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ROLE OF ENVIRONMENTAL AWARENESS IN ACHIEVING SUSTAINABLE DEVELOPMENT

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SUMMARY

This work attempts to clarify how environmental awareness can be utilised as a tool for environmental policy making and management. Since this study covered various areas of social sciences surrounding the study of environmental awareness and its link to behaviour, it was obliged to focus only on the key literatures in each area. Also, due to the information constraints, it was not able to obtain many of the original sources and often relied on the discussions in the tertiary sources. Despite of these limitations, this study hopes to demonstrate the importance in considering environmental awareness as a new policy tool, additional to legal and economic instruments.

INTRODUCTION: CURRENT CONDITION AND JUSTIFICATION FOR THE STUDY ON ENVIRONMENTAL AWARENESS

Increasing economic activities in developing countries result in more energy and consumption demand, which generally lead to environmental degradation. There is a conventional belief that such environmental degradation would resolve as soon as these countries grow economically since that would enable them to afford environmental friendly technology as well as pro-environmental regulations and policies.[1] However, several studies indicated that many developing countries already equipped with environmental policies, legal frameworks and economic instruments, which are regarded as highly sophisticated by international standards (Huber et al, 1998, Fujisaki et al, 1997) and yet face the worsening of environmental conditions. Major difficulties these countries confront are not only the lack of legal and economic framework for environmental protection, but also lack of participation among general public in pro-environmental behaviours.[2]

Moreover, there are increasing needs for such public participation due to the recent change in sources of environmental problems. Today, the sources of pollution have shifted from production to consumption processes. The *Human Development Report* of 1998 (UNDP) affirms this trend and states that growth in consumption and unbalanced consumption patterns [3] are placing unprecedented pressure on the environment. In this light, the acceptance of pro-environmental behaviour by general public, that is, to adopt sustainable life style, is an urgent issue in protecting environment.

The participation of citizen can complement existent legal and economic instruments, which are facing shortage of institutional, managerial and financial capabilities for enforcement. The increase of participation of citizen means that legal frameworks would be more respected and economic mechanisms would be more accepted thus increase their effectiveness. However, it remains unclear what can cause the participation of people in environmental actions. In this paper, hypothesis is established that more environmental awareness means more environmental behaviour and intends to answer the two following questions: What can induce people to participate in the pro-environmental behaviour? How people's behaviour can be changed in more pro-environmental way?

This paper attempts to discuss the role of environmental awareness and its effectiveness in changing people's behaviour by reviewing previous works.

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1 See studies on Environmental Kuznets Curve. More details are presented in the note 7.

2 Pro environmental behaviour is defined as an environmental conscious behaviour such as green buying, recycling and car-pooling.

3 The *Human Development Report* of 1998 by the United Nations Development Programme reports that the increasing world consumption which has now reached $ 24 billion a year, 6 times more than that of 1950.

The review of major works on environmental awareness is organised into the following order:

1) Review of the major trends on environmental public opinions;
2) review of the major hypothesis on environmental public opinion and socio-economic factors;
3) review of the major studies on scale of values and world view;
4) review of the major studies that link awareness and behaviour; and finally,
5) conclude by mentioning further research possibilities and policy implications on this matter.

I. REVIEW OF MAJOR STUDIES ON PUBLIC OPINION ON ENVIRONMENT

Many studies on environmental awareness use results of opinion surveys as a proxy for level of environmental attitude. Although there is a difference between opinion and attitude as Worcester (1996) states "…opinions: the ripples on the surface of the public's consciousness, shallow and easily changed; attitudes: the currents below the surface, deeper and stronger…" many analysis on attitudes are drawn from the results of opinion surveys. Considering this wide use of opinion survey results, basic trends on public opinion on environment are reviewed in this section.

The public opinion survey on environment is generally categorised into time series and cross-national perspectives. The time series data on public environmental concerns exist mainly in developed countries such as the United States, Europe, and Japan. The study of trends in opinion survey is particularly thorough in the United States where data is most available since 1960s. For Europe, there is the opinion survey called Eurobarometer, complied by the European Community. This survey monitors the European's attitudes to the environment from 1982. In Japan, too, there are similar opinion surveys carried out during 1960-70s when industrial pollution was a serious problem. The cross national surveys on environment are conducted first by Harris for UNEP in 1989. This was followed by other attempts by Gallup in 1992, International Social Survey Program, in 1993, MORI (Market and opinion Research International) and WWF (World Wildlife Found) in 1993 and Environics in 1995, to mention a few. In this section, some major works on public opinion on environment is presented to illustrate the basic trends.

1. Results from time series trends on public opinion on environmental issues

In the most of cases, the time series studies on environmental public opinion had been carried out in developed countries due to the early presence of concern for the environment. In general, these results demonstrated increase in interests toward environmental issues from the late 1960s to 1990s. Although the transition process to pro-environmentalist is not exactly the same for all countries, the persistence of interests on environment can interpret as a formulation of environmental attitude. In order to show the process of transformation; the case of the United States is reviewed as an example. The reason for selecting the United State is due to its availability and accessibility to the public opinion data.

The studies on trends of environmental concerns have initiated in the late 1960s in United States when the public interest toward environment had grew with "unprecedented speed and urgency" (Erskine, 1972a). Erskine did one of the earliest analyses on surveys. He illustrated the rapid increase of environmental concerns among American public in the period between 1965 to 1970 (Erskine, 1972a, Erskine 1972b).

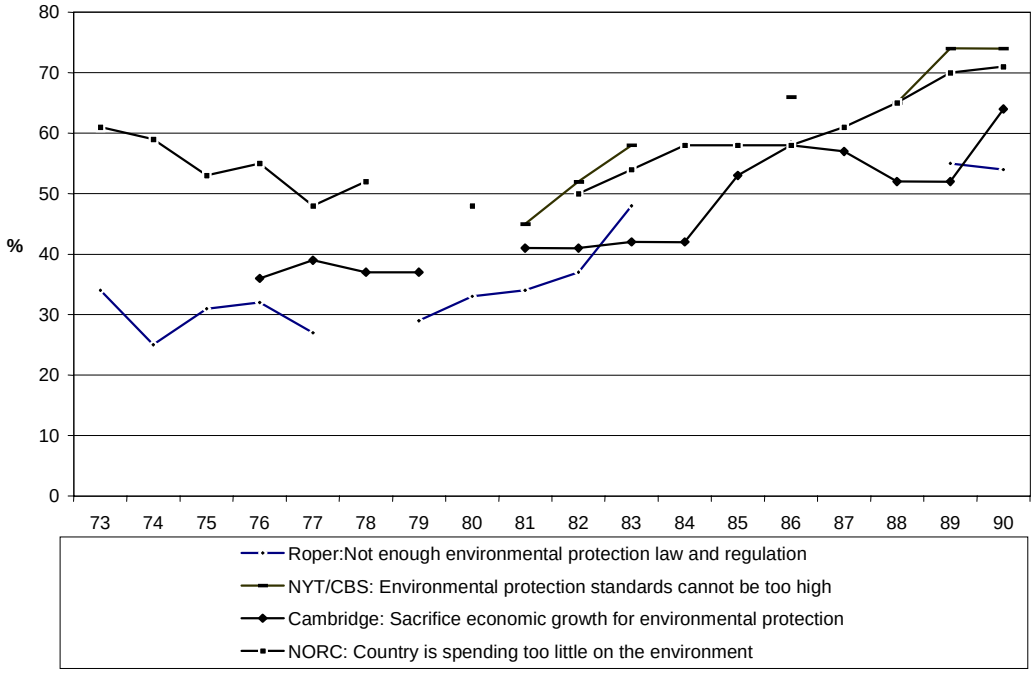
According to his study, only about one in five person considered the problem very serious in 1965 but the situation reversed in 1970 when four in five considered the problem serious. This "miracle of public opinion" reached the "peak" at the first Earth Day in 1970 and later declined in rest of the 1970s, rapidly at first and steadily since around 1973 (Dunlap and Scarce, 1991). This trend of environmental concern was portrayed by Anthony Downs in his work, "Ups and Downs with Ecology" (1972). In this, he stated that like most social problems, environmental problems would proceed through five-stage "issue attention cycle". Downs tried to explain that environmental concerns expressed by American citizen were short-lived and changeable. He predicted that environmental concern would disappear as soon as people are interested in other social issues.

Down's five stage attention cycle are as follows:

1) the *pre-problem state* in which the undesirable social conditions exist and may have arouse the interest of experts or interest groups but have not yet attracted much attention from the public;
2) the *alarmed discovery and euphoric enthusiasm stage* in which one or more dramatic events or crises bring the problem to the public's attention and create enthusiastic support for solving it;
3) a *realisation of the cost of significant progress stage* in which public enthusiasm is dampened;
4) a *gradual decline in the intense public interest* due to recognition of the costs of a solution, boredom with the issue, and decline in media attention to the problem; and finally,
5) The *post problem state* in which the issue is replaced at the centre of public concern by new problems and moves into "a twilight realm of lesser attention or spasmodic recurrences of interest" (Downs, 1972 quoted in Dunlap, 1989).

Dunlap (1992), on the other hand, denied this claim on disappearing environmental concern among American public. In his review of American public opinion on environmental issues from 1965 to 1990, he found that there was evidence of "continued interest" on environmental issues by the public throughout the 1980s (Graph. 1).

Graph 1
Trends of American Environmental Opinions
1970-1990



Source: Dunlap and Mertig, 1990.

According to Dunlap, as a backlash against the Reagan administration's poor environmental policies and continuing occurrence of new environmental problems, substantial increase in public support for environmental protection are observed in 1980s (Dunlap and Scarce, 1991, Gullroy and Shapiro, 1986). In late 80s, this trend was continued by the "discovery" of global environmental problems, such as global warming and ozone depletion, with wide coverage by the mass media. The increased attention is observed in 90s when the Earth Summit in 92 focuses the importance of "sustainable development". The results of opinion polls between 1965-90 indicate the continued concern for environmental protection and the higher level of concern in 90s than in 70s. Based on these results, Dunlap and Scarce (1991) stated the existence of persistent environmental concern among American public and called 1990's renewal of environmental concern as the "second miracle" of public opinion.

