

GREEN MOVEMENTS IN BUSINESS AND INDUSTRY: A REVIEW OF ECONOMIC, TECHNOLOGICAL, AND SOCIAL PERSPECTIVES

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1. INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

Increasing economic growth and prosperity can enhance a society's demand for a more sustainable way of development. Sustainable development and environmental issues have been a matter of public concern for over two decades. As knowledge relating to the cause and effect of environmental deterioration has become more complete, the pressure to change the ways in which our societies behave has increased. Much of this pressure has been targeted towards business and industry which are, in most cases, identified as the major sources of negative side effects of development such as pollution, a widening gap between the rich and the poor, and many social problems.

Businesses and industries provide the goods and services to fulfill many vital social needs and wants. The investments and innovations of businesses drive economic growth and satisfy the demands of the consumers. However, in doing so, be it because of the resources that they consume, the process that they apply or the products that they manufacture, business activity is identified by many critiques as a major contributor to environmental destruction and social hardship. This is not because of an intention of the society, but rather a systemic error of how businesses and industries perform their everyday activities. Schumacher (1973) argues that it is the illusion of the modern age that the problem of production has been solved; i.e. that we can continue to produce and consume at ever-increasing rates, virtually for evermore.

“I started by saying that one of the most fateful errors of our age is the belief that the problem of production has been solved. This illusion, I suggested, is mainly due to our inability to recognize that the modern industrial system, with all its intellectual sophistication, consumes the very basis on which it has been erected. To use the language of the economist, it lives on irreplaceable capital which it cheerfully treats as income. I specified three categories of such capital: fossil fuels, the tolerance margin of nature, and the human substance...the substance of man cannot be measured by Gross National Product. Perhaps it cannot be measured at all, except for certain symptoms of loss. However, this is not the place to go into the statistics of these symptoms, such as crime, drug addiction, vandalism, mental breakdown, rebellion, and so forth. Statistics never prove any thing” (Schumacher,1993).

In his famous books, *The Turning Point* and *The Tao of Physics*, Capra (1983;1992) argues that mechanistic science has the effect of destroying the benign projects typical of the organic world view of medieval European society, and replacing them with manipulative and dominant ones. As a result, our relationship with the natural world changed from one of contemplation to one of control, and in our insistence that the natural world was just another machine, the society losses sight of the complex interactions of which it is constituted. He points out that this is the root of our environmental insensitivity today. However, he further argues that the wheel has turned full circle. The mechanistic paradigm must give way to the systems paradigm, and on this latter the society can refound a more sensitive relationship with the natural world.

Schumacher's and Capra's visions reflect the need for a radical change in the way the society operates. Thus, within the pluralist society a whole range of pressure are beginning to create the preconditions which are necessary to encourage businesses to respond to this challenge. In fact, Businesses are at the core of the debate regarding sustainable practices and are central both to the problem and to the solution. The rapid growth of public environmental and ethical awareness in recent years has placed new

pressures on business and industry. There is no doubt that business industry have been innovating and improving efficiency for many years and many firms have made major advances in their environmental performance. Industry is beginning to develop new technologies and techniques. Governments around the world have tried to incorporate environmental criteria into markets. These economic, technological and social trends move the global economy toward sustainability.

Until recently, the continuing ability of the environment to supply raw materials and assimilate waste while maintaining bio-diversity and a quality of life is being undermined. If development is to continue there is a need to find a way in which there is no further environmental degradation. In its simplest form, sustainable development is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). Such a simple statement has profound implications. It implies that all human activity must refrain from causing any degree of permanent damage through its consumption of environmental resources. These resources may be the material and energy inputs used in production or the services that the natural environment provides as it assimilates waste. As an ultimate objective, the concept of sustainability is immensely valuable. However strategies are needed to translate conceptual theories into practical reality (Welford and Gouldson, 1993).

At the centre of sustainable development, business must seek to provide the services demanded by consumers with the minimum environmental impact at all stages. This is a far reaching challenge as it involves a reformulation not only of production processes but also of product consumption. One major obstacle preventing sustainability from being achieved is the overall level of consumption experienced in the developed society. While increasingly governments are adopting economic instrument such as taxes, subsidies and product labelling schemes to reduce and channel consumption towards more sustainable alternatives, there is also a need for education among consumers. The most effective way to educate a society is through product information provided by business. This is one simple example of how reality can be pursued.

However, sustainable development is not only about direct impact on the environment. A key part of the concept is about equity. The massive inequality in wealth and standards of living displayed across the world make sustainable development harder to achieve. Business can make an initiative by incorporate social cost, which normally beared by public, in its cost structure. By this practice, which often referred as internalising of externalities, business can help bring equality to the society as a whole.

It is an attempt of this study to scrutinize how businesses and industries, which are the most powerful forces in manipulating modern society, play their roles in bringing sustainable society concepts into reality. This study is aimed to provide a conceptual framework of sustainable business concepts through economic, technological, and social perspectives.

1.2 RATIONALE OF THE STUDY

Considering the well-known fact that business has been at the centre of power in the modern society, one cannot deny that business is a force that ought to be harnessed to effect positive social changes. However, it has been a maxim of many years standing that the goal of business and industry are incompatible with the preservation of the environment and enhancement of equality among the rich and the poor. It is unclear whether that maxim was ever true in the past, but there is certainly no question that it is untrue today. Graedel and Allenby (1995) argue that the more forward-looking corporations and the more forward-looking nations recognize that providing a suitable quality of life for earth's citizens will involve not less industrial economic activity but more, not less reliance on new technologies but more, and that providing a sustainable world will require closer attention to business-social interactions.

In the past, business and industry concern themselves almost entirely with the maximization of economic profits and only a certain remedial action for dealing with environmental matters. Hence, they emphasize regulatory compliance and "end-of-pipe" technology. Moving into a more complicate concept of sustainable development together with increasing pressure and expectation from the society, business and industry need a radical reform. Up to present there is no consensus on to what extend should the reform take place. While it is difficult for business to refute the general need for sustainability and environmental protection, their response, according to Welford (1995), has been piecemeal, adopting bolt-on strategies aimed at fine-tuning their environmental performance within the traditional constrains imposed by a traditional capitalist society. To date there have been a lot of publications aimed at telling businesses how

they can achieve a measure of environmental improvement, but rather less on posing business with a real challenge to change the very way in which it operates which will lead to real progress in the subject. Moreover, those publications mostly view problems from a single perspective. There is a need to develop a conceptual framework for green business and sustainable business practices from economic, technological, and social perspectives in order that business, together with the society as a whole, are able to further determine their policy framework regarding the matter.

A study of the vital aspects of sustainable business, focussing on its economic, technological, and social aspects, is necessary to the derivation of feasible development strategy.

1.3 OBJECTIVES OF THE STUDY

The overall purpose of this study is to examine the sustainable business concept from different perspectives including economic, technological, and social perspectives. The study concerns itself around the question of why and how regarding those perspectives. It is an aspiration of the study to suggest policy initiatives and strategies for planning and management of future generation companies, which are the powerful forces in determining sustainable future for the whole society.

1.4 SCOPE OF THE STUDY

This study focuses on the movements of business and industry in pursuing the concept of sustainable development. It begins with the discussion on the needs of modern society regarding better quality of life and better environment, which are reflected in the concept of ecological restructuring of modern society. It then goes on to look at how business and industry adopt the concept of sustainable development in their operations. Different perspectives of these efforts are, essentially, the main focus of this study. However, due to limited time period, it shows the readers specifically on the economic, technological, and social perspectives of sustainable business and industrial practices.

1.5 NATURE OF INFORMATION

This study is mainly based on secondary data and secondary information extracted from various sources including books, journal articles, official reports, and conference papers. Knowledge and some experiences of the author gained during the period of eleven years in professional practices and five years in teaching at a graduate level are informal sources of data and information.

2. CONTEMPORARY SOCIETY AND THE ENVIRONMENT

This chapter intends to provide an overview of the distinct theoretical contributions to the understanding of the relationship between the contemporary society - referred to by many authors as "modern society", "post-modern society", and "post-capitalist society" - and the environment - including physical environment and social environment. It attempts to elaborate on the spectrum of thoughts by various scholars regarding the matter and propose the linkage between those school of thoughts and the economic, technological, and social aspects of green business.

2.1 CONTEMPORARY SOCIETY: GLOBALIZATION AND LOCALISM

Every few hundred years in Western History there occurs a sharp transformation...Within a few short decades, society rearranges itself - its world view; its basic values; its social and political structure; its arts; its key institutions. Fifty years later there is a new world. And the people born then cannot even imagine the world in which their grandparents lived and into which their own parents were born. We are currently living in such a transformation. It is creating the post-capitalist society (Drucker,1993).

There is, in fact, no consensus on how to coin the contemporary society which characterized by rapid transformations of modern institutions. However, there have been several scholars who attempt to illustrate the contemporary society. Drucker (1993) describes his perception of contemporary society in his book *Post-capitalist society* in terms of structural, social, economic, and technological transformations. According to him, the western society, including those in the category of newly-industrialized countries, have move into a new and different society. The collapse of the communist regimes marked the event. He then argues that the same forces which destroyed Marxism as an ideology and Communism as a social system are

also making capitalism obsolescent. For 250 years, from the second half of the eighteenth century on, capitalism was the dominant social reality. For the last hundred years Marxism was the dominant social ideology. Both are rapidly being superseded by a new and very different society. The new society uses the free market as the one proven mechanism of economic integration. It is not, according to Drucker, an “anti-capitalist society”. It is not even be a “non-capitalist society”; the institutions of capitalism are surviving though some, e.g. banks, may play quite different roles. But the centre of gravity in the post-capitalist society - its structure; its social and economic dynamics; its social classes and its social problems - are different from those that dominate the last 250 years, and defined the issues around which political parties, social groups, social value systems, and personal commitments crystallized.

