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論文提要內容：

長久以來，科學家及環境學家曾指出環境污染問題，這些問題將會持續，也是身為國家公民的我們該面對的。本研究試圖點出馬來西亞與新加坡現存的環境政策重要的觀點，並比較兩國在此議題上的成就，最後判定新馬兩國那一國的環境政策較出色。歷史上及政策上文獻之回顧，以及過去修習有關新馬兩國環境政策課程所做的研究是支持學生下定決心撰寫本論文的動機。更具體的來說，本研究旨在透過新馬兩國政府在政策上評估、設計、執行、培育政策以及決策者內部互動情形來鑑定新馬兩國政府的角色以及政府的可信度。

在審慎的權衡後，評估新馬兩國環境計劃之利弊是否符合國際標準。為了收集所需的資料，文獻回顧是必要的。本論文的資料來源包括許多學者的文章、專書以及政府官方所發佈的網路資源。本研究發現新馬兩國設計的政策以及目標能是可延續的，然而決定性的發現是透過比較後分類歸納得知的。在支持環境化的國家，這也有助於最後政策的產生。學生研究的發現的根據是由於新加坡致力於成為環境化的國家，這比起其競爭的鄰國馬來西亞還要更有環保意識。

在最後比較兩國的環境政策，新加坡無疑地在面對環境政策上的挑戰時，能夠有令人滿意的評估，主要是因為新加坡認知其是一個小國家並且大量依賴進口能源。接者，新加坡擁有較優秀的政策，像新加坡綠能計劃不但可以清理新加坡河的水源，還可以處理新加坡人所製造出的廢料。在環境政策上，新加坡政府在設立目標與實踐上成績顯著，因此新加坡在未來可以提高目標。新加坡執行國家政策上也佔有優勢，這可能是因為新加坡人民懼怕政府的原因；另外一方面，也可能是比起馬來西亞在國土面積上比馬來西亞小的關係。透過發揚環境日以及提高廢料處理的意識，新加坡政府在教育公民以及訓練私人企業方面也有顯著成績。

馬來西亞在最後的比較中劣於新加坡有幾個原因。馬國的確有能力評估環境上的挑戰並且面對它。然而，馬國似乎認為經濟成長更重要，因為馬國過去經濟並不好。雖然馬國能夠創造環境政策，如: 2020 年大馬計劃，但是馬國卻無法達成其政府過去所設立的目標。馬國也無法執行其環境政策，因為馬國內的聯邦無權使用國土並且無法執行各聯邦內想推行的環境政策。至於在訓練課程及教育方面，馬國內部腐敗成風，而且在主要的政府機關常常出現人手不足的現象，以致於無法分配訓練提倡環境上的政策。

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Abstract:

For years Scientists and other environmental experts have warned us about the effects of pollution, and other environmental problems that have and will continue to face us as global citizens. This study was conducted in order to identify other important aspects of existing environmental policies of the countries of Malaysia and Singapore to compare the two in an effort to see which had the better environmental policy. Historical and policy review, and actions through projects over the course of the two countries environmental life was a tool used for basing my decision. Specifically, this research aimed to identify the role and reliability of the countries governments based on the perspectives of how well they could assess, create, implement, and train policy and policy makers within their countries.

Advantages and disadvantages of both countries projects were weighed and assessed to see if they could meet their goal criteria. To gather the needed data, a review was used. This required the use of many scholarly articles, books, and online resources presented by some of the countries governmental bodies. The results showed that both the countries of Malaysia and Singapore created policies and goals for becoming more sustainable. This in turn resulted in a final comparison of the two countries through various categories. This helped in creating a final decision regarding the more environmentally friendly nation. The basis of my findings resulted in showing that Singapore has done more to become more environmentally aware and friendly than their competing neighbor.

After the final comparison was done, it was clear that Singapore had better assessed the environmental challenges facing them as they recognized that they were a smaller nation that relied heavily on imported energy. Next, Singapore was better at better policies like the Singapore Green Plans, cleaning up the Singapore River, and found a way to deal with the waste that they did create. Singapore was also successful in meeting

their goals in which they set, and therefore could aim higher for the future. Singapore also gained an edge as they could better implement their countries polices, perhaps based on the idea that the people of Singapore fear their government and perhaps that because they are smaller in size as compared to Malaysia.

Malaysia in the final comparison proved secondary to Singapore for several reasons. Malaysia did have the ability to assess the environmental challenges facing it. However, it seemed as if they felt that economic growth was more important. This was already something that they failed to learn from in the past. While Malaysia could create environmental policies like the Malaysia 2020 plan, they could not meet the goals needed to reach it in the years before. Malaysia also failed in implementation as states in Malaysia have the right to use land and implement policies headed down as they see pleased. As for training and education Malaysia also faced corruption and was heavily understaffed in key offices that allotted training and environmental promotion.

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Preface

In today's world, country officials and policy makers are facing a new type of threat. The cloud that looms over them is one that has somewhat snuck upon us despite much knowledge and warning from the past. For years scientists and other environmental experts have given great warning about the effects of pollution, and other environmental problems that will face our future given our need to advance at rapid rates. As preservers of our future, it is not only appropriate but a necessity to create crucial policy that will preserve life for future generations. Faced with this issue it is important for officials, policy makers, and leaders to "green up" the environment in which we all live. While we are a diverse people living in many distant lands, we are all of the same earth with the same basic needs. Policy is created as a way to regulate the way in which we interact with each other, to limit, allow, or control and policies can also be used. This idea of going green has been widely accepted and used in many of today's modern ways of thinking and planning. The main topic of my thesis will be to focus on Green/environmental policy in Malaysia and Singapore. My thesis will also focus and give background for some of modern day technologies, tools, and instruments that both countries can use in creating essential policies.

Environmental policy is any action deliberately taken or not taken to direct human activities with a view to prevent, reduce, or diminish harmful effects on nature and natural resources, and ensuring that man-made changes to the environment do not have harmful effects on humans. It is helpful to consider that environmental policy contains two major terms: environment and policy. Environment primarily refers to the

ecological dimensions or the ecosystem, but can also take account of social dimension for example the quality of life and an economic dimension managing resources. Policy can be defined as a, "definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions."[1] Environmental policy focuses on problems stemming from human impact on the environment. Environmental issues generally addressed by policy include air and water pollution, waste management, ecosystem management, biodiversity safety, and the protection of natural resources, wildlife and endangered species.

Environmental policy instruments are tools used by governments to implement their environmental policies. Governments may use a number of different types of instruments. For example, economic incentives and market-based instruments for example taxes and tax exemptions, exchangeable permits, and fees can be very effective to encourage compliance with environmental policy.[2] Voluntary measures are also another means of instruments, such as bilateral agreements negotiated between governments and private firms and commitments made by firms free from government pressure, are used in environmental policy. Another instrument is the implementation of greener public purchasing programs. Examples of greener public purchasing programs include initiatives aimed to increase the recycled content of government purchases and to increase the efficiency of energy-using devices. It is normal for several instruments to be combined to an instrument mixture created to deal with a certain environmental problem. It is not uncommon for environmental issues to have many different phases; several policy instruments may be needed to effectively address each problem.

[1] http://www.merriam-webster.com/dictionary/policy accessed 12/2010
[2] http://www.oecd.org/about/0,3347,en_2649_34281_1_1_1_1_1,00.html accessed 12/2010

Moreover, instrument mixtures may allow for greater flexibility in finding ways to comply with government policy. However, instrument mixtures must be carefully put together so that they do not challenge each other. Next, the overlapping of instrument mixtures lead to unnecessary administrative costs making the execution of environmental policies more expensive than necessary. In order to help governments realize their environmental policy goals, the OECD Environment Directorate studies and collects data on the efficiency of the environmental instruments governments use to achieve their goals as well as their consequences for other policies.[3]

[3] http://www.oecd.org/department/0,3355,en_2649_34281_1_1_1_1_1,00.html accessed 12/2010

Chapter 1

The Energy Policy of Malaysia is determined by the Malaysian Government, which address issues of energy production, distribution, and consumption. The Department of Electricity and Gas Supply acts as the regulator while other players in the energy sector include energy supply and service companies, research and development institutions and consumers. Government-linked companies Petronas and Tenaga Nasional Berhad are key members of Malaysia's energy sector. [4]

Governmental agencies that contribute to policy are the Ministry of Energy, Green Technology and Water, Energy Commission (Suruhanjaya Tenaga), and the Malaysia Energy Centre. Among the documents that policy is based on, are the 1974 Petroleum Development Act, 1975 National Petroleum Policy, 1980 National Depletion Policy, 1990 Electricity Supply Act, 1993 Gas Supply Acts, 1994 Electricity Regulations, 1997 Gas Supply Regulation and the 2001 Energy Commission Act.[5]

The Ministry of Energy, Green Technology and Water has identified three principal energy objectives that would be instrumental in guiding the development of its energy sector:[6]

Supply

[4] National Energy Policy". *Ministry of Energy, Green Technology and Water*. 2008-01-31. http://www.kttha.gov.my/template01.asp?contentid=19. Accessed 12/2010
[5] National Energy Policy". *Ministry of Energy, Green Technology and Water*. 2008-01-31. http://www.kttha.gov.my/template01.asp?contentid=19. Accessed 12/2010
[6] National Energy Policy". *Ministry of Energy, Green Technology and Water*. 2008-01-31. http://www.kttha.gov.my/template01.asp?contentid=19. Accessed 12/2010

- To guarantee the provision of adequate, secure and cost-effective energy supplies through developing indigenous energy resources both non-renewable and renewable energy resources using the latest cost options and diversification of supply sources both from within and outside the country.
- In pursuit of the supply objective, policy initiatives, particularly with respect to crude oil and natural gas, Malaysia has looked to ensure the life of domestic non-renewable energy resources, as well as diversification away from oil dependence to other forms of energy sources.

Utilization

- To promote the efficient utilization of energy and discourage wasteful and non-productive patterns of energy consumption.
- The policy's approach to realize this objective is to rely heavily on the energy industry and consumers to exercise efficiency in energy production, transportation, energy conversion, utilization and consumption through the implementation of awareness programs. Demand side management initiatives by the utilities, particularly through tariff incentives, have had some impact on efficient utilization and consumption.
- Government initiatives to encourage cogeneration are also aimed at promoting an efficient method for generating heat energy and electricity from a single energy source.

Environmental

- To minimize the negative impacts of energy production, transportation, conversion, utilization and consumption on the environment.
- The environment objective has seen limited policy initiatives in the past. All major energy development projects are subjected to the mandatory environmental impact assessment requirement. Environmental consequences, such as emissions, discharges and noise are subjected to the environmental quality standards like air quality and emission standards

Renewable energy policy

The Malaysian government is seeking to strengthen the development of renewable energy, particularly biomass, or using plant and animal waste as the 'fifth fuel' resource under the country’s Fuel Diversification Policy. The policy had a target of renewable energy providing 5% of electricity generation by 2005, equal to between 500 and 600 megawatts of installed capacity. The policy has been backed fiscal incentives,

such as investment tax allowances and the Small Renewable Energy Programme (SREP), which encourages connecting small renewable power generation plants to the national grid.[7]

The Small Renewable Energy Program allows renewable projects with up to 10 Mega Watts of capacity to sell their electricity output to Tenaga Nasional Berhad. In 2005 there were 28 approved biomass projects involving the installation of 194 Mega Watts of grid-connected capacity. There were also four approved landfill gas-based projects, with 9 Mega Watts of capacity, and 18 mini hydro-electric projects offering 69.9 MW of total capacity.[8]

Production and consumption

Usually, energy production in Malaysia has been based around oil and natural gas.[9] Malaysia currently has 13 Giga Watts of electrical generation capacity.[10] Power generation capacity connected to the Malaysian National Grid is 19,023 Mega Watts, with a maximum demand of 13,340 Mega Watts, as of July 2007 according to Suruhanjaya Tenaga.[11] Total electricity generation for 2007 was 108,539 Giga

[7,8] Business Monitor International (February 2008). "Malaysia Power Report Q2 2008", London,UK: Business Monitor International

[9] Renewable Energy and Kyoto Protocol: Adoption in Malaysia". Publicweb.unimap.edu.my. http://publicweb.unimap.edu.my/~ppkas/home/index.php/news/articles/29-renewable-energy-and-kyoto-protocol-adoption-in-malaysia. Accessed 12/2010

[10] Global Energy Network Institute 1-619-595-0139 (2007-06-28). "National Energy Grid of Malaysia - National Electricity Transmission Grid of Malaysia". Geni.org. http://www.geni.org/globalenergy/library/national_energy_grid/malaysia/index.shtml Accessed 12/2010

[11] "Statistics of Interim on the Performance of the Electricity Supply in Malaysia for the First Half Year of 2007" (PDF). Suruhanjaya Tenaga. 29 January 2008. http://www.st.gov.my/images/stories/upload/st/st_files/public/statistik_interim_2007-bi.pdf. Accessed 12/2010

Watts/hour with a total consumption of 97,113 Giga Watts/hour or 3,570 kilo Watts/hour per capita.[12] The generation fuel mix is 62.6% gas, 20.9% coal, 9.5% hydro and 7% from other forms of fuel.[13] In 2007, Malaysia consumed 514 thousand barrels of oil daily against a production of 755 thousand barrels per day.[14]

Malaysia only has 33 years of natural gas reserves, and 19 years of oil reserves, even as the demand for energy is increasing. Because of this issue the Malaysian government is looking to expand into renewable energy sources. Currently 16% of Malaysian electricity generation is hydroelectric, the remaining 84% being thermal.[15] The oil and gas industry in Malaysia is currently dominated by state owned Petronas[16], and the energy sector as a whole is regulated by Suruhanjaya Tenaga, a statutory commission who governs the energy in the peninsula and Sabah, under the terms of the Electricity Commission Act of 2001.[17]

Singapore

Singapore is a small island state with a lively economy which cannot keep up without imported energy. The resource-scarce country refines 1.3 million barrels of

[12] "Electric Supply Industry in Malaysia Performance And Statistical Information 2007". *Suruhanjaya Tenaga*. http://www.st.gov.my/images/stories/upload/st/st_files/public/Report_Performance.pdf. Accessed 12/2010

[13] Department of Electricity Supply Regulation, Energy Commission (2007). "Electricity Supply Industry in Malaysia - Performance And Statistical Information 2006" (PDF). Suruhanjaya Tenaga. http://www.st.gov.my/images/stories/upload/st/st_files/public/st_esim_bi.pdf. Accessed 12/2010

[14] "BP Statistical Review of World Energy June 2008". *BP plc*. June 2008. http://www.bp.com/statisticalreview. Accessed 5/25/2009

[15] Global Energy Network Institute 1-619-595-0139 (2007-06-28). "National Energy Grid of Malaysia - National Electricity Transmission Grid of Malaysia"

[16] "U.S. Energy Information Administration Independent Statistics and Analysis Malaysia". U.S. Energy Information Administration. 2009. http://www.eia.doe.gov/cabs/Malaysia/Profile.html. Accessed 10/2010

[17] Overview of Energy Commission". St.gov.my. http://www.st.gov.my/index.php?option=com_content&view=article&id=2388&Itemid=1689&lang=en Accessed 10/2010

crude oil daily with less than 100,000 barrels per day for its own consumption. Singapore ratified the United Nations Framework Convention on Climate Change (UNFCCC) in August 1997, and signed the Kyoto Protocol in April 2006. Clean energy will be encouraged where ever possible. The country also will ride on the opportunities created by its already forceful energy sector.

Green House Gases and electric power generation of Singapore:[18]

(a) Efficiency and low carbon fuel:
Power generation consumes 51% of total fuel in Singapore. From 2000 to 2006, the overall power generation efficiency was raised from 38% to 44% through the adoption of combined cycle using steam and gas turbines. This accounted for 15.8% reduction of CO2 emission. A switch from the fuel oil fired power plants to dual-fuel plants with 75.8% share of natural gas further reduced the CO2 emission by another 25%. The combined effect of these measures had contributed to 37% reduction of CO2 from the electric power generation plants. This reduction well exceeds the growth in total electricity consumption of 20% (average annual growth of 3.5%) during the same period.

(b) Increase energy utilization rate
Cogeneration and tri-generation: The other ways that improve fuel utilization and reduce GHG emissions are cogeneration (electricity and heat) and tri-generation (electricity, heat and chilled water). This idea utilizes every rejected heat from the system to push the energy utilization rate close to 100%. There are already cases of success like the 815 MW SembCogen combined cycle, the 155 MW ExxonMobil Cogeneration and the 5 MW Pfizer tri-generation plant.

(c) Biomass and waste as fuel:

[18] http://www3.ntu.edu.sg/home/msclow/Singapore%20clean%20energy%20policy-May%2008.pdf Accessed 11/27/2010

Biomass and waste are no longer disposed by land-fill in Singapore. They are converted to electrical energy by four modern gigantic incinerators. The one installed in year 2000 has an annual capacity of 1 million tons - one of the largest in the world. The power from the incineration plants contributed to about 2.8% of total power consumption – incinerating about 2.5 million tons of solid waste per annum. Incineration might add to the CO2 discharge but it help in the conservation of fossil reserve.

(d) Is nuclear power feasible?

Under the pressure of high fuel price and CO2 emission issues, nuclear power again re-emerges as an alternate clean energy in the region. Due to Singapore's small size and dense population, the option of nuclear power is not feasible. However, as espoused by a recent National Energy Policy Report, "Nonetheless, we should not write off any energy option for Singapore. As technology improves, energy sources which are not viable for Singapore today may become viable in future", the nuclear issue is not ruled out completely.

(e) Renewable energy

The Solar and fuel cell power options are available but subjected to key constraints of cost and technology. In the past one year, billions of dollars from private sector have been already committed to clean energy research and manufacturing in Singapore.

• Three companies (Natural Fuel, CMS Resources and Neste Oil) committed to a total production capacity of 2.8 million tons per year in bio-fuel production.

• The world largest wind power firm, Vestas, set up a research centre in Singapore hiring more than 150 staff.

• The Renewable Energy Corporation ASA (REC) invested 3 billion Euros in Singapore building a world scale solar manufacturing complex. It produces solar wafer, cell and module with annual capacity of 1.5 GW and employing 3000 people.