The study of Dunlap and Scarce (1991) demonstrated that growing majorities share following tendencies:

1) consider environmental problems as serious, worsening and increasingly threatening problem for human well-being;
2) support government action to protect environmental quality;

3) give priority to environmental protection over economic growth and indicate a personal willingness to pay the costs of such protection.

These results, together with the results of opinion polls, indicate that environmental concern has reached a point to became an environmental "attitude" from temporary "opinion" among the American citizens during the period 1965-90.

2. Results from cross national opinion survey on environmental concerns

There is a limited number of cross national opinion surveys on environmental awareness. The existing extensive cross-national surveys identified are Harris's *Public and Leadership Attitudes to the Environment in Four Continents* of 1989 and Gallup's *Health of the Planet Survey* of 1992. Each of these surveys is done with different methodologies and cover different groups of countries.

Harris Survey, Public and Leadership Attitudes to the Environment in Four Continents (Luis Harris and Associates, 1989) [4]

The survey showed that people, both general public and leaders, in most of the countries, are feeling that environmental condition have worsen compared to the past and are aware of harmful effect of environmental degradation on health. Most people believe something ought to be done and environmental protection should be the major governmental priority. Although many shared the pessimistic view toward the condition of environment, especially among young and women, they believe that environmental degradation can be avoided if proper measures are taken. Substantial majority of public and leaders believed that advocacy by the United Nations and world leaders on the environment would help to improve the situation since protection of the environment require involvement of government, international organisation, business, voluntary organisations and individuals. These results indicate the existence of global consensus that stronger action is necessary from both government and international organisations through formulating the law to regulate anti-environmental activities. As for the individuals, many expressed their willingness to make material sacrifices and personal contributions in order to protect the environment. These contributions can be realised in terms of lower standard of living, higher taxes, and some kind of direct involvement in pro-environmental activities.

[4] Louis Harris and Associates conducted one of the first multinational surveys on environmental attitude by public and leaders in 1989 for the United Nations Environmental Programme. The questionnaire was used in 21 separate surveys conducted in 16 countries (Argentina, Brazil, China, Hungary, India, Jamaica, Japan, Kenya, Mexico, Nigeria, Norway, Saudi Arabia Senegal, West Germany, United States, Zimbabwe) aiming general public and leaders. This survey consist of variety of interrelated elements such as: awareness on environmental issues, level of concern about environmental issues, perception for the cause of pollution and environmental degradation, attitudes to global and regional interdependence; and attitudes to possible policies for addressing environmental problems (Louis Harris and Associates, Inc., 1989).

This survey is open to a number of criticisms, which throw doubts on its validity as cross-national survey. This is due to fairly small (300-600) sample size for each country, use of different sampling methods in each country, limited samples to residents in major urban areas and problems of bias in the format of questions**.**

Gallup Survey, The Health of the Planet Survey (1992) [5]

The Health of the Planet Survey (Dunlap, Gallup and Gallup, 1993, Dunlap and Metig, 1995) was conducted on wide range of environmental perceptions and opinions from citizen in economically and geographically diverse nations. The survey was descriptive, although certain items were relevant to policy issues and explanatory studies of attitude formation. The initial results provide relevant to policy issues and explanatory studies of attitude formation as well as evidence of widespread concern about the environment in most countries.

The result of survey demonstrated only a slight difference between developed countries and developing countries including the question on the willingness to pay for the cleaner environment. This contradicts the conventional belief that the economic growth is a pre-requisite for higher environmental concerns. The survey also demonstrated that residents of the poorer nations —which often suffer from poor water quality and high levels of urban air pollution— are much more likely to see their health as being negatively affected by environmental problems at present. Based on these findings, Dunlap and Metig (1995) stated that environmental problems are no longer viewed as just a threat to quality of life but are considered a fundamental threat to human welfare. According to Ladd (1982), people in developing countries often depend directly of the immediate environment for sustenance and are more vulnerable for natural disasters. In this sense, environment degradation affect greater those in developing countries. Therefore, as Dunlap and Mertig state, environmental degradation is not only a threat to the quality of life but also a threat to human survival (Dunlap and Mertig, 1995).

Although developing countries and developed countries share the general increase of concern on environment, their attitude differs on more specific environmental issues (Mitsuda, 1992). For instance, when main causes of environmental degradation were asked, people from developing countries tends to raise factors as ‘over population’, ‘incapability of government’, ‘lack of education’, and ‘technological problem’ but people from developed countries tends to raise the ‘individual consumption’. In fact, India (74%), Philippines (65%), Mexico (64%), and Turkey (56%) raised the problem of ‘over population’. Russia (55%), Turkey, Mexico, and Korea (all 50%) raised the ‘incapability of government’, Turkey (75%), Mexico (68%), Chile (66%), India and Brazil (both 61%) raised the ‘lack of education’. On the other had, US (73%), Canada, West Germany (both 68%), UK.(60%), Ireland (57%) and Switzerland (56%) raised ‘individual consumption’. This portrays the difference between developed and developing countries.

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[5] *The Health of the Planet Survey* was conducted in 22 nations (Brazil, Canada, Chile, Denmark, Finland, Hungary, India, Ireland, Japan, Mexico Norway, Philippines, Poland Russia, Switzerland, Turkey, Uruguay UK, U.S, West Germany) in January-March 1992 by the Gallup International Institute and Dunlap. This survey employed standard probability samples designed to be nationally representative, with 1000 or more face-to-face interview in each country, representing a total sample of nearly 30,000.

Although less preoccupation for “individual consumption” is expressed by developing countries, they admit the responsibility and effectiveness of citizen’s activities in improving environment. For instance, environmental education was chosen as the top priority in 12 out of 22 developing countries studied when survey asked to choose only one factor in which “developed countries must co-operate with developing countries” among the followings: environmental education, environmental technology, environmental legislation, family planning, omission of overseas debt. Also, for a question, who is responsible for environmental protection, most of developing countries choose “citizen” whereas developed countries choose “government”.

Many of above findings by Gallup coincided with previous study by Harris. In particular, those referring to increasing tendency of environmental awareness, willingness to contribute or to sacrifice for the betterment of environment and general consensus that something must be done in order to improve the situation. At the same time, Gallup’s study is unique in the sense that it illustrated not only the opinion and attitude of the people but also questioned for the actual behaviour/actions implemented by the citizens. It was equally successful in identifying important difference between developed and developing countries such as the principal actor responsible for environmental protection.

Both time series and cross-national analysis demonstrated different aspects on trends of environmental public opinion. The time series analysis, for the case of the U.S., illustrated the process of the formation of environmental attitude by citizens. The cross national analysis on environment showed universal trends of increase in environmental awareness. Both analyses showed, despite of fluctuation on environmental opinions, increase in people's environmental concerns and willingness to contribute for the environment.

Although these studies are successful in pointing out the existence of concerns among general public and its intentions for taking environmental actions, these analyses remained descriptive since these did not link the environmental concerns, attitudes and intentions to actual behaviours. For instance, different studies of Gallup revealed that despite the fact that high porcentage of people are concerned and willing to take actions, fewer people in developing countries are actually taking the “Green consumer behaviour”

and only around 5-10% are actually participating in the environmental activities.[6] Therefore, as it was stated in Dunlap, it is important to know "how much of such concerns are mobilised and translated into pro-environmental behaviours" (Dunlap and Scarce, 1991).

[6] Environmental activities are defined by MORI as follows: 1) Read/watched T.V. about wildlife/ conservation /natural resources/Third World, 2) Walked in the country side/ along the coast, 3) Selected one product over another because of its environmental-friendly packaging, formulation or advertising (green consumer), 4) Given money to or raised money for wildlife, conservation or Third World charities, 5) Been a member of an environmental organisation (even if individual joined more than two years ago) 6) Subscribed to a magazine concerned with wildlife/ conservation /natural resources/ Third World, 7) Requested information from an organisation dealing with wildlife/conservation/natural resources/ Third World, 8) Campaigned about an environmental issue, 9) Visited/ written a letter to an MP/Councillor about wildlife/natural resources/ Third World, 10) Written a letter for publication to a newspaper about wildlife/conservation/natural resources/Third World, 11) Used unleaded petrol in your car. It is categorised that those complete more than 5 as Environmental Activist, 3-4 activities as Semi-activits and 0-2 activities as Passive. Weber, Richard and Michele Corrado, "International Attitudes to the Environment" paper presented at WAPOR (World Association for Public Opinion Research) Conference, Copenhagen September, 1993.

II. REVIEW OF THE MAJOR HYPOTHESIS ON ENVIRONMENTAL AWARENESS FORMATION

A number of studies have examined the associations between environmental concern and socio-demographic factors. These studies are mainly focused on finding a "link" between high environmental concern with particular social attribute in order to explain the major causes of environmental awareness. In this section, several hypotheses on environmental concern and some social attributes such as age, gender, social status and political ideology are reviewed (Van Liere and Dunlap, 1980, Dietz, Stern, and Guagnano, 1998).

1. Age and environmental concern

Many studies reveal the relationship between the concern and age. It says that in general, younger generation tends to be more concerned about environmental quality than older generation. The earliest of this study, as it was stated in the Mohai and Twight (1987), was realised by Malkis and Grasmick (1977, quoted in Mohai and Twight, 1987) which discovered the dominant relationship between age and environmental concern from a survey of Minneapolis. Since then, Lowe and Pinhey (1982, quoted in Mohai and Twight, 1987) had studied the association between age and environmental concern as well as Grimes (1980 quoted in Mohai ad Twight, 1987) all of them using the result from the national survey. The extensive literature survey of Van Liere and Dunlap (1980) also stated 'age' as a dominant factor in determining the degree of environmental concern.

In these studies, attitudinal changes, due to the ageing process, or "age-effect", are explained on the basis of changing views of individual as his/her role in the society changes with ageing. For instance, it is generally thought that with ageing, individuals increase the "accumulation of material and social resources", become more involved in "religious, political economic and social subsystems" and impel to take conservative actions in order to maintain their status quo (Hornback, 1974 quoted in Mohai and Twight, 1987) since until recently, environmental issues are generally viewed as a "threat" to existing social order. Hence, younger generations are considered more open to the environmental issues than the older ones.