In essence, Drucker describe the “knowledge-based society” as a main characteristic of modern society. However, the environmental problems, according to him, will be intensified by the transnational nature of organization together with flows of resources and knowledge. Regarding the matter, he insists the necessity of having the responsibility-based transnational organization to deal with environmental problems.

Toffler (1995) describes the modern-society by pointing out at a transformation of the economic structure of industrial society: the evolution of a service economy, the dominance of white collar workers and professionals, the emergence of communication and computerization technology, the increasing importance of theoretical and scientific knowledge in societal reproduction and the growing economic and social preoccupation with leisure and the quality of life. He calls these changes “The Third Wave”.

The Third Wave brings with it a genuinely new way of life based on diversified, renewable energy sources; on methods of production that make most factory assembly lines obsolete; on new, non-nuclear families; on a novel institution that might be called the “electronic cottage”; and on radically changed schools and corporations of the future. The emergent civilization writes a new code of behaviour for us and carries us beyond standardization, synchronization and centralization, beyond the concentration of energy, money, and power (Toffler, 1995).

In fact, Toffler’s optimistic view of modern society regarding the environment can be expressed in the following quotation:

Many changes in the society’s knowledge system translate directly into business operations. This knowledge system is an even more pervasive part of every firm’s environment than the banking system, the political system, or the energy system...(for example) a smart computer program hitched to a lathe can cut more pieces out of the same amount of steel than most human operators. Making miniaturization possible, new knowledge leads to smaller, lighter products, which, in turn, cuts down on warehousing, transportation, and waste (Toffler, 1995).

Pasuk (1995) also sees a positive side of knowledge-based society. He argues that the present trend, in other words, the trend towards globalization, will disseminate new ideas and values about rights and conservation of environment and natural resources, which will set the universal standard to be followed everywhere. The civil society will be strengthened and the organization among the lower class of the society will have opportunities to play more roles and that there will be more pressure on the government and state to adjust their roles in line with the changes. Moreover, a network of a movement about rights and conservation will spread all over the globe and will help strengthen the civil society. This will in turn enable local community to form into organization and to manage their own society better than before.

Not all scholars are subscribed to an optimistic paradigm of the contemporary society. Gare (1995) points out the environmental crisis, which he perceives as a main product rather than merely a side effect of western-style development, as the ultimate outcome of social disorientation. He argues that this disorientation is accentuated by the globalization of economic and cultural processes. The conditions of this have been the spread of capitalism, Western imperialism and the development of global media system. The ease with which people can now communicate over long distances, the rapidity with which people can travel and goods can be transported, has brought the affluent throughout the world into closer contact, while creating greater distances between them and the people in their geographical neighbourhood. International trade has steadily increased as a proportion of the national income of almost all nations. New patterns of communication within transnational business enterprises and financial organizations have reduced the autonomy of their local branches, and capital can be moved in and out of countries with astonishing speed. To him, modern society possesses a higher degree of both resources and human exploitation.

The idea of progress was very much bound up with a particular group of people identifying themselves as having advanced more than others, as being at the cutting edge of the evolution of humanity. The notion of progress was based on a hierarchical ordering of nations and races. Such hierarchical ordering

of peoples has been threatened by globalization (Gare, 1995).

However, one of the most interesting trend that goes together with globalization is localism. According to Prawes (1995), in many places in many countries, people are interested to relearn, and expand the language, culture, local wisdom and production methods which they have inherited from their ancestors. They see traditional culture as enabling them to live a much more harmonious life in line with the natural world and the local environment. He sees this trend as parts of a reaction to the exploitative nature of present society. However, the result of the conflict between globalization and localism remain doubtful. Rangsana (1995) believes that globalization will lead to a collapse of local community and local resources because labour and resources will be exploited by the multinational companies while Chatthip and Pornpilai (1995) argues that local communities still have the potential to sustain for a long time. This is because local communities contain several strategic attributes which are favourable to their survival. These are their geographical locations, the natural environment and methods of production, historical conditions, and ways of thinking. The finding from the study of localism in Thai villages by the two authors offer challenges to the view that globalization will lead to sameness and exploitation all over the world.

One common, noticeable point made by all of the critiques on contemporary society is a dichotomic nature of modern society: exploitative while bringing better quality of life through economic prosperity at the same time. It is interesting to see how institutions and people in the society adopt this dichotomy. The environmentalist might wish economic growth would not take place. Even if people were content with their present living standards, the inevitable rise in the world's population would make growth essential, simply to keep existing standards. Therefore for millions of people who still live in poverty especially in the third world countries, growth is the only hope of a better life. Besides, most governments believe that their people want to become richer. Many also believe that, if a choice has to be made, their people would rather be wealthier than protect the environment.

Therefore, the single most important question for policy-makers is quite clear: is it possible to have both economic development and a better physical and social environment at the same time? In other words, is it possible to find a practical solution to contemporary society's dilemma? To answer this question, it is a prerequisite to take a closer look into key underlying principles of modernism which is a foundation of development in contemporary society.

2.2 KEY TENETS OF CONTEMPORARY SOCIETY

According to Norgaard (1994), contemporary society's principal beliefs arose with the successes of modern science and political reorganization in the Western world during the past three centuries. To him, the environmental disasters and social injustices identified in prior discussion on development can be shown to be rooted in these underlying tenets.

...The first important tenet of modernism is that Western science steadily advances, constantly produces better and better technologies and ways of organizing, and hence future generations will continually be better off than are current generations. Inherent in this tenet has been the idea that better technologies and social organization facilitate better control over nature, not a better, deeper relationship with nature. Belief in progress has excused people from the moral dilemma of addressing the effects of their decisions on the opportunities for the next generation. Furthermore, underprivileged peoples accepted injustices on the premise that, if they worked hard and did not fight the system, their children had a good chance of being among the privileged...The second key nexus of beliefs is at the intersection of positivism and monism. Positivism is the belief that values and facts can be kept separate. Monism is the belief that the separate sciences - physics, chemistry, biology; the applied sciences such as agriculture, engineering, and forestry; and the social sciences such as economics - lead to a unique answer when confronting complex problems. This logically lead to a conclusion that, once legislative bodies establish goals, they can delegate problems to experts to solve. This line of thought has facilitated the development and operation of centralized technocracies...and yet lay people generally are excluded from participating in most social decision-making...Third, modernism is also characterized by the belief that the cultural differences will fade away as people discover the effectiveness of rational Western culture...(this leads to the fact that modern Western society) fully expected people of other cultures to see its superiority. Alternatively, those peoples who could not see its superiority were considered hopeless cases who were impeding the progress of the majority to utopia and who therefore could be rightfully suppressed... (Norgaard, 1994).

2.3 CONVENTIONAL VIEWS OF ENVIRONMENT AND DEVELOPMENT

All three characterizations of contemporary society incorporate understanding of how modern technologies facilitate the exploitation of the environment, or the discovery of new resources and access to lower grade resources. In fact, the environment is viewed as a pool of resource inputs rather than complex system that is transformed by development. Science has been the driving force in the development process as characterized by the schematic illustration presented in figure 1. The advance of science, the spread of education necessary to generate and use science, the investment in new capital incorporating new technologies generated by science, and the design of new institutions complement each other in the development process. This process, according to Jacobs (1991) and Norgaard (1994), is almost linear. Environmental and social systems appear at the top of the schematic as the source of resources which the advance of science and the design of new institution depend upon. At the bottom of the schematic, there is a feedback within the economic system. New investments generate both a higher standard of living and a surplus for reinvestment, hence the arrow looping back to capital accumulation. Note that environment and social systems are treated as separated entities from the feedback loop.

This schematic fits the widely accepted understandings of progress and also underlies most economic explanations of development. In this schema, development might become unsustainable if technology and social order do not advance sufficiently quickly to uncover new resources and make enough poor quality resource accessible. Therefore, the solution to unsustainability, according to this schema, is to accelerate technological change and adapt society to these changes. That is if development is unsustainable, the driving forces of development - technology and social change - should be accelerated.

In contrast with the conventional worldview, the 1970s and early 1980s saw at least three school of thought with regard to the analysis of the relationship between modern society and the environmental crisis: the neo-Marxist approach, the (post-) industrial society theory, and the “counter-productivity thesis”. Each school emphasized different aspects of modernity and sought to promote different remedies for the disturbed relation between modern society and nature. The following section discusses those three school of thoughts consecutively.

2.4 THE EVOLUTION OF ECOLOGICAL THOUGHTS IN CONTEMPORARY SOCIETY

In the view of neo-Marxist, the “treatmill of production” is what cause the continuing disruption of the sustenance base, i.e., physical environment (Schnaiberg, 1980). According to him , a small number of powerful corporations continually propel the process of capital accumulation. Relying heavily on the analyses of Marxist theorists, Schnaiberg appears to reduce the different aspects of the environmental crisis to the monopoly-capitalist character of contemporary society, leaving little room for a more profound analysis of the industrial aspects of production in relation to environmental problems. Pepper (1984; 1993) has also argued that the capitalist character of modernity is the key to understanding of the modern environmental crisis. In his view, there is a failure to identify the capitalist mode of production and the class character of Western society as the central causes of the exploitation of nature and various other related social abuses. In essence, it is the capitalist character rather than the industrial mode of contemporary society which is the more important factor in the environmental crisis.

