

Trade and Environment: Review of Relationship and Implication of Environmental Kuznets Curve Hypothesis for Malaysia

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ABSTRACT The relationship between trade and environment is experienced by different countries in a different way and it is also widely accepted that trade impacts the environment in a wide variety of ways and through a multitude of channels. This study is primarily an effort to review the relationship between trade and environment in Malaysia. Then the study briefly reviews, within this relationship, the implication of Environmental Kuznets Curve (EKC) hypothesis for selected environmental pollutants in Malaysia. The findings of the study show no evidence of an inverted-U shaped Environmental Kuznets Curve (EKC) for any of the six air and water pollutants in Malaysia. A few relevant policy options have been discussed following the findings and the study closes with some concluding remarks.

INTRODUCTION

It is now apparent in both developing and developed countries that economic growth driven by trade speeds up the process of environmental degradation if adequate environmental safeguards are not put in place. The externalities originated from market failure are the issues that must be resolved for protecting the environment from trade driven pollution. Market failure occurs due to the fact that producers and consumers do not have to bear the full cost of their actions. Inefficient government policies are also indirectly influencing the trade-environment relationship via some economic activities. The well-known examples include the subsidization of energy, agriculture, and fishing, which aggravates pollution problems and resource degradation rather than solving them and such instances, can be described as "policy failures". Trade liberalization is also causing environmental degradation across countries depending on the pollution propensity of expanding business activities. It is recognized that trade liberalization and its outcome such as free trade are both drivers of environmental degradation. The trade theory has demonstrated that free trade maximizes the efficiency of resource allocation by channeling

economic activities to least-cost producers, it thus produces a given level of output at the least cost. If natural and environmental resources are efficiently priced (i.e. all relevant social costs are accounted for), the global output resulting from free trade is also produced at the least environmental cost. Under such conditions, free trade would maximize social welfare. But the net effect on social welfare would depend on the relative magnitude of the positive and negative effects of free trade activities. The trade-related major environmental effects summarized by the Organization for Economic Co-operation and Development (1994) and Panayotou (2000) include scale effects, structural effects, income effects, product effects, technology effects, and regulatory effects. It is now widely accepted that globalization-induced free trade impacts the environment through the above six channels.

The relationship between trade liberalization, economic growth, and the environment in Asia-Pacific has not yet been charted (Strutt and Anderson 1998). Conceptual framework and evidence from Malaysia reveal that trade openness has both positive and negative impacts on the environment and that economic integration constrains national environmental policymaking. Ivanova (1998) stated that the positive impacts of the openness to trade and foreign investment can include: transfer of more efficient, cleaner production technologies and consumer goods via foreign direct investment and imports; norm-

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building that occurs through cross-border exchange of goods, services, capital, and ideas; transmission of higher environmental standards via import requirements by "large-market" countries. If the goal of good environmental management is not simply ecosystem and resource conservation but sustainable human development, then the benefits of growth-inducing trade openness would also include rises in per capita income and consumption (Zarsky 1999). On the other hand trade openness causes national economies to rising market demand and the pressures of international market prices, which rarely include any estimation of environmental damage. With environmental degradation simply outside the market equation, market signals do not give information about the true costs of production (Grossman and Krueger 1992). As a result, global production and consumption patterns could be grossly inefficient, in both economic and ecological terms. Studies reveal that without explicit environmental policies and regulations, trade and investment liberalization will not certainly promote sustainable use of resources and ecosystems. A host of rules and disciplines has been erected to frame the architecture of the world's trading system (Wee and Heyzer 1995). Studies also reveal that environmental degradation is the cost of development and those studies suggest a "grow now, pay later" principle as the way to overcome poverty and achieve industrialization. In fact, the way to measure the relationship between environment and development is not the absolute, additional cost of environmental investment is the additional cost minus the benefit (Lucas et al. 1992).

The rapid development in Malaysia has produced various environmental problems. Rapid growth, fueled in part by foreign investment and trade openness, has made Malaysia to get recognition as one of the fastest Southeast Asian country. Malaysia's rapid economic success has come at the expense of severe and rising environmental degradation, including the pollution of water and air systems, depletion of resources such as forests, wetlands, and fisheries, and loss of flora and fauna. Such environmental degradation imposes large monetary costs not only to Malaysia, also to Southeast Asian region and the world. High rates of environmental degradation are also evident throughout south-east and Northeast Asia, as well as Mexico and Chile (Ivanova and Angeles 2006). Environmental groups in Indonesia, for example, predict that, at