Buttel (1979, quoted in Mohay and Twight, 1987), according to Mohai and Twight (1987), analysed this issue applying the path analysis and demonstrated that the relationship between age and concern was largely direct, rather than indirect like other variables such as education, place of current residence and political liberalism. He presupposed two hypothesis on the relationship between age and environmental concern as follows: 1) difference in attitude originates from generation difference (cohort effect) or 2) attitude changes are due to the changes in socio-economic conditions followed by the ageing process (age-effect).

Although Buttel (1979 quoted in Mohai and Twight, 1987) could not find enough evidence from result of his investigation, he opted for the first hypothesis that states that attitude caused as the difference in the historical and economical background, or "cohort-effect." This argument is similar to the Mannheim's (1952 quoted in Mohai and Twirght, 1987) theory of generations, which suggested the important historical events during adolescent and young adulthood phase can affect strongly.

Other researchers support Buttel on this matter. Reviews of the literature (Cutler, Kaufman and Glenn, 1975 quoted in Mohai and Twight, 1987) explained that ageing does not necessarily mean a shift toward conservatism since "attitudinal change over time is just as likely to be in liberal direction as in a conservative direction". Glenn (1980 quoted in Mohai and Twight, 1987) expressed a preference for a cohort effect since he found out that not only cohort data have fail to support the ageing-conservatism, but that individuals and cohorts have generally become more liberal rather than conservative over the past few decades. Inglehart (1990) also supported the "cohort effect". He found that historical and social conditions of individuals' in 'formative' or pre-adult years are an important factor to determine their pro-environmental preferences. Although Mannheim's theory do not mention it directly, Dunlap (Van Liere and Dunlap, 1980) suspects that continued exposure to alarming information on environmental deterioration, via news media and environmental education, would formulate 'ecology-minded' generation whose commitments to environmental reform do not disappear as they move into adulthood.

Although link between age and environmental concern is suggested by various scholars, there are inconsistencies in the survey results to support their hypothesis. For instance, the result of Harris survey (1991) showed only a weak relationship between environmental opinion and age. Furman (1998) also shares this view in his case study of Istanbul, Turkey.

2. Gender and environmental concern

The relationships between gender and environmental concern are studied and "carefully theorised more than other structural variations in environmental concern" (Dietz, Stern, Guagnano, 1998). It is generally believed that women are more concerned about environment than men because "women are potentially more environmentalist than men due to biospheric orientation" (Diamond& Orenstein, 1990, Griffin, 1978, Merchangt, 1979 quoted in Stern, Dietz and Kalof, 1993). This is supported by the Harris survey (1991), which showed that more women are concerned about the environmental quality, critical about policy taken by government and willing to accept lower standard of living for fewer health risks.

Nevertheless, other empirical investigations show inconsistent results on this hypothesis. For instance, one of the earlier studies done by McEvoy (1972, quoted in Van Liere and Dunlap 1980) showed that men are more concerned about environment than women due to their higher level of education and involvement with the communities and political issues. However, other studies shows that women are more concerned about

environment than men because men are much more concerned about economic growth and economic stability (Passino and Lounsbury, 1976 quoted in Van Liere and Dunlap 1980) and consider environment as constraint to the economic growth. The review of further analysis by Mohai suggests (quoted in Stern, Dietz, and Kalof, 1993) that women tend to be more concerned about local environmental issues than men, but this difference is smaller when it comes to the issues at national or global level. It also notes that women are less likely to take political actions to protect the environment.

There is a discussion on "mother" and "father" effects by Blocker and Eckgberg (1989 quoted in Stern, Dietz and Kalof, 1993). These discussions are based on difference in gender roles. They state that, in general, mothers are more concerned about local environmental problems than fathers. The reasons for such differences are based on role in the society: mothers prioritise welfare and health of family (which closely associates with the local environmental quality such as water, air and solid waste), while fathers prioritise economic and material well being of the family (George and Southwell, 1986 quoted in Dietz, Stern and Guagnano, 1998).

Many studies suggest the possible relationships between gender and environmental concerns. However, this relationship must be treated with caution. All investigations indicated that environment-gender association has much to do with the difference in social role, which is culturally conformed and changes greatly from time to time. Considering the fact that these hypothesis are based on Western culture and on period varying between 1970s to 90s, different outcome can be expected from different cultural and historical context. Therefore, more investigation on different cultural context and time period are necessary to consolidate the gender-environment link.

3. Social status and environmental concern

There is a hypothesis that states "environmental concern is positively associated with social class as indicated by education, income and occupational prestige" (Van Liere and Dunlap, 1980). Inglehart (1990) and earlier, Andrews (1978), gave an explanation for this hypothesis based on the fact that once people solved their basic material and physical needs, they opt for more aesthetic aspect of human existence or "quality of life", such as better environment.

In sphere of economics, the discussion on Environmental Kuznets Curve (EKC) [7] supports the similar relationship between income and environmental quality. It states that improvement of environmental quality is achieved as income (GDP per capita) increases. This relationship is identified both in terms of time series and cross-national series.

A hypothesis states that as individuals become more educated, they are more concerned about environment (Kohut and Shriver, 1989, and Vining and Ebreo, 1990 quoted by Mainieri, Bernett, Valdero, Unipan, and Oskamp, 1997). The higher education is associated with higher concern since it is directly related to the access to information on environment and ability to process the information into knowledge. The study by Arcury (1990 quoted in Furman, 1998) supports a consistent and positive relationship between environmental knowledge and environmental attitudes.

However, caution is needed to directly link the educational level to high level of environmental concern since educational level also involves other social factors. For instance, better education generally means better job, thus having more economical "surplus" which may allow individuals to pay more attention to the "luxury good" such as environmental quality. Also, the social background that permits individuals to have better education could have some effect on the their thinking process.

4. Political ideology and environmental concerns

There is a hypothesis that links political ideology and environmental concerns. In the U.S., people who support democrats and liberals are more concerned about environmental quality than those support republican and conservative counterparts. The similar trend also exists in Great Britain where right-wing Tory, conservative, is placing less importance to environmental issues than left wing Labour and Liberal Democrats (Worcester and Corrado, 1991). The reason for such difference, as categorised by Dunlap (1975) are: 1) "environmental reforms generally are opposed by business and industry because of the costs involved and 2) environmental reforms entail an extension of government activities and regulations". These results prove that the right-wing conservative favouritism toward business, and opposition to stronger role of state

[7] The environmental Kuznets curve postulates that an inverted U curve relationship exists between income level and environmental quality. This suggests that environmental quality deteriorate as income increases but as it gets to the peak, that quality starts to improve with income increase. The World Bank (1992) which reported the evidence of this relationship for several environmental indicators, such as safe water and sanitation, particulate matter and sulfur dioxide, supported this theory. The relationship was found for different indicators. The study of Rudel and Roper (1997) find the relationship with rain forest reforestation rate, Grossman and Krueger (1995) with air and river contamination, and Robert and Grimes (1997) with intensity of Co2. The evidence from The World Bank (1992) supported this theory with several environmental indicators such as safe water and sanitation, particulate matter and sulfur dioxide.

World Bank, *World Development Report 1992*, Washington D.C., 1992, Gene Grossman and Alan Kruger "Economic Growth and Environment, The *Quarterly Journal of Economics*, May 1995. Roberts, Timmons and Peter Grimes, "Carbon Intensity and Economic Development 1962-91: A Brief Exploration of the Environmental Kuznets Curve," *World Development*, Vol. 25 No2, pp. 191-98, Rudel, Tom and Jill Roper "The Paths to Rain Forest Destruction: Cross national Patterns of Tropical Deforestation, 1975-90" *World Development*, Vol. 25 No1, pp. 53-65.

whereas left wing tends to put emphasis on social and welfare issues, which include environment.

Critics on relationship between political ideology and environmental concerns are as follows: firstly, this hypothesis owes too much to Western case studies where political sides are clearly divided and not common for other countries. Secondly, as Inglehart (1990) states, “political ideology is generally understood to refer to an action plan propagated by some specific political party or movement; it is adopted more or less consciously as the result of explicit indoctrination”. This means that person formulates his/her attitude first and chooses the political parties but not vice versa. Therefore, political ideology is not a pre-requisite for having the environmental concern but it comes afterwards. Also, like for other hypothesis, difference in cultural and historical context must take in to account in linking the political ideology to environmental concerns.

Studies focused on finding a ‘link’ between socio-demographic attributes with environmental concern were successful in identifying some relationships with some social attributes. However, many empirical results are not consistent with these hypotheses. Also, most of these studies are based on experiences from Western culture; hence, the hypothesis suffers lack of applicability to countries with different cultural backgrounds.

Although these studies go one step further than the descriptive studies on public opinion by establishing an association with the socio-demographic factors and environmental concerns, validity and applicability of conclusions drawn from these studies are limited. The limitation is caused by the fact that the socio-demographic attribute do not represent all dimension of the decision making process for individuals and these hypothesis are constructed based on cases which are culturally biased. Therefore, what needs to be examined is a core factor that determines the decision of individuals, such as value system or worldview, which is formulated by multiple socio-economic factors.

IV. REVIEW OF MAJOR STUDY ON RELATIONSHIP BETWEEN VALUES/ WORLDVIEW AND ENVIRONMENTAL AWARENESS

The value system or worldview of individual is fundamental and it is rarely changed. Value is defined as "the deep tides of public mood, slow to change, but powerful" in comparison to opinion [8] and attitude (Worcester, 1996). If public opinion is a reflection of the current information and situation given to the person, socio-economic background can be considered as a framework of a person who receives such information. In this context, the value/worldview is considered as one of the most important element in decision making.

Each individual is embedded in social structure where the decision is shaped by individual's values and worldview [9] (Stern, Dietz, Guagnano. 1995, Inglehart, 1990). The studies assume that broad concept such values and attitudes determine more specific concerns for environment since these concepts act as filters for new information or ideas. Information that went through the "filter" is more likely to influence the formation of attitudes (Kempton, Boster and Hartley, 1995). Hence it is important to identify the values /worldview that would influence positively to the formulation of environmental attitudes. In this section, two major studies are reviewed. Those are a study on "value system" by Inglehart and a study on "worldview" by Dunlap.