According to Mol (1995), Marxist analyses have been criticized from a radical perspective by a group of authors who can be labelled “counter-productivity” or “de-modernization” theorists. These theorist, such as Ivan Illich, Andre Gorz, Rudolf Bahro, Otto Ullrich, Wolfgang Sachs and Hans Achterhuis, criticize neo-Marxist theorists for their preoccupation with the social relations of production, which left the “forces of production” undertheorized. In the counter-productivity view, the analysis ought to incorporate the power of technology embodied in the organization of the industrial system and contemporary society if we are to arrive at an understanding of why the production and consumption system of contemporary society runs counter to the goals of which it was designed and an explanation of the increasing discrepancy between economic wealth as reflected by a steadily growing gross domestic product, and the well-being of man and nature. The industrial system is minutely administered, in an ever more centralized, hierarchical way. This centralized, hierarchical character should be analysed in relation to the technical systems that are presented in the system of production and consumption, but are no longer adapted to demands of man and nature. Finally, this model of industrial production has become widespread as an organizational device, and its technological rationality has penetrated the educational, welfare and health sectors, among others, of

contemporary society. Consistent with their analysis of the environmental crisis as part of an all-embracing crisis of the industrial system, counter-productivity theorists share the belief that a solution can only be found by partially dismantling the existing system of production, in other words, “industrial disarmament”, as called by Bahro (1984).

The third school of thought is referred by Mol (1995) as the post- industrial society theory which has the central assumption that “the development of industry and its impact on society are the central features of modern states”. What distinguishes this school of thought from the rests is its more positive evaluation of the “all-embracing logic of industrialism”. Industrial societies pass through various stages in their maturation, technology being one of the primovers and determinants of their general development. Class conflicts belong typically to the infancy of industrial society and lose their significance during the more advanced phases of its development. The adjective “post” stands for the transition into the latest phase in the development of industrial society, characterized by a shift towards a service sector based economy, the displacement of blue collar labour by white-collar labour, and the substitution of non-material values for material growth oriented conception (Inglehart, 1987). Although their portrayal of post-industrial society mainly highlights its consequences for the occupational structure, the role of science and technology, and the meaning of leisure, the changes that have taken place within the production structure, according to these theorist such as R.J. Badham, J. Gribbin, B. Ward and Alvin Toffler, considerably lessen the burden on the society and nature.

Mol (1995) gives an assessment of the consistency and adequacy of both “left-wing” (including the counter productivity theories) and the “right-wing” variants of post-industrial society perspectives by incorporating Frankel (1987)’s critiques. As for the left-wing de-industrialized, small-scale alternatives, the questions arise with respect to their factual independence from the world market and the inability of this school of thought to specify the proper scale of small-scale communities. The crucial theoretical dilemma is the way local and regional levels are thought to be related to national and international levels. To mol, intermediate or convivial technology, autonomy in social relationships on the personal as well as on the social group level, and direct responsibility for and control over materials circulating within the ecosystems are all desirable ends in themselves. But the realization of these goals in the context of local experiments thought to be exempt from power relations and market forces operating on a worldwide basis has become less realistic due to the intensification of international social relations and the increasing level of time-space distanciation within contemporary society.

Mol (1995) also argues that within the (hyper-)modernization approaches of post-industrial society theorists, local level processes of social change are analysed as the outcome of a reorganization of mainly economic production ant the international level. Toffler’s “third wave” theorem is an example of major weaknesses inherent in a theoretical scheme in which a network dominated by multinational corporations at the global level coexists with demarketized, autonomous lifestyles at the local level. Frankel (1987) illustrates the major problems involved in just simply abolishing market and state regulation at the regional and national levels, as well as those of putting too much faith in the innovative and democratic potential of multinational corporations. In short, his criticism of post-industrial society theory in its super-industrial form comes down to its lack of understanding of the capitalist character of production, in which state planning has become the prerequisite for controlling local industries.

In summary from the above discussion, the environment still play a minor role in the debates. A number of general sociological theories were applied in order to gain an understanding of the burdening of the sustenance base, but these insights did not affect the transformations in the institutional scale of contemporary society.

2.5 THE ECOLOGICAL MODERNIZATION THEORY

Several social scientists have contribute to the advancement of the ecological modernization theory into a more consistent theory of social change in contemporary society in relation with its natural environment. Developed in the beginning of 1980s primarily in Germany, the Netherlands, and the United Kingdom, the theory attempt to describes the process of ecological restructuring which refers to the ecology-inspired process of restructuring going on in the institutions of contemporary society. The process is accelerated by the side-effects of modern development, especially environmental degradation.

According to Mol (1995), the biggest contributor to the theory has been Joseph Huber, a German sociologist. Huber distinguishes three analytical categories or “spheres” in his analysis of the ecological

restructuring of contemporary society. Apart from the distinction between the industrial system (or technological sphere) and the life world (or sociological sphere), he introduces a third sphere: nature (or the biosphere). In Huber's view, the main problems in contemporary society are related to the colonization of both the sociological sphere and the biosphere by technological sphere, or the industrial system. To Huber, these problems are interpreted as structural design faults of the industrial system and can be overcome by a socio-ecological restructuring of the basic institutions of the industrial system or the technological sphere. In short, the ecological modernization theory should be interpreted as a theory of the restructuring of the industrial system in order to surmount the colonization of nature by the industrial system.

With respect to the institutional restructuring of the industrial system, the ecological modernization theory focuses on the modification of processes of production and consumption according to ecological criteria. Huber asserts that the central economic theme of the socio-ecological reconstruction will be the ecological modernization of production and consumption cycles by the introduction of new and more intelligent technologies.

In working out proposals for an ecological restructuring, Huber focuses on the industrial, rather than the capitalist, character of contemporary society as his point of departure, leading to an emphasis on technology and production forces in the reform process. He identifies two central aspects which constitute the heart of the ecological transformation or the ecological restructuring of processes of production and consumption. In the first aspect the emphasis is on technological transformations and changes which highlights the shift from end-of-pipe and clean-up technologies towards the clean production processes and products. That is, a more ecologically sound material and energy input and output in the economic system and the monitoring of these material and energy flows.

In the second aspects the emphasis is on the "economization of ecology" or the introduction of economic concepts mechanisms and principles directed at protecting the environment. This second aspect also includes a number of other elements, such as more incidental eco-taxes, the introduction of environmental liability, the redirection of insurance conditions towards environmental care, the increasing demand for ecologically sound products on the market, the introduction of the environment as a factor in economic competition and of environmental audits as a precondition for commercial loans and economic investments. The general aim is to get economic actors to systematically take environmental considerations into account in their participation in economic processes of production and consumption. In this way, nature and environmental resources are to regain an institutionalized place in economic processes and decision making.

In addition to introducing the technological sphere as the causal factor inducing socio-economic change, the theory introduces a multi-dimensional model of contemporary society in which all core institutions interact and jointly develop towards a next socio-economic change, characterized by its ecological soundness. Neither of the institutions has any primacy in societal development. The main preoccupation remains, however, with the interaction between technology and economy via the transformation of processes of production and consumption. The developments along these two dimensions reveal the core of the theory and it is, in fact, both a normative and a descriptive theory at the same time.

The crucial question to be asked with regard to the universal validity of the theory is whether the theory could be applied to developing countries. According to Mol, a "transfer" of the theory may show some similarities with the transfer of technology from the North to the South, which will not always be adapted to the local social, institutional, ecological and cultural contexts. However, the theory seems to be more appropriate to certain geographical areas including New Industrializing Countries because of the globalization of every aspect in contemporary society especially technology, markets, and environmental consciousness. He proposes that an attempt should be made to perform more empirical studies and theoretical elaborations in different sectors and countries in order to improve this theory of ecological modernization.

In summary, the ecological modernization theory attempts to find practical solutions, rather than merely criticize, for the contemporary society to react to the problem of environmental degradation. The subsequent chapters will look at those aspects - economic, technological, and social - stated by the theory in more details.

3. SUSTAINABILITY : A CHALLENGE TO BUSINESS

Environmental and other social problems are a major and urgent issue facing the society. In spite

of recent technological advances, the scale of this worsening situation is new and global, and recognized increasingly as being outrageous. It is connected directly with the industrialization of the last two centuries. The challenge is that “business-as-usual” is not sustainable in the long term; the fundamental issue is how businesses can be managed to have an improved environmental, as well as corporate performance, with the least other negative side effect to the society. The focus of this chapter is on the conceptual framework of sustainable business practices.

3.1 A PRACTICAL CONCEPT OF SUSTAINABLE DEVELOPMENT

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992 put the spotlight on environmental issues and on the need to achieve “sustainable development”. The issues demonstrated the global realization that healthy economies depend on healthy environment. In fact, sustainable development implies a new concept of economic growth, not only a call for environmental protection. It has been defined in the *Bruntland Report* by the World Commission on Environment and Development (1987) as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. According to Tapper (1994), Sustainable development involves four key components:

- *Integrating the environment and the economy* - recognizing that the economy and the environment interact, and that economic gains in the short term which are bought at the expense of the environment cannot be economically sound.
- *Long-term planning* - recognizing that a focus on short term economic planning inevitably undermines the long-term delivery of a decent environment, since it places little value on long-term outcomes; and that to deliver a healthy environment requires long-term planning which respect environmental time scales.
- *Equitable sharing of resources throughout the world* - recognizing that without a fairer sharing of resources within and between countries, those who have the most are liable to over-consume and to use resource in ways that are environmentally unsound, while those who have least are forced into short-term, environmentally damage activities in order to survive.
- *Protecting the environmental assets* - recognizing the need to retain environmental assets also known as “critical environmental capital” (including the quality of air and water, soil fertility and biodiversity) above minimum thresholds, and that this imposes limits on the use of physical space, the management and consumption of resources, and emissions of pollution and waste.

Another definition of sustainable development seems to possess a more general concept: Sustainable development is a process in which economic, fiscal, trade, energy, agriculture, and industrial policies are all designed to bring about development that is economically, socially and ecologically sustainable. That is, current consumption cannot be financed by incurring debts that future generations must repay. And natural resources must be used in ways that do not create ecological debts by overexploiting the carrying and productive capacity of the earth (Human Development Report, 1992).