current rates of logging, Indonesian forests will be exhausted within 10 years (Pangestu 1994). In Thailand, the huge unregulated flows of foreign investment have made a nightmare of Bangkok and severely widened the gaps between urban and rural Thais (O'Connor 1999). The Australian Asia Pacific Center reports that water pollution is the most widespread environmental problem in Asia as the levels of dissolved mercury in Asian rivers far exceed recommended World Health Organization (WHO) standards. A few examples underline the gravity of the situation: a Malaysian government report (O'Connor 1999) ranked only 27 percent of 116 surveyed rivers in Peninsular Malaysia as "pollution free", while the others are ranked as "biologically dead" or "dying". In Bangkok, key sections of the Chao Phraya River are either biologically dead or very close to being so, owing to uncontrolled dumping of both industrial and human waste; and animal species that populated the length of the river declined from 121 in the late 1960s to 31 in recent times (Leavitt 2000). Deforestation is another important issue in Southeast Asia's trade-environment nexus. The highest rate of deforestation in the world during the period between 1981 and 1990 was found in the mainland of Southeast Asia. In the Malaysian state of Sarawak, loggers eliminated 30 percent of the forest area in barely twenty-three years (1962–1985); unless stopped, they will eliminate the rest by the end of the current decade and in just eight years (1982–1990), a third of the forests of the island of Sumatra, Indonesia disappeared (Strutt and Anderson 1998).

It is universally agreed that trade does play an important role in economic growth. Although trade will increase economic growth of a country, the theory shows that, removal of an export tax on a product could result in increased of production that leads to increased environmental pollution (Rahim and Nesadurai 1996). The relationship between trade and environment under certain conditions might be contradictory. But the global trades, which are ruled by regulations and standards, drive developing countries to produce environmental friendly product and minimizing environmental impact especially from its business and industrial activities.

Developing countries depend on trade to accelerate its economic success. Trade plays an important role in economic growth and has consistently outperformed domestic output of the developing countries. Trade benefited both

developed and developing countries and more countries are now moving toward liberal trade regimes to enhance their economic growth. Economists and environmentalists argue that liberalization of trade through the promotion of a more efficient use of resources and sustaining growth could make a vital contribution towards creating the conditions necessary for environmental improvements. They also argue that that trade liberalization and environmental policies will generate benefits through improving allocative efficiency, correcting market failures, and strengthening the potential of the internalization of environmental instruments such as the polluter pay principle. In fact, the wealth created by trade liberalization will also increase the quality of life and eradicate poverty, which has been described as an underlying cause of environmental degradation in many developing countries. For instance, with outward-oriented trade and investment policies Malaysia achieved improved environmental standards compared to those with less open policies, and hence it can be argued that trade liberalization is more likely to raise environmental standards. The present study is an effort to review the linkages between poverty and environment and to briefly review, within this relationship, the implications of Environmental Kuznets Curve (EKC) hypothesis for selected environmental pollutants in Malaysia.

RESEARCH METHOD

This study is based on qualitative analysis covering a large volume of secondary materials, which were found relevant to the issue area. In reviewing the linkages between trade and environment for Malaysia the findings of various recent studies have been analyzed. The implications of Environmental Kuznets Curve hypothesis for Malaysia are discussed in this study considering the levels of economic growth and some major environmental pollutants of the country. It is worthwhile to mention here that the relevant secondary materials have been extensively used, interpreted and reinterpreted to substantiate our arguments in this paper.

RESULTS AND DISCUSSION

Relationship between Trade and Environment

Historically, Malaysia has depended on trade

for its economic growth and development. Nevertheless, it also recognizes the importance of managing its natural resources to ensure environmentally sustainable economic development. This is especially so, as reflected in the Second (1991-2000) and Third Outline Perspective Plan (2001-2010). Appropriate mix of policies, strategies, and technological development has been adopted to ensure synergies between economic and environmental systems. Malaysia is also a signatory of several international environmental agreements from Rio Summit, Kyoto Protocol to recently held United Nations Framework Convention on Climate Change, and a member of the World Trade Organization (WTO). But a study by Abdullah (2001) reveals that Malaysia needs to monitor global environmental issues, which may have implications on its trade and development policies, as well as to abide by the principles of fair and equitable trade. In fact, Malaysia's Vision 2020 to become an industrialized country by the year 2020 requires trade as the key mechanism to sell its locally manufactured products to global market. During the Eighth Malaysia Plan period (2001-2005), total trade expanded at an average rate of 7.2 percent per annum from MYR684.7 billion in 2000 to MYR967.8 billion in 2005 and gross exports grew at an average rate of 7.4 percent per annum to MYR533.8 billion in 2005 (Malaysia 2006). With this performance, Malaysia was ranked the 18th largest exporter, contributing 1.5 per cent of world exports. Malaysia's key major exports are manufacturing, petroleum, forests, and agriculture products. In the past, trade activities caused significant negative impacts on the environment, but with current development in trade agreements and negotiations, Malaysian trade policies and strategies are considered as the effective tools to achieve sustainable development.