1. Materialist vs. Post-Materialist theory [10]

Ronald Inglehart (1977, 1990 and 1997) does one of the early and extensive researches on value systems. He has written widely about cultural values and has developed a theory of 'Post Materialist Societies'. His works set the hypothesis that a society's culture- its basic values and beliefs of its peoples- are closely linked with its economic and political system. His analysis demonstrated powerful linkages between value systems and socio-economic systems. According to that, the increase of environmental concern is considered as one of the phenomena caused by the "value shift" from 'materialist' to 'post-materialist' (Inglehart, 1990). This means that there was a 'shift' away from the long predominant preoccupation with material well being and physical

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[8] As stated earlier, Worcester (1996) states that " …opinions: the ripples on the surface of the public´s consciousness, shallow and easily changed; attitude: the currents below the surface, deeper and stronger…"

[9] The work of Dietz, Stern and Guagnano (1995), differentiates value from worldview in the following three points: 1) values are formed earlier in life, within the family whereas worldview may be the result of political and social experience in the larger world; 2) values seem more general than worldviews, encompassing broad dispositions or orientations that seem nearly as basic as personality itself; 3) values probably are more stable over the life course because they can be challenged only in terms of their desirability or appropriateness.

[10] Inglehart defines Materialist as those "emphasising economic and physical security above all" and Post-Materialist as those "emphasising self-expression and the quality of life" (Inglehart, 1997).

security toward greater concern for the quality of life, which includes environmental quality.

He sets of two hypotheses for the factors, which influence value changes (1977):

1) A Scarcity Hypothesis: an individual's priorities reflect the socio-economic environment: one places the greatest subjective value on those things that are in relatively short supply.
2) A Socialisation Hypothesis: The relationship between socio-economic environment and value priorities is not one of immediate adjustment: a substantial time lag is involved because, to a large extent, one's basic values reflect the conditions that prevailed during one's pre-adult years.

The scarcity hypothesis is similar to the principle of diminishing marginal utility in economic theory. Like in Environmental Kuznets Curve, he considers that economic factors tend to play a decisive role in determining the 'shift'. For instance, under condition of economic scarcity the materialist value prevails; however, as material scarcity diminishes, demand for the quality of life, Post-materialist value, increases. Although it shares the basic concept with theory of Environmental Kuznets Curve, Inglehart suspects that environmental quality improvement is not simply achieved by the economic level since post materialist value reflect one's *subjective* sense of scarcity. Therefore, the situation of social welfare, cultural and political setting of individuals in which one is raised, also have an influence on the change in environmental quality. In this context, the socialisation hypothesis becomes important.

He also considered that “value system”, established during one’s formative years, has an impact on “cognitive mobilisation” or political behaviour such as ecological movement. He links the degree of impact to the social background of individuals by claiming that impact is greatest among those with relatively high levels of education, political information, political interest and political skills. In relation to that, relationships between degree of post-materialist and socio-demographic factors such as education, age, sex, political ideology, religion were analysed. As the result, he fond that that age and economic level are the strongest factors for Post-materialist value, environmental concerns, thereby confirming his 2 hypothesis.

In his work of 1997 (Inglehart, 1997), he extends his 'materialism and post-materialism thesis' into modernisation and post modernisation and explains Post modernism as the selective re-valorisation of tradition or as a rise of new values and lifestyles. This work focused on the process of democratisation and citizen’s political participation as the sign of Post-modernisation and, through the discussion of increased participation and changing role of institution indicated the importance of awareness in starting a social movement. He states that " awareness is essential to any realistic strategy of social change…" (Inglehart, 1997). He considers the change in the value from modernisation to post-modernisation is occurring as a result of diminishing return of modernisation felt *subjectively* by the population through the degradation in the quality of life, in which includes environmental quality.

He also refereed the importance of link between attitude and behaviour. He states that, the *specific* attitudes are generally" unrelated or only slightly related to overt behaviours" (Wicker, 1969 quoted in Inglehart, 1997); however, the *global* attitudes are relatively good at predicting global patterns of behaviour. He admits that these attitudes do not determine behaviour in any one-to-one fashion but assert that such attitudes, combined with situational factors, will become an indicator of behaviour since behaviour requires both motive and opportunity.

Inglehart's work is criticised on the bases of the lack of information and small variety of countries studied. Although he had huge amount of samples (as much as 200,000), the information (such as experiences in the pre-adult, "former" period) that he obtained from these samples are not enough to prove his hypothesis of socialisation (Inkeles, 1991). Also the works of Brechin and Kempton (1994) and Furman (1998) question the effect of Post-materialist on environmental values. They claim that increasing concern for the environment is a global phenomenon, emerging from multiple sources such as observation of environmental degradation, institutional process, availability of effects of the mass media and information, therefore, that environmentalism may have transformed itself as a part of materialistic value.

2. New ecological paradigm and human exceptionalism paradigm

In addition to materialist/post-materialist theory, theory of Human Exceptionalism Paradigm/New Ecological (Environmental[11]) Paradigm, founded by Dunlap and Catton, is frequently mentioned in discussion of environmental concern. This theory focused on worldview on environment and evaluated its relationships with socio-demographic factors. They claimed conventional sociology is unable to find a solution for environmental problems because it stems from particular worldview, "Human Exceptionalism Paradigm (HEP),[12] which fail to acknowledge the biophysical bases of social structure and social life (Buttel, 1996, Taniguchi, 1998). They asserted a need to "shift" paradigmatically from HEP to New Ecological Paradigm: NEP.[13] The NEP, unlike HEP, consider human beings as a part of ecological system (Buttel, 1996) and the environmental improvement can be achieved through the spread of NEP among public (Buttel, 1996).

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[11] Dunlap uses the term "ecological" except for his paper written in 1978.

[12] According to them, HEP is explained as: 1) human being has exceptional status because its has culture; 2) Culture has unlimited variety and it changes much faster than biological characteristics, 3) thus, differences of human beings stems from socialisation process and such differences can be fixed socially; 4) thus, accumulation of culture means that enabling to solve all the social problem as well as unlimited progress (Taniguchi, 1998).

[13] New Environmental Paradigm: NEP is characterised as: 1) Human beings are just one of the species which is dependent on life community which formulates our social life, 2) In the natural network exist complex relationships of factors, results, and feedback. The human activities in such network should create various unexpected results, 3) World is limited, and there exist the physical and biological limit for economic growth, social progress and other factors, which regulate social phenomenon (Taniguchi, 1998).

Dunlap considers studies on environmental concern are important in order to know whether the "shift" had taken place in the society. In this opinion, the "shift", which imply increase of environmental concern, not only gives legitimacy to the pro-environmental social movement, but also put pressures on government in policy making and implement environmental regulations. In this context, he considers the trends of public opinion on environmental issue as a sign of environmentalism. He came up with a set of questions [14] to measure the degree of NEP to estimate the worldview of citizens. This set of questions is widely used in different studies such as in case of the United States (Kempton, Boster and Harley, 1995) and case of Istanbul, Turkey (Furman, 1998) amongst others. Despite of his contribution in the concept of NEP, Dunlap is often criticised for not linking his theoretical work to his empirical contribution on environmental attitude (Fujimura, 1996, Taniguchi 1998).

The study of values and worldview are important in predicting people's behaviour since these work as "filters" for the information and ideas. However, studies discussed above concentrated on evaluation of the 'shift' in value system/worldview and lack the analysis to link the value/worldview and behaviour.

[14] The scale of NEP is consisted of 12 items (Van Liere and Dunlap, 1979 quoted in Furman, 1998). Respondents were asked to whether they strongly agree, agreed, undecided, disagreed or strongly disagreed with each item. These items are categorised in three themes: Balance of Nature, Limits to Growth, and Humans over Nature. The Balance of Nature consist of 4 items which asks for the followings: 1) The balance of nature is very delicate and easily upset, 2) When humans interfere with nature, it often produces disastrous consequences, 3) Humans must live in harmony with nature in order to survive, 4) Mankind is severely abusing the environment. The limits to growth consist of the followings: 5) We are approaching the limit of the number of people the Earth can support; 6) The earth is like a spaceship with only limited room and resources; 7) There are limits to growth beyond which industrialised society cannot expand; 8) To maintain a healthy economy, we will have to develop a steady state economy where industrial growth is controlled. The human over nature consist of: 9) Mankind was created to rule over the rest of nature; 10) Humans have the right to modify the natural environment to suit their needs, 11) Plants and animals exist primarily to be used by humans; 12) Humans do not need to adapt to the natural environment because they can remake it to suit their needs (quoted in Furman, 1998).