The above mentioned definitions of sustainable development are, in fact, concise and easy to conceive. However, these abstract definitions seem to put more burdens on how to materialize the concept especially with regard to business framework. The challenge of defining sustainable development is much complicate than expected. Norgaard (1994) argues that sustainable development cannot be defined operationally because materials and energy flow in and out any system boundaries that we try to control their sustainability, whether they are local, regional, or transnational boundaries. There is no way that societies could keep track of all of the flows that are quantifiable, no way that they could make sense out of them if they did, and no way to keep track of the unquantifiable flow, for example technology, at all.

However several attempts have been made by academics and business organizations in order to identify operational frameworks of sustainable development in business practices. The very first attempt based the idea solely on the ecological side of sustainable development. Therefore, it is essential to illustrate how businesses and ecological systems are related.

3.2 BUSINESS, INDUSTRY, AND ECOLOGICAL SYSTEMS

A simple explanation regarding the relationship between the systems is that business and industry use water, energy, and resources to produce goods and services. Waste are generated in the production process and, once the goods and services are used up, they are disposed of, and become waste. Business and industrial system is powered predominantly by fossil fuels. It has high reliance on non-renewable resources, and on use of renewable resources, including fresh water supplies, at rates in excess of their capacity to generate. A low proportion of waste is recycled; pollutants and most waste are produced at rates in excess environmental capacities to detoxify them, and accumulate in the environment - land, air, and water. Many are ,in fact, inherently toxic.

By contrast, ecological system or ecosystems are powered by renewable energy ultimately derived from the sun. Ecosystem rely predominantly on the recycling of limited stocks of essential element, i.e., ecosystem growth is resource-limited and does not exceed rate of nutrient recycling. In the most mature ecosystems a large proportion of the nutrient stock is incorporated into the biomass of organisms. These take organic wastes as their resources and energy source; the capacity of the ecosystems matches the rate of inflow of wastes and dead organism.

Tapper vividly illustrates how industrial system and ecosystems interact, and points out how the structure and function of ecosystems provide an ultimate model for sustainable business and industry.

As business and industrial systems interact with ecosystems, changing land-use and overuse of biological resources reduces the overall level of biological capital and ecosystem functioning. Intensive harvesting of particular species changes ecosystem composition and functioning, and introduces instabilities. Industrial wastes entering ecosystems are an additional burden and exceed ecosystem waste handling capacity; many of the wastes are toxic, and further impair waste handling, as well as the regenerative capacity of ecosystems. Where industrial waste are also ecosystem nutrients, growth of certain species is promoted and pushed out of balance with the rest of ecosystem; the waste products from this accelerated growth overwhelm waste handling capacity and reduce available resource to the rest of the ecosystem - this positive feedback loop continues until ecosystem function is severely impaired, and ecosystem composition is changed...once critical thresholds are crossed, outcomes become highly unpredictable, and the possibility of dramatic and catastrophic change is large...The essence of this is that the structure and function of ecosystem provide a model for sustainable industry. We need to change industrial systems as well as process so that they will become: cyclical; more efficient at conserving resources and; avoid the release of wastes, especially toxic waste. This will require the redesign of industrial processes and products so as to reduce the consumption of resources and energy. It also requires a move away from those industries that are least sustainable, and towards those that have a sustainable lon-term basis (Tapper,1994).

Yet, Tapper does not elaborate on to what extent should an organization adopt itself towards a more environment-friendly organization.

3.3 THE “GREEN SCALE”

In order to measure improving environmental performance there is a need to define an ultimate goal towards which the organization must move. Welford (1995) define this utopian form of organization as the “transcendent firm”. This firm has ideals very similar to those of green philosophy and performs in a way which is completely consistent with an ideal environment-friendly organization. He then place this firm at one end of his “green scale”. At another end, There is a firm called “resistant firm”. Thus the firm’s environmental performance would be represented by extreme resistive behaviour. The organization’s prime and ultimate motive would be profit and satisfaction of shareholders. Firms can, therefore, be categorized in between these hypothetical organizations according to the organization’s environmental performance on the scale developed by Dodge et al. (1993). The scale is represented by the following interval values:

- | | |
|----------------|--|
| <i>Stage 1</i> | Total resistance to environmental values and rules. Organizations would be absolutely unresponsive and reactive to environmental initiatives. |
| <i>Stage 2</i> | The organization observes environmental laws but actions reflect an unwilling attitude or lack of ability to comply. Action are being enforced through legislation or court decisions. |
| <i>Stage 3</i> | Organization begins to adapt to change. Early indications of proactive and responsive behaviours. Actions are no longer based entirely on complying with environmental |

legislation but the organization begins to exhibit voluntary behaviour.

Stage 4 The organization voluntarily seizes and preempts its actions with environmental concerns. It proactively engages in setting the agenda. It is responsive to the many external stakeholders.

Stage 5 The organization's environmental values, attitudes, belief and culture exhibit a total support for the environment. The organization would proactively support and responsive to all living things. It would act in a way which is fully consistent with sustainable development.

The scale thus gives an idea of how a certain organization can become "green". However, in order to comply with the ideology of sustainable development, business and industry should consider a more holistic mode of operations which depart from merely environmental consideration, to the one embracing social responsibility and equity.

3.4 BEYOND ENVIRONMENTAL PERFORMANCE

One of the challenges of sustainable development is for the society to consider modes of business and industrial organization as well as the internal organization of the firm that lead towards a future which promotes environmental quality and equity. This section explores in more detail the sort of business-related strategies which firms will need to adopt firstly in order to be compatible with sustainable development concept. In fact, the strategies to achieve the goal of sustainable business are still evolving. Many authors suggest their strategies based on their ideology, beliefs and experiences. It is an intention of this study to leave this section open-ended, hoping to develop a comprehensive and practical strategies upon what are discussed here.

Until recently, the debate on sustainable development in business practices has largely been one of rhetoric rather than action. While it is difficult for business to refute the general need to conform with environmental and social forces, to date there has been little practical guidance as to how real progress might be made. The need now is to develop patterns and practical solutions to meet the challenge of sustainable development. Businesses are central to the problems and to the solutions. Changing those powerful businesses practices to more sustainable ones can ensure prosperous future of the society. Indeed, the involvement of business is crucial if the world is to achieve sustainable development because governments have many critical short-term issues demanding their attention. The activities of many government, especially in the developing world, may thus be rather insular for the foreseeable future. At the same time, businesses are increasingly multinational, have longer time horizons, and depend for their survival and prosperity on relatively stable global business conditions and on responding to the desires and concerns of many different groups. Private firms, not governments, choose, develop, implement, and understand technology and management. Hence, responsible corporations may turn out to be among the global leaders in the transition between unsustainable and sustainable development (Graedel and Allenby, 1995).

An effective approach to achieve the goal of sustainable business requires not only dynamic management of innovation, but also a radical transformation in a number of critical areas of business. This transformation task that faces business stakeholders in all kind of business is unique because it demands fundamental changes in many traditional assumption and beliefs. One of the authors who suggest this is Davis (1990), who proposes radical business transformation strategies, which inspired by the book "*Small is Beautiful*" written by E.F. Schumacher - a renown economist. These strategies are:

1. A corporate vision of stewardship

Conventional mission statements of most companies have been narrowly written. The vision they have embodied have failed to suggest a vital and responsible engagement in a creative endeavour necessary for general benefit. A company lives not only by its mission statement, but also operates with a set of common values. They vary somewhat from company to company, but in general they reflect the conventional underlying beliefs and assumptions of business and industry. The radical change arising out of the moral choice to pursue a course of sustainable development must, according to Davis, result in a change both in the shared values and in the vision of a company.

2. An appropriate scale of operation

One of the most serious problems of any company that has to be intensely innovative is the inertia a large organization experiences in making rapid responses to the need for frequent change. Since a change of direction towards sustainable development necessary means that innovation in all kinds of business will become more intense, it is important to consider carefully the optimum size of operation.

3. The measuring of sustainability

All of the various measurements that play a vital part in the daily lives of managers have been devised to provide the kind of information they require to run their businesses in accordance with the assumptions and belief about what is important and unimportant in economic life in general and business life in particular. With a new set of assumptions and beliefs in sustainable business, and a new vision set of common values for the company that are a basis for sustainability, managers will need to modify some of the numbers they use daily and eliminate others. Some new numbers will need to be introduced. For example, life cycle costing rather than discounted cash flow. Without such changes a company is likely to continue on a "business as usual" course, no matter what the expressed intentions to change may be, or how sincerely they are held.

4. Flexible work arrangements

The monolithic, hierarchical form of work should be replaced by multi-dimensional arrangements, or network arrangements. The potential of information technology is enabling these new work arrangements. The marriage of business needs with the needs of the workforce will frequently produce companies with small core operations that employ the services of a cluster of specialist suppliers of skill, knowledge, technology and effort. Some of companies and the society will even increase their benefit if some of their core in-house activities are carried out by employees working from home rather than from a company plant or office.

5. An orchestral style of management

In the best companies autocratic and paternalistic management styles have been gradually changing to more consultative forms. With the emergence of "total quality management" a further advance is being made towards greater participation at all levels. The challenge of sustainable development should accelerate in all kinds of company. The principal reason is that "man management" becomes an even more critical factor than it has ever been. Comparatively small teams of highly skilled professionals in a wide variety of specialism can only be led successfully with the kind of leadership - such as is displayed by the conductor of an orchestra - that inspired full participation.

6. Enduring quality

The value changes that are both explicit and implicit in a move towards sustainability will have profound effects on the meaning of quality and its expression. Across the entire business spectrum the concept of quality are likely to undergo very many changes, from the rather narrow contemporary concept to questions of resources and environment, new codes of good practice and new standards for managers and professionals.