In achieving sustainable development, various environmental related policies and regulations have been implemented in Malaysia. These include the Environmental Quality Act (1974), 45 environmental-related legislations, National Policy on Biological Diversity (1998), National Mineral Policy (1998), and Third National Agricultural Policy (1998-2010). The National Environmental Policy outlined the management of the environment and natural resources in an integrated manner, including the use of legislations and market based instruments to encourage the adoption and development of

environmentally sound technologies and products. It is apparent that Malaysia has already taken the policies and strategies that promote sustainable development. Some of these policies have already been implemented while others are still at the stage of implementation, which requires the infrastructure and capacity in terms of human, technical, and financial resources from the government and private sector. Malaysia's perception on trade-environment issue is that environment-related trade instruments would lead to economic growth that will provide the resources for environmental protection while promoting healthy environment, preserving ecological integrity, and natural resource stocks necessary to promote long-run economic growth. In fact, Malaysia recognized the importance of these environment-related trade instruments and has been active in negotiations on several international environment-related trade instruments. The Framework Convention on Climate Change, The Vienna Convention for the Protection of the Ozone and the Montreal Protocol as well as the Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste has strong input from Malaysia. Malaysia has also shown its commitment towards eco-labeling and has taken proactive steps in implementing it.

As mentioned earlier that Malaysia has already implemented some trade related tools for environmental protection. Example of trade related tools, which have been implemented by Malaysia, was the phasing out of the use of ozone depleting substances (ODS). This is inline with The Montreal Protocol signed in 1987, which requires signatories to comply with its requirement. Under Article 5 of the Protocol, developing countries with consumption of the chlorofluorocarbons (CFCs) and halons less than 0.3 kg per capita are exempted from the implementation of the control requirements for a period of ten years. Ozone depleting substances consumption in Malaysia was estimated to be less than 0.3 kg per capita in 1989, therefore the country was qualified for this requirement. Malaysia has also implemented strategies to phase out the use of ozone depleting substances. With assistance from the Multilateral Fund of The Montreal Protocol amounting US\$24.8 million from 1991 to 1995, the aerosol industries in Malaysia have almost completely phased-out chlorofluorocarbons, while the foam industries made substantial progress in substituting chlorofluorocarbons with viable alternatives. To

facilitate the implementation of the national program, amendments to existing legislations were also made, including The Customs Duty (Amendment No. 35) Order 1989, and Environmental Quality (Prohibition on the Use of CFCs and Other Gases as Propellants and Blowing Agents) Order 1993. These industries, however, were able to phase out ozone depleting substances use by the year 2000, which is earlier than the mandatory date of 2010 stipulated under the Montreal Protocol for developing countries.

The worth noting is that Malaysia's forest products were particularly affected by environment related trade tools. Global trade mechanism requires country producing forest products to implement sustainable forest management (SFM), which primarily requires protection of forest ecosystem. Malaysia is concerned about environmental degradation and loss of biodiversity. In order to assure that the process of harvesting the natural resources from forest gives minimal impact, sustainable forest management policies and strategies have been implemented in the country. Malaysia is committed in sustainable forest management, which will sustain economic growth from timber and forest product while maintaining environmental stability and ecological balance. In order to achieve this at least fifty percent of land area will be maintained as forest covering with a total land area of 32.9 million hectares, where the natural forest base is 18.9 million hectares. Out of this, a total of 14.1 million hectares of natural forest have been designated as Permanent Forest Reserve (PFR), which will be managed to ensure balance between various purposes such as production, protection, social, and educational objectives. In addition 3.39 million hectares of land have been allocated for protection forests in the form of national parks, wildlife sanctuaries, and natural reserve. Sustainable forest management efforts of Malaysia will allow timber and non-timber product for eco-labeling or eco-certification under International Tropical Timber Organization (ITTO) criteria. To establish a timber and non-timber product certification timber scheme based on International Tropical Timber Organization criteria and indicators, a Committee on Timber Certification (CTC) has been established to operationalize a certification scheme in Malaysia. Under this scheme more timber and non-timber products will be able to be eco-certified and to promote sustainable forest management. As a final point to the issue, Malaysia sincerely considers sustainable

development as important to its economic growth and industrial development in materializing the national vision 2020. It is also evidenced by the country's Eight Malaysia Plan (2001-2005) that the Government of Malaysia stresses the importance of sustainable development and promotes the use of cleaner production for its business firms and industries (Malaysia 2001).