• A consortium is actively conducting product development in Singapore for direct methane solid oxide fuel cell for power generation.[19]

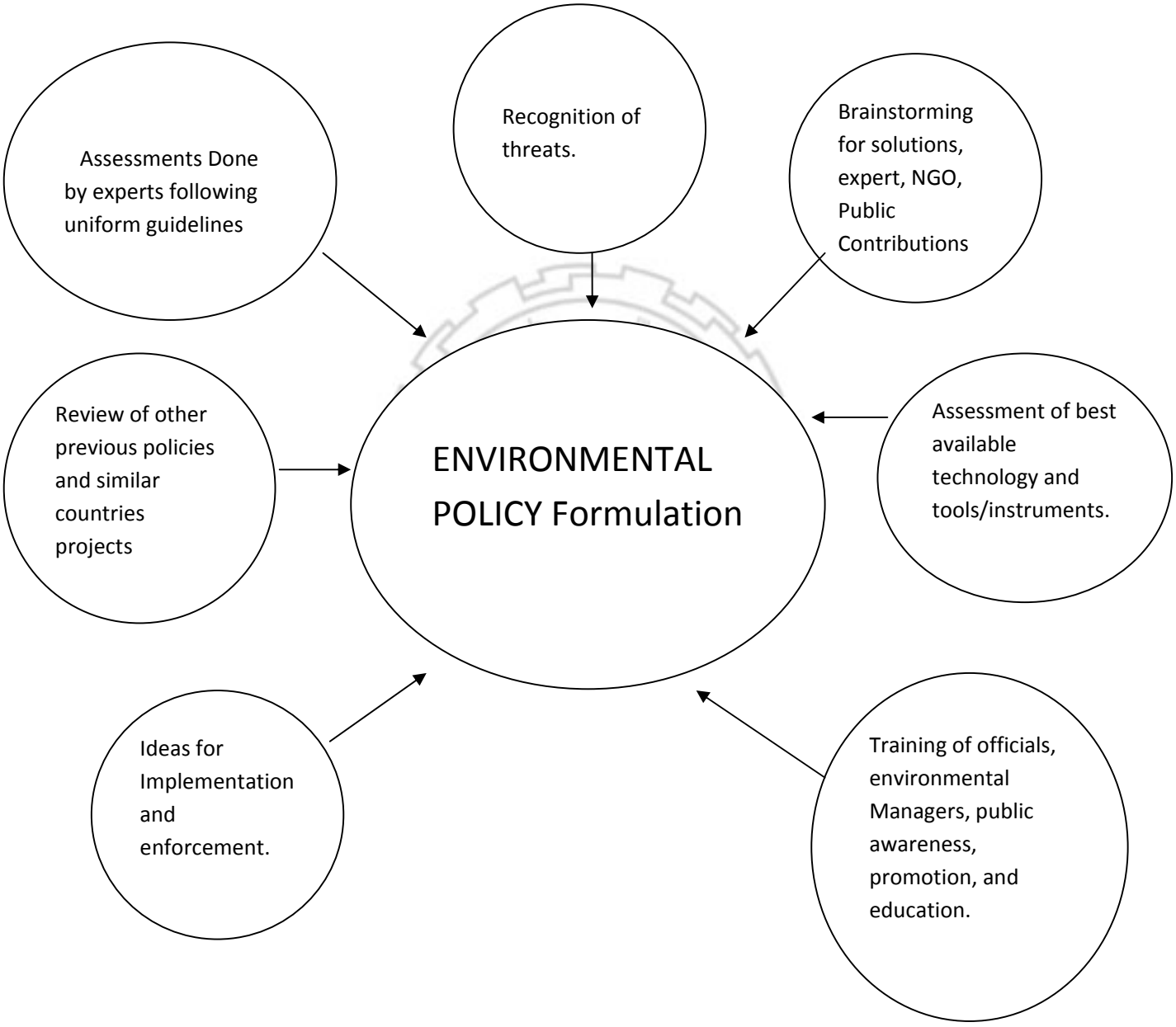
Approach/methods

In this thesis in order to properly, I will plan to use the numerous tools, instruments, assessments, and global examples that can lead to proper policy formulation. I will also examine Both Malaysia from a historical sense to view their emergence into environmental policy making. By creating the background and looking at the historical view of both countries policies, I believe that this paper can help to the countries learn from their past with an idea for the future. It is my belief that Proper Environmental Policy formulation will require a mix of many different elements that include:

In this thesis I have selected the countries of Malaysia and Singapore, because I believe these are two key countries in the region. For years Malaysia was seen as a manufacturing giant and its size gives them plenty of opportunity to grow with their environment and be a leader in the region. As for Singapore, this smaller country has grown by itself. It is financially strong yet almost totally reliant on imported energy sources. If Singapore continues to follow its goals outlined in plans like SGP they will definitely be an environmental super power for the region.

[19] http://www3.ntu.edu.sg/home/msclow/Singapore%20clean%20energy%20policy-May%2008.pdf Accessed 11/27/2010

Fig. 1 Making Environmental/Green Policy



Assessments must be done in order to recognize threats to the environment.

This should be done with EIAs or SIAs. EIA usage should be used by trained experts

after a uniformed list of guidelines. Countries and Policy makers may look at other countries for examples of policies and experiences. Next, Brainstorming can be done with open forums for NGOs and the public to come up with ideas for policy formation. At this time it will be important to see what technology and policy tools will be available for use. Policy creation can only result after these ideals are used together. Policy makers should also consider how to implement and enforce their newly created policies.

Research Objectives and Motivation:

In this paper my research objectives and motivation will be to compare the Green/Environmental policies and sustainable management techniques, and the tools that help to create policies global with the aims at use for Malaysia and Singapore. The countries of Singapore and Malaysia are important in the Southeast Asian region. It will be important for them to use proper policies to create a successful environmentally friendly country, as I believe that will make them stronger in the region. Malaysia and Singapore have already taken steps to be leaders regionally and can only improve with better environmental ideals. This will be important as I believe policies that do exist already within the two countries are somewhat outdated, poorly enforced, or just for show.

By examining these general theories and tools, I hope to offer some assessment of each tool, as well as if and how those tools can be implemented into Malaysia, Singapore's, or both countries policy making arena. We will learn that not all environments and environmental problems are the same, so the idea that policies, tools, or ideas must be changed to fit the scenario needs to exist. I also look to show how

some policies in their current form can be changed to better fit into a scenario where they could be used. In order to do this, it will be important to look at existing environmental policies that do exist within the two countries themselves, as well as looking at general theories and tools that apply globally.

Malaysia is a larger, more diverse country that has a history of production with the hopes of becoming more than a developing country. Their past history has not led them to learn anything for the future, and their existing policies seem to be more for show than anything else. Their idea for years has been that the environment can take one for the team in the hopes of better development or a quick buck. We can label this the profits now pay later method. Real environmental failure in Malaysia comes from a lack of enforcement that stems from various other interests of politicians and land planners or product developers. This later extends out into a web of other problems.

For Singapore, they are a country that grew from the middle class. They are smaller in size when compared to Malaysia. Singapore is a financial center, and is reliant on imported oil and other forms of energy for sustainability and survival, as they do not have the Natural resources that Malaysia does. Their small size makes the people easier to control, and I believe that the people fear the government and will therefore follow what the rules are. Real environmental failure comes from not properly using their space to their advantage and problems with soil, environmental noise, and pollution.

Motivation for this topic comes from the idea that the environment is an ever increasingly important topic. The environment has been a greatly debated topic since the 1970's and continues well on into the 21st century. It is also a topic that the whole

world faces together. It should therefore take the coordinated efforts of the world to balance and solve the problem associated with it. Second, Southeast Asia has also been somewhat of a forgotten region by western countries. It is especially true within the United States. Perhaps since the end of the Vietnam war.

Southeast Asia is also growing region that will continue to be of importance as the worlds continues to grow closer. The United States, China, and others have already put its eye and military focus back on the region, and many countries are already putting bids and sending military vessels within the South China Sea's to enhance presence and strength within the area. Since we are growing closer together, previous boundaries seem to be slowly disappearing and countries are facing similar obstacles. It will benefit the world if policies for the environment and its sustainability can be formulated and implemented and enforced in all parts of the world. Countries should look at each other for example and help in creating policies that can better fit their environmental problems.

The scope for this essay does not include any involvement or opinions from any Government official in the form of a personal interview or any direct comment regarding to environmental policy making myself. During the time of information gathering for this essay, I placed numerous calls and emails to both countries Representative Offices in Taipei as well as abroad to the respective offices of each in their own countries. Email exchanges with some did not provide any necessary information. My own personal questionnaire given to Singaporeans and Malaysians separately returned one response each. Which I felt was not enough to make any further assessment.

Hypothesis

My hypothesis for this paper looks to show that:

- Policies in Malaysia and Singapore Need improvement
- Singapore has the environmental advantage over Malaysia

Literature Review

Herzi and Noordin's article entitled *Towards Sustainable development? The Evolution of environmental policy in Malaysia,* gives a historical perspective of policy making in Malaysia. They start by saying, during the colonial and first two decades following independence, environmental damage was seen as an," irrevitable consequence of development." At this time laws were introduced to promote good use and sustainability of resources but were not aimed at associated environmental problems. These were usually single issued, fragmented and inconsistent**,** and ineffective in environmental management. Next they make their point solid when they say that the first few decades following independence was seen as a bi-product of development. This would ultimately set a general mindset of most environmental offenders, politicians, or major producers.

Malaysia's environmental response came in 4 parts. Stage 1 in 1971 was for Malaysia to learn how to deal with these environmental issues. Ideas for tackling issues were there, but later saw problems with regard to enforcement as each state within Malaysia had its own freedom under one constitution. In stage two, Malaysia tried to balance environment and growth but it would have been unbalanced with rapid economic growth. 1977-1988 saw Malaysian citizens taking a stance in promotion of

environmental rights. This tarnished Malaysia's name abroad and the government would soon be blamed for deforestation. Malaysia did continue try to better improve their environment with policies like the National Forestry act and National Energy Policies. Malaysia would try to manage the forests better and ensure longer energy by making production limits. And try not to be too dependent. 1987 also brought out the requirement of EIAs for Malaysia. Despite the requirement, only about 25% of EIA reports are properly completed and give a proper assessment.

After the 5th Malaysian plan, Malaysia got involved in more regional non-binding consensus with ASEAN like the Jakarta Resolution. From 1988 the state executive committee met to hold a meeting for all Malaysian states. Two ideas thrust Malaysia onto the sustainability bandwagon. First, was the ability for better diplomacy, and the second was due to worlds watchful eye regarding the Penan People. Malaysia also went as far as to establish the Langwaki Declaration in 1989, and was a member of the DANCED program, which looked to transfer environmental technology and know- how to developing countries from Denmark.

Despite signing their name to many agreements and creating many nice sounding policies, environment is only in the backseat in Malaysia's advancement car. If Malaysia could commit to an environmental advancement, they could be a stronger and economic and environmental country. They can also use their position as the Muslim connection to the west as their benefit. Malaysia should also take the steps to educate their population, companies, and government in being a more sustainable. Malaysia also needs to make sure their policies at the federal level, is enforced on state levels or

give some initiative or punishment like taxes on those who don't. They need to better enforce and educate city planners and politicians for EIAs. The idea that single ideal policies are effective must be made to create a more multi-effective policy as they are not integrative. Also Malaysia must change the thinking that pollution is a bi-product of growth.

Government agencies must also cooperate together to create, implement, and enforce policies. Malaysia needs to also take the opportunity to send their citizens or young diplomats abroad to train or be thrown into the fire of the real world environmental policy making as there seems to be a lack of experienced personnel. Training for this could be provided from NGOs or experts abroad on EIAs. It is not that Malaysian's do not know how to demand a better environment; it's that their culture suppresses their emotions when they feel threatened. Malaysia needs to be better engaged globally.

Ainual Jarias Bt Maidins article titled, *Challenges in Implementing Environmental Protection in Malaysia,* discusses the challenges posed in implementing and enforcing environmental protection measures in Malaysia. Maidin starts by establishing a general background for the problems the government faces with defeating environmental problems that come from poorly planned development. It is believed by Maidin that Malaysia's post-independence policies are the reason for Malaysia's environmental problems.

Despite their want to commit to better environmental policy, Malaysia has had a problem balancing growth with environment. Maidin believes people have the wrong

idea about preserving the environment, as they see preservation at the cost of limited development. This idea again seems to be a common theme as seen before. Most agree that the problems regarding the environment, comes from poor implementation and enforcement. Maidin also believes that policy makers would rather have short term economic growth over long-term development. This has contributed immensely to the environmental problems of the country. Other Problems Maidin points out deal with political favors for better opportunity, a lack of experience and the workforce with regards to who is left in charge of policy implementation and enforcement, a lack of punishment for those who are the heavy polluters, and corruption. Maidin finally calls on Malaysia to have a one-stop center at the federal level to implement environmental protection measures, as well as to enforce regulations.

Maria Francesch-Huidobro, proposes in her study called, *Governance, Politics and the Environment,* that Singapore's environmental governance is undergoing a process of liberalization from the inclusion of NGO's in policies related to the protection of the environment and nature conservation. It is a governance theory that makes up Huidobro's study to include the state, civil society, government-NGO relations, and environmental protection as focal points.

Governance is a tool that can be used for analyzing the process of liberalization in Singapore's environmental politics, because of its recognition of CEO's and collaboration among these involved. A governance approach will recognize various types of domains, giving a different type of governance. Huidobro calls Singapore a disciplined governance. Next, she states that Singapore tries to be democratic in nature, but that they are in fact, a limited democracy and. NGO's are, and continue to become

an increasingly prominent feature of governance and are growing slowly in Singapore. NGO's are usually more, proactive in their approaches. Even though NGO's cooperate with the government, they are somewhat held back by the strings of one state, this is especially true in Singapore.

Last, a governance approach to environmental protection, often favors the protection of the environment and nature. In disciplined governance, conservation should be second and opposed to economic growth. There is no doubt that NGO's and civil society members are on the rise, they just remain weak due to the idea that they don't want to be seen as challenging the governments dominance. Huidobro states that there has been an increase in the number of public volunteerism. These volunteers, civil societies, and NGO's are already and are willing to continue to be involved in policy making and governance. However, Huidobro will later say that while this is good, they lose some positive attributes because they lack real experience.

Many argue that Singapore does not have environmental movements. Huidobro states that groups such as green peace, friends of the WWF are nowhere to be found in Singapore. Singapore does have NGO's, but they have no concern for the environment. These groups are various and include the Singapore Zoo and Cathay Pacific. These groups were also not formed voluntarily, and are not always aimed at preserving the environment. Huidobro argues that environmental NGO's in Singapore compared to the west, differ because in Singapore's NGO's are more like outsiders, whereas NGO's of the west are more like insiders that have links to the government, and are considered experts. Outsiders like Singapore work independently trying to create public opinion against government proposals in order to declare change. However, they are seen by

some as going against the environment. Huidobro also refers to the authors Mekani and Stengel with hopes that NGOs in Singapore will follow. Which include ideas to be constructive, experienced and professional, well informed, use of proper connections, flexibility, see allies over enemies, and firm enough to hold your ground without being too difficult. These ideas can and should also be used by policy makers and policy implementers and enforcers to get their policies accepted. If NGOs can follow these ideals almost like smart power they should be able to create some change to the government in Singapore without being seeing as challenging the government.

Huidobro concludes that despite their success, Singapore seems to act in a reactionary manner instead of a preventative one with regards to the environment. This can be seen with the cleanup that was needed for the Singapore River and the Kallang Basin. Huidobro calls on better communication on many levels as she believes that those in charge do not have the necessary experience to be better than they are somewhat inexperienced. This will later result into solutions that seem to only be partly solved.

One issue that Huidobro does not mention can be expanded upon from the last, is that there is a lack of outside experience for projects. Singapore prefers to use local talent which seems to not have the experience needed. It might be better for Singapore to bring in some outside experience for making a more complete project or policy ideal. Next, planning guidelines by many developers tend to ignore issues like soil condition and wildlife habitats. NGO's should be given a chance to assess urban planning. Singapore should also take the necessary steps to invite in international experts to better educate local developers and to work with many departments in creating a

sounder environmental framework.

Singapore takes the steps in teaching many developing countries how to be successful. However, they can be stronger if they follow the same path and learn to improve themselves and learn from others.

The more widespread use of EIAs is a necessity that is currently limiting success in Singapore. The requirement of its use will make them a more powerful leader of environmental ability not only in the region, but well into others. EIAs work on a second level, because they help to facilitate cooperation something that Huidobro believes deeply in. Huidobro believes that a framework for environmental law will facilitate, coordinate, and create emphasis and knowledge about conservation.

Finally, the creation of the Singapore Green plans from the 1990's through 2012 and the future has and will continue to make Singapore a more environmentally friendly city. These have been reflected in Government publications by the Singapore government like the Envision publications inform its citizens about positive developments of the government's environmental works. The article promotes ideas like The Singapore River cleanup, packaging improvements, Eco-labeling, resource conservation, recycling promotions, and waste management.

Singapore's Semaku offshore landfill is one example of waste management. However, their issue of not having land space for garbage disposal is a real problem. Singapore like many other countries burns its waste and is trying to dispose as much as eighty five percent of waste, in an environmentally friendly way. Of course these methods sound nice. However, waste incineration only creates more pollution for the environment. The filters used to clean the polluted air also become heavily polluted and

dangerous for the environment. Needless to say this also requires disposal. Usually it goes into the ground with the leftover ash which is not so friendly to the environment. By looking closely at how the government presents its facts, one can better judge the current situation itself. On paper, from a Government run and focused online publication Singapore's many projects sound nice, but of course they have their own flaws. As with all reading it should be up to the reader themselves to decide the validity of the arguments made.

Chapter Arrangement

- Chapter I is an Introduction. In this chapter I will explain my research methodology, such as background, research objectives, literature review, and organization of chapters.
- Chapter II will introduce some general tools, policies, and instruments used by various countries, organizations and, various scholars.
- Chapter III will introduce Malaysia from a historical standing and offer some information regarding their environmental standing, laws, and future plans.
- Chapter IV will introduce Singapore from a historical standing and offer some information regarding their environmental standing, laws, and future plans.
- Chapter V will offer an overall assessment of both countries policies and how they can better use existing tools and offer some criticism.
- Chapter VI will be the conclusion.