7. Just forms of ownership

Sustainable development requires responsible, long-term investment from sources that have both a vest interest in the corporate agent and a legal obligation to serve the common good as well as the stakeholders. The "absentee landlord" system, as it presently operates, is not best suited to that role; alternative forms of ownership need to be promoted. The choice being made for sustainability is based on principles of natural justice and equity. For this choice to be effectively pursued similar principles must be employed within the agencies that are engaged in the task. Thus businesses must be seen to be operating on just and equitable principles. The example of the Body Shop in the UK, Bangchak Petroleum in Thailand, and other franchising examples point the way to alternatives that decentralize ownership, control and obligations creates a closer relationship between investment and a particular small group of workpeople.

8. Convivial rules of the business game

The rules that govern the operation of businesses have been designed to foster the "indiscriminate" growth that is leading towards environmental and ecological damage and the rapid exhaustion of some non-renewable resources. They have also led to concepts of quality, types of technology, instruments of business management and systems of corporate ownership that appear to be inappropriate to the concept of sustainable development. Therefore, they must be carefully tested against the new principle.

9. Systemic technology

It is clear that much more careful attention will have to be paid to any new technological developments. In particular, all possible side-effects will need to be studied in great detail before widespread use is allowed. Since the beginning of the Industrial Revolution the process of development has become increasingly fragmented as knowledge and experience have accumulated and individuals have become more specialized. As a result the focus of attention has tended to be on the achievement of progressive improvement in "elements of the total system". Instead of maximizing the performance of one element of the system, it is crucial to optimizing the whole system. The subsequent part of this study, the technological perspectives of green business, deals specifically with this matter.

Davis, in fact, laid down many interesting points towards sustainable business practice. However, the criteria used to assess the "sustainability" of certain companies are, in fact, vary among researchers and difficult to formulate. According to Davis(1990), sustainable development is a complex idea which, from a business point of view, can be described as something that (a) uses renewable resources in preference to non-renewable, (b) uses technologies that are environmentally harmonious, ecologically stable and skill enhancing, (c) design complete systems in order to minimize waste, (d) reduces as much as possible the consumption of scarce resources by designing long-life products that are easily repairable and can be recycled and (e) maximizes the use of all the services that are not energy- or material-intensive, but which contribute to the quality of life. In a more quantitative forms, these criteria are:

- Efficiency in resources utilization
- Work satisfactions such as spiritual growth, creativity, dignity
- Relationship with community and pressure groups
- Clean technology
- Amount of non-economic activity which enhance society
- Degree of participation and decentralization of power
- Stakeholders' well-being
- Use of renewable resources
- Ownership by communities
- Product quality and environmental soundness of product
- Investment policy
- Shared values and Management's vision of sustainability

In pursuing the challenges imposed by the societal, economic, and regulatory forces, there are many organizations that currently act as a catalyst in this "sustainable reforming process", although they are not totally comply with the above criteria. One example is the Thailand Business Council for Sustainable Development (TBCSD). It is established with an aim to provide business leadership as a catalyst for change towards sustainable development through offering an implementation of constructive policy and action oriented projects design to clean-up the environment and introduce a better lifestyle for the public at large. The members of these kind of organizations are the targets that this study aims to collect primary data by intensive research through qualitative case studies.

Internationally, there are a lot of evidences regarding business initiative in sustainable development. Books by Roddick (1991), Hopfenbeck (1992), Jackson (1993), Welford and Gouldson (1993), Vaitilingam (1993), Taylor et al. (1994), Cairncross (1993;1995), and Hawken(1995) provide a considerable amount of case studies in the western countries. They confirm that a large amount of business corporations in every sectors are redirecting their practices towards a more sustainable way of doing business.

4. ECONOMIC PERSPECTIVES OF GREEN BUSINESS

A paradoxical behaviour of modern society that shows demands for higher material consumption and environmental protection at the same time induces a rationality of having effective regulations, policies, and instruments for measuring the trade-off. Currently, the political condition for actions to protect the environment and ensure better equality, especially in the developed and developing countries, are created among governments, consumers, and businesses as a result of this paradoxical trend. As a consequence, government interventions in the form of rules and regulations are put into action which, in practice, create both controversy due to inconsistency of enforcements and economic burdens for stakeholders. The illusion of choosing between economic growth and environmental quality treats economic growth, quality of human

life and the environmental quality as if they are incompatible alternatives. That is, the idea not only fails to recognize the dependency of economic activity performance on the health of the ecosystems, but also poorly reflects human needs which is a holistic pursuit of economic, social, and environmental goals. At present, environmental regulations cost countries a large and increasing amount of money. Most developed countries spend between one to two per cent of their gross domestic product on environmental protection, and that proportion is likely to rise over the rest of the century (Cairncross, 1993). It is therefore important not just that environmental priorities are carefully chosen, but that regulations are applied in the most cost-effective way possible. Otherwise, their impact on economic growth is more likely to be unacceptably high to the governments and the societies that have to enforce them. However, this chapter argues that economic instruments, rather than government rules and regulations, ensure a more viable framework for business operations to pursue sustainable growths due to their equitable rationality and their cost-effectiveness. The logic is simple, the more governments can hold down the costs of complying with standards, the more they are likely to persuade polluters to assume a different set of costs: those of preventing pollution and negative side-effect to society. The chapter then goes on to discuss the topic of international trade and the environment as a broader perspective of economic roles in sustainable business.

4.1 GOVERNMENT REGULATIONS

In a large and complex society, Government may have to intervene to protect the environment. The traditional approach to environmental protection has been to make regulations imposing standards on business and consumers. Government intervention and regulations are stemmed by the fact that the “invisible hand” of the market fails to align the interests of the individuals or individual companies with those of the society at large. In most production and consumption activities, the costs to the environment and to the society exceed any private cost to individuals and companies. As a consequence, governments need to step in to align private costs with social costs although the practices are rarely the most cost-effective way to clean up. According to Jacobs (1991), the oldest remedies against environmental damage are through the court. But since the nineteenth century, and the spread of industrialization, the machinery of common law has increasingly been supplemented in two important ways. Governments have devised regulations; and more recently, they have tried to develop various sorts of economic instruments, which will be discussed later in this chapter. At the same time, there has been a growing awareness that the activities of governments can themselves be environmentally harmful. In short, the market can fail, but government can also make mistakes.

Most governments primarily use regulations to protect the environment. They tell companies and other bodies what to do. Cairncross (1995) argues that from the economist’s perspective, such policy are second best: regulation carries a variety of economic costs. Economists, therefore, devote much energy to the search for alternative policies that minimize the costs of intervention. Some have looked for ways to extend the concept of property rights, so that individuals have a greater incentive to care for the environment, and the court can use the common law to discourage damage. While the other most cost-effective method of intervention described by Daly (1977) as “Depletion Quotas” is, in principle, very attractive, the method aims, however, at reducing production and consumption which may have trouble altering the society’s consumption behaviour if it is put into practice by the government. Therefore, an alignment with public opinions and behaviour is also a crucial factor determining effectiveness of regulations.

The regulation that aims at zero pollution is rarely a wise one for three reasons: first, a small amount of pollution may not be harmful; second, the investment cost to reduce pollution to insignificant amount is far more expensive than the one allowing a reasonable amount of it; third, the goal posts may be altered, better measuring techniques may allow people to measure lower concentrations of pollutant. Just because a pollutant can more readily be detected, it is not necessary more dangerous. As a consequence, emission standards are set either by mandating a particular technology, or in terms of requirement on environmental quality of a certain area. Therefore environmental standard should vary from place to place. The most vulnerable parts of the environment should have a lot of protection while those parts that matter less should not. Again, degree of vulnerable depends upon government bodies.

The gap between legislative intention and actual enforcement often mentioned as one of the serious failure of government regulations cited by several authors such as Baumol and Oates (1971); Pearce et al. (1990); Cairncross (1993; 1995); Porter and van der Linde (1995).

According to Cairncross (1995), government regulations do not perform well as a policy tool due

to the following reasons:

- Regulation encourages government to do what it does worst: second-guess companies about what is the best technology to achieve a particular goal.
- Regulation rarely attempts to balance costs and benefits. The costs are often disguised: if municipality waterworks has to install expensive sewage-treatment and so raise its rates, customers may blame it, not the government, for setting higher standards.
- If regulations are strictly enforced, they tend to load high costs on to some polluters, low costs on to others. A company that is installing new plant may find it relatively cheap to meet higher regulatory standards simply by changing the specifications for equipment. A company with a lot of old plant, making low profits and not investing, will find that stricter regulations drive it out of business. But in fact regulations are often tougher for new entrants to an industry than for existing firms. As a result, they may discourage investment in new equipment even if it is cleaner than the old one.
- Regulation tends to set a floor as well as ceiling. No polluter has any incentive to discharge even less dirty waste into the local river than the regulation allows; and no entrepreneur has an incentive to develop technology that reduces pollution even below the minimum regulation.
- Regulations work best when they are applied to a few large polluters. But as pollution increasingly comes from many small sources, governments will have to turn to taxes and fees to encourage clean-up.

However, the most favourable point for regulations is that it is very comfortable to issue and implement: governments know what they are asking for, people know what they are getting, and companies know what they are supposed to deliver. Moreover, because regulations generally conceal the true costs of a policy, environmental standards can be set higher than they would be if their true costs were understood (Cairncross, 1993).

4.2 PRICING THE ENVIRONMENT

In search of an effective market-based economic policies, economists have frequently proposed the adoption of a system of taxes and subsidies to control externalities, where the tax on a particular activity is equal to the marginal social damage it generates. In practice, however, such an approach has rarely proved feasible because of our inability to measure marginal social damage. Baumol and Oates (1971) concluded in their research on the use of standards and prices for protection of the environment that we established a set of admittedly somewhat arbitrary standards of environmental quality (e.g., the dissolved oxygen content of a waterway would be above x percent at least 99 percent of the time) and then imposed a set of charges on waste emissions sufficient to attain these standards. While such *resource-use prices* clearly will not in general produce an efficiency in resources allocation, it is shown that they nevertheless do possess some important optimality properties and other practical advantages. In particular, it is proved that for any given vector of final output such prices can achieve a specified reduction in pollution levels at minimum cost to the economy, even in the case of firms with objective other than that of simple profit maximization.