Implication of Environmental Kuznets Curve (EKC) Hypothesis

Although economic growth and per capita income are the most commonly used indicators of human advances, environmental economists have long been concerned by the consequences of growth and trade on the natural environment. Since the end of the 1960s, numerous reports have questioned the sustainability of economic growth in relation to the current consumption patterns and lifestyle. The most influential report was perhaps "The Limits to Growth", written by the Club of Rome (Meadows et al. 1972), which predicted that key natural resources, in particular non-renewable resources such as fossil fuels, would become increasingly scarce over time and eventually exhausted if economic growth as we know it were to continue. The same report also warned that the environment's carrying capacity would become over-strained by different pollutants and possibly collapses, unless human activities were held at bay. In short, economic growth and environmental quality were viewed as being on a collision course in which one or other would eventually have to surrender. It is apparent that the implementation of adequate environmental standards is still lagging behind particularly in many developing countries, and it is still factual that economic growth without the necessary precautions is not sustainable in the long run. The important reason why environmental protection is slow to implement in many developing countries is because of low incomes. If poverty is at the core of the problem, economic growth will be part of the solution to the extent that it will allow countries to shift gear from more immediate concerns to long run sustainability issues. The fact is that growth per se does not reduce environmental pollution and the environmental protection requires that increased income must be followed by tighter environmental standards. Some empirical evidence suggests that environmental pollution increases at the early

stages of development but decreases after a certain income level has been reached, an observation that has come to be known as the Environmental Kuznets Curve (EKC). An illustration is provided in Figure 1 and the next section would present implications of the Environmental Kuznets Curve hypothesis that was tested for selected environmental pollution in Malaysia.

Prior to looking at the implications of the Environmental Kuznets Curve hypothesis for Malaysia, it is worth noting why trade is an issue in this context. The most direct reason is that trade is an important cylinder that propels the engine of growth. Obviously, what ultimately drive economic growth are investments in physical capital, human capital, and technology. As far as the trade regime is concerned, the relationship with growth is mainly indirect and via two channels. First, trade barriers distort the price signals of an economy and thus also the allocation of scarce investment funds. Second, countries without trade, hence referred to as closed economies, tend to fall behind in technological development. Assuming other factors as constant, open economies tend to grow significantly faster than closed economies. Some studies show evidence in favor of the Environmental Kuznets Curve hypothesis, while others are not. The evidence suggests that the Environmental Kuznets Curve hypothesis may be valid for some types of environmental indicators, and for different reasons, but equally invalid for other important indicators (Barbier 1997). Those indicators that appear to demonstrate some characteristics of an inverted U-shaped pollution path are certain types of local, primarily urban, air pollution and, to a lesser extent, some types of freshwater pollutants (Nordstrom and Vaughan 1999). In contrast, environmental pollutants of a more global nature do not seem to accord with the Environmental Kuznets Curve hypothesis, notably CO₂ emissions. In essence, countries seem more prone to act on pollutants that affect their own backyard than those that degrade the global environment.

Most empirical studies on the environment-income relationship analyze cross-sectional or panel data for samples of developed and/or developing countries, to obtain a single (average) curve. This is often interpreted as the trajectory of environmental degradation and recovery that developing countries are likely to experience currently. This approach may be misleading. An Environmental Kuznets Curve obtained from

cross-country regressions “may simply reflect the juxtaposition of a positive relationship between pollution and income in developing countries with a fundamentally different negative one in developed countries, not a single relationship that applies to both categories of countries” (Vincent 1997b). In reviewing the implications of the Environmental Kuznets Curve hypothesis for Malaysia, we found very limited number of studies, which tested the hypothesis for air and water pollution in the country. Malaysia has experienced a rapid economic growth since the 1970’s and today the country is considered as one of the fastest developing countries in the Southeast Asia. Malaysia, unlike most developing countries, has long time series data on environmental quality. Vincent (1997a) compared the results of econometric analysis of Malaysian monitoring data with the predictions of cross-country studies for a country at Malaysia’s income level. While cross-country results would predict that SO_x emissions should have been rising during 1987-91 and particulates should have been falling during the late 1980’s, Malaysian monitoring data indicate exactly the reverse: declining SO_x and rising levels of particulates. This means Vincent found no evidence of an inverted-U shaped Environmental Kuznets Curve for any of the six air and water pollutants he analyzed. Income was either positively associated with pollutants (particulates, pH, and ammonia nitrogen) or not associated at all (BOD, COD, and suspended solids). The author explains the results as reflections of the country’s