IV. REVIEW OF MAJOR STUDIES THAT LINK ENVIRONMENTAL AWARENESS AND BEHAVIOUR

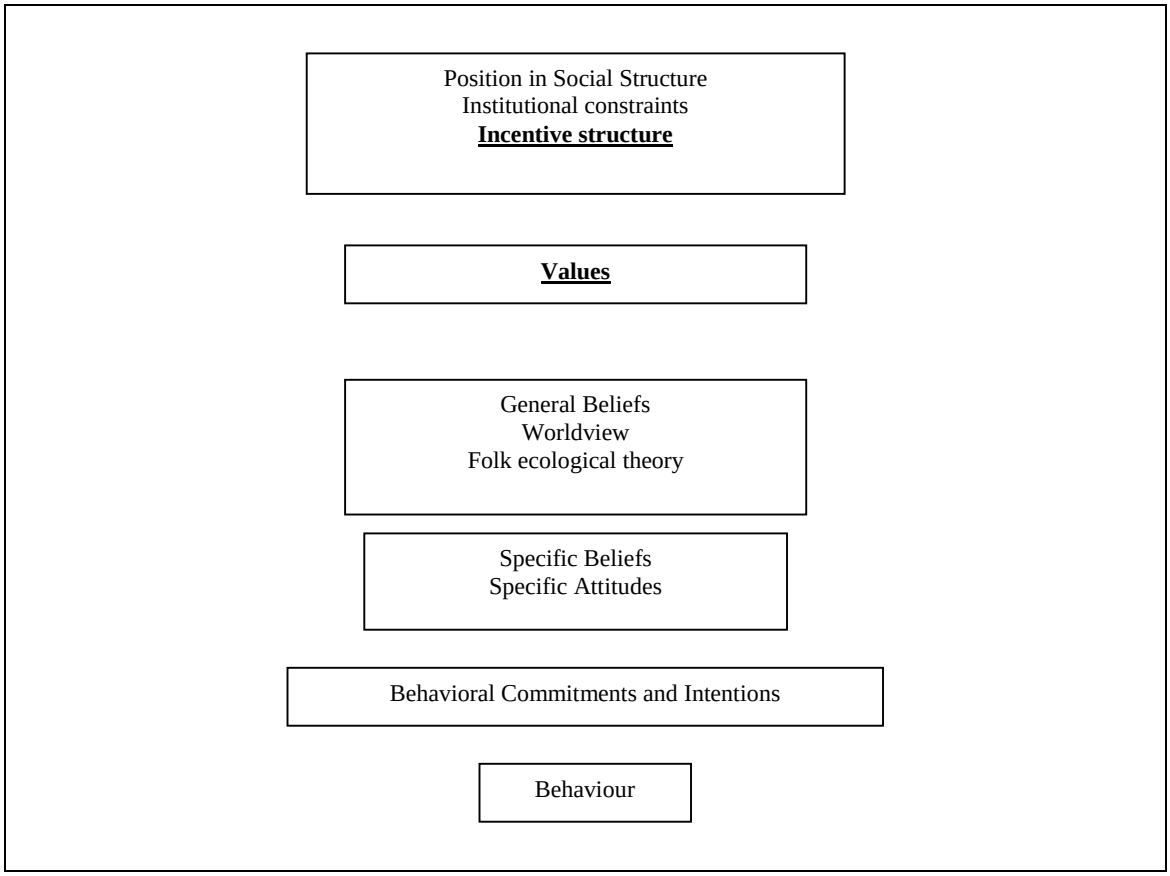
As the *Human Development Report* (1998) states, the consumption of individuals are increasing with tremendous speed and putting significant pressure on environment. This reality is already pushing people, in both developed and developing countries, to accept that some of their lifestyle are unsustainable (Dunlap, Gallup and Gallup, 1993). The study on the trend of environmental attitudes is considered important because such attitude were thought to predict environmental actions (Stern and Oskamp, 1987). There were also a hypothesis that an attitude is "an enduring set of beliefs about an object that predispose people to behave in particular ways toward the object" (Weigelt, 1983, quoted in Tarrant and Cordell, 1997). These are based on the idea that people with pro-environmental attitude would behave as such.

A number of studies showed inconsistency or non-existence of the relationship between pro-environmental attitude and behaviour (Buttel 1996, Van Liere and Dunlap, 1981, Mainieri, Barnett, Valdero, Unipan, Oskamp, 1997). In fact, although the opinion poll demonstrated that the highest percent of environmental concerns are recorded in 1990s in its history (Dunlap and Scarce, 1991), few of these concerns have directly transformed into pro-environmental behaviours. Several studies has demonstrated empirical results such as: a) low correlation among environmental behaviours, b) different levels of specificity in the measure of attitude and behaviour, c) effects of extraneous variables and d) lack of measurement reliability and validity (Mainieri, Barnett, Valdero, Unipan, Oskamp, 1997).

Most of the studies on environmental concern are conducted by sociologist and political scientists on environmental awareness and end by identifying the level of specific attitudes or at the level of behavioural commitments. For this reason, these studies were criticised by social psychologist for not reaching to the behavioural level (Stern, Dietz, and Kalof, 1993, Stern, Dietz, Guagnano, 1995). The study of worldview and value would enable to approach the inner cause of environmental concerns; however, the social psychological approach attempts to find out the factors that lead to action.

The work of Stern, Dietz and Guagnano (1995) offers a framework which binds together earlier works on environmental concern and extend further to behavioural level in their schematic causal model of environmental concern (Fig. 1). In this framework, factors such as: 1) position in social structure, institutional constrains, incentive structure; 2) values; 3) general beliefs, worldview, folk ecological theory; 4) specific beliefs, specific attitudes; 5) behavioural commitment and intentions; and 6) behaviour, are presented in this order. In the model, the strongest causal effects are considered to exist between variables that are adjacent, despite the fact that non-adjacent factors could also affect each other directly for instance, between institutional constrains/incentive structure and behaviour or behavioural commitment amongst others.

Figure 1
Schematic Causal Model of Environmental Concern



Source: Stern, Dietz, Guagnano, 1995.

In the model, social structure factor acts in two ways. Like Inglehart (1990) stated in the *Culture Change*, social structure "shapes early experience" and forms "individual's values and general beliefs or worldview". But unlike Inglehart, they linked social structure factor to behaviour and added that these factors also "provide opportunities and constraints that shape behaviour and the perceived response to behaviour" (Stern, Dietz and Guagnano, 1995). The values and worldview are considered as an antecedent to more specific beliefs by acting as filters for new information or ideas. Hence value and worldview influence greatly in formation of attitudes and behavioural commitments and intentions.

In this section, attempts are made to: 1) clarify inhibiting factors for pro-environmental actions; 2) review two of the major theories that link awareness to behaviour; 3) suggest the possible tools which may induce behaviour.

1. Inhibiting factors for taking pro-environmental action

Despite the existence of high public concern on environment and taking pro-environmental actions are still difficult for most of people. The reasons for such inaction are characterised into three: subjective character of environment, dilemma between convenient life and environmental conservation, and difficulty in executing the right behaviour.

Subjective nature of environment

The discrepancy between the concern and behaviour is explained by the lack of clear link between the general environmental concern to specific action and lack of image as environment affects the individuals. In general, people obtain two kinds of knowledge: descriptive and procedural (Hirose, 1995). The descriptive knowledge explains cause and effect of phenomenon. The procedural knowledge gives instructions to achieve or avoid such phenomenon. Most of environmental information belongs to the descriptive type of knowledge but not the procedural one. For instance, people have general knowledge, as the consumption of too much paper would destroy forests. However, they lack procedural type of information such as what type of paper can be recycled and how could be collected to be recycled.

Another factor that makes difficult for people to change behaviour is the unclear link between one´s action and its impacts on environment. For instance, as stated earlier, consumption is putting more pressure on environment than ever but in order to explain how consumption affects environment, it must go through the long chain of process and makes it difficult for individuals to feel responsible for the damages cause by his/her action. This is especially true when environmental damages are caused at international and global levels. For example, it is very difficult to link clearly how ‘eating hamburger’ in U.S. would ‘destroy native forest’ in Brazil if there were no information to fill the gap.

Having environmental concern and behaving accordingly is quite another matter. The factor discussed here presents the deficiencies in the current environmental knowledge held by people and adequate information that would induce people to take pro-environmental action. If the link between environmental condition and behaviour remained weak, it is hard to expect the pro-environmental action to occur and continue.

Dilemma between Convenient Life and Conservation of Environment

The dilemma between convenient life and environment can be explained by the work of Garret Hardin (1968), “Tragedy of the Commons”. In his work, Hardin differentiated the individual and collective gains when people are using common goods, such as environment. He took the example of herdsman who seeks to maximise his gain by taking rational decision under the condition that each individual herdsman are allowed to keep as many cattle as possible on the commons, pasture. The utility maximisation under such condition has positive and negative consequences. He gains by the positive utility nearly 1, if he decides to add more animals, but he loses for a fraction of 1 by

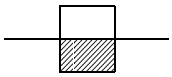
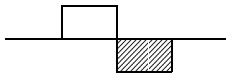
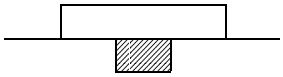
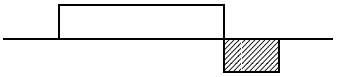
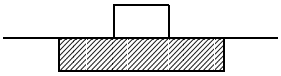
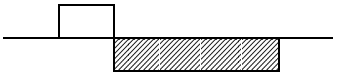
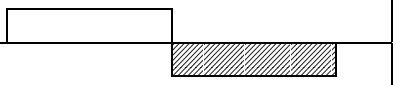
overgrazing the pasture which will be shared by all the herdsmen irrespective of whether he decides to add more animal or not. Hence, as a rational being, the individual choice would be to add another animal to the herd to maximise his individual gain. However, if all herdsman decide to maximise his gain, the pasture will be overgrazed and eventually everyone will lose, thereby "tragedy" occurs (Hardin, 1968).

The dilemma between convenient life and better environmental quality is thought as a dilemma between having one more cattle and loosing productivity of the land. A key feature of common goods is non-excludability: those who provide the good are unable to prevent others from consuming it. Once provided, these goods can thus be enjoyed by anyone, irrespective of whether they helped provide them. A temptation thus exists for individuals to free ride and let others contribute. From the perspective of individuals, change in behaviour depends on the existence of collective action; whether enough individuals will contribute rather than free ride (Balmey, 1998).

The degree and type of "social dilemma" depend upon the circumstances of environmental degradation. The environmental problems are generally grouped by the locality of the problem such as local, national, regional and global level. This coincides with the thinking that closer the people are to environmental degradation, quicker the establishment of consciences for collective action because responsibilities for environment, or commons, in smaller locality, are generally stronger than those dispersed. Funabashi (1989) viewed cases differently (Fig. 2). He considered that the difference in the relationship between the beneficiary and victimised would make variances in people's acceptance toward the collective action. By that, he looked at the relationship between benefited and victimised and differentiated the cases by what he called "benefit vs harm zones". He divided the relationships first, in 2 types: A) beneficiary and victimised are duplicated and B) beneficary and victimised are separated.