In order for the process of valuing the environment to be more practical, Pearce, Markandya, and Barbier (1990) suggested some implications of the valuation procedures. These implications are:

1. By at least trying to put money values on some aspects of environmental quality we are underlining the fact that environmental services are not free. They do have values in the same sense as marketed goods and services have values. The absence of markets must not be allowed to disguise this important fact.

2. By trying to value environmental services we are forced into a rational decision-making frame of mind. Quite simply, we are forced to think about the gains and losses, the benefits and costs of what we do. If nothing else, economic valuation has made a great advance in that respect.

3. Many things cannot be valued in money terms. That is altogether different from saying they are “priceless” in the sense of having infinite values.

4. The fact that we find positive values for so many environmental functions means that an economic system which allocates resources according to economic value (i.e., consumer preferences) must take account of the positive economic values for environmental quality. Yet the actual values are zero in

many cases.

4.3 POLLUTER-PAYS PRINCIPLE

Dominated by the environmental pricing and the production-consumption behaviour of the society, the polluter-pays principle is believed by the author to be the most effective market-based economic policy. It works by creating incentive to become cleaner. When properly designed, the policy should impose on a polluter the costs that would otherwise be dumped on the environment. As described by Cairncross (1993), the policy has two primary advantages namely the short term and the long term. In the short term, it will generally provide a given level of environmental improvement at a lower cost to society than will regulations. This is because polluters will have an incentive to reduce the amount of pollution they produce for as long as it is less expensive to do so than to pay more environmental charges, using the technology they judge to be most efficient. Regulations, by contrast, take account of the costs of cleaning up only in a rough and ready way. In the long run, it offers companies and individuals a continual argument for going further than a standard would demand. If companies pay a higher rate for every unit of toxic material they dump, they have an incentive to use as little toxic material as possible and to look for new technologies available that use none at all. The consequence is a positive incentive to buy less polluting technologies instead of an incentive to postpone changes as with regulations. According to the research by Porter and van der Linde (1995), tougher global market-based environmental policies can enhance competitiveness by pushing companies to use resources more productively and encourage managers to recognize environmental improvement as an economic and competitive opportunity due to the enormous opportunity cost of pollution-waste resources, waste effort, and diminished product value to the customer.

4.4 A HOLISTIC GROWTH

In pursuit of a sustainable growth, a society needs a holistic approach of economic development. The word “holistic” implies paradoxical goals of economic prosperity, environmental sustainability, and social stability. The market-based economic policies for environmental protection discussed here give lights to those desired goals. Although it is hard to deny that environmental regulations and standards are needed to inaugurate an era of cleaning-up the country, the method is not considered to be cost-effective and may create negative side-effect to the process of capital accumulation in the long run. Technological innovation in the form of cleaner production and efficient process is a prerequisite for capital accumulation in this stage of development. To encourage innovation and competitiveness for the private sector, economic policies such as polluter-pays principle is needed. To be effective, the polluter-pays principle must be aligned with the natural assimilative capacity (i.e., capacity to assimilate pollution and waste) possessed by each geographical area of the country. Last but not least, it is a powerful economic policy for the protection of our environment considering our aims for both economic growth and better quality of life.

5. TECHNOLOGICAL PERSPECTIVES OF GREEN BUSINESS

Reorientation of the economic system of production and consumption or in other words business transactions, as stated by the previous chapter, requires three fundamental preconditions if it is to be feasible. According to Manzini (1993) these preconditions are: availability of appropriate technological strategies; social consensus; and a new value system match by new quality criteria, with qualities that will be at the same time “environmentally sustainable”, socially acceptable, and culturally valuable.

This chapter orients itself towards the first precondition, i.e., the technological strategies to pursue sustainability in business and industrial practice and involves mostly with the production aspects of business. Such technological strategies in production will, basically, need to be resource-conserving, pollution preventing or environment-restoring and at the same time economically viable. Many articles such as by Crosson and Rosenberg (1989); Gibbons et al. (1989) and; Hoagland (1995) show that significant technological progress has already been made toward delivering desired end-use services at significantly lower environmental costs. Surprisingly, the economic costs of the “conserving technologies” also often turn out to be lower. Cost advantage - not environmental concerns - are responsible for, for example, enhancing energy conservation technology around the world. In short, the biggest obstacle to successfully implementing “conserving technologies” is economic viability of a project, not the technologies themselves. However, the economic criteria used by most decision makers mainly concern investment costs. There is a growing need for a holistic approach to effectively assess technological investment, such as the life-cycle assessment

approach, in order for cleaner technologies to be marketable.

Davis (1990) argues that much more careful attention will have to be paid to any new technological developments. In particular, all possible side-effects will need to be studied in great detail before widespread use is allowed. Since the beginning of the Industrial Revolution the process of development has become increasingly fragmented as knowledge and experience have accumulated and individuals have become more specialized. As a result the focus of attention has tended to be on the achievement of progressive improvement in “elements of the total system”. Instead of maximizing the performance of one element of the system, it is crucial to optimizing the whole system. This chapter intends to provide such conceptual frameworks by introduce the concepts of Industrial Ecology and Clean Technology.

5.1 SUSTAINABLE DEVELOPMENT AND ENGINEERING

Technological progress via engineering projects is the most distinct evidence of development. Businesses use innovation in engineering as their workhorses to achieve economic success. Invention in all forms enter markets as products or processes for everyday use. Although engineering brings better quality of life for societies as a whole, pollution is also the adverse phenomenon from most of the engineering progress. Sustainable development, from the engineering point of view, is an effort to use technology to help clean up the pollution it helped make, and engineers will be central players in its success or failure. Key aspects include more efficient energy use through conservation measures and switching to renewable resources, waste minimization, much greater recycling and reuse of materials, more comprehensive economic/environmental assessments employing product life-cycle analyses, and better management of resources.

The importance of incorporating environmental concerns with technical development projects is stressed by Prendergast (1993):

“If you look at the practice of engineering over the past 150 years, engineers have embraced protection of public safety as a goal that has been integrated into every discipline.

In 10 to 15 years, our goal is to integrate the principles of sustainability in the same way, so that an engineer would no more design a project that was unsustainable than one that is unsafe.”

To an engineer, a sustainable system is one that is either in equilibrium, operating at a steady state, or a system that changes at a rate considered to be acceptable. As a model for sustainability, Prendergast proposes natural ecosystems like hydraulic, food and climate cycles - “close loops” that change only very slowly and allow for natural environmental adaptation - in contrast to the “linear approach” humanity has taken up until now. Figure 2 illustrates these systems.

MacNeill (1989) argues that another essential condition for sustainable development regarding technological progress concerns the nature of production. If growth rate of up to 3 or 4 percent in the industrialized countries and up to 5 or 6 percent in developing countries are to be sustained, a significant and rapid reduction in the energy and raw material content of every unit of production will be necessary. Thanks for achievements in engineering progress that evidences of positive signal for sustainability are emerging. During the past two decades, economic and technological changes have resulted in the absolute reduction in the demand for energy and some basic materials per unit of product. Nowhere has this been more marked than in energy. Following the first oil shock, between 1973 and 1983 the 24 OECD members, all industrialized nations, improved their energy productivity on average by 1.3 percent annually (Patrick et al., 1993). The same trends are evident in many other areas such as water, steel, aluminum, cement and certain chemicals.

The transition to recycled materials is an integral part of limiting the material content of growth, and this transition is, according to MacNeill, already well under way in some countries. The potential gains remain enormous, however, if only because most countries and industries have a long way to go just to catch up with the leaders in this technology.

When an industry reduces the energy and material content of its product, it saves on overall cost per unit of production and reduces environmental emissions and wastes as well. In fact, this is often a more effective way of reducing emissions than expensive “end of pipe” technologies that serve no other purpose. The environmental benefits of resource reduction and recycling extend back to the beginning of the production cycle. They manifest themselves in decreased mining and mining wastes, decreased consumption and pollution of water, decreased air pollution, decreased deforestation and decreased erosion. Thus

engineering achievements that have put more burdens on the environment are becoming more and more environment-friendly. The subsequent sections deal specifically with these emerging holistic and systemic view.

5.2 INDUSTRIAL ECOLOGY

The end of the 20th century has seen a subtle change in the way many industries are confronting environmental concerns: They are shifting away from the treatment or disposal of industrial waste and toward the elimination of its very creation. This strategy attempts to get ahead of the problem, so that society is not destined to face an ever growing mass of waste emanating from the end of a discharge pipe or the brim of a garbage pail. It seems likely that the next century will see an acceleration of this trend, a clear departure from the past emphasis - by industry, by government regulators and even by most environmental organizations - on late-stage clean up (Frosch, 1995).

The trend mentioned by Frosch is now gaining its momentum. What most people would like to see is a way to use industrial waste productively. In fact, it is money going out the door in the form of processed material and its embodied energy. To avoid this inefficiency, manufacturers need to consider how to design and to produce products in such a way as to make the control of waste and pollution part of their businesses. There is a need to pay attention to the entire product life cycle, worrying not only about the materials used and created in the course of manufacturing but also about what happens to a product at the end of its life, that is, at disposal - in terms of a disposal problem and a source of refined material and energy. In short, attention is paid to the potential effects of excess waste and pollution in manufacturing at the very start of the design phase.

Frosch also mentions that overcoming these problems is in part a technological problem. However, the answer is not depend entirely on those breakthrough technologies, but rather based on “coordinating” the conventional methods in more prudent ways and on developing legal and market structures that allow suitable innovation. These efforts involve complex considerations of product and process design, economic and optimization, as well as regulation and handling of hazardous materials. Thus, the answer relies on a holistic rethinking of how to systematically incorporate the lesson from nature about reuse and recycling in manufacturing processes on a larger scale. That is, viewing industry as an interwoven system of production and consumption. The analogy with nature suggest the name “industrial ecology” for this idea.