resource endowment (e.g. natural gas discovery) changing population patterns and policies both environmental and otherwise. He is however, careful to point out that the lack of Environmental Kuznets Curve evidence in Malaysia does not disprove the Environmental Kuznets Curve existence elsewhere, but it simply underlines the often-repeated caution that policy makers should not assume that economic growth would automatically improve the environment. Both economic and environmental policies can and do play a role, and this role can be positive or negative and within the realm of their choices.

However, one reason for the absence of Environmental Kuznets Curve evidence in Malaysia, in addition to the reasons just given, may be the fact that being a fastest developing country, Malaysia has not yet undergone the transition from positive to negative emissions elasticity. Carson et al. (1997) analysed air emissions data for the United States, a country that must have undergone such a transition. This study addressed per capita emissions for seven air pollutants in the fifty states of the United States based on per capita income. The study found that emissions per capita for all seven pollutants decrease with increasing per capita income, a finding that is consistent with the Environmental Kuznets Curve hypothesis’ prediction, which also means that at high-income levels, the income elasticities of emissions are negative. Looking at the implications of the Environmental Kuznets Curve hypothesis, it can be reasonably argued that it takes time for change in income to affect pollution levels. A country’s initial income level does affect pollution levels, suggesting that perhaps there is a slow dynamic process, where by rising incomes result in a more effective regulatory structure by changing public preferences and making resources available to regulatory agencies. Countries with low-income levels have a far greater variability in emissions per capita than high-income countries suggesting more divergent development paths. This has the implication that it may be more difficult to predict emission levels for low-income countries approaching the turning point as shown in Figure 1.

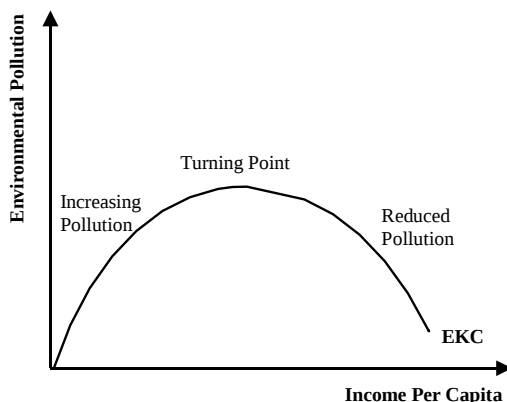


Fig. 1. The shape of Environmental Kuznets Curve (EKC).

CONCLUSION AND RECOMMENDATIONS

The issues of trade-environment and Environmental Kuznets Curve Hypothesis discussed in this paper can be concluded by drawing some

remarks and forwarding a brief policy option. Observations reveal that Malaysia's trade related activities are not significantly causing environmental degradation as evidenced by the finding of Environmental Kuznets Curve (EKC) hypothesis. In fact, there will always be some sort of environmental problems even in the developed and industrialized countries due to externalities originated from market and policy failures. Therefore we feel that comments on trade-environment relationship should be made with caution. Since trade is fundamentally a global issue the solution to trade related environmental problems lies largely on precautions of the global economic decision makers. Being it the case, solution to Malaysian trade related environmental problems does not lie on adopting and implementing better environmental policies and strategies by the country alone, rather the same efforts need to be done by its all other global trading partners. For instance, the additional demand from the world market may induce agricultural farmers to increase the usage of agrochemicals to boost production for exports. Similarly, the increased demand from the world market may encourage unsustainable fishing or logging in the absence of a proper management regime. Therefore before dealing with trade related any environmental problems, countries throughout the world initially need to identify what the sources of such problem are. If not, any actions for solving trade related environmental problem will unnecessary impose costs on society. As a final point, it is inherent for Malaysia as well as any country to ensure through regulations, incentives, and voluntary agreements that business activities, particularly finance and investment, are directed toward sustainable economic, environmental, and social development goals.

NOTE

1. The hypothesis is named after Simon Kuznets (1955), who received the Nobel Prize for economics in 1971 for his work on the relationship between the level and inequality of incomes, which tend to follow an inverted U-shaped relationship. That is, income inequality tends to become worse as a country grows out of poverty, stabilising at a middle-income level, and then gradually becoming more equal.

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