Chapter 2

General Tools and Instruments for Environmental Policy

Dieter Helm suggests that a policy requires clear objectives and objectives that derive from them. It also requires an appropriate set of instruments and a set of institutions capable of implementing it. [1] Helm says that there has been some legislation that has passed, but overall policy has been mostly dull. Next, Helm uses the Brutland definition of sustainable development to say that, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. [2]

Helm uses two ideas to show some problems with sustainability. The first is that we still do not understand the environment enough to know what levels and types of activities are sustainable. Second, is the idea that politics and economics are hotly contested. Argument follows the discussion of economic growth versus development. This is true both now and for the future. Helm says, "recognizing the uncertainty of scientific evidence is important in policy design." [3] Helm notes that it can be beneficial to set boundaries on the things we know. This can be aimed at the loss of biodiversity.

[1] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp1. Print.
[2] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp4. Print.
[3] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp5. Print.

Helm also aims at the ideas of overpopulation and greenhouse gas emissions. So countries should take aim at policy making.

Helm shows that some scientists are optimistic at the idea that falling death rates will meet falling birth rates which will create some stabilization. Next, that alternative energy sources will overtake fossil fuel sources.[4] This will lead to a reversal in environmental damage. Policy makers should thus encourage supply side substitutions. The Pessimistic side says that shows the ideas that the most densely populated countries will continue producing greenhouse gases. In this scenario policy makers should reassess economic growth and adjust to lower consumption levels aimed at avoiding disasters in the next century.

A 1994 UK white paper entitled, *Sustainable development: The UK Strategy* , says:

"sustainable development does not mean having less economic development, on the contrary, a healthy economy is better able to generate the resources to meet people's needs, and new investment and environmental improvement go hand in hand. Nor does it mean that every aspect of the present environment should be preserved at all costs. What it requires is that decisions throughout society are taken with proper regard to their environmental impact."[5]

[4] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp6. Print.
[5] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp10. Print.

Helm sees this as fitting the environment into an economic calculus. Next, is the idea that environmental assessments must be included in all policy processes. Helm points out the UK governments vision of sustainable development through 4 objectives

- social progress which recognizes the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources; and
- maintenance of high and stable levels of economic growth and employment.[6]

With regards to instruments Helm says, “Once the optimal level of pollution has been defined, and targets set, environmental policy is then concerned with selecting appropriate instruments.[7] The traditional approach is command-and control-regulation. In this system, a licensing regime sets limits based upon the local environmental quality and the best available technology. This instrument comes from the 1990 UK Environmental Act and is mostly aimed at integrated pollution control. Helm says that problems associated with this are that regulators have their own interests and make their own designs for environmental precedence’s. Also those policy makers are usually unaware of the best available technologies. The last problem associated with this instrument is enforcement.

Economic tools are helpful. Helm uses the idea that the cost benefit analysis tool, “can help to give an initial idea of the level and the extent of uncertainty by testing the

[6] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp11. Print.
[7] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp17. Print.

robustness of estimates to small changes in assumption.[8] Economic instruments also avoid a supply-side bias of command and control. Helm truly, believes that a carbon tax would encourage consumers to save on things like electricity and gas and push for a switch to non-fossil fuels. This would put pressure on R&D to get to work. Helm argues policies like landfill taxes or recycling credits are only a few instruments that have been successful in implementation.

Helm wants to know why it is so hard to create economic instruments. This mostly is due to income. "Polluting activities are frequently ones for which demand, at least in the short term is price inelastic. [9] To create an instrument for this would mean that the tax will be high. This will without a doubt effect personal income. Taxes are available to the public, so Helm notes that this may be a reason why the government has been reluctant to experiment with tax instruments. The solution here is to tax pollution, "through the regulation of privatized utilities, whose activities are closely associated with the main forms of pollution."[10] Also, services prices will fall due to a private company's productivity improvement. Helm next calls for a tax on carbon emissions as it would create two responses. "In the short run, the capital stocks, cars, power stations, industrial plant, the transport infrastructure is given, and main effects will fall on demand through reduced use and energy efficiency measures. However, in the long term a supply response is to be expected from technical change."[11]

[8] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp18. Print.
[9] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp18. Print.
[10] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp20. Print.
[11] Helm, Dieter. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp22. Print.

Sustainable Development and Policy

Giles Atkinson in his chapter on Sustainable Development and Policy notes that, "sustainable development cannot deliver all desirable policies objectives now and into the future, and in practice we would expect there to be trade-offs among competing goals, such as sound economic policies to foster growth and a better environment."[12] Atkinson points out that if the costs for sustainability are too high, then some may be reluctant to try. For the purpose of this essay, this will be seen later in a review of Malaysia's sustainable development. Other countries have a reverse mindset and say that it is a sacrifice that is required. More like Singapore. Achievement to do this might result in the restriction of the economy to reduce how much people consume. Some disputers to this argue that a reduction policy is too radical, undesirable, and unnecessary in terms of achieving sustainable development.

Enforcement and Compliance

Anthony Heyes opens his discussion on enforcement and compliance by saying "environmental regulations are only useful if firms comply with them." [13] Next, he notes that regulations must be enforced in order to work. This can be costly, and since enforcement is costly, it is often left incomplete and later resulting noncompliance. Ignoring can only lead to poor and misleading results further down the line. Heyes, moves on in order to present a common idea of self-reporting. Firms can take the required steps to report on how much pollution they emit. This idea is of course less

[12] Atkinson, Giles. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp32. Print
[13] Heyes, Anthony. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp91. Print

popular, as most firms may not report how much they are actually emitting. Failure to report or lie about reports or would in Heyes mind lead to higher pollution taxes or penalties.

Another idea aside from self-reporting would be increased inspections. Firms found in violation should have a punishment that is harsh enough to make an example for others and call for further prevention. Punishments also must be willing to be somewhat forgiving. [14]

Heyes idea for self-reporting sounds positive and encouraging, however, it does exactly the opposite. Heyes idea is that companies that fail to report or lie about reporting would be taxed heavily or be forced to pay high penalties. This comes across as somewhat of a slap on the wrist for those companies that are raking in profits, and can just write the tax off as a loss. This would better work if penalties or taxes would increase with continued or increased pollution emissions rates. Increased inspections the other ideas for pollution combat seem to ignore the idea of existent or prevalent corruption.

Environmental Agreements and Taxes

In Martin Eneveldosen's book: *The Theory of Environmental Agreements and Taxes,* Envelodson looks at an element labeled 'Green Taxes'. "The Green Tax is an economic instrument that imposes a legally non-binding, agreement between first in an industrial sector agreeing to reduce the sectors overall pollution on a collective basis

[14] Heyes, Anthony. *Environmental Policy objectives, Instruments, and Implementation*. New York: Oxford Press Inc., 2000. pp102. Print

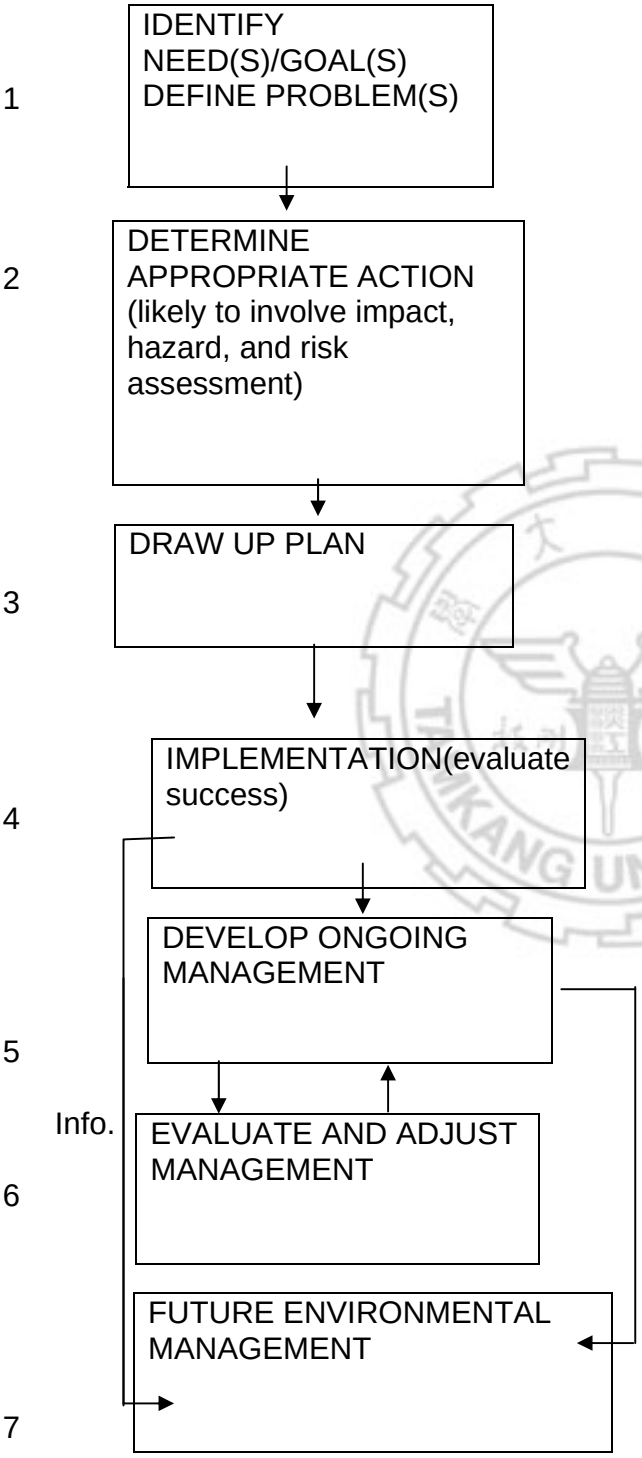
and the relevant authority, which in turn agrees to hold back alternative legislation." [15] Envelodsen argues that political implementation of green taxes are somewhat difficult. This is a type of taxation that usually gains heavy opposition from business groups. The result after a redesigned policy is usually an emissions tax that is watered down from its original condition.

Managing Sustainable Development

In CJ Barrow's book entitled: *Environmental Management for sustainable Development,* Barrow not only gives various definitions of what environmental management is, but also says it must do three things. 1. Identify goals. 2. Establish whether these can be met. 3. Develop and implement means to do what it deems possible.[16] Management at first is easy. Society might not know what they need, but they what they want. Barrow suggests that sustainable development requires trade-offs between current consumption and ensuring the future. With this in mind, Barrow calls on environmental managers, "to identify goals, and then win over the public and special interest groups."[17] Next environmental management must be planned for the long term. For example:

[15] Enevoldsen, Martin. *The Theory of Environmental Agreements and Taxes*. Northampton: Edward Elgar Publishing, Inc, 2005. pp5. Print.
[16] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp7. Print.
[17] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp7. Print.

Figure 2 Goals for Management



[18]

Next, “environmental management must co-ordinate and focus developments, to improve human well being, and try to mitigate or prevent further damage to the earth and its organisms,[19] There are five ideals that may lead to environmental management adaptation:

- *Pragmatic reasons*- fear or common sense makes people or administrators seek to avoid a problem.
- *Desire to save costs*- it may be better to avoid problems or counter them than suffer the consequences: pollution, species extinction, human deaths, costly litigation. There may also be advantages in waste recovery, energy conservation and maintaining environmental quality.
- *Compliance*- individuals, local government, companies, states and so on may be required by laws, national or international agreement to care for the environment.
- *Shift in ethics*- research, the media, individuals, or groups of activists may trigger new attitudes, agreements or laws.
- *Macro-economics*- promotion of environmental management may lead to economic expansion: a market for pollution control equipment, use of recovered waste, more secure and efficient energy and raw materials supply; or there may be advantages in ‘internalising externalities’.[20]

Environmental issues have also matured and transformed in the sense that before people just kept listing problems, to ideas more proactive forms, such as problem solving and policy making, “Most environmental managers would accept that sustainable development is one of their key goals, but providing a universally acceptable definition of sustainable is not easy.”[21]

[18] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp8. Print.
[19] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp9. Print.
[20] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp10. Print.
[21] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp11. Print.

Sustainable development needs maintenance of environmental quality and that resource benefits should be shared. Also that environmental management faces real world challenges such as:

- greed, corruption and foolishness;
- knowledge and technical skills which are still too limited;
- increasing numbers of people who demand more and more material benefits;
- the time available to make real progress in resolving key environmental degradation is probably limited(quite possible less than fifty years). [22]

We learn from Barrow that Environmental management is a growing idea. It will take time to adapt and spread and work to fit into all conditions. It will require a proactive approach and must work with other ideas to be successful. If we do not use management properly or at all we will be more vulnerable to environmental disaster and will be less sustainable.

Environmental management will only be successful if it has the following goals.

- sustaining and, if possible, improving existing resources;
- the prevention and resolution of environmental problems;
- establishing limits
- founding and nurturing institutions that effectively support environmental research, monitoring and management;
- warning of threats identifying opportunities;
- where possible improving 'quality of life';
- identifying new technology or policies that are useful.[23]

An environmental manager must also take the steps to, "balance between environmental protection and allowing human liberty.[24] Next, Barrow gives a breakdown about what sorts of approaches that environmental managers can take. He

[22] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006.pp16. Print.
[23] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp23. Print.
[24] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp24. Print.

offers that some approaches may overlap and that all managers do not all have the same ideas or access to technology.

1 *Ad hoc approach:* approach developed in reaction to a specific situation.

2. *Problem-Solving approach:* follows a series of logical steps to identify problems and needs and to implement solutions.

3 *System approach:* for example,

- ecosystem(mountain; high latitude; savanna; desert; island;lake and so on)

  (Dasman et al., 1973; Ruddle and Manshard, 1981)†

- agro-ecosystem (Conway, 1985a and 1985b).

4 *Regional approach:* mainly ecological zones or biogeophysical units, which may sometimes be international (i.e. involve different states, e.g. an internationally shared river basin). For example,

- watershed(Easter et al.,1986)
- river basin (Friedman and Weaver, 1979 Barrow,1998)†
- coastal zone
- island
- command area development authority(irrigation-related)
- administrative region
- sea(e.g. Mediterranean; North Sea Baltic; Aral Sea, etc.).†

5. *Specialist discipline approach:* Often adopted by professionals. For example,

- air quality management
- water quality management
- land management
- environmental health
- urban management
- ocean management
- human ecology approach
- tourism management/ecotourism
- conservation area management.

6 *Strategic environmental management approach:*

7 *Voluntary sector approach:* environmental management by, or encouraged and supported by, NGOs. For example,

- debt-for-nature swaps
- private reserves
- 'ginger groups' which try to prompt environmental management
- Private funding for research or environmental management.

8. *Commercial approach:* environmental management for business/public bodies.

9.*Political economy approach:*

10. *Human Ecology approach;*[25]

Note: †= biogeophysical system

Strong and Weak sustainable Developments

Environmental Economists split sustainable development into two extremes,

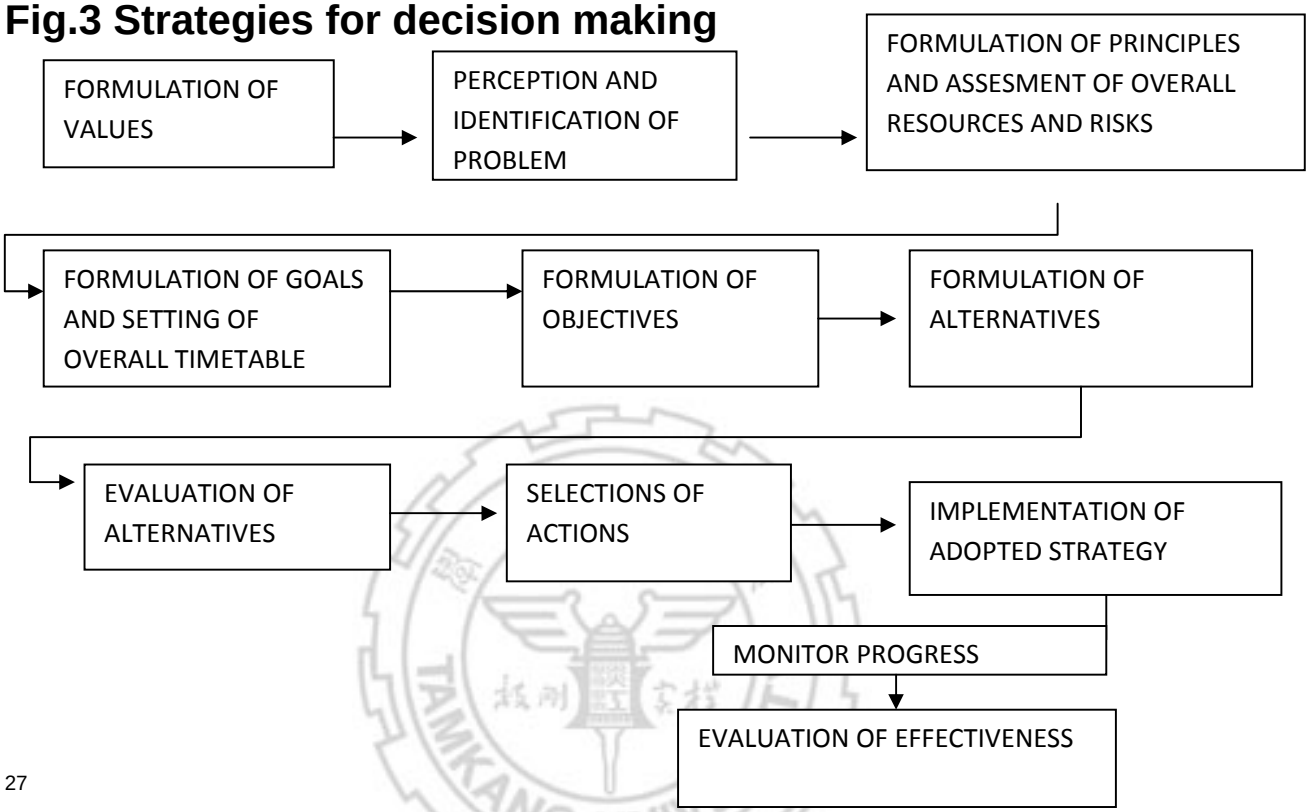
Strong and weak.