The core ideology of this concept is that, the nature as an integrate whole minimizes waste. Almost nothing that is produced by one organism as waste is not for another organism a source of usable material and energy. All plants and animal, dead or alive, are food for something. In this perfect natural system, matter and energy go around and around in large cycles, passing through a series of interacting organism.

With this insight from the natural ecosystem, the idea is whether there are ways to connect different industrial processes that produce waste, particularly hazardous waste. A fully developed industrial ecology might not necessary minimize the waste from any specific factory or industrial sector but should act to minimize the waste produced overall. The essence of industrial ecology in a larger perspective can be described as follow:

Industrial ecology is the means by which humanity can deliberately and rationally approach and maintain a desirable carrying capacity, given continued economic, cultural, and technological evolution. The concept requires that an industrial system be viewed not in isolation from its surrounding systems, but in concert with them. It is a system view in which one seeks to optimize the total materials cycle from virgin material, to finished material, to component, to product, to obsolete product, and to ultimate disposal. Factors to be optimized include resources, energy, and capital...A full consideration of industrial ecology would include the entire scope of economic activity such as mining, agriculture, forestry, manufacturing, and consumer behaviour (Graedel and Allenby, 1995).

This definition tends to encompass all the activities in the economic system. However, to begin materialize the concept, many requirements must be met for this redirection to be accomplished. As incentive for designing and producing something specifically so that it can be reused, companies will need reliable markets. Many early attempts at recycling failed because they just collected materials - a pointless exercise unless somebody actually wants to use them. If there are going to be markets for what would otherwise be waste, information will need to be available on who has what, who need what, who use what. This information is typically inaccessible now because companies tend to be secretive about their waste stream (Davis and Hyfantis, 1993).

In addition to the need for more complete market information, society requires rational regulations to make this concept of industrial ecology possible.

Frustrations with regulations frequently arise because we have fostered and develop environmental laws that attempt to deal with one problem at a time. The regulatory framework focuses on disposing of or treating industrial wastes without regard for the possibility of minimizing or reusing them. In fact, it often acts to thwart recycling. Once a substance is classified as hazardous waste, it becomes extraordinarily difficult to do anything useful with it, even if the material is identical to a “virgin” industrial chemical readily bought and sold on the open market (Frosch, 1995).

This situation clearly illustrates what can be a serious problem: well-meant environmental regulation can have the adverse effect of increasing both the amount of waste created and the amount to be disposed, because it puts up high barriers to reuse. In short, in order for the concept of industrial ecology to be effectively in practice worldwide, there is a need for the fundamental reorganization that allow used materials to flow freely between consumers and manufacturers, between one firm and the next and between one industry and another. The burden for industrial ecology concept is not a technical, but rather a managerial one.

5.3 CLEAN PRODUCTION

Industrial ecology strategy looks at the technological perspective of green business and industry in a rather comprehensive way. A more details technological framework can be found in the concept of cleaner, or simply clean production strategy.

Clean(er) Production can be defined as the method of product manufacturing under which raw materials and energy are used in a rational and integrated way in the cycle. Hence the production and consumption of both raw materials, resource and secondary material resource must be incorporated in the cycle so that any impact on the environment does not disturb its normal functions (Modak et al.,1996).

It has to be stressed that both the industrial ecology and the clean production are the two side of the same coin. Clean production tends to put its priority towards optimizing each individual components of the industrial system while industrial ecology tends to optimize the whole entity. At present, clean production seems to be the focal point in order to begin materialize the concept of industrial ecology.

Jackson (1993) identifies two operational pathways of clean production. In the first place, the environmental impacts of the processes, product cycles, and economic activities are minimized by reducing the material flow through those processes, product cycles, and activities. If this reduction in material flow is to occur without loss of services, it means the material efficiency of those processes. Thus the need is called to improve the efficiency with respect to the throughput of energy and materials. Secondly, the recognition that certain kinds of materials represent priority hazards in the environment highlights the need for substitution of hazardous materials, products, and activities with less hazardous ones.

There are steps to be taken by business for a successful implementation of a clean production strategy as suggested by Modak (1996):

1. Undertake an environmental review of a business and raise awareness of environmental issues. A natural outcome is the preparation of a business environmental policy endorsed by the top management, and an appropriate management structure. A commitment from the management team is essential in order to assist the necessary culture change and provide resources.
2. Establish robust environmental management and planning, which should include a reporting and reward system related to define the goal of clean production. The growing adoption of Total Quality Management, coupled with the development of country and international quality standards (e.g. ISO 9000, ISO 14000 series), to all aspects of business operations, provides the appropriate mechanism for ensuring robustness.
3. Carry out environmental audits on suppliers of services. Resources should be focused on the major issues, e.g. waste management services should only purchased from companies which achieve an acceptable standard.
4. Carry out waste and energy audits on high priority areas of operations, to identify opportunities for waste/energy reductions. Determine the current real cost in the near to medium term. Ensure that waste disposal costs are allocated to the companies to use waste as raw materials.

5. Assess the environmental impact of major raw materials during their production, storage and delivery. Identify materials which have high toxicity to the environment and which are of serious concern to human health.
6. Develop and implement a strategy to reduce waste production and energy consumption where economically feasible, and replace raw materials which have an unacceptable impact on the environment or human health.
7. For products, carry out life cycle analyses from raw materials through production, use and final disposal addressing material and energy consumption, waste generations, etc. Develop and implement a strategy to reduce environmental impacts throughout the cycle. This often involve changes to raw materials and production processes. However, the most important changes are likely to be to the product itself, either a partial or total redesign or completely new product.
8. Implement a training program on clean production strategy as part of general environmental training.
9. Publicize clean production goals and achievements internally and externally.
10. Monitor progress and report to the responsible senior management, including summary information on performance against goals.

The above steps are not one time activities, and need to be repeated on a regular basis.

In summary, efficiency improvements - in processes and product cycles - and the substitution of hazardous materials and activities with less hazardous ones ensure a reduction in environmental burdens without any compromise in term of service, offering the prospect of a strategy for clean production. While most of those above mentioned steps will be readily implementable with ease, achieving all of the considerable potential for clean production will in many cases involve institutional change, economic change, and change in consumer behaviour - the path in the search for sustainable development.

6. SOCIAL PERSPECTIVES OF GREEN BUSINESS

This chapter elaborates on the social and cultural perspectives of green business, with particular emphasis on the roles of business in the reorientation of production and consumption process in societies. It begins with a discussion of business and social equity based on environmental considerations and moves towards how business lead the changes in consumer's values of certain societies.

6.1 BUSINESS DEVELOPMENT, ENVIRONMENT AND EQUITY

There is a certain relationship between environmental performances of a company and equity in a society. Cairncross (1995) explains the relationship between poverty and environmental quality. She argues that improving the environmental performance of businesses may not make a country richer in the conventional sense, but it definitely improves the living standard of the poor. She refer to the World Development Report published by the World Bank in 1992 which argued:

“Unlike the rich, the poor cannot afford to protect themselves from contaminated water; in cities they are more likely to spend much of their time on the streets, breathing polluted air; in rural areas they are more likely to cook on open fires of wood or dung, inhaling dangerous fumes; their lands are most likely to suffer from soil erosion. The poor may also draw a large part of their livelihood from unmarketed environmental resources: common grazing lands, for example, or forests where food, fuel and building materials have traditionally been gathered. The loss of such resources may particularly harm the poorest” (World Bank, 1992).

One can imagine, from the above quotation, how the rich and the poor compete for resources. There is no doubt that the rich, equipped with more power, opportunity, and privilege, always win. The fact that businesses, especially larger ones, represent the rich put more solid ground for Cairncross' argument.

Developments in business sectors, poverty, and environmental degradation are also contemporary social discourses in Thailand. As a result of the National Economic and Social Development Plans, the Thai economy has constantly registered high growth rates since the early 1960's when the industrialization process began. Especially after the late 1980's the GDP was estimated at more than 8.0 per cent every consecutive years. Thailand's economic growth is characterized by its natural resource utilization, rapid in industrialization, rapid and concentrated urbanization, as well as increased income and consumption. The

manufacturing sector has increased its share of GDP from around 16 per cent in 1970 to about 37 percent in 1992 mirroring the continual decline of the agricultural sector whose share is now relegated to about 15 percent. More significantly, the manufacturing share of exports increased from under 10 percent to almost 80 percent (TEI, 1995).

The illusion of poverty alleviation in developing countries like Thailand by using development policies such as the “trickle-down” effect has proved itself to be flawless. One of the reasons why developing country wealth does not reach the poor is that those who control it tend to be more interested in western markets and western lifestyles brought by businesses. Their purchase of western armaments and consumer goods does nothing to give livelihoods to their own people (Ekins, 1993). Paradoxically, therefore, “development” can end up giving more benefit to the rich countries which provided the initial “aid” than to the poor people in the countries which received it. The same analogy can be drawn for the interaction of the rich, represented especially by large companies, and the poor in the same country. In short, the vicious circle of poverty occurs due to the lack of opportunity and a widening gap of income (i.e., relative poverty) created generally by business transactions in the light of the mechanism of free market capitalism.

Ekins (1992) illustrates how poverty, in turns, creates more social burdens. He explains that in many cases it is not lack of development that has brought popular impoverishment, but development itself, as when natural resources that provide a decent subsistence livelihood for large numbers of people are turned into business and industrial raw materials that benefit relatively few. Those who are displaced or dispossessed or both probably began neither absolutely nor relatively poor. While modest, their lives are likely to have been both self-sustaining and commensurate with their expectations and those of their peers. They will have been useful, productive members of their society. After the “development” project, be it large industrial estates producing consumer goods or road construction or whatever, these people’s life changes forever. They may sell their land and destroy their communities. Cut off from their traditions, the vast majority of the displaced will drift to the slum of big cities like countless development refugee before them. Such rural-urban migration has historically been a common factor of all industrialization.

