cons cannot even understand why the Founders in the Preamble to the American Constitution listed justice as the first of five purposes for the new polity and listed freedom last"(3).

Castells describes how a new era began on October 27, 1987 with the City of London's Big Bang the deregulation of capital and securities markets. By 1998 the average daily exchange in currency markets was equivalent to \$1.5 trillion. He sees this electronically based system of financial transactions, outside human control, as an Automaton. Though he feels this Automation has to be brought under control, such may be unlikely unless there is a "dramatic financial crisis or social upheaval" (Hutton, Giddens, 70) because there is U. S. opposition to any financial regulation as the current system is of great, if short-term, advantage to the U. S.

George Soros, a top member of the global economic elite, writes that a more level playing field for countries "on the periphery" is essential to contain the rising tide of nationalism from endangering the global capitalist system. Jeff Faux and Larry Mishel, President and Vice-President of the Economic Policy Institute in Washington, D. C., contend that countervailing institutions and policies are needed to slow further trade and capital liberalization. Their three specific suggestions are:

- (i) Debt reduction and, in some cases, forgiveness, for the poorest nations and enhancement of policies to spur domestic development.

- (ii) Enforceable protection of core human and labor rights in trade and investment agreements, while strengthening the ILO's monitoring capacity and making adherence to such rights a condition for economic relationship with world bodies.
- (iii) Reduction of financial volatility, a tax on international securities transfers and an end to bail-outs to pay off private creditors, leaving poor nations with unplayable debts.

Another proposal, which has practical potential for changing the present paradigm, was put forward by leading U. S. Democratic Senators in 1996. It was the idea of the Responsible Corporation, whereby the U. S. government would reward responsible corporate behavior with special tax breaks. Unfortunately, the proposal was scuttled due to pressure from Wall Street. Hutton believes it would be feasible to build an international coalition to do something similar.

The above examples are the kind of proposals coming from so many and such diverse sources. There are those who believe the system can be changed by reforming institutions and policies, while others insist that completely new institutions are required. Some proposals emphasize decentralization of the system, while others claim that only new global institutions can help.

A. Analysis of the Situation and Proposals for Change from Robert Kuttner

"The further backward you look the further forward you can see."

-Winston Churchill

Kuttner is Co-Editor of *The American Prospect*. In his recent book, *Everything for Sale: The Virtues and Limits of Markets*, Kuttner comments on one of the great political achievements of the 20th century: "the domesticating of laissez-faire capitalism's brute power, under democratic auspices" (Hutton, Giddens, 152). Democratic governments worked towards economic stability and steady growth through micro-economic policies. They regulated the more destructive tendencies of markets, while empowering trade unions and later creating environmental standards. Other contributions from the governments towards this system included the provision of social insurance, financing of education and training to school children and workers, and the making of direct public investments. All of these led to a type of capitalism which was more socially acceptable and economically efficient than the present model.

While there was little low-wage competition outside Europe and North America, there was a period of high growth and full employment. Ordinary working people had rising living standards together with social support and economic security. The task presently is to figure out what kind of global economic context is compatible with a managed market economy at the state level, as well as the kind of politics required for supporting the economic project.

A century of achievements through democratic struggle have been undercut by the ability of industry to outsource production to areas of the world with little or no social or environmental regulation. States are now unable to police their banks, stock exchanges and capital markets, as well as their social standards. An entire economic system is undermined, "with great costs to stability, security, opportunity, growth and democratic citizenship"(Giddens, Hutton, 155).

Kuttner maintains that a third path, which will promote reconstruction of a mixed economy, is required. To accomplish this, either nation-states reclaim power over market forces or new transnational institutions of governance must be established. Kuttner believes there is an alternative to simply accepting a downward convergence of wages and benefits as an inevitable price to be paid for the "efficiency" of the global market. Re-regulation of capital flows is necessary if governments are to reclaim the capacity to pursue the combined policies of high growth and social justice.

What is needed is a global economic regime which allows the mixed economy to flourish in each individual country. It will require the show-down of short-term speculative movement of capital and currency trades. Labor and environmental rights must be on a par with property rights. There must be a financial regulatory system with global standards and an end to unregulated offshore havens. Professor James Tobin's proposed tax on financial transactions should be reconsidered. Likewise, the good idea which was initiated by the government of Chile required any foreign investor to place 30% of the investment amount on deposit with the Chilean central bank for a year, as insurance against capital flight.

The IMF and World Bank must again become agents of growth and stability rather than of austerity. There have to be globally accepted taxation conventions which prevent multi-national corporations (MNCs) from playing national governments against each other for tax concessions.

The emergence of regional entities such as the EU can facilitate the rebuilding of a mixed economy. Construction of stronger institutions of global governance, which are outside the control of corporations and specific economic interests are also important. A new strategy may need to be adopted to limit laissez-faire trade to regions with similar regulatory and social standards.

B. Analysis of the Situation and Proposals for Change from the International Forum on Globalization (IFG)

"The basic moral problem that faces man as he moves into the age of automation, the age of accelerating conquest of nature, is whether he is really fit to live in an industrial society; whether his institutions will adjust rapidly enough; whether he will rivet himself with an absurd institution like full employment in the economic order when it is not only unnecessary but unadministratable in anything but a slave society; whether freed from the necessity to devote his brain and brawn to

the production of goods and services, he can address himself to the work of civilization itself."

-Luis O. Kelso

For the IFG, the main issue is governance; will people have a democratic voice in deciding what rules are in the best interest of the society? Or will small ruling elite, meeting in secret and far from public view, be allowed to set the rules that shape the human future? Who will care for the health and well-being of people and the planet if the only concern for decision-makers is personal profit?

IFG is especially concerned that the quality of life for the majority of the world's people is deteriorating. The number of chronically hungry people declined steadily during the 1970s and 1980s but has been increasing since the early 1990s. It is predicted that by 2008, 2/3 of the people of Sub-Saharan Africa and 40% of the people of Asia will be undernourished. More and more people must live with violence and insecurity. These are spreading together with growing inequality, an unraveling social fabric, and the collapse of critical environmental systems.

The basics of human life are beginning to be privatized and available only to those who can pay for them. The corporate world is encroaching on all spheres of life: health care services, basic education, drinking water, traditional seed varieties, and the genetic and molecular building blocks of life, including the human genome.

In addition, most large corporations are massively inefficient, wasting nature's and society's resources. They are surviving on subsidies, exemptions and indirect benefits gained by paying less than a living wage, maintaining substandard working conditions, marketing hazardous products, dumping untreated wastes into the environment and extracting natural resources from public lands at below-market prices. CPA Ralph Estes estimates that in 1994 corporations extracted more than \$2.6 trillion in such subsidies in the U.S. alone-about 5 times their reported profits. This suggested that global corporations benefited \$10.7 trillion annually from public welfare benefits.

According to the IFG, the primary change needed is to promote economic democracy, involving equitable participation of all people in the ownership of the productive assets on which their livelihood depends. If this essential change is made, there would be a diffusion of economic power leading to a similar diffusion of political power and re-establishment of political democracy. The growth of economic democracy would likewise provide a more firm foundation for individual, community, and national economic self-determination.

From a macro-perspective, three major changes would characterize a shift from domination by global corporations toward more democratically, socially and ecologically sustainable enterprises. Firstly, there would be a reversal of

corporate concentration, giving priority to smaller businesses and the sharing of income more equitable. Secondly, businesses would be required to be rooted in one place removing the present mobility enjoyed by global corporations. As they would be owned by people who have direct involvement in their operation, they would serve to give strength and efficient and sustainable enterprises. Accountability is built into the economic system as ownership is local and the owners must bear the actual outcomes of their decisions. Similarly transparency and openness are essential.

The IFG also maintains that much of the change required will be for repairing the enormous damage caused by the Bretton Woods institutions. Specific targeted recommendations are:

"Debts must be cancelled, commodity prices stabilized, control established over the goods and money flowing across borders, anti-trust measures implemented to break up concentrations of corporate power, corporations with repeat criminal convictions dichertered, national economies rebuilt and redirected with proper regulatory regimes to meet local needs, the environment healed, the power or corporations curbed, financial speculation brought under control, wealth redistributed to create a semblance of equity, and the democratic accountability of governments established" (IFG 225).

In addition, common heritage resources must be shared among all. These include physical resources such as water, land and forests. Secondly, culture and knowledge are collective creations of our species. And lastly, modern common resources which address basic needs such as public health, education, and both personal and social security.

C. Analysis of the Situation and Proposals for Change from George Monbiot

"If I could make a wish
It would not be for power or riches
But rather for, a passion for the possible
I'd want only a glance, eternally young,
Which sparkles away?
And allows shining through
My yearning to glimpse the impossible"

-Soren Kierkegaard

In Manifesto for a New World Order, Monbiot clearly identifies the sources of the major problems in the world and the bearers of responsibility. He indicates the reasons why reform of existing organizations is not feasible for resolving the problems and proposes the creation of four new global institutions.

Relationships with advanced economies, formerly colonial, have been predatory for the past 500 years. Once "independence" was obtained by the former

colonies, the current trading system was fashioned by the colonial powers to ensure that wealth flowed from their weaker trading partners into their own economies. The system moved from formal colonialism to informal coercion. Despite a net transfer of natural wealth from the poor world to the rich world over these 500 years, the poor are said to owe the rich \$2.5 trillion.

The Native American leader Guaicaipuro Cuautemoc says that between 1503 and 1660, 185,000 kilograms of gold and 16 million kilograms of silver were shipped from Latin America to Europe. His people would view this transfer not as a war crime but as a friendly loan, granted by America for Europe's development. If the indigenous people of Latin America charged a modest 10% compound interest on this loan, Europeans would owe Native Americans a volume of gold and silver which exceeded the weight of the planet.