Strong – belief that the existing stock of natural capital should be maintained or improved. Rejection of strategies such as substitution (e.g. not burning oil, which is non-renewable, and then invest some of the profit in sustainable energy sources such as wind generators). The same amount of natural capital is passed on to future generations. Human misery is as acceptable as cost of reaching sustainable development (Pearce and Barbier, 2000: 24; Schaltegger et al., 2003:23). This means that development must be based on natural capital that can be regenerated.
Weak – the costs of attaining sustainable development are careful weighed in human terms- unpleasant impacts are resisted, even if sustainable development is delayed or endangered. Substitution is possible- i.e. if need be it is permissible to trade natural capital through substitution(future generations receive about the same total capital, but it may have changed). What cannot yet be substituted is protected. Broadly, this viewpoint concedes that existing economics and development strategies may be used(Neumayer, 2004).[26]

[25] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp25. Print.
[26] Neumayer, E. (2003) *Weak Versus Strong Sustainability:* exploring the limits of two opposing paradigms(2nd edn), Edward Elgar, Cheltenhelm.

Environmental management seeks sustainable development through effective strategies and steps for decision making:

Fig.3 Strategies for decision making



[27]

However, they frequently overlap and interact. “It is vital to ensure that they do not interfere with each other and, if possible are mutually supportive-which necessitates both a local knowledge and strategic coordination ultimately at the global scale.[28]

Environmental Management can better support sustainable development by:

- Identifying key issues;
- Clarifying threats, opportunities and limits;

[27] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp31. Print.
[28] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp31. Print.

- Establishing feasible boundaries and strategies(Nijkamp and Soeteman, 1988; Pearce and Barbier, 2002);
- Monitoring to reduce the chance of surprises.[29]

Strategies can help to create a successful development if it has the key elements of supportive and sustainable institutions, the use of appropriate ethics and motivation.[30]

Barrow moves to list some principles that hopefully will help enforce the fight on pollution. The first is the polluter pays principle. This works on a few levels as it says polluters are forced to pay for the errors they make, and hopefully will learn for the future. This also helps to take the financial hit off those who would otherwise be paying to fix the polluters mistake. It also looks to curb the idea that companies can, "safely push the environmental envelope." [31]

Next, the Precautionary principle is one that fits its name. This principle is preventative which is opposite of its polluter pays brother, which is more of a responsive policy. Kribel shows that there are four central components.

1 taking preventive action in the face of uncertainty;
2 shifting the burden of proof to proponents of a development;
3 exploring a wide range of alternatives to try and avoid unwanted impacts;
4 increasing public participation in decision making. [32]

use of this principle is seen more in Europe. Barrow points out that the downside to this principle is that it has its costs as some developments must be abandoned if some

[29] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp31-32. Print.
[49,50] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp32. Print.

[32] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp33. Print.

projects seem risky. The Precautionary principle looks for the primary cause of problems and looks at a desirable future development. By doing this, it can look at what will hinder future developments of the scenario, and then they can move forward. Barrow uses Lomborg to say that "the Precautionary Principle may be undesirable, because it encourages pessimism, which can cause planners to abandon a proposal rather than go ahead. And build what they think is 'a margin of safety'. Also that funds spent because of unsound use of the precautionary principle could mean less to spend on other things."[33] Barrow calls this law undemocratic because it uses action before a law of regulation has actually been broken.

Threat to Management

Environmental management faces problems, from inadequate data. "There are still huge gaps in knowledge of the structure and function of the environment, the working of global, regional and local economies, and how societies and individual humans behave."[34] The improvement of technology has allowed for a somewhat real time observation of environment. This is just usually and incomplete picture which often can be misleading. The big decisions are made by the big wig politicians, lobbyists, the public, or NGOs, Sometimes these decisions lack expertise. Barrow says that environmental managers face two short term problems. (1). Problems may suddenly. Demand attention and allow little time for solution. (2) The desirability that planning

[33] Lomborg, B. (2001) *The skeptical Environmentalist: measuring the real state of the world.* Cambridge University Press, Cambridge.(published in Danish 1998)
[34] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006.pp. Print.

horizons stretch further into the future than has been usual practice. [35] Decisions and policies of course are better made given more time. Next, Predictions about environment are hard to make, and a non-stable environment presents even more of a challenge.

Environmental management is more than managing challenges. It must, "Model and monitor to gain sufficient knowledge and give early warning signs to have any chance of coping.[36] Threats are random and difficult to manage and recognize whole some seem to be harmless, and overlooked. Using experience and integration environmental management can and must handle human nature and must incorporate all variables associated with them. From a historical standpoint environmental management was often done by people with a scientific background. Now, environmental management has widened to include people that have a social studies based background.

Using Science to manage the environment

Environmental management's use of science uses two approaches, (1)Multidisciplinary- which involves communication between various fields but without much of a breakdown of discipline boundaries. (2) Interdisciplinary (even holistic)- the various fields are closely linked in an overall coherent way.[37] Barrow says environmental science has to be problem oriented, as well as taking on both multidisciplinary and interdisciplinary studies.

[35] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp35. Print.
[36] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp36. Print.
[37] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp39. Print.

Managing the environment can sometimes be referred to as 'environmentalism' as it usually has a range of interests directed at reaching better environmental management.[38] Those involved in this often face:

- data problems
- modeling difficulties
- analytical difficulties
- insufficient time for adequate research
- lobbying from various stake holders
- funding limitations.[39]

Barrow suggests that environmental managers should use the past as an example to aid future projects.

Ecology

The field of ecology has also stepped up to take a crack at environmental management; Political Ecologists seek to build foundations for sustainable relations between society and environment in the real world.[40] Barrow says Ecologists have also developed some concepts and ideas to manage the environment. This can be seen through the maximum sustainable yield and carrying capacity. While these can be calculated correctly, they can sometimes give a false hope for security.

I. Defining Green

[57] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp41. Print.

[58] Blaikie, P.M. (1985) *The Political Economy of Soil Erosion in Developing Countries.* Longman, Harlow.
[59]

The 1980's saw the development of many environmentalist groups. Members of these groups took on initiative to adjust their lifestyle and encourage others to do the same. They hoped that it might cease environmental damage.[41] Some environmentalists look to things like politics, commerce, law, law, business and technology as tools for improving the environment. While others shy away.[42] Barrow uses some common green characteristics to show values of green:

The 'four pillars of green';

1 ecology
2 social responsibility
3 grassroots democracy
4 non-violence

The 'six values of green';

1 decentralisation
2 community-based economics
3 post-patriarchal principles
4 respect for diversity
5 global responsibility
6 future focus

Green characteristics;

- holistic approach
- disillusionist with modern unsustainable development paths
- non-violence
- a shift in emphasis away from philosophy of means to ends
- a shift away from growth economics
- a shift towards human development goals
- a shift from quantatitative to qualitative values and goods
- a shift from interpersonal and organizational to interpersonal and personal

[41] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp82. Print.
[42] Anderson, W.T. (1993) Is it really environmentalism versus biotechnology? *Bio technology* 11 (2), pp 236.
Narveson, J. (1995) The case for free-market environmentalism. *Journal of Agricultural and Environmental Ethics* 8 (2), pp145-156

- commonly a feminist interest
- a decentralized approach-'think globally, act locally'[43]

II. Green Movement

Barrow calls it a very diverse social or cultural movement that is concerned with environment and takes political action. Arne Naess says that there are two levels of green movement. Light green is a more shallow movement, while deep green is more of a deep ecology.[44] "Deep green or deep ecology seeks to replace the existing social, political and economic status quo with new environmentally appropriate bioethics and supportive politics.[45] Deep Green supporters blame most environmental problems who think human life is the most important entity on earth with regards to modern development. Social Ecology is seen as deep-green. Supporters of this see environmental problems stemming from social problems. Barrow says that main stream deep ecology "is that social ecology is humanist rather than ecocentric."[46] Light-green or shallow ecology looks to put forth ecological principles to ensure better management and control of the environment for human benefit. Barrow uses an idea from Burch and Sutton to examine social science potential input into the environment.

- to provide information on social development needs and aspirations to explain, present and predict future human attitudes, ethics and behavior;
- to study and develop ways of focusing the activities of social institutions, non-governmental organizations, groups of consumers and son on to achieve better environmental management;
- to show the environmental manager social constraints and opportunities;

[62-65] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp83. Print.

- to unravel the often complex and indirect social causes of environmental problems;
- the articulation and fulfillment of the shared interests of people(so far mainly at the local, regional or national level). National governments have mainly been reactive rather than forward-looking: social science will be needed to clarify how people think, nations relate to each other and institutions behave if a more proactive approach is the goal;
- to cut through 'technological determinism' so that the voice of social science may be heard.[47]

Social science has also been helpful in dealing with the forestry management, agricultural development, irrigation extension and management, pastoral development and range management and conservation, human resources management, risk perception, hazard avoidance, consumerism, and property rights.[48] Social science will be important in managing the stress which will see the future. Environmental Managers have the obligation, "to weed out unreliable advocacy and ensure that rational enquiry is not discouraged.[49]

Management in Practice

Barrow applauds women for being one of the most influential contributors to establishing environmentalism and green politics, as they are the one that Barrow believes does 75% of the work but earning perhaps only 10% of a family's income.[50] Next Barrow shows that since ideas like, "environmentalism green politics and environmental management, are largely creations of western democracies, their

[47] Redclift, M.E. and Benton, T.(eds)(1994) *Social theory and the Global Environment*, Routledge, London.
[48] Shankar, U. (1986) Psychological dimensions of environmental management, *Current Science* 55 (6), pp 297.
[49] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp90. Print.
[50] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp91. Print.

influence and usage has spread worldwide, but there are often needs to be a considerable degree of adaptation to or substation for locally appropriate approaches."[51] Next, is the idea that a solution might be to use the local expertise or know how to, "discover from local people what plants have potentially useful properties."[52] The past saw sustainability through a combination of ideas like local rule or superstition. This thinking has dropped off. The main theme is that sustainability cannot be truly achieved without public participation.

In terms of environmental management, with reference to business and law, Barrow aims to say, "law should provide guidelines and rules for arbitration, without which chaos and destruction ensue. Both business and law must evolve rapidly to face challenges such as competition for limited degrading natural resources, globalization and transboundary problems adequately." [53] It is not only companies that need to be sustainably managed, but management needs to be done at the corporate level. To do this, environmental managers should:

- education of employees to be aware of environmental issues;
- updating management on relevant environmental regulation, laws and issues;
- selecting specialists and checking that environmental management tasks contracted out to consultants have been satisfactorily conducted and are properly acted upon;
- ensuring waste management is satisfactory;
- avoiding legal costs, reducing insurance premiums, risk and hazard assessment;

[51] Selin, H. (ed) (1995) *Nature across Cultures: views of nature and the environment in non-Western cultures*. Kluwer Academic, Dordrecht.
[52] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp92. Print.

[53] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp111. Print.

- if necessary, correcting mistakes of the past.[54]

Companies may also be more sustainable for 5 reasons. 1,because it helps identify opportunities; 2. Because it can improve efficiency (for example, identifying waste recycling potential; 3. Because there is a fear endangered by disasters and wish to avoid such problems, and to cut liability and insurance costs; 4. For public relations; 5.out of genuine ethical concerns.[55] Failure to adopt seriously will only result in little progress. The International Chamber of Commerce Created an expert panel of business representatives to create a business charter regarding sustainable development.

The 16 principles set out in the charter are as follows:

1. Corporate priority-To recognise environmental management as among the highest corporate priorities and as a key determinant to sustainable development; to establish policies, programmes and practices for conducting operations in an environmentally sound manner.

2. Integrated management-To integrate these policies, programmes and practices fully into each business as an essential element of management in all its functions.

3. Process of improvement-To continue to improve corporate policies, programmes and environmental performance, taking into account technical developments, scientific understanding, consumer needs and community expectations, with legal regulations as a starting point, and to apply the same environmental criteria internationally.

4. Employee education-To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

5. Prior assessment-To assess environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site.

[54,] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp113. Print.

[55]Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp114. Print.

6. Products and services-To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, reused, or disposed of safely.

7. Customer advice-To advise and, where relevant, educate customers, distributors and the public in the safe use, transportation, storage and disposal of products provided, and to apply similar considerations to the provision of services.

8. Facilities and operations-To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of renewable resources, the minimization of adverse environmental impacts of waste generation, and the safe and responsible disposal of residual wastes.

9. Research-To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with the enterprise and on the means of minimizing such adverse impacts.

10. Precautionary approach-To modify the manufacture, marketing or use of products or services or the conduct of activities, consistent with scientific and technical understanding, to prevent serious or irreversible environmental degradation.

11. Contractors and suppliers-To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.

12. Emergency preparedness-To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with emergency services, relevant authorities and the local community, recognizing potential transboundary impacts

13. Transfer of technology-To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

14. Contributing to the common effort-To contribute to the development of public policy and to business, governmental and intergovernmental programmes and educational initiatives that will enhance environmental awareness and protection.

15. Openness to concerns-To foster openness and dialogue with employees and the public, anticipating and responding to their concerns about the potential hazards and impact of operations, products, wastes or services, including those of transboundary or global significance.

16. Compliance and reporting-To measure environmental performance; to conduct regular environmental audits and assessment of compliance with company requirements, legal requirements and these principles; and periodically to provide

appropriate information to the board of directors, shareholders, employees, the authorities and the public.

To date, more than 2,300 companies have signed up to it, and the list includes corporations such as Norsk Hydro, Deloitte & Touche, Akzo Nobel, and Xerox. In addition, several industry associations use it as the basis for their sustainability programmes.

Endorsement of the ICC Charter is voluntary. By signing it, companies commit themselves to respecting its 16 principles for environmental management. The ICC is currently assessing how companies that have endorsed the Charter are applying the principles, and what their experiences were with implementation. [56]

Barrow later asks if, “business just seek to comply on regulations, and avoid legal liability taxation or insurance claims-or does it go beyond compliance?” The answer is that, “perhaps businesses will seek win-win approaches to try to reduce environmental damage and improve their competitive edge through increased productivity and/or lowered costs.”[57] Finally, business might just accept environmental management under any various types of motives like

- precautionary principle-seeking to avoid problems and litigation costs;
- eco-efficiency- green to be efficient/profitable;
- proactive- forward planning and possibly a wish to promote new environmental standards;
- compliance-simply doing what state and/or public opinion asks for.[58]

Tools for Sustainability

[56,58] http://www.iisd.org/business/tools/principles_icc.asp accessed on 4/20/2012

So what are the tools used for business that either sustain themselves or keep trucking along with sustainable management? The first is ecological engineering. It is the design, creation and management of ecosystems that process bi-products and waste or recover minerals from effluent mine spoils.[59] Its aim is to create an ecosystem which integrates human society and natural environment. Second, is taxation labeled Pigouvian taxes. These taxes look to ensure that a manufacturer pays all costs from raw material to any final disposal. While this sounds good in theory, large companies making huge profits can write this off, but it may hurt the little guys. Beaumont argues that, "the polluter pays" principle can be a virtual license to pollute if the fines are not set high enough, and that can damage small business."[60] The third tool that can be uses is green marketing. It was apparent in the 1980's that companies could use "green" ideals as a positive marketing tool. Some manufacturers have used this to their advantage and created a better, cheaper, easier recycled marketing is a growingly important supporter of environmental management.

The next tool a manager can use is eco-labeling. In this sense goods can be marked to show that they are approved by a countries government. This works as a scheme to influence consumes to buy better, more friendly products. The problem here lies perhaps not with the product or the consumer, but perhaps with the manufacturer. "So an 'environmentally friendly' product may come from a factory which causes

[59]Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp121. Print.

[60] Beaumont, J.R. (1992) Managing the environment: business opportunity and responsibility. *Futures*. 24(2):pp187-198

pollution, or present a disposal problem after use."[61]

Seventh, is an idea called, Total Quality Management and Environmental Management Systems. This system aims to provide obedience to policy through a structured management system, and allow for third parties to see through documentation and records TQM was created with the hopes of improving industrial competitiveness.[62] EMS will usually require that a company or body publishes and regularly updates an environmental policy statement. EMSs will also help with organizational structure, procedures, resources, and policy implementation; opponents to this suggest that EMS can create policies that are rigged for easy to achieve results.

If seeking a harsher tool than EMS and TQM one might consider a 'Covenant'. A covenant is, "a written voluntary agreement signed by the company or other body and the government or agency seeking regulation."[63] A covenant will require a company to write a new company plan every four years. The Idea comes from the Netherlands where, "The plan coverage includes pollution control and energy conservation, and is seen as getting national policies implemented at local level."[64] NGOs view the plan as close minded as the covenants are private and perhaps can lead to looser environmental controls. Also, it would seem that there is no punishment for staying

[61] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp122. Print.

[62]1 Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp122. Print.

[63,64] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp123. Print.

away from such environmental agreements. The final idea looks at a whole picture on equipment of a product. This tool is called a life cycle assessment, as it hopes to examine a product or services life. This also includes the final stages of perhaps recycling or the ceasing of use for a product. The background for this suggests that, "it can suggest efficiencies and problems that need to be avoided or mitigated."[65] Overall ideas are still being developed.

To some managing the environment can be seen as a waste of time, money, and resources. Barrow points out that many companies and perhaps some countries often lie about their 'greenness' or perhaps give some false hope. This can be seen by many scholars as "Corporate greenwashing." [66] Barrow next states that, "improving media and internet communications also helps counteract greenwashing by making it easier for environmentalists to find and exchange information and attack offenders."[67] Beaumont summarizes some present business that aim at resource use with regards to their eye on environment by saying:

- the majority of businesses are aware that the environmental issues are important;
- some businesses are doing something- it may be from genuine concern, but often it is for public relations or profit motives;

[65] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp124. Print.

[66] Greer, J, and Bruno, K. (1997) *Greenwash: the reality behind corporate environmentalism.* Third World Network, Penang/Appex Press, New York.

[67] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp124. Print.

- too often businesses adopt a ‘react and repair’ approach rather than following the precautionary principles;
- only a few businesses are acting at a strategic level;
- businesses are in need of strategies such as industrial ecology, but will need to be encouraged or forced to adopt them.[68]

i. Environmental Management through law

Environmental management has already stated its relationship with law. Many law schools have developed and are expanding existing courses. Law should also be the responsible driving force for providing an environmental framework. “Law is crucial for environmental management in a number of ways aiding:

- regulation of resource use;
- protection of the environment and biodiversity
- mediation, conflict resolution and conciliation;
- formulation of stable, unambiguous undertakings and agreements.[69]

Being that there are many different legal systems, environmental managers must work with these systems and their experts to achieve one, desirable goal. Law will encourage better environmental performance and push for the punishment of those who stray away from environmental requirements.