Second, he divided each type into 4 categories according to combinations of different sizes of zones as follows: 1) restricted benefit and harm zone, 2) expanded benefit zone and restricted harm zone, 3) restricted benefit zone and expanded harm zone, 4) expanded benefit and harm zone (Funabashi, 1989). He states that the example of pasture by Harding would belong to type A, category 1) since herdsman is the benefited at the same time victimised by his action and it is restricted in the relatively small locality. On the contrary, air pollution caused by automobile exhaust an example of type A, category 4) since victim and beneficiary are duplicated but the area more extended. The problem of locating dumping site for solid waste falls into type B, category 2) since beneficiary and victimised are separated and victim is concentrated small locality, near the site, than beneficiary. According to Funabashi, people are more likely to take actions when they knew that they would be directly harmed or benefited from taking the collective actions. However this require enough information on damages and benefits of such collective pro-environmental action because not all-environmental degradation is visible and explicit to the individuals.

Figure 2
Categorisation of Benefit and Harm Zones

	Benefit and harm are duplicated	Benefit and harm are separated
Restricted Benefit Zone Restricted Harm Zone	 Example: The over exploitation of fishery resources in a pound ("tragedy of commons").	 Example: The conflicts between farmers in up river and down river for irrigation water.
Extended Benefit Zone Restricted Harm Zone	 Example: The construction of highway (victims of sound pollution are restricted to those who live near the high way).	 Example: The construction of waste deposit out of city (victims are those who live near the waste deposit).
Restricted Benefit Zone Extended Harm Zone	 Example: The air contaminating industries damage others but they suffer from it as well.	 Example: The industries contaminate river water and cause damages for others.
Restricted Benefit Zone Extended Harm Zone	 Example: The traffic congestion (drivers receives damages as well as benefit).	 Example: global warming (victim is future generation)
	 Benefit Zone	 Harm Zone

Source: Funabashi, 1989.

Changing the behaviour is difficult especially if it involves fewer conveniences and more tasks. Many empirical studies prove this point by illustrating the discrepancies between high environmental concerns and relatively low participation in pro-environmental behaviours. From this section, it is possible to conclude that factor that inhibits one from act environmentally is his own "rational" decision of seeking his own interests based on an illusion that world is unlimited.

Difficulty in executing the right behaviour

Even after the people decide to behave in pro-environmental manner, lack of correct knowledge and technology inhibit people to take effective measures. Some studies showed that although many people said that they have acted "pro-

environmentally", in many cases, what they believed to be "pro-environmental actions" are not considered pro-environmental for its ineffectiveness (Hirose, 1995). Effective measures are unlikely to be taken if environmentally harmful behaviour is taken unconsciously. Also, the difficulty of changing the behaviour is high when the behaviour is strongly embedded to one's daily routine.

The theme common for all the factors mentioned in relation to pro-environmental action was the provision of correct information. The availability of information may play a key role in linking people's action to environmental risk and individual responsibility, indicate the correct and specific action to avoid such risk and involves one into collective action.

2. Socio-psychological frameworks on environmental attitude-behaviour link

Several theoretical frameworks exist to examine how individuals decide to engage in different forms of pro-environmental behaviour. According to Hirose (1995), earlier models are: "Energy Conservation Model" by Honnold and Nelson, "Yard Burning Model" by Van Liere and Dunlap, and "Energy and consumption model" by McClelland and Canter, Consumption Model by Seligman and Ferigan to mention a few. Amongst these earlier frameworks, Ajzen and Fishbein's Theory of Reasoned Action and Schwartz's Norm activation Model are the most cited. These models are originally formulated for other purposes but are extended and applied to the environmental attitude-behaviour context.

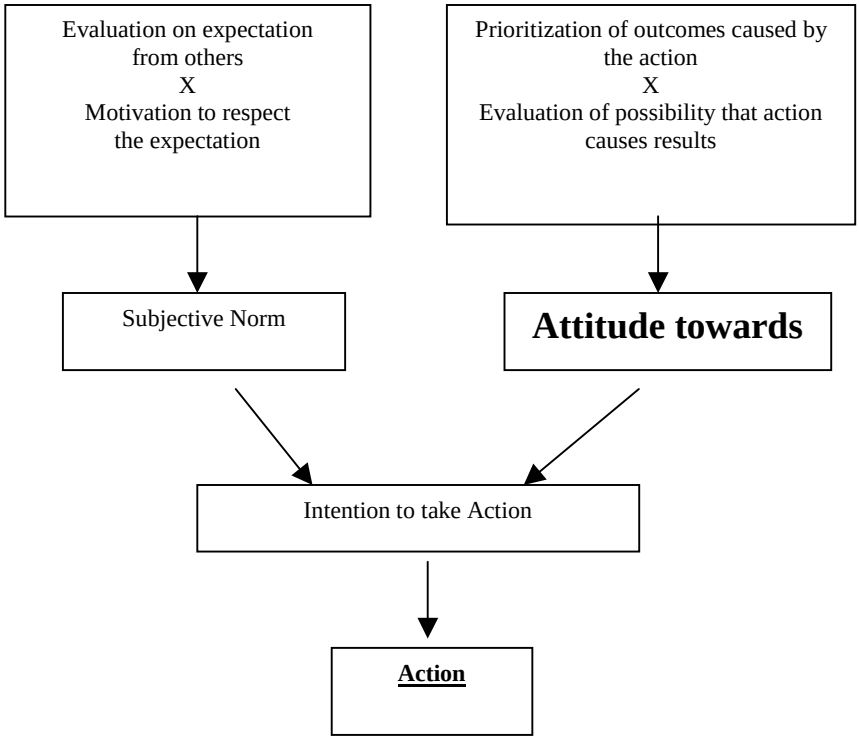
Framework by Ajzen and Fishbein

Original Theory of Ajzen and Fishbein

The Theory of Reasoned Action by Ajzen and Fishbein (Ajzen, 1991, Ajzen and Fishbein, 1975 quoted in Stern, Dietz, and Guagnano, 1995 and Hirose, 1995) analyses behaviour as an output of attitudes toward specific objects, subjective norms about behaviour towards those objects and perceived control over behaviour. This original model of Ajzen and Fishbein is proved of its effectiveness in predicting behaviour in case of voting as well as one's job selection.

The original model by Ajzen and Fishbein predicts the behaviour from attitude as explained in the diagram (Fig. 3). The 'intention to take action' is determined by 2 factors: 'attitude towards taking action' and 'subjective norm'. Attitude is defined as decisions taken based on his/her personal norm. The subjective norm is defined as decision taken based on how the individual is expected to behave in the society. The attitude toward action is determined by one's priority of taking the particular action and the evaluation of possible effect from the action one is about to take. The subjective norm is determined by an evaluation of expectation by others and strength of one's feeling of responsibility to meet the expectation or social norm.

Figure 3
Fishbein and Ajzen Attitude and Action Model drawn by Hirose



Source: Hirose, 1995

Application of Ajzen and Fishbein Models on pro-environmental behaviour

One of the earlier attempt to apply Ajzen and Fishbein model to the case of pro-environmental behaviour was done by Seligman and Ferigan (1990 quoted in Hirose, 1995). First, they hypothesised that consumption behaviour is based on the rationality that maximises the utility. Next they applied Ajzen and Fishbein Model to the case of Energy and Water conservation behaviour. In case of water shortage, the subjective norm affected strongly to determine one's action by proving empirically that water saving was much more practised in watering the garden, activities exterior, much more than other activities that are done inside of the house (Hirose, 1995). This is an example that shows that “expecting how ‘others’ consider one’s action” induced individuals to take collective action.

Activation of Environmental Norms based on Schwartz’s Model

Original theory of Schwartz’s Norm Activation Model

Schwartz’s Norm Activation Model analyses behaviour as an outcome of beliefs on the consequences of actions and norms about personal responsibility to undertake

specific action in response. This theory is also called theories of activation of altruistic norms (Widegren, 1998). This is because the theory is originally developed to explain the purpose of altruistically motivated 'helping behaviour'. In its most basic form, Schwartz's theory states that the activation of norms of 'helping' is most likely when an actor is aware of the 'positive consequences of helping' for an 'object in need' and ascribes 'responsibility' to him/herself for 'helping'.

In this theory, Schwartz hypothesises that "individuals sometimes act in response to their own self-expectations than their own personal norms" (Schwartz, 1977, quoted in Widegren, 1998). In this, he differentiates the social norm from personal norm. He defined personal norm as one's self-expectation such as pride and self-esteem. He further assumes that the personal norm becomes "activated" for 'helping' by the awareness of consequences for others "in need" and admit to ascribe the "responsibility" to help the person in need.

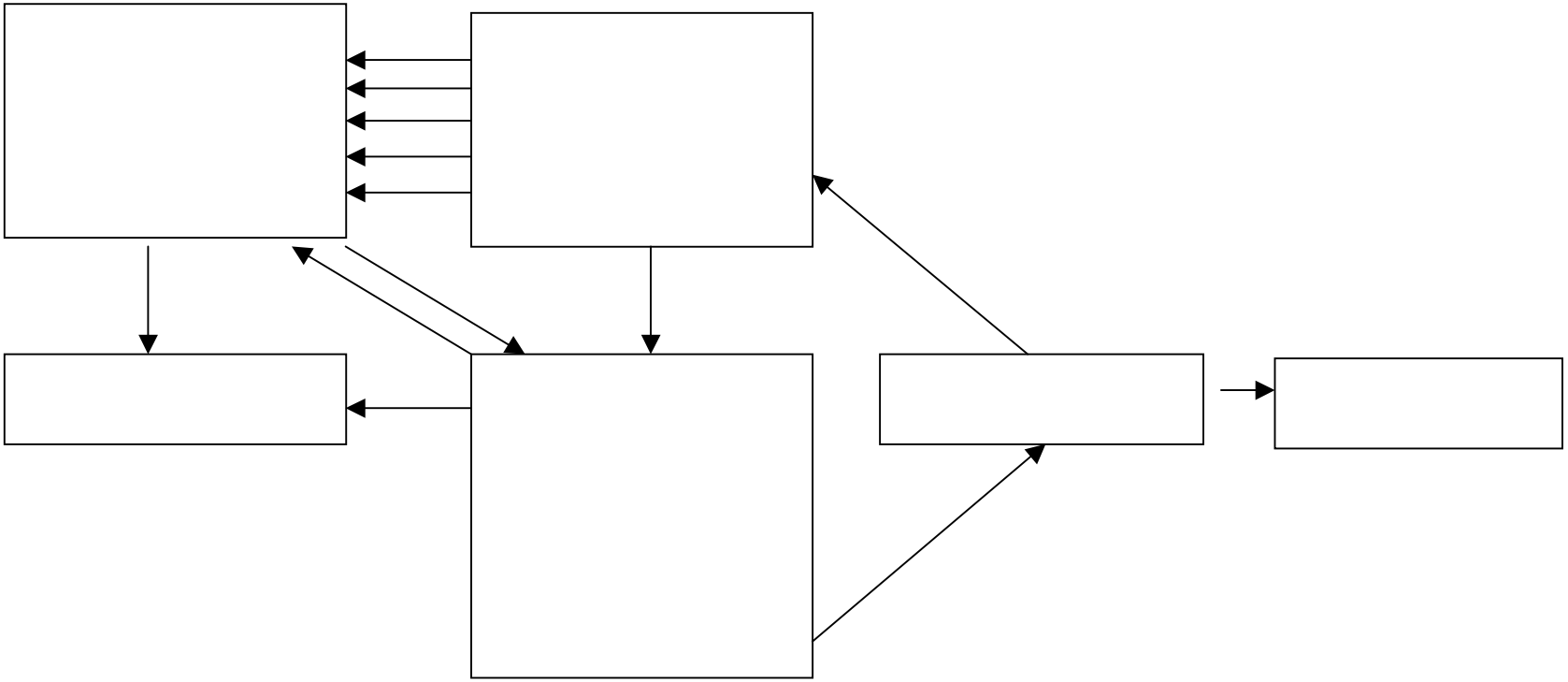
The process of activation of personal norm to behaviour is divided into five sequential stages. Each stage is explained as follows (Schwartz, 1977 quoted in Blamey, 1998) (see Fig.4).