Heinrch Haussman has demonstrated that one pfennig (about half a U. S. cent) invested at 50% total debt in the form of interest, but still owed three times more in 1996 than they did in 1980. The world economy has been designed by the wealthy and powerful and is very kind to them. In 2002, the ten wealthiest persons in the world had a combined wealth of \$266 billion, five times the annual flow of aid from rich to poor nations. There is a series of simultaneous and connected processes, which lead to empowering capital and taking away citizen's ability to shape their own lives. These processes include removal of controls on the movement of capital, removal of trade barriers, change in the rules for companies trading within the borders of poor countries (called "harmonization"), growth of MNCs and their displacement of local and national businesses. In contrast to the obligations imposed on the poor the U. S., the world's biggest international debtor (\$2.2 trillion), does not suffer any restrictions. Rather than imposing austerity programs, inflation control or forced liberalization, the U. S. benefits from the IMF and WB insistence that foreign exchange reserves be held in dollars. From this, the U. S. gets three subsidies:

- i. The IMF/WB required that dollar resources be invested in the U. S., strengthening its capital account.
- ii. Poorer nations pay 18% interest on borrowed dollars, but lend back to the U. S. at 3% interest.
- iii. The U. S. receives seignorage, i. e. the difference between the currency value and its production cost.

The U.S. uses its position and power to manipulate international economic and political situations in its favor. An example is the UN resolution permitting the U. S. to wage war on Iraq in 1990. Upon recognizing potential opposition from temporary members of the Security Council, the U.S. bought the votes of Zaire, Ethiopia and Columbia by persuading Saudi Arabia to offer them free oil. This left Cuba and Yemen as the only two members to vote against the resolution. As

reported by Thalif Deen's article, "UN Credibility at Stake Over Iraq," in Washington's Inter Press Service News Agency on 1 October 2002, the U. S. ambassador told the Yemeni representative, "[that was] the most expensive vote you will ever cast." Three days later, the U. S. cancelled its \$70 million of annual aid to Yemen.

In 2002, the U. S. gave \$3.9 billion, or three times its entire aid budget for Africa, to merely 25,000 cotton farmers, reducing world prices by an estimate 26% and badly damaging the livelihood of millions of farmers in Africa and other poor countries.

Corporations, under what is known as the military-industrial complex, have obtained inordinate power, as have financial speculators; they have made practically all governments the representatives of global capital. The coercive power of economic globalization is now unmatched by the moral power of political globalization.

The UN was given three responsibilities when it was established but only constitutionally empowered for the first. It was to mediate between states with opposing interests. Secondly, it was to restrain the way states treated their own citizens. Finally, its global responsibility was to represent the common interest of all people in the world. Though the UN was founded save the world from the "scourge of war", 30 million people, mostly civilians, have since died in armed conflicts. The five permanent members of the Security Council are the world's five biggest arms dealers. The Soviet Union regularly used its veto to protect its own invasions and other military actions. In addition, the U. S. has launched over 200 armed operations to further its political and economic interests since 1945.

Some have suggested that an NGO forum be established alongside the UN, but Monbiot sees this as a potential disaster. He does not see NGOs contributing to the democratic movement needed to reconcile the conflicts.

The IMF and World Bank are also not able to be reformed, according to Monbiot, in order to serve impartially for the good of the world's people. They follow the principle of \$1,1 vote but require 85% agreement for any resolution to be passed. Owning more than 15% stock in each institution, the U. S. could prevent any change not in its favor.

Thought the IMF and World Bank put pressure on poor countries for "good governance" and "democracy", they themselves are known throughout the developing world as having poor governance and lack of democratic practice. They are seen as tools of the wealthy nations to help them get access to the natural resources in poor countries, establish their corporations and benefit from the markets of the poor. These institutions no longer even pretend to help the poor, but rather are concerned about receiving their debt repayments and transferring their wealth to the rich nations.

Monbiot, after analyzing the major problems in the present economic-political global situation and explaining why current institutions cannot be reformed, comments on proposed solutions and specific actions which could be undertaken for creating a new world order.

He maintains that an essential action is to bring the corporation under control of the democratic will. Since it has been the source of so many of the world's ills and is now a dangerous entity, human beings must realize that it is simply a means of exchanging goods and services for money, not a person but a machine lacking rights, privileges and powers.

Some have proposed that the adverse situation can be changed through what is termed "consumer democracy," shareholder democracy, or simplicity. Monbiot maintains that such an approach is too weak and diffuse to cause major change. The concept of replacing the global with a local economy both locks the poor into poverty and avoids the issue of political power.

Monbiot calls democracy "the least-worst government system". Since it has the potential for its own improvement, it outranks other systems. The problem with democracy today is that power has been migrating to the global sphere and people have been alienated. There is no democratic control over the global economic institutions. Although there is a division of opinion as to whether to re-democratize politics (at the national and local levels) or democratize globalization, Monbiot insists on the latter. Likewise, he does not believe reform is possible but maintains that revolution is the only true solution for promoting a new world order. Critics have always scoffed at the possibility of a revolutionary change, but it has historically occurred when there is mass mobilization and strong political will.

The present globalization process had already, unwittingly, laid the groundwork for the world's people to free themselves from the dictatorship of vested interests. Monbiot explains:

"Corporate and financial globalization, designed and executed by a minority seeking to enhance its wealth and power, is compelling the people it oppresses to acknowledge their commonality. Globalization is establishing a single, planetary class interest, as the same forces and the same institutions threaten the welfare of the people of all nations. It is ripping down the cultural and linguistic barriers which have divided us. By breaking the social bonds which sustained local communities, it destroys our geographical loyalties. Already, it has forced states to begin to relinquish nationhood, by building economic units-trading blocks-at the level of the continent or hemisphere" (Monbiot, 8-9).

In addition, globalization has eliminated the ideologies which divided the world, creating a political space in which a new, global politics can grow. By taking over state power for its exploitative purposes, it has created disenchantment

everywhere. Through the issues of endless nation's economies, whose banks have reserves of only \$1.3 trillion. Through the new communication and transport networks, globalization has given the world's people the means by which they can come together and coordinate their revelation.

For implementation of the "revolution," four institutions need to be installed, beginning with the creation of a democratically elected world parliament. Second, a democratized UN General Assembly would assume the powers vested in the Security Council. Third, an International Clearing Union would automatically discharge trade deficits and prevent the accumulation of debt. Finally, a Fair Trade Organization would restrain the rich while emancipating the poor.

Monbiot describes in some detail the manner in which the new institution of a world parliament could be organized and funded. In *Manifesto for a New World Order*, he presents the system with safeguards for ensuring that people everywhere are equally listened to and contributing to decisions which affect their lives (67-137). The greatest challenge perhaps to realizing a new global democratic body would be resistance by the nations and peoples who would have to relinquish power. However, a world parliament would become realistic if mass mobilization and political will, the bases for a revolution, are realized.

In 1994, the IMF and World Bank were established through an agreement formulated in Bretton Woods, New Hampshire, U. S. One of the key participants at the meeting was John Maynard Keynes, considered the best economist of his day. Unfortunately, the proposal he made for establishing a global bank, which he called the International Clearing Union (ICU), was over-ruled by the American negotiator in favor of the presently existing World Bank.

The main components of the ICU were to be as follows:

- i. The bank would issue its own currency, exchangeable with national currencies at fixed exchange rates. This currency (the bancor) would be used to measure a country's trade deficit or trade surplus.
- ii. Every country would have an overdraft facility in its ICU account, equivalent to half the average value of its trade over the previous five years. This would ensure that deficits and surpluses added up to zero.
- iii. Any country using more than half of its overdraft allowance (having too much trade deficit), would be charged interest on its overdraft and would be obliged to reduce its currency value by up to 5% (making its exports more attractive). It would also have to prevent the export of capital. This could serve as a strong incentive for every country to avoid both trade deficits and trade surpluses.

- iv. Any nation with a credit balance more than half the size of its overdraft facilities would be charged 10% interest and would be obliged to increase its currency value and to allow the export of capital. If by the end of the year, its credit balance exceeded the total overdraft value, this surplus would be confiscated.
- v. All surpluses and interest payments would be transferred to the ICU's Reserve Fund, which could be used for such things as elections to the world parliament and for its operations costs.

The rules of the ICU would change the way in which nations with a trade surplus operated. Firstly, exports would become less attractive due to currency valuation. Secondly, capital would not leave nations with major deficits for nations with large surpluses.

Keynes brilliantly designed a system whereby both deficit and surplus nations would be brought back to equilibrium. As Monbiot comments:

"Instead of temporary debts leading to permanent debts, and small debts leading to big ones, credit and debit would cancel each other out by the end of every year. The economic and political power of the creditor nations would no longer accumulate, just as the present weakness of the debtor nations would no longer drive them further into dependency" (163).

The third new institution proposed by Monbiot is a Fair Trade Organization (FTO). It is estimated that an increase of 1% in the share of world exports for poor countries would reduce the number of extreme poor by 128 million, 12% of the total. The question of fair trade has brought together many of the poor countries to resist the wealthy in the framework of the WTO. As the wealthy continue to give immense subsidies in agriculture, they press the poor to reduce their small subsidies. Awareness by the poor has created great anger at the hypocrisy of wealthy nations.

Preconditions for fair trade would permit poorer nations and poorer people within them to rise from poverty and compete on equal terms with the wealthy. Infant industry protection has allowed almost all the world's presently wealthy nations, to develop and would be a first step for the poor to rise. Tariff barriers and other import restrictions, along with development and export subsidies, would be employed until the nations reached a certain level of wealth.

Poor nations also could impose strict conditions upon foreign investors whereby they would have to leave behind more wealth than they extract. Intellectual property protections could be set aside to give the poor the technology transfer now denied by trade rules.

Wealthy nations would be required to remove trade barriers. They could neither subsidize their industries nor put any restraints on imports from poorer nations.

Though this seems discriminatory, it is the best way to create a level playing field. As poor nations develop, they too would be required to give up the special helpful measures mentioned above. Thus, temporary protectionism would be used as a means for promoting development and accelerating redistribution of wealth among nations. These policies would also reduce the need for foreign investment and domestic long-term dependency on MNCs.