[68] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp125. Print.

[69] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp126. Print.

Environmental Management Participation

Environmental management involves a mix of policy making, planning, and enforcement. No two management projects will ever be alike, so there can be no uniform framework or equation to follow. Environmental management can be put into the following components:

1 *Advisory*

- advice, leaflets, phone help-line;
- media information (which can be covert, i.e. hidden in entertainment or open);
- education;
- demonstration (e.g. model farm).

2 *Economic*

- taxes;
- grants, loans, aid;
- subsidies;
- quotas.

3 *Regulatory/control*

- standards;

- restrictions;
- licensing of potentially damaging activities.

In a given situation a mix of these components will be undertaken. When the mix results in poor enforcement, and/or people involved are not won over, results are likely to be limited. Management can adopt three distinct stances:

1 preventative management-which aims to preclude adverse environmental impacts;

2 reactive or punitive management- which aims at damage limitation or control;

3 compensatory management- mitigation of adverse impacts through trade-offs. [70]

Participants involved in environmental management will include:

- *Existing users*: Land or resource users(male and females may make different demands); there may well be multiple users.
- *Groups seeking change*: Government (may be conflicting demands from various ministries or policy makers); commerce (national, MNCS/TNCs), individuals seeking personal gain or to change the situation, international agencies, NGOs, media, academics, 'utopians').
- *Groups pressed into making changes*: The poor with no option but to over exploit what is available without investing in improvement; refugees, migrants, relocates, eco-refugees (forced to move or marginalized so that they change the environment to survive), workers in industry, mining and so on, who face health and safety challenges while carrying out changes.
- *Public* (may not be directly involved: May be affected as bystanders; may wish to develop, conserve or change practices (if aware of what is happening); expatriate or global concern.
- *Facilitators*: Funding bodies, consultants, planners, workers, migrant workers (latter two groups affected by health and safety issues), internet exchanges of environmental data.
- *Controllers*: Government and international agencies, traditional rulers and religions, planners, law, consumer protection bodies and NGOs (including

[70] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp165. Print.

various green/environmentalist bodies, trade organizations, media, concerned individuals, academics, global opinion, and the environmental manager. [71]

ii. Assessment & Predictions

Environmental Impact Assessment or EIAs have no specific definition. So it is therefore appropriate to use a generic meaning. EIAs from a general definition look to combine administrative planning, analysis and public involvement in pre- decision assessment.[72] The observations describe EIA's as:

- It is a proactive assessment, and should be initiated pre-project/programme/policy, before development decisions are made. In-project/programme/policy and post-project/programme/policy assessments are common. While these may not allow much problem avoidance, they can advise on problem mitigation, gather date, feed into future impact assessment, improve damage control and the exploitation of unexpected benefits.
- It is a systematic evaluation of all significant environmental) including social and economic) consequences that an action is likely to have upon the environment.
- It is a process leading to a statement to guide decision-makers.
- It is a structured, systematic, comprehensive approach.
- It is a learning process and means to find the optimum development path.
- It is a process by which information is collected and assessed to determine whether it is wise to proceed with a proposed development.
- It is an activity designed to identify and predict the impacts of an action on the biogeophysical environment and on human health and well-being, and to interpret and communicate information about such impacts.
- It is a process which has the potential to increase developers' accountability to the public.
- It usually involves initial screening and scoping(to determine what is to be subjected to EIA, and to decide what form the assessment should take).
- It should be subject to an independent, objective review of results.
- It should publish a clear statement of identified impacts with an indication of their significance (especially if any are irreversible).

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[71] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp145. Print.

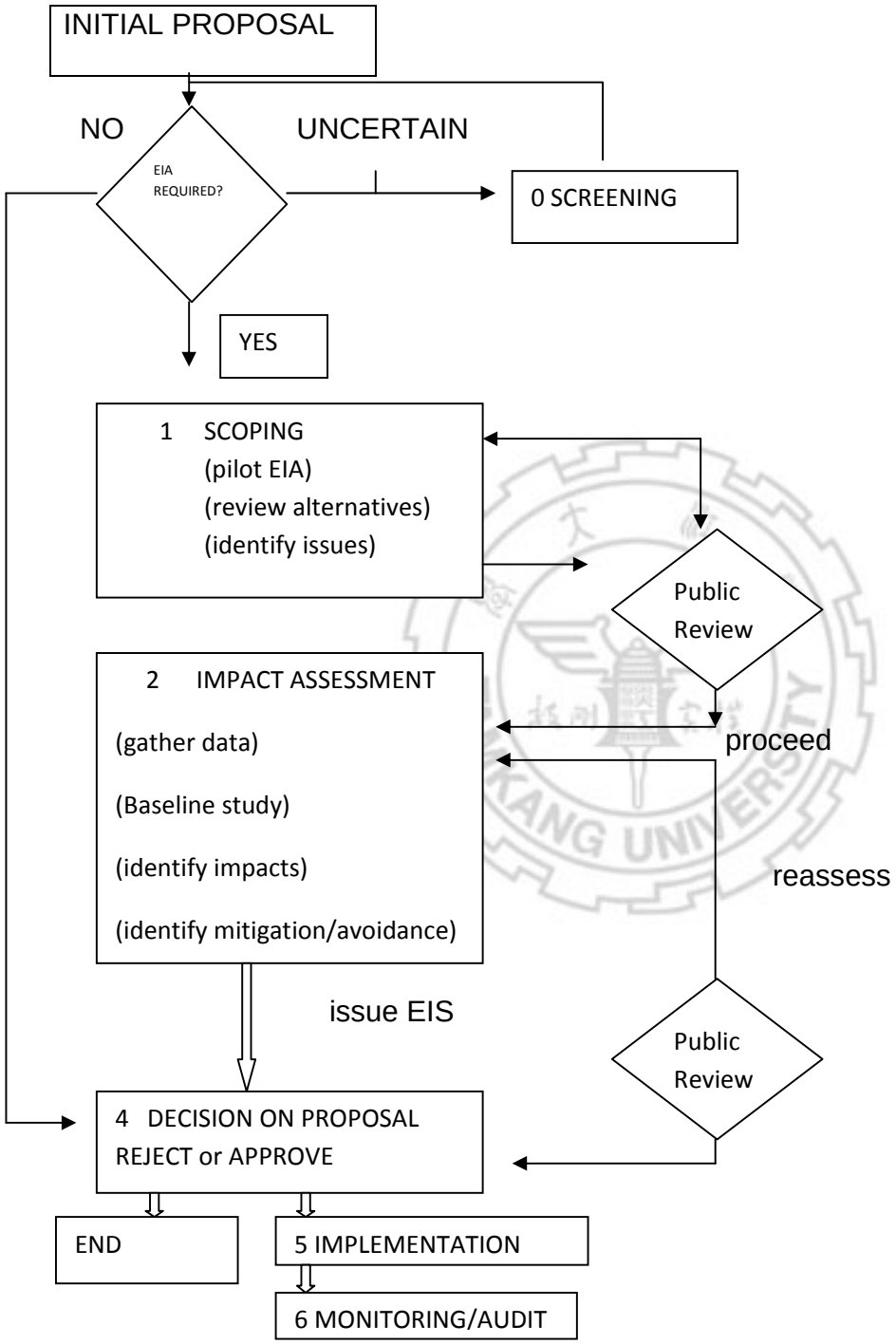
[72] Goodland, R, and Edmundson, V. (eds)(1994) *Environmental Assessment and Development*. The World Bank, Washington, DC.

- It should include a declaration of possible alternative development options, including nil-development, and their likely impacts.
- Ideally there should be public participation in EIA(it is often partial or avoided).
- There should be effective integration of EIA into the planning/legal process.[73]

Next Barrow shows an illustration of what he compiled based on ideas from other EIA process writers.

[73] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp206. Print.

Fig 4 EIA Process[74]



Screening(phase 0) is concerned with deciding which developments require and EIA. This should prevent unnecessary assessment, yet ensure that there is no escape when assessment is needed(in practice that is difficult). Screening may not be mandatory in some countries.

Scoping (phase 1) overlaps phase 0 and should help determine the terms and of reference for an EIA, the approach, timetable, limits of study, tactics, staffing and so on. By this state the EIA should consider alternative developments. In practice, a decision as to how to proceed may already have been made by a developer.

Identification, measurement and evaluation of impacts(phase 2) may proceed with or without public review(s) A variety of techniques may be used to determine possible impacts: as human judgment is involved, this is an art rather than a wholly objective scientific process, regardless of the statistics uses. The difficulty of identifying indirect and cumulative impacts makes this a tricky and often only partially satisfactory process. This phase is much assisted if an adequate set of baseline data is available- often it is not, and extensive desk and field research is needed.

Checking findings(phase 3) may follow a public review and/or may involve an independent third party to ensure objectivity. A statement, report, chart, or presentation is usually released- effectively the product of an EIA; this is termed the Environmental Impact Statement(EIS) and is what the decision makers, environmental managers (and perhaps the public) have to interpret.

Decision on proposal(phase 4) in practice, where a development has already been decided on or is even under way, corrective measures can be perfected. It is a way of passing on hindsight knowledge to planners in the future. The EIS may not be clear or easy to use: Some countries require irreversible, dangerous and costly impacts to be clearly shown. It also useful if alternatives and potential benefits are indicated. The environmental manager must be able to read the EIS and identify gaps, weakness, limitations. An EIA must not be allowed to give a false sense of security.

Implementation(phase 5) this is where an environmental manager is especially active. Unexpected problems may arise.

Monitoring and Audit(phase 6): in practice this often omitted or is poorly done. If planning and management are to improve, efforts should be made to assess whether the EIA worked well. It is also important to continue monitoring to catch unexpected developments, Efforts to asses EIA are generally termed post-EIA audits. An EIA can easily be a snapshot view and ongoing monitoring or report EIA can help counter that.[75]

iii. Environmental Audits

Environmental audits or accounting are important parts of environmental management. As a part of management, audits look to acquire data which can sometimes be expressed in economic terms. The idea of environmental accounting is to, establish the current status of an ecosystems stock taking. It can be done from the,

[74,75] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp207-208. Print.

"knowledge of how the ecosystem is structured and functions to collect data showing the state of an area."[76] These environmental accounts in the form of audits can be conducted on many levels and focus on different details. Eco Auditing looks at assessing, "the environmental performance of a company, public authority or, in some instances a region."[77] Eco Audits offer the benefits of:

- they generate valuable data for regional or national state-of the-environment reports;
- they are a means for ensuring the continual improvement of environmental management;
- they may be a valuable way of monitoring;
- they can help establish an effective environmental protection scheme which may reduce insure premiums(finsinger and Marx, 1996);
- they can assist efforts for sustainable development;
- they can inform the public about the body's environmental performance, which is good PR;
- they can help involve the public in environmental management;
- they help identify cost recovery through recycling, opportunities for sale of by-products and so on;
- they reduce risks of being accused of negligence and losing court cases;
- they may reduce the need for government inspections;
- they can ensure that often complex regulations are know about and followed, and that licenses are obtained;
- they offer management more peace of mind.[78]

Risks are also associated with eco-audits. These risks include:

- they may spot a problem that is costly to cure, which might otherwise have been overlooked without too much harm;
- they can be expensive
- a body may fear trade secrets will be exposed to competitors;

[76] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp-190. Print.
[77] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp191. Print.
[78] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp192. Print.

- smaller companies cannot conduct eco-auditing in house and must use specialists from outside(costly, wish a risk of loss of trade secrets).[79]

Eco-audits shown by Barrow come in six different forms.

- *Site or facility audit*- A company or body audits to see how it conforms to safety and other regulations, and care for the environment.
- *Compliance audit*- To assess whether regulations are being heeded and/ or policy is being followed.
- *Issues audit*- Assessment of the impact of a company's other body's activities on a specific environmental or social issue(e.g. rainforest loss)(Grayson, 1992: 40)
- *Minimisation audit*- To see whether it is possible to reduce: waste; inputs; emission of pollutants (including noise); energy consumption and so on.
- *Property transfer audits*(pre-acquisition audit, merger audit, divestiture audit, transactional audit, liability audit)-A company or body audits prior to divesture, takeover, joint venture, alliance, altering a lease, sale of assets and so on to show whether there are any problems such as contaminated land.
- *Waste Audits*-to see whether regulations are met, whether costs can be reduced by sale of by-products and so on (Ledgerwood et al., 1992; Thompson and Wilson, 1994). The motivation to audit may be to comply with legislation or come from a desire to prevent problems.

[79]Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp192-193. Print.

- *Life-cycle assessment/analysis*- Evaluation that can extend beyond the time horizon of a single owner, company or government (it is cradle-to-grave) (e.g impacts of something from manufacture through use to disposal) (British Standards and Institution, 1994c; Fava, 1994) [80]

Social Impact Assessments and other tools

Another tool used by environmental managers, are Social Impact Assessments or SIAs. These, "seek to assess whether a proposed development alters quality of life and sense of well being, and how well individuals, groups, and communities adapt to change caused by development."[81] Methods for SIAs take the form of surveys, interviews, census data, public hearing findings, research, analysis, and marketing. Other tools that assess potential for impacts are Ecological Impact Assessments, which, "considers how organisms rather than people will be affected by activities."[82] These assessments also rely on other ecosystem components like habitat evaluation. This has been used by the US Fish and Wildlife and the US Army Corp of Engineers.[83] This aims at assessing "the suitability of an ecosystem for a species or the impacts of development on a habitat."[84]

Next, is Land-use planning which operates on different scales. It "indicates the situation at the time of the study, and is not the same as a capability classification,

[80] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp193. Print.
[81] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp194. Print.
[82] Westman, W.E. (1985) *Ecology, Impact Assessment and environmental planning*. Wiley, Chichester.
[83] Canter, L.W. (1996) Environmental Impact Assessment(2nd edn). McGraw-Hill, New York.
[84] Suter, G.W II (ed)(1993) *Ecological Risk Assessment.* Lewis, Boca Raton, FL.

which looks to the future."[85] It complements EIA's in sustainable development. The downside is that it usually poorly integrated. Geographical information systems also include the idea of Land-use planning.

The next predictive tool for sustainability is the Universal Soil less equation. This uses "data on a wide range of parameters to estimate and predict average annual soil loss."[86] the equation is commonly used by the US Departments of Soil Conservation and Agricultural. It must be used cautiously, as problems arise when the data used is not precise or accurate. It uses an equation to come up with the soil loss answer.

Other tools use the Agroecosystem zones concept aimed at a range of parameters over a limited planning term. The Farmers Systems research applies to agricultural research and development. It has five basic steps. They include:

1 Classification- the identification of homogenous groups('target groups') of farmers.
2 Diagnosis- identification of limiting factors, opportunities, threats and so on for the target group.
3 Generation of recommendations- which may require field experiments, pilot studies and/or research station work.
4 Implementation- usually working with an agricultural extension service.
5 Evaluation- which may lead to revision of what is being done.[87]

Next is the Rapid Rural Appraisal, which is focused on land capability assessments looking to use local people and reduce time and costs of preparation.

[85] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp218. Print.

[86,87] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp219. Print.

Finally, is the Participatory Rural Appraisal which asks, “local people to share, enhance, and assess their knowledge of life and conditions to plan and act.”[88]

iv. Technology

Assessments can also take the form of technology. Technology, “explores the impacts of human technological innovation; it seeks to establish whether equipment and techniques will work and what effect they might have.” [89] The United States since 1967 has worked with this idea of technology. An International society for technology assessment operated from the USA, and later developed into the International Association for Impact Assessment(IAIA), “a body which promotes EIA, SIA, technology assessment, hazard assessment risk assessment, and related activities.[90] The problem with all impact assessments, are that they are usually caring a ‘snapshot approach’. Such an approach can be ineffective. Assessments need some type of continuous regulation. Finally Barrow introduces this idea of Strategic Environmental Assessment. The SEA works through a tiered approach to make a framework for program and policy impact assessments to take places, and should be used in the beginning of the development process. “SEA must make accurate assessments in spite of often vague proposals and policies, and it must cope with often uncertain system boundaries; limited information on existing and future developments; a large number of possible

[88,89] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp220. Print.
[90] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp225. Print.

alternatives to consider; the involvement of, possibly uncooperative, bodies; and possibly more political pressures than are felt by EIA."[91]

Conclusion

Helm's suggestions about what policy requires are very correct. He does notice that while some policy has passed, it has been dull. Perhaps we might argue that policy he is referring to is not really dull, just limited. Limited because, as global citizens we have not achieved the environmental wants or needs seriously use policies to their full potential. Helms also touches on the idea that many countries and people see sustainable development limiting regular development, as we will later see with regards to Malaysia. His use of the Brutland Report's definition of sustainable development is one that should be echoed and etched into the minds of all countries.

The idea that we do not understand the environment enough is spot on. However, it does seem that many take these issues very seriously, and those who do are often weak in their fight to promote their beliefs. Second, the fight between economic growth versus development stems from the idea that politics and economics are heated and well sought after topics. The idea that it will be helpful to set boundaries to solve the things we know is also true. We must use what we know to solve immediate problems and help pave the way for future implementation.

[91] Barrow, C.J. *Environmental Management for Sustainable Development*. second. Abingdon: Routledge, 2006. pp232. Print.

Helms use of the UK's 1994 white paper on sustainable energy proves the point that environmental assessments can be used in all policy processes. Helms point that politicians have their own agendas are unaware of the best available technology, also holds water. Politicians are briefed daily on security reports, economic reports, plus various others. Policy makers should also be subject to a technological report by an expert outside the political realm that can be specially appointed, or perhaps environmental cabinets/ committees should hold forums to allow outside technological information to be presented, assessed, supported/or promoted.

Carbon taxes while sounding good do not really seem to be the answer, as its usually the public that pays, leaving polluters free to keep polluting, however the idea that the polluter pays creates in some instances the idea that some companies should pay for their emissions. Recycling credits and landfill taxes are all instruments made into tools that have been successful. This can expand do use the ideas of tree planting days for companies to plant trees around factories or heavily polluted areas. Companies can also take action in being active in providing better services like paved roads made from recycled materials or take more initiative in leading environmental cleanups, perhaps sponsored and participation by bigger companies.