The Stage 1 (Attention) involves three steps: first, individuals notice that a person/object is in need, second, individuals identify actions which could help the object in need, third, individuals recognised a personal ability to engage in these actions. The "awareness of need" includes an "awareness of the consequences" of inaction for the "object in need". After these three steps are fulfilled, individuals move to the Stage 2. If that is rejected, it will go to non-normative, or inaction, exit.

At Stage 2 (Motivation), three types of evaluation are made: first on non-moral factors such as "physical, material and psychological implications that follow directly from the action", second on value, moral and emotional factors such as "implications of the actor's held values", and third on social factors (Blamey, 1998). The first category is the evaluation of planned action against things such as risk of injury, trauma, or cost in terms of monetary and time that may incur as the result of action. The second category is the assessment of the action against one's moral and internalised values as to evaluate how much of satisfaction one could achieve from the action or inaction. The third category, social implication, involves outcomes that depend on the reaction of others. Individual assesses how the action would comply with socially accepted standards (social norm) of "helping" behaviour. In such context, the definition of 'others' varies from single individual to society at large depending upon the situation. In this Stage 2, feelings of obligation, or awareness of responsibility is generated.

Figure 4

Process Model of Norm-Activation Model



Source: Blamey, 1998 elaborated by author.

At Stage 3 (Anticipatory Evaluation), justification of an action is made. It is the cost-benefit evaluation of on the three implications mentioned above. In this, salience of specific costs and benefit in Stage 3 is influenced by both the values of the individual and situational cues. If the result of Stage 3 indicates the clear decision of inaction or action, then the process ends at this Stage. If the cost and benefit of helping are fairly evenly balanced individuals go into the Stage 4, which delay the decision or re-examine the situation.

In the Stage 4, individuals re-evaluate the case by denying to the situation, which one had so far recognised. The re-examines the case by four types of denial to neutralise feeling of obligation created in the first 2 stages. These are “denial of need”, “denial of effective action”, “denial of ability”, and “denial of responsibility” etc. Once the process of denial is completed, cost and benefit are re-evaluated. This process continues until a decision is made. The duration of this process varies depending upon urgency of the situation and anticipated monetary or moral cost in delaying the decision. After these processes, individual enters into the Stage 5, “behaviour,” which takes the form of action or inaction.

Application of Schwartz’s model on pro-environmental behaviour

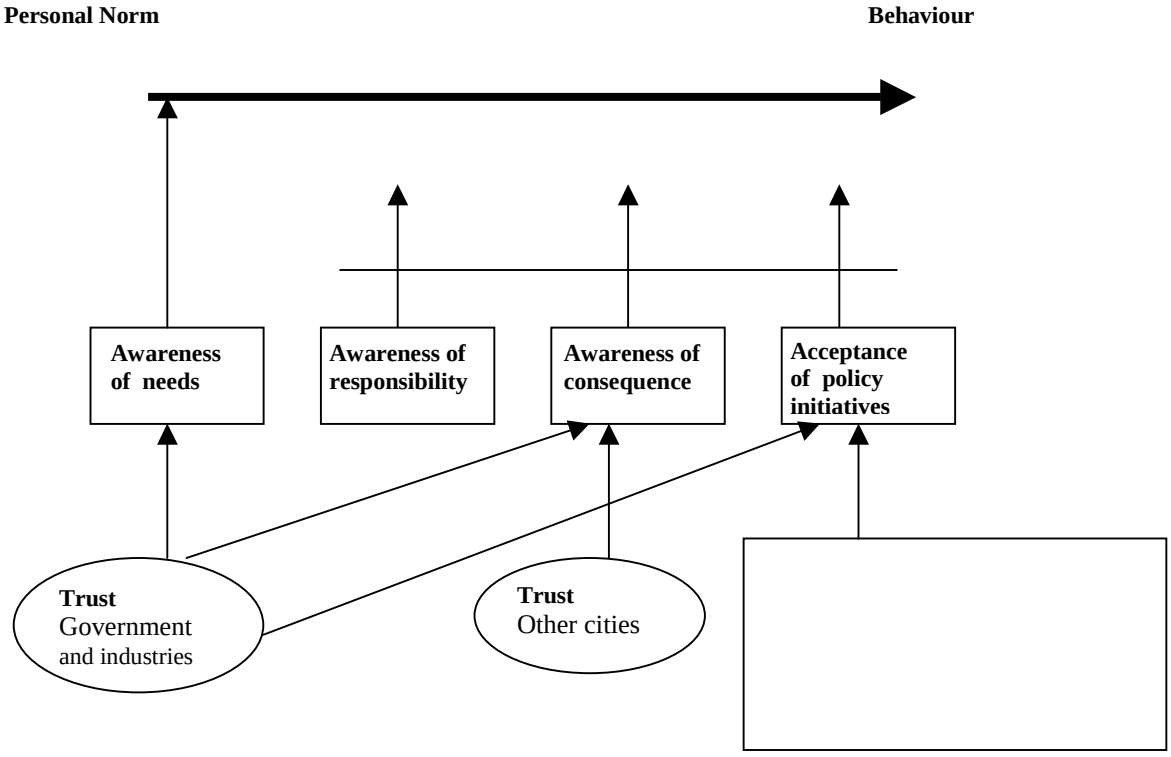
The Schwartz’s Model has been applied to explain the pro-environmental behaviour (Stern, Dietz and Kalof, 1993). According to Blamey (1998), such application date back to Heberlein (1972 quoted in Blamey, 1998) on explaining the widespread changes in environmental attitudes and with the rise of what has been referred as “environmental ethic”. Van Liere and Dunlap (1978 quoted in Hirose, 1995) also applied this theory on the yard burning behaviour. Most recently, this model is applied in consumer responses to energy situation and recycling behaviour (Black, Stern, Elworth, 1985, Nielsen, 1991, quoted in Blamey, 1998, Widegren, 1998).

Blamey (1998) attempted to apply Schwartz’s theory to the public goods, such as environment. As Hardin (1968) discussed previously, collective action is necessary to protect common goods. Blamey, in order to include the collective action, extended the model. In this new model, attitude-behaviour relationship is expressed as following figure (Fig.5). In process of transforming one’s “Personal Norm” (PN) into “Behaviour”, it goes through the process of establishing inter-relating factors such as Awareness of Needs (AN), Awareness of Responsibility (AR), Awareness of Consequences (AC) and Acceptance of Policy Initiatives (AP).

This model is established specifically to illustrate how institutions can “alter or co-ordinate human behaviour”. In this given situation, Blamey (1998) supposes that having an incentive to co-operate and being assured that others will contribute, is not a sufficient condition for contributing towards the provision of public goods. Individuals may, for example, need to be assured that organizations (Government) involved in implementing the “policy bargain” will do their bit and that this will be done in accordance with shared standards of fairness. In this sense, the “Awareness of Needs (AN)” in the expanded model included first, non-human object for individual in need,

such as environment, and second, factor of "trust" from government and industries to initiate "helping" behaviour.

Figure 5
Norm-Activation Model by Schwartz extended by Blamey



Source: Blamey, 1998

The value and moral implication of 'self' or "Awareness of Responsibility (AR)" is considered to have indirect influence with the "trust" in Government or any other institutions, which execute the policy. On the other hand, the "Awareness of Consequences (AC)," the evaluation of the judgement on the action individual is about to take, is directly influenced by the "trust" in government as well as "trust" in "other citizens". This is because the consequence of action is influenced by the government in formal norms (regulations) as well as by informal norms (social pressures).

Finally, the "Acceptance of Policy Initiative (AP)" is added in the extended model. This AP tends to involve norms of distributive and/or procedural justice, which is established where no formal policy initiative is exited. In the context of AP, AR and AC are reflected as "inaction" or "action". Also, the collective awareness such as AR of

"government and industry" and "other citizens" as well as AC of "government and industries" and "other citizens" influence AP.

In the extended Schwartz's model involves co-operation and trust for "others" in obtaining desired effects in environmental quality. This is due to the fact that co-operative or collective action is crucial in treating environmental matters. The realisation of this co-operative behaviour is more likely when the actions of others are easily monitored. The studies show that people feels much obligated to co-operate when others will do likewise. In fact, Blamey (1998) states that the "trust" established among actors plays a central role in the definition of parameter of needs and costs and benefits of executing "helping" behaviour. Also, Braithwaite et al (1994 quoted in Blamey, 1998) concluded that both "social and shared understanding" of goals between regulators and regulatees is the key to successful regulatory compliance. He continued that this tendency of keeping the regulation is strengthened if the iterations of game are involved because that would establish the reputation for co-operation or more "trust". Therefore, in order to manage the environmental policy successfully, first the "trust" between regulatees and regulators becomes necessary. This is only achieved with the establishment of clear and acceptable norm, continuity in its implementation and disclosure and diffusion of information on policy.