The new fair trade system would be flexible, allowing countries to use or not use particular tools for development. Monbiot again points out that recent history contains a proposal which could have fostered many of the objectives mentioned above to promote fair trade. It was called the International Trade Organization (ITO) and was proposed by the U. S. in 1943. Its charter was drafted in Havana in 1948 and U. S. President Truman defended it to the U. S. Congress. However, after strong corporate lobbying causing delayed consideration, it was dropped in 1950. Even the WTO, in theory, provides for the "special and differential treatment" of poorer countries.

In addition to changing the rules governing trade among nations, an FTO would address the balance of trade by ensuring that temporary deficits did not contribute to permanent debt. The FTO would be empowered to monitor implementation of the policies for fair trade and impose penalties on nations which disregard them. The ICU and world parliament would equally be capable of overseeing justice for all nations.

The fourth and final major institutional change proposed by Monbiot is the democratization of the UN, taking away the privileged position of the permanent members and transferring all functions of the Security Council to the General Assembly.

VII. A Universal Paradigm: Making Justice Live

"The present evolutionary crisis of humans on planet Earth is that of a final examination for their continuance in the Universe. It is not an examination of political, economic, or religious systems, but of the integrity of each and all individual humans' responsible thinking and unselfish response to the acceleration in evolution's evermore unprecedented events."

-R. Buckminster Fuller

In the new paradigm, the relationship between the parts and the whole is reversed. The properties of the parts can only be understood from the dynamics of the whole. Ultimately, there are no parts at all. What we call a part is merely a pattern in an inseparable web of relationships. The entire web of relationships is intrinsically dynamic.

In the new paradigm, the question is no longer what people will get from globalization; it is now what would people want from globalization, if they could

choose. From the reflections and discussions in this paper, some of the main elements of what they want are quite clear.

Firstly, the need for global governance which will be for the good of society, the economy and the environment needs to be created. Secondly, the economic globalization process must be radically re-directed so that the world's wealth is equitably distributed and social exclusion is brought to an end. As Confucius has said, "Where wealth is centralized the people are dispersed where wealth is distributed, the people are brought together."

The specific contents of the universal paradigm would include the defense for the welfare state, of social solidarity, stable employment and workers', rights. Even more basic to establish economic and political democracy, as well as justice for all, is the issue of the equitable ownership of the productive assets of the world community.

Also to be included in the new paradigm is concern for what Castells calls the Fourth World and dealing with the "black holes of capitalism." Human rights must be central to the future. Democracy must be reaffirmed, with particular extension to citizen participation at the local and regional levels.

The vitality of cultures rooted in history and in various places and contained in languages, needs to be supported against commercialization of culture and the culture of real virtuality. Identity both personal and communitarian--must be understood as a sine qua non of human existence.

In the political, social and economic realms the local must take precedence over the global. With local empowerment will come an explosion of creativity, continual change and new life. Global politics and institutions must focus on providing opportunities at local levels, supporting these efforts, and coordinating the positive results for the good of humankind and of nature.

Definitions/Explanations of Terms

Capitalism: An economic system wherein there is the private ownership of property, price signals set in markets guide economic activity, and the desire for profit is expected to be the motivation for action.

Culture: Initially, culture referred to the cultivation of crops and rearing/breeding of animals. In the 16th century it was extended to the active cultivation of the human mind. In the 18th century it acquired the meaning of a distinctive way of life of a people. In the 19th century the plural "cultures" was used especially in comparative anthropology. The Columbia Encyclopedia defines culture as "the integrated system of socially acquired values, beliefs and rules of conduct that delimit the range of accepted behaviors in any given society."

Culture of Real Virtuality: A system in which reality itself (that is, people's material/symbolic existence) is fully immersed in a virtual image setting, in the

world of make believe, in which symbols are not just metaphors, but comprise the actual experience.

Democracy: A form of government in which sovereignty resides in people and gives them an inalienable right to self-governance. In democracy, people have equal rights; the will of the majority is expressed and exercised through voting and elections between competing candidates and parties. Governments are the voluntary creation of people and therefore subject to their will.

Development: An increase in one's ability to satisfy one's own needs and legitimate desires, as well as those of others. It is not the same as growth, which can only be justified if it contributes to development. Development has four aspects: the pursuits of (1) truth (through science, technology, and education), (2) plenty (through economics), (3) the good (through ethics and morality), and (4) beauty and fun (through aesthetics).

Ecodesign: The application of our ecological knowledge to the fundamental redesign of our technologies and social institutions so as to bridge the current gap between human design and the ecologically sustainable systems of nature.

Ecoliteracy: The understanding of the principles of organization that ecosystems have evolved to sustain the web of life.

Economic: The process by which national economies are increasingly linked through trade, financial flows, and foreign direct investment by multinational firms.

Emergence: The ability of a living system to move from low-level rules to higher-level sophistication. These are bottom-up, not top-down, systems. It is technically known as self-organization. It has been recognized as the dynamic origin of development, learning and evolution; in other words, creativity is a key property of all living systems.

Governance: It is not the same as government. It is the framework of rules, institutions and practices that set limits on the behavior of individuals, organizations and companies.

Industrialism: A mode of development in which the main sources of productivity are the quantitative increase of factors of production (labor, capital, and natural resources), together with the use of new sources of energy.

Inequality: The differential appropriation of wealth (income and assets) by different individuals.

Informationalism: A mode of development in which the main source of productivity is the qualitative capacity to optimize the combination and use of factors of production on the basis of knowledge and information.

Information Society: It is not society that uses information technology. It is the specific social structure, associated with, but not determined by, the rise of the information paradigm.

Justice: Functionally, justice is a set of universal principles that guides people in judging what is right and what is wrong, no matter what culture and society they live in. Justice disposes a person to respect the rights of others and to establish in human relationships the harmony that promotes equity and fairness with regard to other persons and to the common good. The basis of justice is the dignity of each human person. Justice reflects the qualities of balance and equivalence.

There are various types of justice such as commutative, distributive, participative and individual. Social justice has, as object, the common good of the entire human society. It guides humans in creating and perfecting institutions and requires each member of the society the duty of work with others to design and continually perfect institutions as tools for personal and social development. Economic justice is a subset of social justice concerning the creating, maintaining and perfecting of economic institutions. The ultimate purpose of economic justice is to free each person economically to develop, to the full extent of her potential, as human being.

Misery: Refers to what social statisticians call "extreme poverty", that is the bottom of the distribution of income/assets, or what some experts conceptualize as "deprivation", introducing a wider range of social/economic disadvantages. Manuel Castells, for example, uses the term to refer to those who are more than 50% below the poverty level.

Network: A connective system composed of nodes, without the need for a center. The nodes may be of different sizes and may be linked by asymmetrical relationships.

Network Society: A society made up of networks of production, power, and experience, which construct a culture of virtuality in the global flows that transcend time and space.

Network State: A state characterized by the sharing of authority along a network, such as the European Union. Since a network has nodes that may be of different size, a network state does not preclude the existence of political inequalities among its members.

Nonlinear Dynamics complexity Theory: "Complexity" is derived etymologically from the Latin verb *complicare* ("to twine together") and the noun *complexus* ("network"). Thus the idea of nonlinearity—a network of intertwined strands—lies at the very root of the meaning of "complexity". It is a new mathematical theory a body of mathematical concepts and techniques to describe and analyze the complexity of living systems.

Paradigm: The mind-set by which humans think about reality as well as the conceptual tools which help create, constantly innovate and change this mind-set. These conceptual tools may be summarized as "bottom-up intelligence", emergent thinking or self-organization.

Phenomenology: An important branch of modern philosophy founded by Edmund Husserl at the beginning of the 20th century and developed further by Martin Heidegger and other philosophers. Its central concern is the disciplined examination of experience, with the hope that a true science of experience would be established in partnership with the natural sciences.

Poverty: An institutionally defined norm concerning a level of resources below which it is not possible to reach the living standard considered to be the minimum norm in a given society at a given time (usually, a level of income per a given number of members of a household, as defined by governments of authoritative institutions).

Social Exclusion: The process by which certain individuals and groups are systemically barred from access to positions that would enable them to an autonomous livelihood within the social standard framed by institutions and values in a given context.

Subsidiary Principle: Power and decision-making must reside at the lowest level competent to deal with such. Higher-level authorities and institutions only take charge of decisions that lower levels cannot assume effectively.

Symbiosis: The tendency of different organisms to live in close association with one another and often inside one another like the bacteria in our intestines.

Technology: The original Greek *technologia*, derived from *techne* meant a discourse on the arts. First used in English in the 17th century, it meant a systematic discussion of the "applied arts," or crafts. In the early 20 century the meaning was extended to include not only tools and machines but also nonmaterial methods and techniques, meaning a systematic application of any such techniques. Today, most definitions emphasize its connection with science. One definition by Manuel Castells is "the set of tools, rules, and procedures through which scientific knowledge is applied to a given task in a reproducible manner" (Capra, 2002, 92-93)

Universal: Everything is embedded in the universe through nature and evolutionary processes; human cognition recognizes this, accepts it, and partners with it to promote ecological sustainability.

Universal Paradigm: Humanity develops a way of thinking by which all personas are seen as having equal value and as belonging to the universe, which is the home for all life. All people join together to constantly contribute new insights to a mind-set which is committed to learning from, preserving and promoting the gifts of the universe, nature and evolution for ecological sustainability of our universe.

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Rise and Fall of Knowledge Power: An In-depth Investigation

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Abstract

Knowledge falls short of expressing all the aspects of 'ilm. Knowledge in the Western world means information about something, divine or corporeal, while 'ilm is an all-embracing term covering theory, action and education. It may be said that Islam is the path of "knowledge." No other religion or ideology has so much emphasized the importance of 'ilm. There have been many discussions in the media and newspaper about the wonders of the golden age of Islam. The Muslim World held knowledge power for over five hundred years. They dominated in the field of historiography, religious texts, medicine, astronomy, mathematics, sciences, literature, geography and travel and many other areas during 750-950AD in the world history. But the current Muslim World is far behind in knowledge power than the rest of the world despite holding vast sources of economic resources. How Muslim knowledge powers became great and how they declined, is a question before today's researchers. Knowledge power is a much softer type of power, if anything; it forms one of the major foundation stones for great power. In this study, we explore the phenomenon and several factors responsible for the fall of Muslims' knowledge power. However, given the long and varied human history of knowledge and scientific discovery, if Islamic countries want to become knowledge power, Islamic countries should make a realistic action plan for human resources development. In the present study, we also explore the scope of initiative to power the knowledge economy in order to restore the flagging of knowledge powers.