In Atkinson's chapter he first argues that if costs for sustainable achievement are too high, countries will be hesitant. Some countries do take the initiative to taken on the financial burden. This will sometimes result in a reduction policy. One may argue that the word 'reduce' is not so popular on a consuming world. A reduction policy might be better accepted if it is renamed or re-labeled. A term like a 'conservation', 'preservation', or 'prevention' will be better accepted as it sounds better. Reduction creates a negative

sounding ideal. Conservation, preservation, or prevention sounds like something people can get behind. It sounds like action is being taken, and encourages people to take action. People all want to be seen by others as positive and taking action.

Chapter 3

Money First, Environment Later

Malaysia is a county made up of eleven states plus Sabah and Sarawak Island on Borneo. “Malaysia is recognized as one of the worlds twelve megadiversity countries or hot spots, needing special attention to arrest rapid habitat loss.[1] Malaysia is wealthy in natural resources like tin, oil, timber, and natural gas. Malaysia also went through a period of rubber manufacturing and mining. The reason for rain forest loss was caused by economic development. Large areas of land were developed for rubber and oil palm, logging, and increasing demand for timber which was heavily harvested by the state government. Malaysia can be described as a developing nation and perhaps therefore not as responsible for their impact on the environment.

Poor control of mining equaled ruined mining lands and a deterioration of rivers . Between the years of 1909 and 1939 mining produced 16.26 million tons of sediment into the peninsular Malaysian rivers. [2] The colonial administration introduced the Federated States Mining Enactment in 1928. This was a framework that would look to oversee mining activities and restore affected rivers. As a result of poor enforcement high sediment loads in rivers have persisted even though tin mining activities have long

[1] Myers, N. 1988. Threatened biotas: “Hot Spots” in tropical forests. *The Environmentalist,* 8: pp187-208.
[2] Balamurugan, G..1991 The mining and sediment study in Malaysia with special reference to the Kelang River Basin. *The Environmentalist,* 11:pp281-291.

ceased.[3] Other ecological impacts of land clearance include high sediment loads in rivers from the erosion of soil. Rivers were also polluted by liquid waste from rubber and palm oil mills. This pollution accounted ninety percent of the total industrial pollution load from rivers. [4]

A full scale conversion of land took place for rubber plantations. This was especially true in the early 1900's. Along with the plantations came roads, tracks, and housing. By the nineteen fifties the idea for rural development was sought after more heavily. Therefore there was more and more conversion. The Federal Land Development Authority brought a wave of encouragement. They converted over 100,000 acres of forest land by 1965.[5]

As a social and economic plan labeled, "FELDA" received high approval as a rural policy.[6] However, environmentally critics did not give such similar praises. Impacts on the environment included hydrological change and erosion, pesticide, contamination of the surface water, pollution by mill effluents, and a loss of specialized plants and animals.[7] In an effort to control soil erosion and cultivation of land in hilled areas, came the emergence of the Land Conservation act of 1969. By 1970 the environmental impacts of land based agriculture development continued to rise with the implementation of new economic policy in1971, the scale to clear land for plantations

[3] Balamurugan, G..1991 The mining and sediment study in Malaysia with special reference to the Kelang River Basin. *The Environmentalist,* 11:pp281-291.

[4] Abdullah, A.R., 1995 Environmental pollution in Malaysia: Trends and prospects. *Trends in Analytical Chemistry,* 14: pp.191-198.

[5] Goh, K.C. 1982. Environmental impact of economic development in Malaysia: A review. *Applied Geography,* 2:pp.3-16.

[6] Fold, N., 2000. Oiling the palms: Restructuring of settlements scheme in Malaysia and the new international trade regulations. *World Development,* 28: pp.473-486.

[7] World Bank, 1987. *The Jengka Triangle Projects in Malaysia: Impact Evaluation Report.* Operations Evaluation Department, The World Bank, Washington DC.

was buffed up. From 1976 through 1980 it was estimated that 230,000 hectares of land were deforested for agricultural and urban settlement purposes.

By the 1990's Peninsular Malaysia was dominated by Malaysian manufacturing sectors. GDP jumped from almost fourteen percent in 1970 to thirty 30.5% in 1994. By 2000 populations in urban areas increased from 62% from just an above 50% just 9 years earlier.[8] Newer environmental challenges presented itself in the forms of waste management and frequent interruption of the water supply. [9] River ecosystems health was threatened by untreated industrial toxic, hazardous waste like heavy metals, polyaromatic hydrocarbons(chemicals that occur naturally in coal, crude oil and gasoline. PAHs also are present in products made from fossil fuels, such as coal-tar pitch, creosote and asphalt.), oil, and grease. Untreated household wastewater, and sewage cause more bacteriological contamination for water ways and coastal waters.[10] Recently, air pollution from transportation, industrial manufacturing, and open burning has caused many health problems.[11]

In Peninsular Malaysia during the colonial and first two decades following independence, environmental damage was seen as an, "irrevitable consequence of development "[12] At this time laws were introduced to promote good use and sustainability of resources but were not aimed at associated environmental problems.

[8] DOS, 2001. *Population and Housing Census 2000.* Department of Statistics, Kuala Lumpur.
[9] Aini, M.S. Fakrhul- Razi, A., Suan, K.S.,2001. Water management Satisfaction level, effect and coping of consumers. *Water Resources Management,* 15: pp.31-39.
[10] Abdullah, A.R., 1995 Environmental pollution in Malaysia: Trends and prospects. *Trends in Analytical Chemistry,* 14: pp. 191-198.
[11] Afroz, R. Hassan, M.N., Ibrahim, N.A., 2003 Review of air pollution and health impacts in Malaysia. *Environmental Research,* 92: pp.71-77.
[12] Herzi, A.A. & Nordin Hasan, Mohd. 2006, Towards Sustainable development? The evolution of environmental policy in Malaysia. *Natural Resources forum 30, 39.*

These were usually single issued, fragmented and inconsistent**,** and ineffective in environmental management.

Statutes established to address sectoral management issues:

Management issue	Statutes
Faunal conservation	Straits Settlement Ordinance, No. 3, 1894
	Wild Animals and Bird Protection Ordinance, 1955
	Fauna Conservation Ordinance, 1963 (North Borneo)
Sustainable forestry	Straits Settlements Forest Ordinance, 1908
	F.M.S. Forests Enactment, 1914
	Forests Enactment, 1935
Water and river conservation	Waters Enactment, 1920
	F.M.S. Silt (Control) Enactment, 1922

	Drainage Works Ordinance, 1954
Land and soil conservation	F.M.S. Mining Enactment, 1929
	Land Conservation Act, 1960
	National Land Code, 1965

Sources: Aiken *et al*. (1982), Sham Sani (1997).

The Malaysian federal system faces resource management implementation as each state has control over its own use of land. The federal government may acquire state land, and individual states can convert naturally forested areas for use of economic gains.

This heavy focus on intense resource extraction, rapid development, rising standards of living, and global environmental change are changes in society's response to emerging ecological threats.[13] According to Janicke and Weidner, there are two broad waves of institutionalization of environmental policies. The first occurred in the late sixties until the seventies, by front running developed countries. The examples they use are the United States, Sweden, and Japan. The second wave came following the Bruntland Report, which convened by the United Nations in 1983. The commission was created to address growing concern "about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for

[13] McNeill, J.R., 2000. Something New Under the Sun: An Environmental impact assessment in Malaysia. *Impact Assessment and Project Appraisal*, 18: pp.283-293.

economic and social development."[14] The Rio conference in 1992 brought in the idea of new or revised institutional arrangements for effective environmental protection, and with a focus on the idea of sustainable development. The two values of course differ by terms in their policy contents and corresponding policy instruments.

The first wave can characterized as the early forms of environmental threat, the first wave flattened out following the UN conference on Human environment in Stockholm. The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics. Attended by the representatives of 113 countries, 19 inter-governmental agencies, and more than 400 inter-governmental and non-governmental organizations, it is widely recognized as the beginning of modern political and public awareness of global environmental problems. The meeting agreed upon a Declaration containing 26 principles concerning the environment and development; an Action Plan with 109 recommendations, and a Resolution.[15]

The second wave was more directly aimed at global ecological challenges, the wave took on issues like a loss of biodiversity and climate change, The difference between the waves was that the sustainability problems were different in degree and type. The second wave also washed in tools of experience. For example multiple

[14] Our Common Future, Report of the World Commission on Environment and Development, World Commission on Environment and Development, 1987. Published as Annex to General Assembly document A/42/42, Development and International Co-operation: Environment August 2, 1987
[15] John Baylis, Steve Smith. 2005. The Globalization of World Politics (3rd ed). Oxford. Oxford University Press. pp.454-455

instruments showing that governments are engaging with other parties. If examined from a perspective of institutional theory, policy instruments for both waves of institutionalization are interconnected. The idea for use of path dependency suggests institutional arrangements historically defined it.[16]It can be argued that once a country has chose its particular path, it is very costly and hard to uproot thinking into a new way of thinking into a new path, One may argue that while policy changes, it is still stuck to or reflective of previous policies.

A country like Malaysia introduced administrative changes and legal authority in response to the first wave. This included the establishment of a national environmental agency, ministry of environment, which was then backed by a national environmental law. Malaysia's response to the second wave to some was seen as touchy and haphazard.[17] Malaysia's policy response to environmental challenges came in four main stages.

Stage number one was from 1971 through 1976. The response to environmental problems was seen as if it was just beginning to learn how to deal with these issues, this was followed by the same idea in producing policy action. The government wanted to step up as a big boy on environmental issues, however, problems in this time came on the side of enforcement and coordination as each state was granted its own independence under its constitution. When joining a federated Malaysia, individual states gave up their powers to the federal government. This did not include land, local

[16] Connor, R., Dovers, S., 2004. *Institutional Change for Sustainable Development.* Edward Elgar, Cheltenham.
[17]Weidner, H.2002. Capacity building for ecological modernization: Lessons from cross-national research. *American Behavioural Scientist*, 45: pp.1340-1368.

government, religion, and formulating a forestry policy. [18] To try and control power over forestry, The National Forestry council introduced the Protection of wildlife act in nineteen seventy-two, gave power to the Department of Wildlife and National Parks, to manage wildlife on public and private land. Environmental Quality Act of 1974 (EQA, amended 1985) focused on pollution control and became a legal framework at the federal level and was enforceable throughout the nation. In the third Malaysian plan from, 1976-1980, was a time for development and environment, at this time, the recognition of the environment was considered a component of development planning. By this third plan, the idea was that the objectives of development and environmental conservation should be, "kept in balance so that the benefits of development are not negated by the costs of environmental damage."[19] The difficult situation was seen by trying to maintain a balance in a rapidly developing economy. 1977 through 1988, the continuation of environmental impacts was on the rise. Civil society began to speak out and started the idea of environmentalism in Malaysia.

In March of 1977, a disagreement broke out between the Panhang State and the federal government. The Panhang government decided to log the Endau-Rompin forest reserve. The disagreement resulted in the first environmental protest. A wide range of protestors included conservation groups, scientific societies, political parties and businesses, by 1978 logging stopped and gave Malaysia experience when fighting for the environment. Other cases erupted over the next decade such as logging at the Baram Limbang in Sarawak, and dam construction over the Tembeling River. As a result of these environmental protests, the image of Malaysia globally was changed.

[18] Sham Sani, 1997. *Environmental Quality Act 1974: Then and Now.* Lestari Publisher, Kuala Lumpur.
[19] Malaysia 1976. *The Third Malaysia Plan, 1976-1980*. National Printing Department, Kuala Lumpur.

Singh and Weiss state that, “Malaysia’s image abroad started to suffer, as the government was blamed for deforestation, while the government, on its part branded certain environmental NGO’s as ‘thorns’ in its side.”[20] To better guide the development of the forestry sector, came the National Forestry Policy endorsed in nineteen seventy seven and nineteen seventy eight. This Policy included ideas that:

• Were applicable to Peninsular Malaysia.
• Provided the classification of forests as protective, productive and amenity forests.
• Provided guidelines for the management of remaining forest resources.
• Forest harvesting is carried out in the production forest and state land forest.

Next came the 1984 National Forestry Act which:

Provided for the administration, management and conservation of forests and forestry development within the States of Malaysia.[21]

The act accomplished this by setting aside land for conservation, energy policies like the National Energy Policy of 1979, and contained three principal energy policy objectives to guide energy policy sector development as follows:

- Energy Supply – to ensure adequate, secure and cost effective energy supply from various sources

[20] Singh G., 1992. Case Studies of environmental awareness in Malaysia. Nature and Resources, 28: pp. 30-37.
And Weiss, M.L., 2003. Malaysian NGOs: History, legal frameworks and characteristics. In: Weiss, M.L., Hassan, S. (Eds.), *Social Movements in Malaysia: From Moral Communities to NGOs.* Routledge Curzon, London.
[21] http://www.wildlife.gov.my/ accessed 12/27/2011

- Energy Utilization – to promote and encourage of efficient utilization of the energy
- Environmental Conservation – to minimize the negative environment due to the energy supply chain.

This policy also set the overall energy policy with broad guidelines on long-term energy objectives and strategies to ensure efficient, secure and environmentally sustainable supplies of energy. Along with this came the National Depletion Policy of 1980, which "Introduced to safeguard the exploitation of natural oil reserves because of the rapid increase in the production of crude oil."[22] In other words Malaysia looked to ensure the long term security of energy and supply by creating production limits to reduce overdependence on oil.

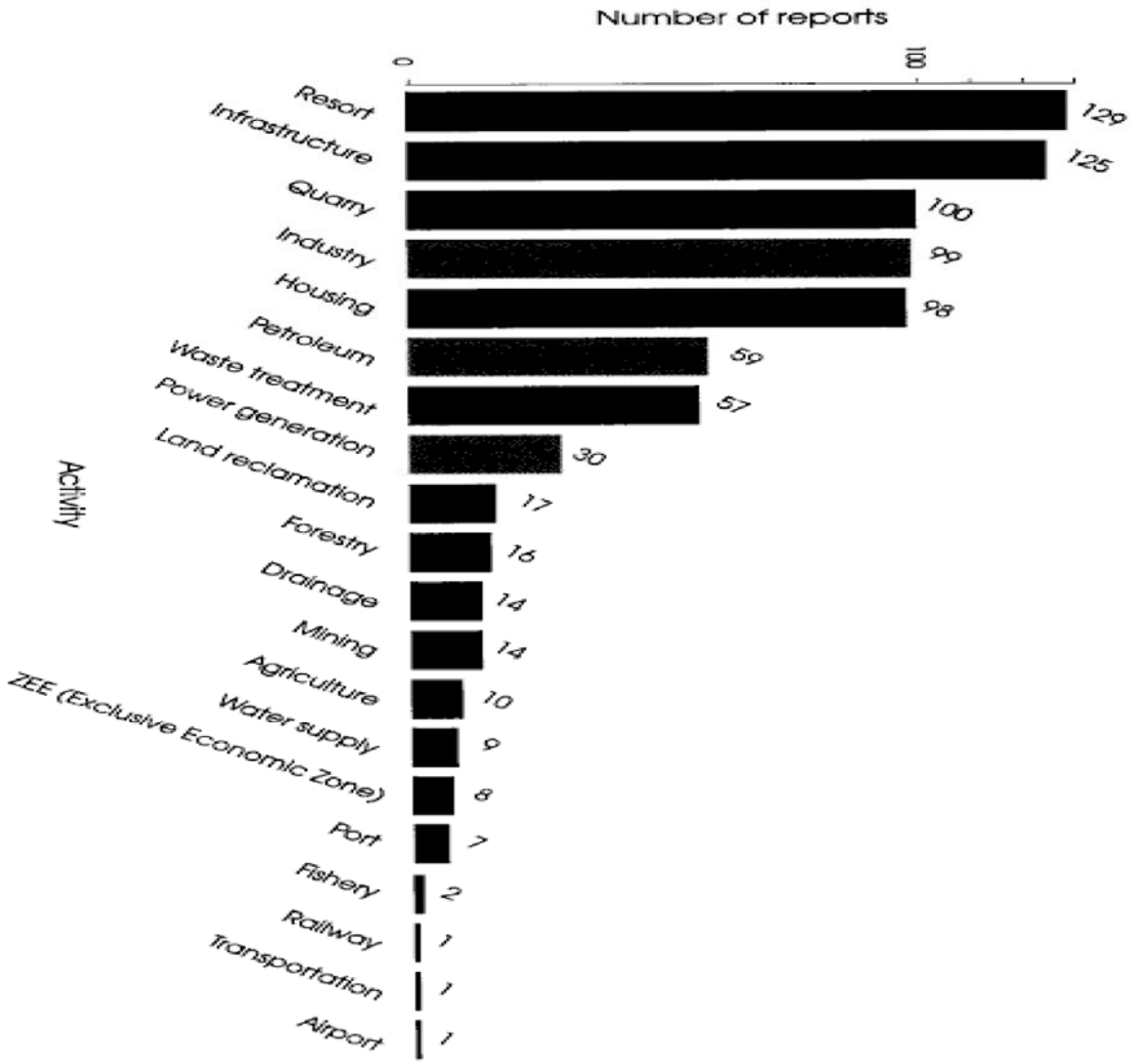
The 1981 diversification policy moved towards a balanced mix of oil, gas, hydroelectricity, and coal. Designed to prevent over-dependence on oil as the main energy resource, its aim was to ensure reliability and security of the energy supply by focusing on four primary energy resources.[23] From the end of 1977 the response to pollution was revised many times for implementing a general framework. The effectiveness of the Department of the Environment in enforcing its general framework in enforcing the Environmental Quality Act (EQA) was stopped short by its small operational budget, limited resources, and poor outside support from bureaucracy.

[22] http://www.asiabiomass.jp/biofuelDB/malaysia/contents002.htm accessed 12/27/2011
[23] Memon, P.A., 2000. Devolution of environmental regulation: Environmental Impact assessment in Malaysia. *Impact Assessment and Project Appraisal*, 18:pp 283-293.

Problems again came in enforcement despite standards being set. Enforcement was left to individual states.