3. Tools to alter behaviour

The promotion of pro-environmental behaviour is vital in achieving the environmental sustainability. The previous section demonstrated the mechanism of individual's decision making process. After discussing how each factor is contributing to one's decision making, it is useful to categorise several tools that induces changes in behaviour.

Tietenberg, categorised these tools into following three: command and control (CAC) approach, market based approach, and information strategy (Tietenberg, 1997). According to him, the command and control approach is mainly based on regulations. The specific examples of such approach are standards, fines or sanctions. The market-based approach (MB) is more laissez-fair and oriented strongly to economic aspect. The specific examples include measures such as tradable permits and emission charges. This approach tries to lead the individual to pro-environmental action by economic incentives. Information strategy is centred on the consumer's right to know approach represented by measures such as eco-labeling, and auditing. The tools for information strategy deal greatly with the consumer advocacy through voluntary measures and public pressure. Whereas earlier two approaches relay on capacities of public sector in implementing specific measures, information strategy gives more initiatives to public at large (see Table 1).

Table 1
TOOLS TO CHANGE BEHAVIORS

	Type of Effect	Techniques	Aims of Techniques	Duration of Effect	Speed of Change	Cost of implementation	Durability of Change for Env.
Legal	Coercion	Prohibition, norms, legislation	Material Disincentives, Social pressure, Legal mandates	Shorts	Medium	High	Weak
Economic	Positive Motivation	Tax, Subsidies, etc	Material incentives	Medium	Quick	Medium	Relatively Weak
Information	Awareness	Education, Publication, Mass media	Creating social Norms	Long	Slow	Low	Strong

Source: Based on De Yong, 1993 and World Bank 1998.

The CAC and MB approaches are basically tools to internalise the external nature of economic cost. The Coase theorem (1960) states that the existence of clear rule would eventually internalise environmental problem such as pollution, and resolve the problem by reaching the economic balance, *Pareto optimum*. These approaches are successful when environmental coverage are limited in local areas or in national boundary. However, these became insufficient as a global environmental problem 'emerged'. In global context, CAC approach would not function as well as MB approach due to the extensiveness of scale in implementing. The information strategy is the new approach which, enables to extend the Coase theorem to much wider public since that potential victims by the environmental degradation became more global than local as has been originally thought (Tietenberg, 1997). The information provision allows the wide application of "polluter pays" principle of pollution control by making people aware of their environmentally non-friendly actions at the same time, making them to realise that they are responsible for them.

De Young (1993) categorised tools differently from that of Tietenberg. He categorised tools as follows: 1) information technique, 2) positive motivational technique, and 3) coercive motivational techniques. The information technique aims to help people understand the nature of environmental problem they are facing, the necessary behaviour needed to resolve the problem, or the steps required to carrying out this behaviour. For instance, this technique is expected to change the individual's attitude and beliefs about the issue, to make them to take appropriate action and ultimately, and gave them appropriate information to induce behaviours, which are, correct and appropriate. The positive motivational technique is a type of intervention that encourages or entices people to change their behaviour through monetary and social reinforcement. The specific examples are such the water utility rate structure that reward reduced consumption, or social recognition. The Coercive technique attempts to change one's behaviour by punishing in terms of monetary or social disincentives. Specific examples are such fines for polluting industries or social pressure for throwing the garbage.

De Yong (1993) further analyses the effectiveness of each tool in implementation process. He stated that each tool should be evaluated from different aspects. Some of these aspects are as follows: duration of effect, speed of change, cost effectiveness, durability of causing pro-environmental actions. Under these criteria, the hypothetical evaluation from above mentioned aspects are made as shown in the table (Table 1). This hypothetical evaluation demonstrates the compatibility of each tool and emphasises the importance of the third tool, awareness or information.

Both models, by Ajzen and Fishbein and Schwartz, provided successfully a link between the attitude and behaviour relationships by breaking down the contributing factors for decision making. Having these models as a background, categorisation by Tietenberg and De Yong identified the effective tools for environmental management. These models and the tools have enormous policy potentials to improve the environmental quality if the current situation is well studied.

V. CONCLUSION

Across many developing countries, people begun to recognize that environmental concerns are no longer luxury only affluent nations can afford and realize that the long-term costs of ignoring environmental protection are high. Although the pace and degree vary from country to country, most of the developing nations are making progress toward addressing both the enormous environmental deficits created by past development and the need for some controls on present and future growth.

As the results of these efforts, many developing countries are now equipped with environmental legal frameworks and some had already introduced market mechanisms to improve environmental qualities. However, these countries are still facing the worsening environmental quality. The difficulties that these nations face are not only the lack of legal and economic framework for environmental protection but the institutional weakness, political and economic turmoil and non-participatory decision making process because these make impossible to maintain the continuity in environmental policy. Considering these institutional, political and financial constraints and effectiveness in applying the information strategy is focused as a new instrument to improve the situation by providing information in an attempt to strengthen the existing legal and economic framework as well as to promote participation of people in pro-environmental behaviour. Provision of information may compose the important part in environment management because it induces participation of people and through this involvement of people make maintain the policy continuity and implementation possible at most cost effective manner.

In this paper, the review of literature was done in order to grasp the public concern and its involvement in environmental policies. Studies on trends of public opinion on environment demonstrated strong and persistent increase in people's concern on the quality of environment. Time series analysis of the U.S. demonstrated that although there was 'ups and downs' in people's interests on environmental issues, there is continuity in interests on environmental issues. This phenomenon is considered as an emergence of "environmental attitudes". The formulation of this 'attitude' is observed in other developed countries such as in Japan and Europe, where time series data is available. The cross-national studies illustrated a raise in environmental concerns as the global phenomena. They found that there were very few difference between developed and developing countries in their degree of concerns on environmental quality. These facts by confirm possible conformation of environment attitude during the 90s at the global level.

Another set of studies attempted to identify social factors that affect the formation of environmental attitudes. Several studies established hypothesis by linking the social attributes to the degree of environmental concern. The attributes such as age, gender, social status and political ideology are considered to have some correlation with the

existence of concerns on environment. However, throughout the review of these studies, we have found the limitation in its validity and applicability. The reasons lay in the change in social surroundings given to each social variable and perception towards the variable. For example, role of women and the situation surrounds them have changed drastically from the past decade and it would be no longer valid to say that women care the environment because she has a minor participation in economic and political activities. Also, hypotheses were mainly drawn from the Western case studies and lacked universality and neutrality for applying them to the different cultural contexts.

Above studies on trends of opinion and attitudes about environment, as well as their link to social attributes, were not successful in identifying the causes for people to take pro-environmental actions. The reasons for its failure lay the over assumption that existence of pro-environmental attitude, measured by opinion survey, is considered as a proxy for taking an environmental action. In searching a factor more concrete and unchangeable that formulate the pro-environmental behaviours, studies are made on value system and worldview. The value system and worldview are considered fundamental factor in creating an attitude as well as promoting environmental action (Inglehart, 1990) and are considered as the 'inner' factor for deciding the behaviour or action. These studies illustrated the shift in worldview and value; towards more environmental sensitive one; however, attention was concentrated in explaining the 'shift' rather than the factors that caused such 'shift'.

Other studies analysed system of decision making in order to link the environmental attitude/awareness to action/behaviour. Although there are differences in two models presented in this paper, Fishbein and Ajzen Attitude and Action Model and Schwarts's Norm-activation Model, both models identified common factors that influence the action. In case of environmental actions, it became evident that not only the individual attitude but also the attitude and reactions by 'others' have great impact in the decision of taking an action.

The citizen's awareness and its pro-environmental actions play crucial role in making the environmental policy successful. The study on behaviour and attitude desegregated the process of decision making and discovered importance and influence of attitude by 'others' in promoting pro-environmental behaviours. This suggests that it is important to mobilise people in 'mass' to obtain effectiveness of policy. In this context, the information tool identified by Tietenberg and De Young becomes significant. According to them the information tool/strategy not only could be able to strengthen their legal and economic instruments on environment, authorities of different levels but also induce people to participate in pro-environmental action by providing information in following areas:

1) General information on environment to make people aware of a problem;
2) Information that explain and link the cause and effect of environmental damage, what individuals should be doing;
3) Information on activities executed by others;

4) Correct information on government policies, to show that public as well as private sectors are also participating in the process of change.

These informations, in context of models provided, would serve as to create the awareness of needs, awareness of responsibility, trust among individuals and to promote collective actions, and finally formulate the trust towards government and acceptance of policy initiatives.

In providing comprehensive environmental information, it is important to target the right population and channel sufficient quality and quantity of information. The provision of right environmental information allows citizens to make right choices on consumption and sanction those who do not follow the rules by means of social and economic pressure. The role of authorities, in this context, would be to regulate the quality and quantity of information to be disseminated and to provide information on existing regulations and market incentives to the public. In establishing such mechanisms, it will be crucial to understand the current status of information received by citizens. The basic understanding of citizens about the environmental issues, the quality and quantity of their knowledge and, over and above, their awareness on environment would constitute an important benchmark for such approaches.

Until recently, people's awareness was never considered as a possible tool to promote environmental policy. However, this tool is actually important and has potential to be a powerful tool in environmental sphere. In fact, all the global trend on environment introduced after the Agenda 21 (United Nations, 1992) - increasing role of citizen's participation on global agenda, emergence of global environmental issues which demand holistic solution, rapid development of information technology, increasing globalisation of economy and its impacts on environment - all indicates the necessity of a way which induces changes in individual's behaviour in the long terms. Nevertheless, there are relatively limited number of study on environmental awareness in developing countries and those exited lack a policy oriented view. Therefore, it is quite urgent that empirical study on environmental awareness to be carried out in developing countries in order to: first, to collect basic information, second, to justify the validity of method and third, to incorporate the outcome into the environmental policy making process.

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