1. Introduction

We learn from history that the early Muslims were conscientious of their mission in life. Their personal and collective life were moulded according to Islamic principles and gained such knowledge which enabled them to become exemplary witnesses of Islam before the world. First generation of Muslims, in particular established a strong attachment with Al-Qur'an from which Muslims drew inspiration, motivation. People of different races and religious beliefs lived together in society in peace and harmony. People were free to travel, live, trade and set up business anywhere in Islamic world. Societies during that time made great progress in science, technology, mathematics, medicine, philosophy, law, jurisprudence and other fields of knowledge. Islamic World became the centre

of knowledge power through making great inventions and discoveries. Present modern technological and social developments have actually evolved from the contributions made by a number of earlier Islamic intellectuals (750AD-1150AD) during Muslim rule. Historian Watt (1972) writes: "We sometimes belittle the extent and importance of the Islamic influence in our heritage, and sometimes overlook it altogether. We must acknowledge our indebtedness to the full. To try to cover it over and deny it is a mark of false pride (p. 1-2)."

Knowledge power is a much softer type of power, if anything; it forms one of the major foundation stones for a great power. How countries and nations become knowledge powers and how they lose their lead? Paul Kennedy explained in his book, "The Rise and Fall of Great Powers" how great powers became great and how they fell. Amongst other reasons it was because of an imperial overstretch, the inability to sustain the military strength by their economies. It is observed that history is a vast early warning system. Patterns swirl around in history and so many times, we see the same pattern re-emerging over and over again. Such is the case with 'Knowledge Powers'.

What is a knowledge power? Before going to discuss about the "knowledge power", we should define what knowledge is! Knowledge falls short of expressing all the aspects of 'ilm in Islamic term. There is no economic development without 'ilm. The latter cannot take place without knowledge or education (Ramadan, 2001). Knowledge in the Western world means information about something, divine or corporeal, which 'ilm is an all-embracing term covering theory, action and education. It may be said that Islam is the path of "knowledge." No other religion or ideology has so much emphasized the importance of 'ilm. The Qur'an emphasizes that one should pursue only that aim of which he has a definite and clear knowledge. In the words of the Holy Qu'ran, Prophet Muhammad (peace be upon him) followed, was "To recite His verses to them, to help their development and to teach them the Book and the way thereof", (Al-Quran 62:2). Prophet Muhammad (peace be upon him) offered to the people the pure knowledge that he received by Revelation from God. His appeal was based on reason. "I call to God with sure knowledge. I and whoever follows me", (Al-Qur'an 12:108).

Historically speaking, economies start by taking stock of material things: land and resources. Whoever controls land and resources has the power. But before long, energy enters the scene. What's the use of owning land and resources if we don't have the energy (the muscle, wind, wood, or oil power) to do things with them? In the Industrial Age, whoever controls the energy wields the power. Yet using energy to manipulate matter takes knowledge-the more the better. Mind-power replaces muscle-power. As knowledge increases, we use matter and energy more efficiently. We do more with less. That is what made the Information Age

so popular: with information, we can do almost anything. At this stage, "knowledge is power". And it is not scarce. Knowledge tends to breed more knowledge. The amount of knowledge produced by a country or nation is the absolute factor, while comparing this amount to other countries/nations is the relative factor. Our discussion of knowledge power will be a very broad based definition, spanning both arts and sciences - all the 'ologies, physics, chemistry, engineering, mathematics, medicine, painting, sculpture, architecture etc. The objectives of this study are:

- (1) To explore phenomenon and reasons- why knowledge power rise and fall, and
- (2) To explore how the Islamic countries can become knowledge power in order to restore its flagging power.

This study is divided into seven sections. Section one is an introduction. Section Two gives a brief history of knowledge powers held by different countries. Section Three makes an attempt to identify the factors behind Islamic World's knowledge power held in the past and section Four discusses in brief about the contribution of Muslims in the knowledge field. Section Five discusses the factors behind the fall of Muslims' knowledge power. Section Six explores the scope of initiative in the Islamic World to power the knowledge economy in order to restore the flagging of knowledge powers.

2. History of Knowledge Power of Nation/States at a Glance

When we read about the way of measurement of knowledge both qualitatively and quantitatively, the points usually look at the number of patents issued to the number of books published in the different fields; the number of scientific research institutes to the number of hospitals and laboratories. We do not have an econometric or statistical model. Perhaps the UN Human Development Index can be a proxy, but it is also very limited in range and scope. Contributing to knowledge fields as a society is absolutely central to the understanding of how a state or country made its policies. It is a combined area of knowledge, power and participation policy and issues of a state where, an impressive knowledge base has become available across various disciplines and research tradition from the time when this world begin to step forward as civilized world. The process of rethinking scientific and political rationality is evident in developments within converging fields such as, science, technology, political science including international relations, public administration and implementation studies. It also includes the utilization of knowledge tradition in the policy of sciences, the sociology of science and technology and philosophy of science etc. Without going into the detailed history of all countries/nations, we would suffice to hit the ages and subject areas where we have seen the contributions of knowledge significantly.

Obviously, because of the slow communications and lack of support infrastructure, which we take for granted these days, the older nations were knowledge powers over a longer period of time than presently. A brief statistics as follows:

India 3000 BC to 500 AD- medicine, religious and social texts, manufacturing, mathematics, sciences, chemistry, town planning, agriculture, astrology, astronomy, social sciences, painting, dance, sculpture, music, literature.

China 3000 BC to 1000 AD- Paper making, Gunpowder and weapons technology, sciences, printing, compass, philosophy, medicine, art, architecture, agriculture, historiography, religious and social texts, poetry, astronomy and astrology.

Greeks 700 BC-300 BC- historiography, religious texts, political science, mythology, alchemy, chemistry, philosophy, literature

Islamic World 750 AD-1150 AD- Historiography, religious texts, medicine, astronomy, mathematics, sciences, literature, geography and travel Italian 600 AD-1600 AD-Arts, sculpture, historiography, architecture, religious texts.

British 1700 AD-2000 AD- Arts, sculpture, sciences, mathematics, weapons development, liberalism, painting, cultural studies, engineering, metal working, astronomy, maritime sciences

American 1800 AD onwards- arts, sciences, mathematics, military science, metallurgy, food and agriculture sciences, nuclear science, political science, engineering, space, computer science.

Contributions in the knowledge field by Muslims has long been a site for a cross fertilization of ideas that have led to productive societies. In the open and welcoming climate, intellectuals during the rules of *Umayyads* (661- 750 AD), *Abbasids* (758 to 1258 AD), *Islamic Spain* (711-1492), *Ottomans* (1290-1924 AD); fostered learning environment that allowed the Muslim civilizations to flourish.

The early Muslims, after having consolidated their administrative system, caught the significance of creative impulse especially during the Abbasid period and began to address themselves to learning. During the early phase of their history, the Muslims came across major scientific and higher educational institutions of Alexandria, Baghdad, Cordova (Spain), Damascus, Istanbul (Saud, 1994). The scientific works of Greeks, Romans and Persians found in these and other places caused a great curiosity in them. They did their utmost to make such scientific literature accessible to them. Manuscripts of the territories under their control were in their access while the literature not in their approach was brought from

the foreign lands on Caliph's orders. Sometimes non-Muslim scholars themselves brought such books to the learning centres of Islam (Saud, 1994).

Material thus collected was in Greek, Sanskrit, and Syrian and Pahlvi languages. In order to make it understandable to the Arabs translation was needed. Numerous academies were founded for translation work. The first such academy, known as Baitul Hikma, was founded at Baghdad by Al-Mamoon, the Abbasid caliph (Saud, 1994). There was a rich library and an observatory in it. Such academies, observatories and libraries were also set up in other parts of the Muslim World. Capable researchers were appointed in those academies. Nowadays Muslims often look back to such "golden ages" with wistfulness, admiration and frustration.

3. Factors behind Islamic World's Knowledge Power

Nadwi (1977) points out that many factors played an important role to instate the Islamic World as knowledge power during 750AD to 1150AD. The main factors were religious, spiritual, moral and humanitarian. There are also other factors such as the dynamism and resilience which are inherent in Islam, together with effective and sincere leadership. The following are other factors which we see as the reasons behind the Islamic World becoming a great knowledge power.

Firstly, rulers during the golden ages of Muslim knowledge power were very strong at the top down sponsorship of research and development. In all the examples of knowledge powers that we have mentioned above, the kings, emperors, governments, business bodies all have backed research, development, universities, schooling, etc. to the extent of being personally involved in offering funds, tithes, sponsorship to institutions and people who are engaged in them. In the olden days, there was equal opportunity to all people who wanted to pursue higher study. Brighter students would get sufficient funds to carry out research or produce knowledge. In addition, institutions of learning were strongly and continuously sponsored by the rulers and the state, unlike today, where someone is sponsored for 10 years and then for the next 100 years nothing. The true Muslim intellectual thinks about God and creation "standing, sitting and lying down," he/she strives for objectivity, regardless of personal preferences, demanding evidence, not mere conjecture(Al Quran 3: 191). According to a very popular Muslim maxim one ought to acquire knowledge even if that meant traveling to China (Hofmann, 2000)⁶⁷. On the flip side, it would be noted that countries, which were not knowledge powers, did not really do anything of this sort. The Mongols were great powers, but they did sweat sod at all for knowledge; the USSR was a great military power but its knowledge powers were strangely skewed.

⁶⁷ This statement is not based on an authentic Hadith but very popular.