Following much discussion, came the requirement for environmental impact assessments. (EIA's) The EIA order of 1987 required 19 different categories for EIA activity usage. Activities have increased to 1000 categories and have included:

Fig.5 EIA Uses in Malaysia



24

The EIA process was created to prevent environmental damage. Its ability is questionable[25]. Some saw EIA's as inadequate as having about twenty five percent of

[24,25] Memon, P.A., 2000. Devolution of environmental regulation: Environmental Impact assessment in Malaysia. *Impact Assessment and Project Appraisal*, 18:pp 283-293..

reports found to use satisfactory methods and properly emphasized studies of the local ecology.[26]

From 1981 through 1985, was the Fourth Malaysia Plan. In this plan less attention was given to environmental considerations. However, the fifth plan from 1986 through 1990 received more attention. Malaysia also promised to be more active in managing transboundary environmental problems through ASEAN. Malaysia started involving themselves into regional non-binding multilateral consensuses, including the Jakarta Resolution, which stated:

> I. That ASEAN member countries adopt the principle of sustainable development to guide and to serve as an integrating factor in their common efforts. II. That ASEAN cooperative efforts be focused upon those common resources and issues that affect the common well-being of the people, of ASEAN, including, but not be limited to:
>
> - the common seas;
> - land-resources and land-based pollution;
> - tropical rain-forces;
> - air quality; and
> - urban and rural pollution.

[26] Vun, L.W., Latiff, A Nordin, M., 2004. Review of ecological input in preliminary EIAs for Coastal resort development projects in Malaysia. *Journal of Environmental Assessment Policy and Management,* 6: pp. 385-401

III. That ASEAN cooperation should encompass governments and government agencies as well as the private business sector, professional associations, educational and academic institutions and non-governmental organizations.

IV. That in affirming this Resolution, the ASEAN Environment Ministers are aware that the pursuit of sustainable development would be best served by the establishment of a regional body on the environment of sufficient stature whose task should include, but not be limited to:

(a) recommending policy guidelines on the implementation of the principle of sustainable development;

(b) facilitating the incorporation of environmental considerations into the programmes and activities of ASEAN committees;

(c) monitoring the quality of the environment and natural resources to enable the periodic compilation of ASEAN state of the environment reports; and

(d) enhancing the cooperation on environmental matters. [27]

This agreement with others provided a framework for any possible future trans-boundary problems in the region,

From 1988, the state executive committee on environment held a joint meeting for all the states of Malaysia. It became a medium for federal policy directions and joint

[27] http://environment.asean.org/index.php?page=agreements:jakartaresolution accessed 12/28/2011

implementation.[28] This committee is seen as somewhat of a joke, or an annual tradition, as meetings are once per year and seem to be more of a policy forum, "together with policy instruments such as NGO public campaigns, and EIA's. This committee also labeled as MEXCOE represents a missed opportunity in functions like potential choice points along the environmental policy path that could have strengthened integration between sectors. The third stage from 1989 to 2000 reflects international influence especially on sustainable development. Malaysia had even participated in global endeavors like the United Nations Conference on Human Environment or UNCHE, which emphasizes, "That defending and improving the environment must become a goal to be pursued by all countries."[29] Malaysia also went as far as to sign the twenty-six principles of the Stockholm Declaration and Action plan.

Sustainable Development

Two factors influenced Malaysia to accept sustainable development. The first was the idea of growing diplomatic influence. Their success gave Malaysia respect and confidence to be a spokesperson for the Southeast region. The second factor that brought the idea for sustainable development was the voice of the international community towards the Wanton Deforestation issue. The movement of the Penan People of Sarawak whose land was being logged, gained attention when they resisted

[28] Jaafar, A.B., 1998. Two decades of environmental quality management in Komoo, I. (Eds.), National Review on Environmental Quality Management in Malaysia: Towards the Next Two Decades. Lestari Publisher, Kuala Lumpur, pp.11-27.
[29] http://www.eoearth.org/article/United_Nations_Conference_on_the_Human_Environment_%28UNCHE%29,_Stockholm,_Sweden accessed 12/28/2011

logging operations in their home territories of the Baram, Limbang, Tutoh and Lawas regions of Sarawak.

i. The Struggle of the Penan

The Penan's struggle began in the 1960s when the Indonesian and Malaysian governments opened up large areas of Borneo's interior to commercial logging.[30] Penan communities were and are reliant on forest produce, and were affected hard by the large scale logging operations that encroached on their traditionally inhabited territories. The logging caused the pollution of their water catchment areas with sediment displacement, the loss of many sago palms that form the staple of the Penan diet, next came the loss of wild boar, deer and other game, scarcity of fruit trees and plants used for traditional forest medicine, destruction of their burial sites and loss of rare plants and animal species.

This situation tied both the hands of Malaysia's government, as individual states had their own forestry regulation. On the other hand, the European Market has threatened to boycott Malaysian timber. The European parliament had even gone as far as suspending European timber imports from Sarawak.[31] Prime Minister Dr. Mahatir Mohamed defended Malaysia's right to develop against eco-imperialist wealth nations.

The Penan people made numerous verbal and written complaints to the logging companies and local government officials. They argued that the logging companies were located on land given to the Penan in an earlier treaty, recognised by the Sarawak

[30] Klare, M (2001) 'Resource Wars: The New Landscape of Global Conflict' pp. 202]
[31] Jaafar, A.B., 1998. Two decades of environmental quality management in Komoo, I. (Eds.), National Review on Environmental Quality Management in Malaysia: Towards the Next Two Decades. Lestari Publisher, Kuala Lumpur, pp.11-27.

State Government, and were thus violating their Native Customary Rights.[32] In 1987, the state government passed the amendment S90B of the Forest Ordinance, which made the obstruction of traffic along any logging road in Sarawak a major offence. Under this law, the confrontations ended with several deaths, many injuries and large scale arrests of indigenous people. Many of the detained reported being beaten and humiliated while in custody.[33]

The Penan explicitly outlined their wants and requirements to the Sarawak State Government of Abdul Taib Mahmud in the 2002 Long Sayan Declaration. [34] The battle between the Penan and Sarawak State Government continues to present day. Most recently the blockade setup by the Penan community of Long Benali was forcefully dismantled on April fourth, two thousand and seven by the Sarawak Forestry Corporation. Samling Corporation had been granted a logging concession by the Malaysian Timber Certificate Council that included land traditionally inhabited by the Penan of Long Benali despite their continued petitions against the concession.[35]

International Diplomacy was the background of Malaysia's third stage of environmental policy response was their ability to champion meetings as a leader of the south when Malaysia chaired the G-77 which is a flexible coalition of developing nations, designed to promote its members' shared economic interests and create an enhanced joint negotiating capacity in the United Nations. In this they drafted the Langkawi Declaration. The Langkawi Declaration on the Environment was a declaration issued by the assembled Heads of Government of the Commonwealth of Nations on the issue of

[32] Mudge, A (2001) 'Swiss Activist Missing in Borneo' retrieved from http://www.borneoproject.org/article.php?id=270 accessed 10/28/2011
[33] Klare, M (2001) 'Resource Wars: The New Landscape of Global Conflict'
[34] Borneoproject.org accessed 11/15/2011
[35] http://www.bmf.ch/en/news/?show=43 accessed 11/15/2011

environmental sustainability. It was issued on October 21st, 1989 in Langkawi, Malaysia. The declaration covers a range of topics related to the environment, blaming past neglect in managing the natural environment and resources. It lists what the Heads of Governments perceived to be the main environmental problems: the greenhouse effect , damage to the ozone layer, acid rain, marine pollution, land degradation, and species extinction. These, the declaration affirmed, were issues that transcended national borders, and hence required the involvement of international organizations, such as the Commonwealth, to coordinate strategies to solve them.[36]

Joining the Big Leagues

In 1993, Malaysia was appointed as the founding chair of the UN commission on sustainable development. Their ability to ascend into international diplomacy abroad brought forward change at home. The 1990 National Steering committee on sustainable development became a defining moment as they worked together with the UNSCED to bring more learning for the policy community. The NSC incorporated views of other NGO's, scientific communities, and the public with its 1991 national report. The National Development Policy stated the need to, "Ensure that in the pursuit of economic development, inadequate attention will be given to the protection of the environment and ecology as to maintain the long term sustainability of the countries development."[37] The need to strengthen interagency coordination was also a priority in the National council for the environment. This was not put into effect but replaced by the seventh

[36] http://www.thecommonwealth.org/document/34293/35468/171730/1989_langkawi_declaration_on_the_environment.htm accessed 11/15/2011

[37] Malaysia, 1991a. The Second Outline Perspective Plan, 1991-2000. National Printing Department, Kuala Lumpur.

Malaysia Plan, by incorporating the environment as a must talked about issue at the meetings of the National Development Council. Environmental issues have also made it to the political domain when it became a policy for the ruling Barisan National Party in the 1994 election.

The National Forestry Act in 1993, called for an improving its further policy framework. The act emphasized the conservation of natural resources, development of sustainable and improvement in efficiency in resource use and management. A full scale study of Green Policy entitled the National Conservation Study was completed by the WWFM for Economic Planning Unit. The study worked to include a natural resource accounting component which showed a decrease in Malaysia's forests.[38] The strategy was never endorsed or put into action. Policies that were accepted were the National Policy on Biodiversity and the National Policy on the environment[39]

Foreign Aid was an important issue in 1994, and the Danish Cooperation for Environment plan , "(DANCED) was established as a follow-up to the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro 1992. In 1993 the Danish Parliament allocated funds under the Environment and Disaster Relief Facility (EDRF) to promote transfer of environmental technology and know-how to developing countries through DANCED. The Programme is managed by the Danish Ministry of Environment and Energy in co-ordination with the Danish Ministry of Foreign Affairs."[40] This was important for Malaysia's policy process and environmental planning.

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[38] EPU Malaysia, 1993, *Malaysian National Conservation Strategy: Towards Sustainable Development, Vol. 4: Natural Resource Accounting.* Economic Planning Unit, Prime Ministers Department, Kuala Lumpur.

[39] MOSTE, 1998, National Policy on Biodiversity. Ministry of Science, Technology and the Environment, Kuala Lumpur.

[40] http://www.iczm.sabah.gov.my/reports/Sandakan%201/mst-Overview.html accessed 11/15/2011

This cooperation also created a more government to government intervention.[41] A 2002 assessment of this cooperation by policy community members stated that dialogue between officials, NGO's, business and academics (inculcated) a new culture of civil society consultation.[42]

The overall objective according to Gorm Jeppesen says:

"DANCED is to contribute to the restoring of the global environment in accordance with the recommendations of the UNCED Conference. The activities of DANCED are at present concentrated in Southeast Asia and Southern Africa. Activities started in Thailand and Malaysia in 1994 and in South Africa, Namibia and Botswana in 1995.

Thematic areas of the DANCED/Malaysia projects include Urban Development and Industrialization; Sustainable Use of Energy; Agriculture; Water Resources; Forests and Wood Resources; Biological Diversity; and Coastal zones.

Projects already under implementation in Malaysia include: Cleaner technology; Tasek Brea; Capacity building Economic Planning Unit; River rehabilitation; Sabah biodiversity; Coastal Zone Management, Malaysia; Peat swamp forestry; University Malaysia, Sabah; Mangrove forests; Forest residues; Perlis State Park; Pig waste; and Human Resources Development – Department of Environment.

Additional projects are in different stages of preparation. Although projects are located all over Malaysia the DANCED programme has a particular focus on East Malaysia."[43]

Malaysia has also even been a member of multilateral environmental agreements or MEA's which pushed environmental policy in the country. Both the Vienna Convention and the Montreal Protocol have also been essential in getting rid of ozone removing substances, Malaysia has also taken the steps in country interest based approaches which shows their ability to learn.

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[41] MOSTE, 1998, National Policy on Biodiversity. Ministry of Science, Technology and the Environment, Kuala Lumpur.

[42] Ramakrishna, S., 2003. The environmental movement in Malaysia. In: Weiss, M.L., Hassan, S. (Eds.), Social Movements in Malaysia: From Moral Communities to NGOs, Routledge Curzon, London, pp.115-139.

[43] http://www.iczm.sabah.gov.my/reports/Sandakan%201/mst-Overview.html accessed 11/17/2011

Status of Implementation of the Convention on Biological Diversity, the Framework Convention for Climate change and the Convention to Combat Diversification:

Chart 1 Convention on Biological Diversity

Conventions	Objectives	Status of implementation
Convention on Biological Diversity	• Conservation of Biological Diversity • Sustainable use of its components • Fair and equitable sharing of the benefits derived from genetic resources	The Cross-sectoral framework, the National Policy on Biological Diversity, which compromises 15 strategies and action plans was launched in 1998. Interagency involvement and collaborations were established including the Biodiversity and Biotechnology council, National Committee on Biological Diversity, National Technical Committee on Biological Diversity, Genetic

		Modification Advisory Committee and Biodiversity Clearinghouse Mechanism based in the forest Research Institute of Malaysia(FRIM).
Framework Convention for Climate Change.	• Protection of Climate System	Malaysia has conducted a national inventory of greenhouse gases, abatement measures and thorough assessment of their impact on the various economic Sectors. Related development is Malaysian success in phasing out CFC's by November 1999 in line with the Montreal Protocol. The National Climate Committee addresses Malaysian interagency involvement and collaboration.

Convention to Combat Desertification (CCD)	• Combat desertification and mitigate the effects of drought • Improve productivity of land, rehabilitate and conserve land and water resources.	CCD implementation in Malaysia focused on soil and water activities. Actions taken by the Ministry of Agriculture include preparation of erosion risk maps, agro-climatic maps, terrain class maps, watershed maps, development of database for soil physical properties and preparation of development plan for agriculture on sloping land.

[44]

Stage three developments were more symbolic and recognition was not supported by institutional reforms. The country has not actually benefitted from sustainable development which brought reforms elsewhere and internationally.

Policy in the fourth stage required putting content of policy to government functions through better policy formatting. “Integration entails incorporation of environmental objectives into non environmental sectors, and takes two forms: Vertical and Horizontal. Vertical integration refers to development within its sector of its own

[44] Herzi, A.A. & Nordin Hasan, Mohd. 2006, Towards Sustainable development? The evolution of environmental policy in Malaysia. *Natural Resources forum 30.* pp. 44

understanding of sustainability and implications. Horizontal integration means a comprehensive cross-sectoral strategy for sustainable development by a central authority.[45]

For Malaysia, vertical integration of environmental policy is seen in policies like the National Spatial Policy and National mineral Policy, "The National Spatial policy specifies areas for conservation and environmentally sensitive areas, which is required of all states of the federation. Such areas will be clearly demarcated in local plans, which are legally binding, under the National Town and Country planning Act, 1972."[46] Environmental Policy goals are incorporated into the third National Agriculture Policy and fuel diversification policy, as they are renewable energies such as biomass, biogas, and cleaner production for industrial manufacturing.[47] Environmental Objectives were incorporated into non-environmental agencies and organizations.[48]

Water reform for resource management is a case of known government commitment, based on the ideas of the privatization of water supply.[49] Water scarcity in Malaysia, like many countries, puts an emphasis on the expansion of supply, to meet demands. Malaysia's water problems forced the government to push for privatization. Nineteen ninety eight established the National water resources council. There were vast problems, such as poor quality, and low pressure. For individual state governments to manage privatization, and was then transferred to the responsibility of the federal

[45] Lafferty, W. M, Hovden, E., 2003. Environmental policy Integration: Towards and analytical Framework. *Environmental Politics*, 12: pp. 1-22.
[46] MOSTE, 1998, National Policy on Biodiversity. Ministry of Science, Technology and the Environment, Kuala Lumpur.
[47] Malaysia, 2003. *Mid-Term Review of the Eighth Malaysia Plan, 2001-2005*. Government Printer, Kuala Lumpur.
[48] Boehmer, K., Memon, A., Mitchell, B. 2000. Towards sustainable water management in Southeast Asia: Experiences from Indonesia and Malaysia. *Water International*, 25: pp.366-377.
[49] Aini, M.S. Fakrhul- Razi, A., Suan, K.S.,2001. Water management Satisfaction level, effect and coping of consumers. *Water Resources Management,* 15: pp.31-39.

government. While government commitment to improve water access is noticeable, the problem only addresses poor public services. Privatization in other countries for economic reasons has compromised social equality and ecosystem functions.

Horizontal integration involves minimizing fiction between environmental and sectoral policies, with greater focus on privatization of environmental objectives.[50] Economic growth is still the overall objective in Malaysia. Instructions for horizontal and vertical integration were beefed up with the October two thousand and two National Policy on the Environment.[51] The policy identifies 8 principles to make economic development fit with environmental needs. In 2000, the state of Selangor took the step to create the first sustainable development strategy. The idea for this was rapid urbanization and extensive conversion of ecosystems.[52] The result of this brought a string of water crisis along the Klang Valley.[53] Despite little commitment to reform, there are many patchy experiments that actually combated horizontal integration through policy. Such examples can be seen through efforts in implementing indicators of sustainable development.[54] Since 2000, the federal government experimented with economic instruments through practice projects in solid waste management, and the cutback on pesticide use. Environmental standards, such as ISO 14000, which exists to help organizations (a) minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); (b) comply with

[50] MOSTE, 2002. *National Policy on the Environment*. Ministry of Science, Technology and the Environment, Kuala Lumpur.
[51] MOSTE, 2002. *National Policy on the Environment*. Ministry of Science, Technology and the Environment, Kuala Lumpur.
[52] Abdullah, S.A., Nakagoshi, N., 2006, Changes in landscape spatial pattern in the highly developing state of Selangor, Malaysia. *Landscape and Urban Planning*, In Press.
[53] Aini, M.S. Fakrhul- Razi, A., Suan, K.S.,2001. Water management Satisfaction level, effect and coping of consumers. *Water Resources Management,* 15: pp.31-39.
[54] Herzi, A.A., 2005. Hasan, 2004. Sustainability indicators system and policy processes in Malaysia: A framework for Utilisation and learning. *Journal of Environmental Management*, 73: pp357-371

applicable laws, regulations, and other environmentally oriented requirements, and (c) continually improve in the above.[55] They have become popular among large companies under the lead of Prime Minister Abdullah Badawi, as part of a complete reform created by the Ministry of Natural Resources and Environment. This ministry tried to combine environmental portfolios under one authority, the results of this ideal have yet to be seen.