Sustainable development is not only about direct impact on the environment, however, and a corporate strategy dealing with narrow environmental performance measures is inadequate. A key part of the concept, which is often conveniently ignored by industry is about equity. It seems clear, therefore, that businesses seek to provide the services demanded by consumers with the minimum environmental impact, reorienting consumers’ behaviour to a sustainable one and, last but not least, provide opportunities for the poor whenever possible. These are thus a biggest new challenge to the business communities around the world.

6.2 WANTS AND NEEDS: THE DRIVING FACTOR

Business operates within societies and their economic structures, rather than distinct from them. This relationship produces benefits, such as the creation and expansion of market; it also produces liabilities, such as environmental impacts and social inequity as described in the previous section. As a consequence, business is constrained by governmental policies and regulations and, specifically, by social norms and values. That is, all business activities are responses to society’s needs and wants. The terms needs and wants, from the standpoint of business, generate demand for products.

Once needs and wants are identified, business acts to respond to the demands. A concept for such interactions is proposed by Graedel and Allenby (1995), which is shown in Figure 3. The flows of information in the figure begin with the needs and wants in the upper left of the diagram. These motive forces are modified by various societal factors, economic constraints, concerns regarding hazards and environmental impacts, and the state of technology. The result is a demand for specific goods and services. Business corporations, responding in their own ways to available information, design, evaluate, and produce these goods and services. The crucial question is how these business responses can influence the societal move towards a more sustainable consumption. Thus, the environmental marketing, or green marketing, plays a very important role in redirecting social values.

6.3 ENVIRONMENTAL MARKETING: THE CATALYST FOR CHANGES

The traditional marketing concepts, or growth-intensive marketing are frequently blamed for a number of negative side-effects on the environment such as 1) the intention to induce exploitation of natural resources; 2) too little regard for the actual needs of the consumer; 3) the promotion of excessive

consumption and; 4) the tendency towards more waste, through advertising incentives, product differentiation and shortening of product lifespan. For this reasons, it is cleared that business redirection is needed, at least in the following areas in order to manipulate social values towards sustainable practices in production and consumption.

- Abandonment of unhealthy products or production methods;
- The use of environment-friendly packaging;
- Avoidance of harmful materials and;
- Taking into account the social costs arising from production.

Hopfenbeck (1992) proposes five environmental marketing policy in order for decision makers to embrace the environment into their decision-making. These are:

- Marketing should be guided by the limitations on resources and not by the creation of consumer needs and wants.
- Marketing should attribute greater importance to stabilizing ecosystem and energy consumption than to the production of the throw-away products.
- Marketing should seek alternatives which prevent the damage to nature
- marketing should promote ecological product design, minimize packaging and develop recycling concepts for the consumers.
- Marketing should aim at decentralizing, for the stability of the system: initially by transforming
- businesses, and then by developing local forms of business on a small scale networking with larger corporations.

However, the complexity of marketing decisions within this policy framework require a comprehensive system of information as Hopfenbeck describes:

It is extremely difficult for business adequately to fulfil its social function because the means of analysing the social effects are unavailable, and because economic objectives are far more clearly formulated than social and ecological needs. The social commitment of a company is limited by the wishes of shareholders and by its relationship with competitors. An environmental orientation of marketing which is not profit motivated, such as the Human Concept of marketing, is hardly likely to be practiceable (Hopfenbeck, 1992).

In short, all forms of environmental protection which cannot be based on a corresponding awareness on the part of the consumer are destined to fail. Thus, environmental marketing has the responsibility of opening up consumer awareness of the environment.

However, the changes of consumer behaviour require a considerable period of time. The conversion of personal responsibility into action is slowed down or prevented by non-environmental motives, such as comfort, pleasure or the low performance standards of the product. Hopfenbeck asserts that contrary to popular belief, the majority of consumers are not sensitive enough to green issues. Although environmental protection has risen on the scale of values, there is still a great gap between general attitude and personal conviction. Only the smallest minority is consistent enough in their interest in the environment to allow this to express themselves through actual purchasing behaviour.

Although it seems to be hard and a huge requirement for these reorientation towards environment-friendly consumption to take place, it is the environmental marketing strategy that lays a foundation and a hope for a desirable society, which will be described in the subsequent section.

6.4 THE MATURE INDUSTRIAL SOCIETY

Manzini (1993) argues that the foundation for environmental quality and social equality lies in the concept of “mature industrial society”, which he describes its characteristics as followed:

- A mature industrial society is one in which the cultural component plays an increasingly important part. It is a society in which producing and consuming are increasingly “cultural actions”. A society in which products are offered and consumed more for what they “mean” than for what they really are. In that society, therefore, an ecologically sound product must also be a culturally acceptable product and be a product that is made known effectively so that its potential cultural acceptability proves actually recognizable.

- A mature industrial society is one in which a sort of “interactive relationship” is established between demand and supply, with mutual influences that tend to be enhanced by speed of communication and flexible production equipment. Supply seeks a demand at which to aim its products; demand is expressed by choosing, from the range on offer, the product nearest to individual orientation or, if suitable answers are not found, it takes the form of “latent demand”. When those choices are noted, the product mix on offer is rearranged; if the “latent demand” is identified as a new market sector, then production is oriented towards new proposals.

It should be noted that mature industrial society is beginning to take shape in contemporary society according to Manzini. At present, it is a less emotional phase, in which the theme of the environment is beginning to be found at every level of society.

In regard to demand, Manzini means that the environmental theme has already begun to penetrate all components of society, adapting to the specifics of individual socio-cultural groups; and it means that this new and growing environmental awareness is generating trends in demand that certainly may still evolve.

In regard to environmental policies of national and international level, he means that it is no longer just a few particularly polluting waste that are involved. Better organized means of action are being developed; they operate at different levels, and above all they tend to take effect further upstream in the production process, to the point of having a direct influence on actual product design.

Concurrently, as markets become international, the requirements of the country with the most restrictive standards, laws, and “environmental quality” demand are tending to assert themselves, and so the products of all competitors will have to be reconsidered to cope with these more restrictive demands.

In summary, business acts as an important force for environment-oriented social mobilization and at the same time, it is shaped by social demands. The interaction that leads to positive changes in business and social requires two-way communication facilitated by modern communication technology and proper organization. Faced by the evolving trends and the prospects they offer, companies have a chance to be ahead of their time and start now to implement “voluntarily” what tomorrow will be required “compulsory” or else to match new quality standards set by the competition.

7. POLICY IMPLICATIONS

The more forward-looking corporations recognize the need to provide a suitable quality of life encompassing healthy environment and equity for all. This requires changes in the perspectives of economic, technological and value of a society. The awareness of corporations, of citizens, and of governments is also required to ensure a promising future.

In deed, the involvement of businesses is crucial if the world is to achieve sustainable development. For businesses to move towards sustainable development their managers and institutions themselves have to incorporate the ideology of environmentalism with every aspects of business. Environmentalism has always attached great importance to the development of participation and so the business organization must become increasingly participatory (Welford, 1995). Environmentalists put great emphasis on decentralization and regionalism, thus, businesses need to consider their own structures and how these can be compatible with a move towards devolved decision making, demergers and compartmentalization. Chapter 3 of this study elaborates in details regarding this policy implication.

Graedel and Allenby (1995) suggest the following policies in order for businesses to be leaders in a movement towards sustainability:

- Private corporations, as the expert in their technology and management, need to become partners in the development of new regulatory structures. This will require the corporations to develop positions that are acceptable to all stakeholders in the society, including regulators and environmentalist, and eschew the adversarial, negative approaches that have too frequently characterized past behaviour.

- New organizations and information flows will have to be developed as corporations internalize environmental issues. In particular, the legal and government affairs organizations within corporations will have to become sophisticated in developing and presenting positions that integrate environment and technology in a responsible manner.

- Corporations need to participate in efforts to design and implement full-cost accounting, so that environmental costs are automatically incorporated into economic decisions.

- Corporations need to view society as a whole, and the community within which they

operate, as full partners in their activities. They need to view communities as customers of their services rather than just purchasers of their products. Environmental issues may, over time, shift the fundamental “reasons for being” of private corporations away from a sole focus on shareholders and profits toward a broader social role.

In addition to the above changes in corporate activities, management changes are also required. Beaumont et al. (1993) suggests the following strategies:

- The establishment of environmental goals and performance.
- The introduction of data management systems to provide the necessary information to monitor performance against stated objectives.
- The allocation of resources to continually improve environmental performance.
- The specification of management responsibilities, processes and procedures to ensure the appropriate actions occur.

Pursuing an environmentally sustainable future requires business to grasp the political dimensions of environmentalism as well. Businesses must therefore be important actors in the social mobilization required to achieve changes in consumption behaviour of consumers.

Business of the future is, therefore, one which is able to transcend the limited ideology and values of conventional “business as usual”. It will embrace policies more in keeping with “green” perspectives presented here in this study and will be ever mindful of sustainable development by introduce wide-ranging culture change programme to make the values and actions consistent with the concept. Last but not least, it will play a full part in educating consumers and campaigning for change through its green marketing.

Welford (1995) calls this kind of companies as the “transcendent company”. He argues that this kind of organization will not appear overnight. It will take time to change traditional ideology and train new breed of management. Moving the business organization on to a sustainable track is fraught with difficulties especially when the present path seems increasingly moves in the opposite direction and towards a “self-destruct mechanism”. However, conventional wisdom must be challenged and therefore, as a minimum, the business organization, its management, its workforces together with all of its stakeholders must begin to consider a change towards a more sustainable future.

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