Secondly, there was respect for scientists, poets, historians, Islamic figures, mathematicians, and the like. The fact that Abu Hanifa (700-767), Malik bin Anas (710-795), Imam Shafi (767-820), Ahmad bin Hanbal (780-855), AlGazzali (1058-1111) and many other intellectual-luminaries were teachers or researchers who were frequently considered to be top of the heap (Ahmad, 2002). They may not have gotten much money or salary, but boy, were they respected. Galileo was penalised and there are many other examples in the western world, but generally, in the Islamic history of knowledge powers, an intellectual, scientist or knowledge producer was highly respected. When one looks at the other end of the spectrum, teachers and scientists are unfortunately not respected at all. We see this in the UK and USA where there is a strange feeling of anti-intellectualism. We see this in our schools where a brainy kid is called by derogatory names such as jerk, nerd, four eyes and so on and so forth. There is hardly any respect for knowledgeable people . If one wants to see how they are respected, he or she can carry out this small exercise at a high school or college in any Islamic countries from Morocco to Brunei or even in India. He or she can ask about high achievers of the school or colleague and then ask their peers about them, or see how their professors and intellectuals are treated. The differences can be observed in this way.

Thirdly, the concept of centers of excellence was present in these knowledge centers. There were the university or knowledge towns of Alexandria, Baghdad, Bashra, Bokhara, Cairo, Cordova, Damascus, Istanbul, Nishapur, Samarkhand, etc. People would congregate there in large numbers, both professors and students, and there would be visiting scholars and scribes. People would go there purely to study, research, perform and read. These cities would possess schools, laboratories, universities, libraries and amphitheaters. But the main thing about this phenomenon was that there was a critical mass of people who would carry on producing knowledge. Just like one swallow doesn't make a summer, just one researcher won't go a long way to make a knowledge power. It needed lots of people congregating together. Synergy would be produced and the entire town would hum with intellectual horsepower. There could be one, there could be many such centers but the key is that there would be groups of people who would congregate together according to their discipline and produce knowledge

This leads us to the fourth factor, having a proper infrastructure to facilitate knowledge production. This factor overlaps with the first and third factors, but is important enough to be discussed separately as it has certain aspects, which were not catered for previously. Physical infrastructure is vital for being a good knowledge power. It encompasses diverse elements ranging from good roads, to physical security, ports to telecommunications, electricity to presence of paper making factories, good sources of food and water, health institutions, arts and crafts institutions, museums, opera and drama houses, churches, temples, living quarters and sewerage systems.

The fourth factor was the great knowledge powers that we mentioned had good infrastructure, they were at peace, trade happened, industry and services were present, etc. Knowledge cannot be produced in a vacuum, but needs developed infrastructure to support it

The fifth factor was presence of capital to convert ideas into action. The kings and emperors of old devoted monies and funds to their centers of excellence, scientists, engineers, chemists and metallurgists. During the Islamic renaissance the potentates devoted significant chunks of change to research and sciences. The Abbasid Caliphs such as Harun Rashid and Al Mamoon were famous for their philanthropy and providing capital to support inventions and discoveries (Ahmad, 2002). The whole saga of finding longitude and an accurate chronometer can be related to the availability of capital by the military and tradesmen of Muslim Emperors.

The sixth and final factor was that there was freedom of speech, individual liberty, concept of private and intellectual property in these knowledge powers. In Islamic world there was freedom of speech. A man could research and study what they wanted. We should not assume that the standards of freedom 3000 years back were identical to those of now, but comparatively speaking, a man could go into a royal court and proclaim a new invention, without fear of retribution, imprisonment or death. This is a critical aspect. If man's mind is fettered by fear, then obviously it cannot go about creating knowledge, but will keep shut and mum.

We have explored some reasons behind knowledge power in Islamic world. Given our long and varied human history, for countries that want to become knowledge powers, we can learn a lot from how previous knowledge powers operated.

4. Contribution of Muslims in the Knowledge Field

Nasr (1993) argues that "a knowledge which has always been and will always be, and which is of universal character both in the sense of existing among peoples of different climes and epochs and of dealing with universal principles. This knowledge which is available to the intellect is contained at the heart of all religions or traditions, and its realization is possible only through those traditions and by means of methods, rites, symbols, images and other means sanctified by the message from Heaven or the Divine which gives birth to each tradition. The "Philosophia perennis" possesses branches and ramifications pertaining to cosmology, anthropology, art and other disciplines.(p. 54)." Nasr (1993) believes that an adequate information must be provided about past Muslims' intellectual contributions in the knowledge field in order to inspire the researchers for further development in the contemporary knowledge field and to meet the intellectual challenges posed by the modern world. The contribution of the Muslims in the knowledge field during the period 750 to 1150 AD was enormous.

The joyful curiosity of earlier Muslims, combined with a readiness to exert one's mind, was the right platform for extraordinary development of the 'knowledge

power' from the late eight century onwards, a few striking examples of which are outlined below (Arnold and Guillaume, 1931). A brief history of Muslims contribution in the knowledge power is discussed below⁶⁸:

Ibn Firmas (died 888) to whom the first flying machine is attributed.

Muhammad bin Musa Al-Khwarizmi (died 846), father of algebra (Al Jabr) and of the algorithm;

Abu Bakr al Razi alias Rhazes (864-935) whose medical work *Mansuri*, the *Liber Almansoris*, was used for centuries in European Universities;

The philosopher and physician **Ibn Sina** popularly known in Europe as **Avicenna** (980-1037), whose medical encyclopedia was still in use in European Universities in the early nineteenth century;

Al Hasan Bin al-Haythan popularly known as **Alhazen** (965-1039), inventor of the camera obscura;

Abu al Rayhan al Biruni (973-1050) who was a universal genius at par with Goethe, historian of science, diplomat, student of sanskrit, astrologer, mineralogist, pharmacologist, etc;

Umr al Khyyam (died between 1123 and 1131), poet and mathematician. He also reformed the Indian calendar with greater accuracy than the 1582 Gregorian calendar;

The jurist/philosopher **Ibn Rushd** popularly known as **Averroes** (1126-1198) who as a multiple commentator on Aristotle has a great influence on Western philosophy. He also discovered sunspots;

Ibn al Nafis (died 1288) an Egyptian physician who discovered blood circulation,

Ibn Battutah (1304-1377), a Moroccan globetrotter at par with Marco Polo and reached Timbuktu, Peking and the Volga;

Ibn Khaldun, an Andalusian whose introduction (*al Muqaddimah*) to his history of the world (*kitab al ibar*) made him both the founder of sociology and modern historiography, introducing a revolutionary critique of traditional historical sources;

The navigator **Ahmad Ibn Majid**- a fifteenth century authority and ocean voyages,

Ocean geographer and admiral **Piri Reis** (1480-1553), a Turkish Muslim whose *Kitab-i-Bahrîye* with its precise maps of the seas, still amazes the researchers.

⁶⁸ See for details Marshal G.S. Hodgson, *The Venture of Islam*, Vol. 2, Chicago, 1974

Muslim rulers of Middle Ages patronized scientific learning and research. They vied with each other in attracting the best scholars to their courts. Due to the patronage of Abbasids, Ummayyids and other Muslim rules in the field of education and scientific discovery, Baghdad, Damascus, Cairo, Cordova and other places became great centers of scientific development and learning (Bucaille. 1982). Between 8th and 13th centuries, at the time when restrictions on scientific development were in force in the West, a very large number of studies and discoveries were being made at Islamic universities and the remarkable resources of the time were found (Arnold and Guillaume, 1931).

There was a tremendous explosion of different branches of knowledge in general and the scientific-technological field, in particular, in the Islamic World. It will be reasonable if we say that the cultural exchange in the Muslim countries was a one way street. Hofmann (2000) states that Muslims could hardly find anything worth learning from the accident. The West was a 'net importer' from the windmill and troubadours' songs to the 'Gothic' pointed arch. This cultural imperialism and one sided globalization-as we would call it today- quite naturally left traces in European languages. When people of the world speak of admiral, algebra, cipher, amalgam, alcohol, lute, guitar, alcove, muslin or tariff, they are still using Arabic vocabulary (Hofmann, 2000).

5. Factors behind the Fall of Muslims' Knowledge Power

From 13th century onward, the brilliant Islamic intellectual activities which shone so brightly in contrast to the darkness of Christian West began to fade. The nations once sunk in barbarism started their scientific adventure while the Muslims turned their back to it. Researchers have propounded different theories to give the answer to this question. Some of them consider that political downfall brought scientific activities to close. Other blame that religious orthodoxy became hurdle in the way of scientific progress. Still other think that economic systems and non-productivity of science compelled Muslims to give up socio-economic and scientific research. In the following paragraphs an effort has been made to find out whether a single factor was responsible for the backwardness of Muslims in the different fields of knowledge or if all these factors, somehow or the other, stopped scientific activities.

(1) The Muslims remained supreme for a long time but in 13th century they lost their force and vitality. This invited others to attack their territories. Tatars' invasion in the East and the Muslim expulsion from Spain deprived them of their past position. This settled deathlike gloom in the centers of learning at Muslim lands. In the former case, the humans were killed indiscriminately and books in the libraries were consumed to ashes. The accumulated treasures of five centuries were lost for ever to humanity (Hitti, 1986). According to Hitti (1986) and Ahmad (2002), the Christians destroyed the intellectual life of the people in

Spain. Along with killing, expelling or converting the Muslims to Christianity, the centers of learning were also destroyed. Hitti writes that even Spanish baths were considered a relic of infidelity and were demolished (Hitti, 1986). Thus, the golden period of Spain came to an end. On the other side, African lands became victims of political turmoil. In Western Africa, the tides of progress was turned back due to the up rise of Berber fanaticism. The centers of learning were converted into the centers of ignorance. There was anarchy in Egypt which discouraged the cultivation of peaceful knowledge. No rulers were left to patronize learning.

(2) Political decline paved the way for a drastic change in economic system formerly based on trade and urban civilization. Under this system Muslim science flourished. From the 12th century onwards, volume of international trade was concentrated and urban wealth declined (Ahmad, 1978). These changes gave birth to the feudal system which turned the tide back.

(3) It is true that in the history of Islam certain believers had harboured a negative attitude towards science, technology and other fields of knowledge. This is a fact that at certain periods, the obligation to educate oneself and others was neglected. It is equally true that in the Muslim world an attempt was sometimes made to stop scientific development. Degenerated type of mysticism also proved injurious to scientific progress in Islam.

6. Scope of Initiatives to Power the Knowledge Economy

Discoveries from within an Islamic perspective, carrying the legacy of the Muslim past, and with the burdens of its present view, it was only natural that the priority and the emphasis should be given to rousing Muslim scholars and thinkers to their responsibility towards the Ummah (Abul-Fadhl, 1992). Therefore, the future of members of the Organization of Islamic Conference (OIC), countries are linked to the knowledge power, and success of Muslims in it will depend upon how well Islamic intellectuals nurture and grow the human resources. "Knowledge power" is used here to include not only the three "Os"- technologies related to info, bio and nano - but also knowledge-based manufacturing and knowledge-based agriculture. All these - and the conventional high-tech areas of nuclear energy, space technology, materials science, etc. - will require human resources of the highest capabilities, in large numbers.

In fact, OIC member countries biggest potential strength is the capability of skills, and especially of high level skills. In the area of information technology (IT), some of the Islamic countries are already seeing an increasing recognition of this. Thus, whether it is a massive ramping up of simpler skills or deploying large numbers of doctorates in research and development (R&D) off-shoring, the Islamic World has proven its competitive edge over rivals. However, to retain this advantage and, hopefully, further widen the gap, it is essential that they should produce ever-greater numbers of even better qualified professionals.

Demographics are on the Islamic World's side: Islamic countries are spread over from Rabat to Bandar Seri Begawan with a majority of young people. The projections indicate that both the number and proportion of working-age people in the population will continue to rise for a couple of decades. In contrast, all the developed countries and, surprisingly, USA too, will face substantial shortages of working-age people. Except for Islamic World which is estimated to have a surplus of 32 million working-age people in 2020, the United States alone will have a deficit of 17 million. While immigration may reduce the shortage, clearly it cannot bridge such a huge shortfall. This means that off-shoring will not just continue, but gain greater momentum in the years to come. To take full advantage of these demographic trends, the Islamic World needs to ensure the availability of a skilled and educated workforce.

Present selection ratios, combined with past growth rates in the expansion of tertiary education, indicate possible shortages in the needs for both the IT (information technology) and business process outsourcing (BPO) sectors. Other knowledge sectors will similarly face shortages. The problem is not so much the availability of graduates, as the very low selection ratios, indicating inadequacy of skills. This reflects poorly on the general quality of education. While the top 10-15 per cent of graduates in Islamic countries are near world-class, a substantial proportion are below average. Therefore, the challenge is to raise the floor. This is true not only for science and engineering, but even for non-technical graduates. The selection ratio for jobs in the booming IT-BPO sector which is below 10 per cent, illustrates this rather starkly, since the requirement for skill sets here is comparatively simpler.

The problems are many-fold and inter-related. The quality of teaching and faculty in the Universities of the Islamic world is a major problem, and one that is of serious long-term concern. This affects multiple batches of graduating students, with a major impact on the quality of the future faculty. The short-term solution is faculty training and faculty development programmes. Ensuring that the curriculum is up-to-date and relevant is another issue. Industries sector of the OIC member countries can play a major role in this by sharing trends, likely future developments and the requirement of skill-sets. It is important to build up a strong conceptual foundation, so that in a world of rapidly changing technology, the graduate can master new developments. The ability of learning how to learn is an essential part of good education.

Infrastructure, especially for science and technology education, needs to be upgraded and continuously updated. Laboratory equipment, libraries, and computers with high-speed connectivity, well-equipped classrooms: all these need to be at least adequate, if not world-class. As the Islamic countries will do more work of greater sophistication, there will be needed for qualified researchers-those who have done a Masters or a doctorate-is going to grow

gradually. Islamic countries cannot achieve its real potential or fully tap the potential of talented individuals, unless they have large numbers of people at the highest level of research in the universities. At present, the numbers are truly dismal; one estimate indicates less than 560 PhDs in technology each year. Equally worrying is the quality: much research tends to be repetitive and irrelevant. Attracting more people into M.Tech and PhD programmes is an urgent necessity, as is the need to ensure that the research they do is relevant. In fact, the inter-relatedness of these problems indicates a solution. If the research done is relevant, industries will value it. MTech and doctorates will then be in demand in the industry sector and will command a good compensation. In turn, this will attract more and better graduates to join an MTech programme rather than take up a job. Possibly, even those who take up a job immediately after graduating may choose to return to university for an advanced degree after a few years of work.

The greater number of M.Tech and PhDs, in turn, will help to reduce the problem of faculty shortages as well as quality. However, to do this, teaching needs to be made a more attractive profession. Today, in most of the Islamic countries, not only are teachers poorly paid, even their social status has suffered a decline. This is a tough problem. While raising the salaries of teachers is a very desirable step, it is obviously a difficult one. Even while this is pursued, industries could help by providing funding for research, for facilities, and sponsor faculties to travel to conferences. This will certainly encourage teachers and permit them to pursue their research interests more fully. It will make the profession more attractive and may help in getting more people to join it.

In the non-technology area, it is essential to make education more relevant to today's needs. Even while a strong theoretical and conceptual foundation is laid, the three years of a degree education must include skills that industry needs. An overwhelming majority of students go into the employment market armed with only BA/BSc or business study degrees. Ensuring their employability is a responsibility, academics and industry need to address together. Given the low load on students in most under-graduate courses, a series of optional, parallel, skill-building courses may be considered. "Soft-skills" such as communication and teamwork must be an essential part of the curriculum in all streams.

Quantity is not a serious problem today: the number of engineering seats is around 300,000 and the number of all graduates is around 2.1 million a year in the OIC member countries. However, as mentioned earlier, the projections of needs are also the potential demand of a substantial expansion. While doing so, it is vital that quality is not only maintained but improved. With privatization, market forces will hopefully play a role in ensuring quality. It may, however, be necessary to go beyond market forces. This may be one area where the governments of the Islamic countries can set the highest standards, creating a benchmark for private institutions. The Governments of the Islamic world must

seek to create at least a dozen world quality institutions such as Massachusetts Institute of Technology/Indian Institute of Technology and Harvard Business School/ London School of Economics each year, in all disciplines.

To stimulate private sector investment in truly high-quality education, the Governments of the OIC member countries should create, on an experimental basis, special education zones (SEZs) or areas where bureaucratic and other regulatory constraints are removed, with complete freedom of recruitment, compensation, import of equipment and students from all over the member countries of the OIC. This may help make the Islamic World a major global education centers.

Islamic countries also need to foster innovation, an area in which the Islamic World has a unique advantage. This requires that Islamic teaching be made compulsory with each branch of study in schools, Colleges and Universities. There is a need to change the examination system, and bring openness into the higher education system. Islamic world should produce such Muslim scholars well versed in Islamic teachings combined with modern knowledge so that those scholars will be competent to apply Islamic principles to the problems of contemporary life. Higher educational institutions need to inculcate the habit of questioning answers, rather than answering questions.

A final critical element for the future of the knowledge industry is the need to attract more of the brightest students into science, the foundation for all technology. Better science and mathematics teaching in schools, better laboratory facilities and an up-to-date curriculum are all necessary, as are many more top-quality Universities like Oxford, Cambridge and Harvard Universities. Much of this needs a private-public partnership, and close industry-academia interaction. Only through this the dreams of Islamic world as a global knowledge power be realised.

Conclusions

In this paper we discussed what makes great knowledge powers and we noted that it is due to six main reasons. A strong top down sponsorship of arts and sciences; respect for scientists and artists; a basic minimum number of artists and scientists who congregate together; having the proper infrastructure needed to support a knowledge generation; presence of capital to convert ideas into action and finally, the freedom of speech, individual liberty and ability to research almost anything that their minds take them to.

Most of the Islamic countries accepted the western model of knowledge power without criticism. Al-Faruqi (1992) points out the need to evaluate western knowledge including science, but fails to generate serious debate. Moudoodi (1987) argues:⁶⁹ "in my opinion there are three or four areas which require immediate attention: jurisprudence (Fiqh), economics, social sciences, philosophy and theoretical sciences. In all these areas research should be conducted with firm belief in the philosophy that Quran and Sunnah of the Prophet are really the perennial source of knowledge and we have to draw everything from this source alone (p.7)."

⁶⁹ Quoted in M.R.Kirmau and H.Muhsin, Basair-e-Moudoodi, Aligarh, Centre for Studies on Science, 1987, p.7

The success of the Islamic World in the struggle in politics and economics has served to intensify their intellectual activity. The scholar and scientists those who have patterned their thoughts after the intellectual dimensions of Al-Quranul Al Kareem have excelled not only in their originality but also in their appeal to the people (Kirmani, 1989). Their attempts to develop knowledge power are valuable.

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A New Approach to Fair Bandwidth Sharing among Multimedia Cellular Networks

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Abstract

Future generation cellular networks, both civilian and military, are envisioned to provide integrated services via inexpensive low powered mobile computing devices. End users often expect seamless connectivity from wire-line to wireless networks. On the other hand, cellular networks are limited in terms of resources like bandwidth, power, and the transmission medium. Therefore, meeting stringent quality of service requirements requires efficient resource management. For this purpose, we need to have an understanding of the user's requirements and subsequently design the resource allocation techniques to satisfy the specific objectives. We conclude here that space dependent contention is an inherent feature of cellular networks. Thus, it turns out that the scheduling of different links is interdependent in cellular networks, whereas different links can be scheduled independent of each other in cellular networks. As a result, bandwidth allocations inherently differ. In addition, several flows share the same wireless link and the issue of contention between flows sharing the same link arises as in cellular networks. Since link scheduling is interdependent, the bandwidth requirement of the flows in one link affects the scheduling of flows in other links as well. The challenge is to obtain a globally fair allocation in spite of this mutual independence.

I. INTRODUCTION

The authors first study several possible qualities of service objectives. Each user may specify individual service requirements, and subsequently the network may allocate resources to meet the desired objectives. However, the pitfall is that there needs to be an elaborate negotiation associated with each session initiation. For wireless networks, where sessions are short-lived, and nodes are continuously on the move, such negotiation may generate significant overhead. The basic idea behind rate-based fairness is to first allocate desired bandwidth to all contending users. If a user cannot utilize its bandwidth, because of constraint elsewhere, then

the residual bandwidth is distributed among others. Thus, no user is penalized excessively, and a certain minimum quality of service is guaranteed to all users. User's satisfaction is often a concave function, i.e., satisfaction increases rapidly with an increase in bandwidth in the low bandwidth region, and increase slowly with increase in bandwidth in the high bandwidth range. As a result, bandwidth allocations inherently differ. In addition, several flows share the same wireless link and the issue of contention between flows sharing the same link arises as in cellular networks. Since link scheduling is interdependent, the bandwidth requirement of the flows in one link affects the scheduling of flows in other links as well. The challenge is to obtain a globally fair allocation in spite of this mutual independence. The main contribution of this paper was to propose policies, which attain maximum fair allocation. The novelty of the scheme was that, for the last few connections, some bandwidth would be reserved virtually and would be maintained or distributed at a priority basis (which are changeable for time) that could reduce the fuzzy and silly connections of an emergency period. And the proposed rate based borrowing scheme was fair in the sense that it would borrow the bandwidth from all satisfied existing connections and the amount of Borrowing bandwidth was the proportion of their difference of desired and minimum bandwidth. Another factor that needed to be considered was that the bandwidth allocation should also depend on the bandwidth demands of the individual flows. For example, if a flow did not utilize most of its bandwidth because of low traffic demand, then the excess might be allocated to contending flows. In addition, the traffic demands of different flows change with time, and typically the wireless nodes do not have any knowledge about the traffic pattern. Thus, the resource allocation policies need to be online in order to cater to the changes efficiently. The bandwidth allocation policy should have provisions to regulate the amount of reclaim, as also to distribute any bandwidth not utilized by flows with less overall traffic demand. Finally, the Rate-based borrowing scheme treated fair allocation of bandwidth equitably and according to their demand. Rate-based borrowing scheme had studied before by M. El- Kadi but the idea of borrowing share was different to the proposed one [1]. M. El-Kadi mentioned that the borrowing amount would be the same for all subscribers. However, as it is argued later, the borrowing amount of bandwidth of subscribers would depend on the proportion of the difference of their desired and minimum bandwidth. Firstly, the algorithm has been formulated for fairness of the borrowing scheme, which is called Fair_Redistribution policy. Then an algorithm has been developed for new call admission, class I hand-off and class II hand-off.

II. BACKGROUND STUDY

Many works have been done previously in the area of cellular communication and channel allocation. The authors have put their concentration mainly on Mona el Kadi's rate based policy [1]. However, substantial research works have been done on connection admission control [6] [8] [10] [11] [12] and handoff [7] [14].

Also some research works have been completed on resource reservation [9] [13]. The authors have carefully studied all these papers to complete their research. Keeping a small pool of bandwidth always reserved for handoffs, as described in Oliviera's scheme [2], obviously reduced the call dropping probability. However, in their scheme, the size of the reserved pool was not determined by requests from neighboring cells, instead they reserved this amount by the sum of differences of all existing connection's expectation level to minimum level. On the other hand, for new call admission they gave the share of such amount, which was the sum of differences of all existing connection's maximum level to expectation level. The proposed scheme does not allow bandwidth for incoming call and hand-offs to use below the minimum level of existing connections. Their scheme gave precedence to class I connections. Class II did not use the reserve bandwidth. In order to lower the call blocking probability, the scheme allowed fair borrowing resources from existing connections. The fair borrowing strategy had the following interesting features:

- A. No class I connection would have to give up bandwidth beyond the expectation level negotiated at call set up time and not give up beyond the minimum level for negotiating at hand-offs management.
- B. If the cell did not have enough free bandwidth for accommodating an incoming call and hand-offs, the existing connections would temporarily have to give up a certain amount of bandwidth based on their tolerate level for both new call and hand-offs.
- C. If bandwidth was borrowed, it was borrowed by maintaining a formula that they could call fair share borrow. The fair share was the proportion of all satisfied existing connection, which was the difference of their desired and minimum level.
- D. When any existing call was terminated or any mobile host left the cell, as soon as possible the borrowing amount of bandwidth would be returned to the degraded connections following the same way means which amounts were borrowed that are to be returned.
- E. The proposed scheme was fair in the sense of borrowing policy because all the satisfied existing connections would have to give up their fair share however some could give more shares and some could give fewer shares, which was defined by the proportion of their desired and minimum bandwidth allocation.

Now Let,

- C = the given cell
- B^T_C = Total Bandwidth of the cell
- B^f_C = Free Bandwidth of the Cell
- x = given service
- BW = Bandwidth
- B^{\max}_x = Maximum Bandwidth. /Desired Bandwidth of a given service.
- B^{exp}_x = Expectation Bandwidth of a given service.
- B^{min}_x = Minimum Bandwidth of a given service.
- ABB = Actual Borrow able Bandwidth.
- FBB = Fair Borrow able Bandwidth.
- B^S_C = Surplus Bandwidth.

$$= \sum_{k=1}^N (B_k^{\max} - B_k^{\text{exp}}) \quad \sum_{k=1}^N (B_k^{\max} - B_k^{\text{min}})$$

For new call. For hand-off

- N = Number of satisfied calls.

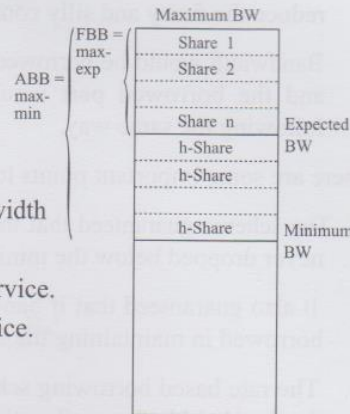


Fig 1 : Parameter of Bandwidth Sharing.

III. NOVELTY OF THE PROPOSED SCHEME

The main contribution of the paper was to propose a novel, fair rate-based borrowing scheme for bandwidth sharing among multimedia services in cellular networks. The key of our approach was to provide a fair rate of bandwidth and priority basis service in bandwidth allocation.

At call setup time the mobile hosts deliver the following parameters to the cell:

1. The desired class of traffic.
2. Their desired amount of bandwidth.
3. The minimum amount of bandwidth in which amount they can maintain their quality.

Class I- real-time multimedia traffic, such as interactive audio and video, and

Class II- non-real-time data traffic, such as email and web applications.

After finding desired amount and minimum amount, they determine their expectation or medium level.

Their scheme attempted to allocate at least an expectation level for new call admission and we could consider the minimum bandwidth for hand-off services.

The novelty of the proposed scheme was that:

- a) In crisis for last few connections, the scheme would reserve some bandwidth virtually and be maintained or distributed it in priority basis ways that could reduce the fuzzy and silly connections of emergency period.
- b) Bandwidth would be borrowed on a temporary basis from existing connection and the borrowed part would be returned to the degraded connections following the same way.

There are some important points to note about the scheme that they explain next:

- i. The scheme guaranteed that the bandwidth allocated to a real time connection never dropped below the minimum bandwidth requirement.
- ii. It also guaranteed that if bandwidth was borrowed from a connection it was borrowed in maintaining the fair share.
- iii. The rate based borrowing scheme was fair in the sense that it would borrow the bandwidth from all satisfied existing connections and the amount of borrowing bandwidth was the proportion of their difference of desired and minimum bandwidth for every satisfied existing connection.
- iv. For last few connections, the policy would reserve some bandwidth for priority basis policy.
- v. Bandwidth would borrow on a temporary basis from existing connection and the borrowing part would be returned to the degraded connections following the same way.

IV. FAIR REDISTRIBUTION ALGORITHM

A. Redistribution algorithm

A fair redistribution algorithm has been proposed named as Fair Redistribution algorithm. This is to implement in the base station of the cell when one or more new services or hand-off services send their request to be connected.

Here is the algorithm for Fair Redistribution policy:

Set

$$B_c^s = \sum_{k=1}^N (B_k^{\max} - B_k^{\exp}) \quad [N = \text{no. of satisfied call}]$$

Set Surplus BW = B_c^s

While Surplus BW > B_x^a

$$\text{Set fair_share} = \frac{B_x^a}{\sum_{k=1}^N (B_k^{\max} - B_k^{\exp})}$$

So, BW given for new connection = each connection * fair share

$$\text{Where 1}^{\text{st}} \text{ share} = \frac{(B_1^{\text{max}} - B_1^{\text{exp}})^2}{B_1^{\text{exp}}} * \text{fair share}$$

$$2^{\text{nd}} \text{ share} = \frac{(B_2^{\text{max}} - B_2^{\text{exp}})^2}{B_2^{\text{exp}}} * \text{fair share}$$

.....

$$N^{\text{th}} \text{ share} = \frac{(B_n^{\text{max}} - B_n^{\text{exp}})^2}{B_n^{\text{exp}}} * \text{fair share}$$

$$\text{Adjust, } \sum_{k=1}^N (B_k^{\text{max}} - B_k^{\text{exp}}) \sum_{k=1}^N = (B_k^{\text{max}} - B_k^{\text{exp}}) - B_x^a$$

B. Call Setup

When a new call requested admission into the cell or network, the cell first attempts to provide the connection with an amount of its expectation level; where the calculation of expectation is followed by Mahfuz and Monjur Murshed presented formula [3]. Because they assumed that, the services demanding less amount of bandwidth should be given more priority than the services demanding more bandwidth.

$$B^{\text{exp}}_x = 2B^{\text{min}}_x - \frac{B^{\text{min}}_x}{B^{\text{max}}_x}$$

If the amount of free bandwidth and the total FBB from all existing connections were greater than or equal to the expected level of new call then it established the call and checked again that the free bandwidth of the cell was greater than or equal to the new call's maximum or desired need. If there was enough free bandwidth than new call's maximum wants then they provided maximum BW for new call and adjusted the amount of free bandwidth. If there were no more bandwidth than new call's maximum need then they checked the resource of the cell, where it was in crisis moment or not and if the resource was in crisis moment then they applied another proposed scheme which was known as priority basis scheme and it is described next.

According to rate based [5] when there is no free bandwidth then the new connections and the hand-off connections use the share from existing connection. But the situation arises when all the existing connection give up their tolerable amount of shared bandwidth and there is no rest for new connection.

All other schemes do not describe them what is happened for a new emergency connection.

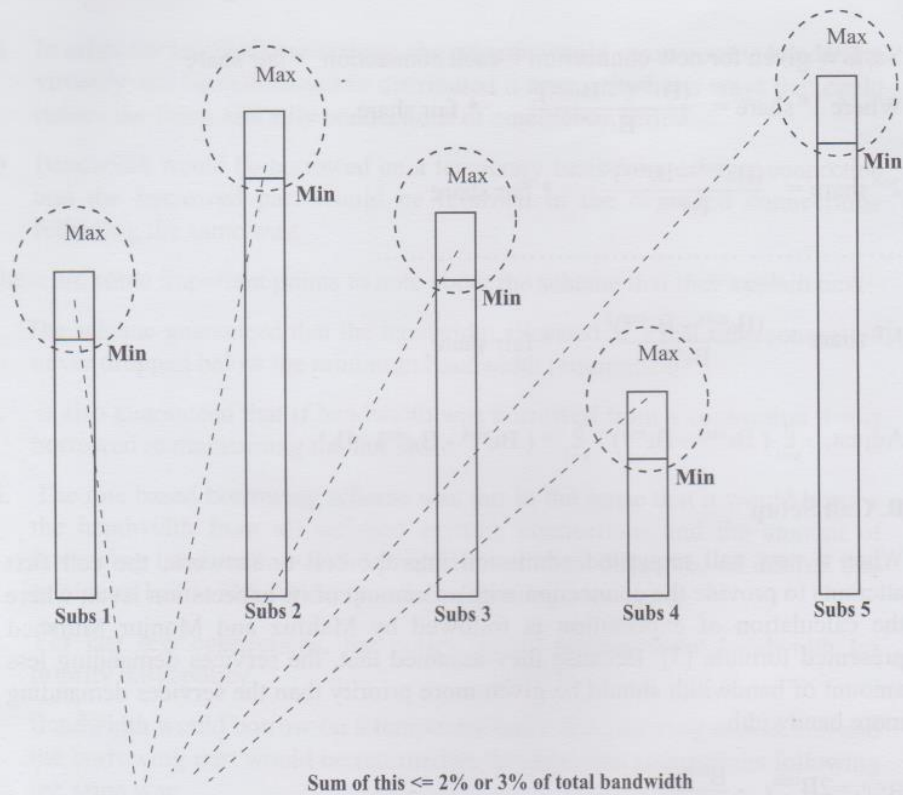


Figure 2: Amount of Bandwidth for Crisis Moments.

a. Proposed Priority Basis Policy

In the proposed priority basis policy, the authors went for the action of taking policy when the amount of sharing bandwidth was less than or equal to 2% or 3% of total bandwidth.

At that time, they used the priority basis policy and the subscriber could establish their connection, which could satisfy this policy. In this policy, they reserved 2% or 3% of the total bandwidth. However, they reserved it virtually that meant only on the crisis time they would use it.

For the protection of less used subscriber in the crisis time, on priority basis policy 1 could use more than one channel which could be denoted priority level 1, priority level 2, priority level 3 etc. and the priority level 1 is obviously more costly than priority levels 2 and 3.

When the resources were almost used, only a little resources were left and the amount was less than or equal to 2% or 3% of the total bandwidth. Only one or two subscribers could enter in the cell. They assumed the rest amount of

bandwidth only could connect one subscriber and these types of subscribers wanted to connect in the mean time.

After observing the entire subscribers' psychology it can be said strongly that at least this policy can protect the less need able or fuzzy or silly call entrance at the crisis moment. So type of number 1 and number 2-call entrance could protect at priority level 1. In the case of number 3 it will kill, some time for understanding with itself was an emergency or not to connect at priority level 1 and in the mean time other real emergency call could enter into the queue.

```

IF  $(B_c^f + \sum_{k=1}^N (B_k^{max} - B_k^{exp})) < a * B_c^f$ 
    IF (agreed) Then
        Priority basis
        method=True.
    Else
        Call rejected by
        user.
    End IF
End IF

```

Figure 3: Priority Level Choosing Algorithm.

When the amount of free bandwidth of the cell (B_c^f) and the sum of all borrowing bandwidth was less than $a * \text{total bandwidth of the cell}$.

Here is a variable and the users can adjust it by pick and off pick. Because during pick hour the probability of emergency call is obviously greater than off pick hour. Therefore, the value of a will decrease off pick hour when it will increase in pick hour.

If the situation was not in crisis moment and there were no more bandwidth of maximum need then effort had been made to satisfy new call's expectation level. These bandwidths were supplied from free bandwidth of the cell and FBB for all satisfied existing connection using Fair Redistribution policy.

It is important to note that the scheme never borrowed ABB from satisfied connections and it did not provide maximum bandwidth for new calls, hampering the maximum bandwidth of other existing calls. In addition, the schemes maintained this policy so strongly that those existing calls, which were never given bandwidth as borrowed to others during new call admission.

Every time bandwidth became available in a cell due to connection releasing its bandwidth allocation.

Here is the algorithm for new call admission:

```

IF  $(B_c^f + \sum_{k=1}^N B_k^{max} - B_k^{exp}) \geq B_x^{exp}$  Then
    IF  $B_c^f \geq B_x^{max}$  Then
        Allocate  $B_x^a = B_x^{max}$ 
        Adjust  $B_c^f = B_c^f - B_x^{max}$ 
    Else
        IF  $(B_c^f + \sum_{k=1}^N B_k^{max} - B_k^{exp}) < a * B_c^f$ 
            IF (agreed) Then
                Priority-basis
                method=True.
            Else
                Call rejected by user.
            End IF
        End IF
        Allocate  $B_x^a = B_x^{exp}, B_x^a = B_x^a - B_c^f$ 
        Adjust  $B_c^f = 0$ 
        Re-distribute Bandwidth based on Fair
        Re-Distribution policy.
    End IF
    Satisfied_call=Satisfied_call+1
    
```

Figure4: New Call Admission Algorithm.

b. Class I and Class II Handoff

In their proposed scheme the hand-off admission policies were different between Class I and Class II connections. When a Class I connection requested admission into a cell as a hand-off [4], the cell was checked to see if the minimum bandwidth requirement could be met with the sum of the available free bandwidth and ABB from all satisfied connection in the cell. In this case, the call was admitted into the cell and gave bandwidth for hand-off services. Then it was checked again if the cell had more or equal bandwidth for maximum requirements. If there was no more or equal bandwidth then it was tried to satisfy its

expectation level from free bandwidth of the cell and if it was not possible to provide, they tried to give expectation level using free bandwidth of the cell and ABB from all satisfied connections. Moreover if it was not possible then several works had been done to satisfy minimum bandwidth for hand off from free bandwidth of the cell. And if it was not possible then they gave minimum bandwidth from free bandwidth of the cell and ABB from all satisfied connections.

Now here is the proposed C1 Hand-off algorithm:

```

IF  $(B_c^f + \sum_{k=1}^N (B_k^{max} - B_k^{min})) \geq B_x^{min}$  Then
  Accept Service
  IF  $B_c^f \geq B_x^{max}$  Then
    Allocate  $B_x^a = B_x^{max}$ 
    Adjust  $B_c^f = B_c^f - B_x^a$ 
  Else IF  $B_c^f \geq B_x^{exp}$  Then
    Allocate  $B_x^a = B_x^{exp}$ 
    Adjust  $B_c^f = B_c^f - B_x^a$ 
  Else IF  $B_c^f + \sum_{k=1}^N (B_k^{max} - B_k^{min}) \geq B_x^{exp}$  Then
    Allocate  $B_x^a = B_x^{exp}$ 
    Adjust  $B_c^f = B_c^f - B_x^a$ 
  Else IF  $B_c^f \geq B_x^{min}$  Then
    Allocate  $B_x^a = B_x^{min}$ 
    Adjust  $B_x^a = B_x^a - B_c^f$ 
     $B_c^f = 0$ 
  End IF
  Re-distribute Bandwidth based on fair_Redistribution
  policy.
Else
  Reject the Service.

```

Figure 5: C1 Hand-off algorithm.

On the other hand, Class II traffic would only be dropped if there was no free bandwidth left in the cell which included free bandwidth and ABB of the cell.

Now here is the C2 Hand-off algorithm:

```

IF  $(B_c^f + \sum_{k=1}^N (B_k^{max} - B_k^{min})) \geq 0$  Then
    Accept the Service
    IF  $B_c^f \geq B_x^{man}$  Then
        Allocate  $B_x^a = B_x^{max}$ 
        Adjust  $B_c^f = B_c^f - B_x^a$ 
    Else
        Allocate  $B_x^a = B_x^{min}$ 
        Adjust  $B_x^a = B_x^a - B_c^f$ 
         $B_c^f = 0$ 

Re-distribute Bandwidth based on fair_Redistribution
policy.
    
```

Figure 6: C2 Hand-off algorithm.

V. Results

MATLAB for simulation purposes was used to assess the performance of the predictive bandwidth reservation and call admission scheme in terms of keeping the CDP low and bandwidth utilization high. For this purpose, the predictive scheme was compared to a fixed-rate scheme that sets aside 5 percent of a cell's bandwidth for the exclusive uses of Class I handoffs. A one-dimensional array of 36 cells each with a static bandwidth allocation of 30Mbps was simulated. In the fixed reservation scenario, an amount of bandwidth equal to 1.5Mbps (i.e. 5% of 30Mbps) was set aside for Class I handoffs. So, the scheme was better than the fixed reservation protocol.

VI. Concluding Remarks

The proposed scheme successfully reduces the call dropping probability and runs faster than the previous schemes. As the proposed scheme has not yet been adopted it requires commercial testing. If it can be deployed the telecom industry of the country would benefit a lot, as well as the common people because the call dropping probability is much less in the proposed scheme.

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