Currently there is no agreement on how to measure whether a government is really on the sustainable path, an evaluation of Agenda 21 in Malaysia for the world summit of Sustainable Development by nongovernmental organizations concluded:

"In Essence, the words are in the right place but in truth the actions are not. The commitment and focus to implement sustainable development practices is not forthcoming."[56]

Malaysia in the 1970's was seen as a leader for creating environmental governance. The ability to respond to development after nineteen ninety two has not been the same. Poor action in the first wave delayed action of the second wave of industrialization.[57]

There are 7 principles of institutional change for sustainability set by Connors and Dovers. Horizontal integration of sustainable developmental is still minimal in Malaysia. They are as follows:

1. Institutional accommodation of sustainability

[55] http://www.iso.org/iso/iso_14000_essentials accessed 12/12/2012
[56] MNF for Rio+10, 2003. *NGO Perspectives for Advancing Sustainable Development in Malaysia. Review of Agenda 21 Implementation in Malaysia*. Malaysian NGO Forum for Rio+10, Kuala Lumpur.
[57] Janicke, M.,1992. Conditions for environmental policy success: An International comparison. *The environmentalist*, 12: pp.47-58.

2. The role of normative change
3. Legal Change
4. International law and policy drivers
5. Integration in theory and practice
6. Subsidiarity
7. Reiteration

The first principal states that the line of distinction between separate environmental issues and sustainability as an integrated policy is not established. The second principal offers the idea that the lack of Political commitment to sustainable development originates with the idea that the concept was supported by some developed countries for eco imperialistic ends.[58] Next, this view dissatisfied any proposal for government reform. Third, In a legal sense there exists no comprehensive reform for environmental and natural resource legislation for sustainable development. Which is interesting because, of their excellent participation in international regimes. Those policy changes that have happened have been marginal. The missed opportunity happened with a non-materialization of a national council for the environment. Regulatory control has only recently been established, others argue that there is political will by the federal government to tackle issues. There is a difference of policy makers who differ on topics of environmental and social development. States continue to invest in economic projects with minimal consideration of the environment. The explanation is that the functional development system in Malaysia runs the risk of being monumental and resistant to change. Despite policies being proposed the environment and natural

[58] Broses, J.P., 1997, Endangered forest, endangered people: Environmentalist representations of indigenous knowledge. *Human Ecology*, 25: pp. 47-69,

resource management are separate sectors.

In stage one; environmental issues were packaged as an independent sector of development planning. Environmental governance was seen as a function of the 1974 EQA, and then administrated by the DOE. The EQA of 1974 is mostly a regulatory instrument for pollution control and does not complete the reason for creating sustainability.

Stage two environmental activism and public campaigns were hindered by the government. In stage three, Malaysia was not successful in institutionalizing sustainability. Perhaps it was because of their choice to campaign for sovereign rights of developing countries, Sustainability choices were too costly as an alternative path to the status quo. Some paths perhaps are too foreign for the federal government to hold. The political economic costs are high for the existing political system. The explanation for this could be explained by the four stages of a developing economy. Path dependency theory says, "When a country is consistently rewarded with increasing economic returns, the mainstream will be hard to change." [59]

Sustainability has been re-labeled as a short term economic growth ideal. This relates to projects on the environment like profitable ecotourism. Environmental policy for sustainable development has become a business as usual venture. Environmental policy will continue to be a marginal consideration to the overall goal of economic advancement. However, if Malaysia does take steps to encourage the environment and sustainability as a core policy, Malaysia's ability to be a state driven for purposeful

[59] Pierson, P., 2004. Politics in Time: *History, Institutions and Social Analysis.* Princeton University Press, New Jersey.

achievement suggests that it is capable of implementing rapid and impressive social and economic development. [60]

Challenges in Implementing Environmental Protection

Ainual Jarias Bt Maidins article titled, *Challenges in Implementing Environmental Protection in Malaysia,* discusses the challenges posed in implementing and enforcing environmental protection measures in Malaysia. Maidin starts by establishing a general background for the problems the government faces with defeating environmental problems that come from poorly planned development. It is believed by Maidin that Malaysia's post-independence policies are the reason for Malaysia's environmental problems. Despite their want to commit to better environmental policy, Malaysia has had a problem balancing growth with environment. Maidin believes people have the wrong idea about preserving the environment, as they see preservation at the cost of limited development. Most agree that the problems regarding the environment, comes from poor implementation and enforcement. Maidin also believes that policy makers would rather have short term economic growth over long-term development. This has contributed immensely to the environmental problems of the country.

Officials in Malaysia have taken stances to introduce both legal and non legal strategies, including legislation, guidelines, and environmental education towards the environment. In the third Malaysia plan the idea was that policies would guide environmental protection to promote sustainable development. 2002 saw a National policy on the environment. J. Dryzek's idea is that environmental policy that is truly

[60] Herzi, A.A. & Nordin Hasan, Mohd. 2006, Towards Sustainable development? The evolution of environmental policy in Malaysia. *Natural Resources forum 30*

sustainable requires the integration on all related aspects, such as water and air to ensure that problems are not dealt with in small pieces.[61]

Some of the first environmental problems involved settlement ordinances aimed at protecting wild birds and water flow. These were the Settlement Ordinance No. 3 and the 1920 water enactment. The merchant shipping ordinance aimed at governing marine pollution by vessels. A poisons ordinance is 1952 regulated the use of toxic substances. The animals ordinance of 1953 tried to control the spread of animal disease and cruelty to animals. Other ideas for environmental control included mining and waste disposal, and forest logging control. In 1960, Malaysia say the Land Conservation Act aiming at conserving hills and was against soil erosion. It also allows the land administer to issue permits for anyone who wants to plant for a short period of time. Policies in the 1970's also came to life in response to threat and not aimed at protecting the future.

The EIA order of 1987 requires all projects use EIAs, The hopes to be used on all developments in Malaysia. If used correctly, it will help Malaysia be sustainable now and in the future. Maidin next presents the idea that he believes the environment is second to what is good for economic growth. Maidin argues that those who do deviate from using EIAs or break the law are hardly tried in court. The DOE who is in charge of implementation and land enforcement has limited powers to deal with land planning. The Power to regulate land lies with the state planning committees. These are at the state level policy concerns. The problem is that the legal framework is that it is sectoral in management of the environment, Problems result from gray areas left unregulated from previous agencies, or perhaps from overlapping on other issues. Environmental

[61] Dryzek, J. Rational Ecology(oxford, Blackwell 1987) pp. 10-13

framework does not support coordination between organizations and individuals working towards the environment. Maidin along with others know that the need for coordination can only lead to uniformed environmental standards. Maidin also feels that, "the nature of the legal framework especially its fragmented and disjointed character is because the state often addresses environmental problems on an ad-hoc basis rather than with a sound management for sustainability"[62] Maidin also brings up the idea of "the rules of standing', that he feels is a problem in itself for Malaysia. Maidin believes that the court causes a barrier for those who are breaking the law of the environment as they are quite liberal in their rulings. [63] Another point that echoes the problem of standing is jurisdiction. It seems to be somewhat of a toss-up between the Federal governments, or States have the right to hear the environmental cases.

Article 74 of the constitution says, "Matters of land, rivers, forests, local government, and town and country planning are within the jurisdiction of the respective state authority."[64] Many of the laws on the books do however lack uniformity. This in turn weakens environmental legislation.

EIAs under a planning authority may take the steps to conduct outsiders help for planning, but they do not have to follow the assessments that outsiders make. Next, Maidin and others argue that Malaysian bureaucracy is new to the concept of

[62-64] Jaria Bt Maidin, Ainul. "Challenges in implementing and enforcing environmental protection measures in Malaysia ." *Malaysian Bar*. (2005): n. page. Web. 29 March. 2012. <http://www.malaysianbar.org.my>.

environmental management and is not conducive to cooperation, Malaysian society to Maidin is hierarchical and that cooperation is tough due to Malaysia's strong cultural characteristics influence. Previous politicians come from bureaucratic backgrounds, and would rely on other bureaucrats for advice and support. "Civil servants and other government officials are often loyal to their superiors in return for job security, financial income and promotions or alternatively employment chances in the private sector in the event of retirement from civil service." [65] The main idea is that civil servants are always loyal to their superiors in order to get some future benefit in the future. Maidin describes this relationship as 'vertical' and feels that Malaysia can better improve with horizontal cooperation. This type of relationship creates linkages between various government institutions concerned with bettering the environment.

Maidin also believes that the environment is in the #2 position when it comes to projects being privatized, These projects are being sold to or given to favored groups or individuals.[66] Cultural ideals are not to be ignored either when it comes to any policy making. "Malaysian's are known to suppress their inner feelings in order to avoid criticism, conflict, disagreement and controversy in conducting all interpersonal relations in a smooth and unthreatening manner."[67] The Southeast Asian style of dealing with unpleasant or dangerous situations is avoidance, silence, repressing emotions with the

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[65] Jaria Bt Maidin, Ainul. "Challenges in implementing and enforcing environmental protection measures in Malaysia ." *Malaysian Bar*. (2005): n. page. Web. 29 March. 2012. <http://www.malaysianbar.org.my>.

[66] Francis Loh, K.W., and Khoo, BT., (eds), Democracy in Malaysia- Discourses and practices, (surrey, Curson Press,2002) pp. 186-87.

[67] Jaria Bt Maidin, Ainul. "Challenges in implementing and enforcing environmental protection measures in Malaysia ." *Malaysian Bar*. (2005): n. page. Web. 29 March. 2012. <http://www.malaysianbar.org.my>.

hope that the problem will disappear if matters are smoothed over. [68] Maidin criticizes Malaysians when he says that they don't realize that environmental protection is not just solved by the government, it requires participation from all levels of the nation. Maidin also believes there is not enough participation or interests in Malaysia to challenge the environmental problems that the country has, and calls on the people to be more active. Malaysia is plagued by a lack of transparency and resources. Maidin also stresses that environmental enforcement comes from transparency and personnel that can uphold it. This is difficult as Malaysia and other developing nations lacks skilled and experienced workers. Those that are in charge of EIA's lack experience in law and Maidin feels this reduces the effect of legal requirements.

Next, is the idea that workers in policy making positions look for any opportunity to find the private sector/cushier jobs. Once their chance comes, workers will leave their workload on those even less experienced or those who are already carrying a heavy load of work. Maidin believes that the idea of "policies and strategies for the improvement of the environment, requires continuous strengthening of an institutional and legal framework with official environmental standards besides subscribing to numerous international treaties.[69] Environmental protection should zone in on conservation rather than corrective measures. Conservation must include the development planning process to focus on features of land and natural resources, environmental impact assessments to prevent negative impacts of production activities and to tighten strings on works and management plans for protected areas. This will

[68,] Pye, Asian Power and Politics: The cultural Dimensions of Authority,(Cambridge, Belknap Press, Harvard University, 1985) pp. 325.

[69] Jaria Bt Maidin, Ainul. "Challenges in implementing and enforcing environmental protection measures in Malaysia ." *Malaysian Bar*. (2005): n. page. Web. 29 March. 2012. <http://www.malaysianbar.org.my>.

also create a morale booster of self-confidence for those that participate.

Malaysia needs to be transparent and touch on environmental laws on all levels of government, from the Federal down to the tiniest Indigenous village. Maidin calls on Malaysia to have a one-stop center at the federal level to implement environmental protection measures, as well as to enforce regulations.

Wawasan 2020 or Vision 2020 is a Malaysian plan introduced by former Prime Minister Mahathir bin Mohamad during the delay of the Sixth Malaysia Plan in 1991. The vision calls for the nation to achieve a self-sufficient industrialized nation by the year 2020. They look to include a wide range of factors including economic prosperity, social well-being, education, political stability, as well as psychological balance. In order to achieve Vision 2020, Mahathir required that the nation required an annual growth of 7% over the thirty years from 1990–2020, so that the economy would be reach a GDP of RM920 billion by 2020.[70]

Mahathir outlined nine strategic challenges that Malaysia must overcome to achieve Vision 2020.

Malaysia as A Fully Developed Country - One Definition

- By the year 2020, Malaysia can be a united nation, with a confident Malaysian society, infused by strong moral and ethical values, living in a society that is democratic, liberal and tolerant, caring, economically just and equitable, progressive and prosperous, and in full possession of an economy that is competitive, dynamic, robust and resilient.
- There can be no fully developed Malaysia until we have finally overcome the nine central strategic challenges that have confronted us from the moment of our birth as an independent nation.
- The first of these is the challenges of establishing a united Malaysian nation with a sense of common and shared destiny. This must be a nation at peace with itself, territorially and ethnically integrated, living in harmony and full and fair partnership, made up of one 'Bangsa Malaysia' with political loyalty and

[70] http://www.pmo.gov.my/?menu=page&page=1904 accessed 4/15/2012

dedication to the nation.

- The second is the challenge of creating a psychologically liberated, secure, and developed Malaysian Society with faith and confidence in itself, justifiably proud of what it is, of what it has accomplished, robust enough to face all manner of adversity. This Malaysian Society must be distinguished by the pursuit of excellence, fully aware of all its potentials, psychologically subservient to none, and respected by the peoples of other nations.
- The third challenge we have always faced is that of fostering and developing a mature democratic society, practising a form of mature consensual, community-oriented Malaysian democracy that can be a model for many developing countries.
- The fourth is the challenge of establishing a fully moral and ethical society, whose citizens are strong in religious and spiritual values and imbued with the highest of ethical standards.
- The fifth challenge that we have always faced is the challenge of establishing a matured,liberal and tolerant society in which Malaysians of all colours and creeds are free to practise and profess their customs,cultures and religious beliefs and yet feeling that they belong to one nation.
- The sixth is the challenge of establishing a scientific and progressive society, a society that is innovative and forward-looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilisation of the future.
- The seventh challenge is the challenge of establishing a fully caring society and a caring culture, a social system in which society will come before self, in which the welfare of the people will revolve not around the state or the individual but around a strong and resilient family system.
- The eighth is the challenge of ensuring an economically just society. This is a society in which there is a fair and equitable distribution of the wealth of the nation, in which there is full partnership in economic progress. Such a society cannot be in place so long as there is the identification of race with economic function, and the identification of economic backwardness with race.
- The ninth challenge is the challenge of establishing a prosperous society, with an economy that is fully competitive, dynamic, robust and resilient. [71]

Changing global conditions amid the Financial crisis of 2007–2010 caused Prime Minister Najib Tun Razak in August 2009, to redefine and recalibrate the vision in terms of how to achieve it along with its timeline. Najib, who said that it was necessary for Malaysia to undertake bold economic reforms, had tasked the National Economic

[71] http://www.wawasan2020.com/vision/p2.html accessed 4/04/2012

Advisory Council (NEAC) to carry out a review of the vision. Najib also said that in order for Malaysia to achieve a developed nation status by 2020, the country has to grow at an annual rate of 8% over the next 10 years. He cited that a lower hypothetical growth of 6% per annum would delay Malaysia's vision to become a developed country by 2030. Malaysia's GDP growth rate averaged 7.2% per annum in the 1990s, and slowed to 5.4% per annum in the following decade.[72]

Conclusion

Malaysia, a country in S.E. Asia is made up of 11 states and 2 islands, is seen as a megadiverse hotspot. The wealth with natural resources allows them to use their land space to create room for their economic growth.

In the early 1900's Malaysia tried their hand at mining. This was until 1928 the mining industry was poorly controlled and resulted in heavy river deterioration. This led to policy action. The 1928 Federated States Mining Enactment, was passed in the hopes of restoring rivers, and overseeing mining in the future.

At this time land was also being converted for rubber plantations. Plantations would need roads, which would eventually lead to housing and more rural developments. By 1965 under FELDA, Malaysia converted over 100,000 acres. This plan, while highly approved, was seen to environmentalists as the exact opposite of what needed to be done. This development of land for economic gain would continue on for decades.

[72] http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aAvHYIgq46lg&FORM=ZZNR8 accessed 4/04/2012

The 1990's brought forward Malaysian manufacturing and tremendous GDP growth, along with population. With this, problems like waste management, poor water flow, pollution and dumping of toxic or harmful chemicals into rivers. This would lead to many health problems. Herzi and Noordin make their point solid when they say that the first few decades following independence was seen as a bi-products of development.` Those laws introduced to promote sustainability to Herzi and Noordin were not aimed at helping environmental problems, as they were single issued and ineffective for waste management.

Malaysia's environmental response came in 4 parts. Stage 1 in 1971 was for Malaysia to learn how to deal with these environmental issues. Ideas for tackling issues were there, but later saw problems with regard to enforcement as each state within Malaysia had its own freedom under one constitution. In stage two, Malaysia tried to balance environment and growth but it would have been unbalanced with rapid economic growth.. 1977-1988 saw Malaysian citizens taking a stance in promotion of environmental rights. This tarnished Malaysia's name abroad and the government would soon be blamed for deforestation. Malaysia did continue try to better improve their environment with policies like the National Forestry act and National Energy Policies. Malaysia would try to manage the forests better and ensure longer energy by making production limits. And try not to be too dependent. 1987 also brought out the requirement of EIAs for Malaysia. Despite the requirement, only about 25% of EIA reports are properly completed and give a proper assessment.

After the 5th Malaysian plan, Malaysia got involved in more regional non-binding consensus with ASEAN like the Jakarta Resolution. From 1988 the state executive committee met to hold a meeting for all Malaysian states. This seems as a missed opportunity, because members meet once a year in a forum based meeting. Two ideas thrust Malaysia onto the sustainability bandwagon. 1. Was the ability for better diplomacy, and the 2nd was due to international eye regarding the Penan People. Malaysia also went as far as to establish the Langwaki Declaration in 1989, and was a member of the DANCED program, which looked to transfer environmental technology and know- how to developing countries from Denmark. Despite signing their name to many agreements and creating many nice sounding policies, environment is only in the backseat in Malaysia's advancement car. If Malaysia could commit to an environmental advancement, they could be a stronger and economic and environmental country.

They can also use their position as the Muslim connection to the west as their benefit. Malaysia should also take the steps to educate their population, companies, and government in being a more sustainable. Malaysia also needs to make sure their policies at the federal level is enforced on state levels or give some initiative or punishment like taxes on those who don't. They need to better enforcement and education for EIAs. The idea that single ideal policies are effective must be made to create a more multi-effective policy as they are not integrative. Also Malaysia must change the thinking that pollution is a bi-product of growth. The government agencies must also cooperate together to create, implement, and enforce policies. Malaysia needs to also take the opportunity to send their citizens or young diplomats abroad to train or be thrown into the fire of the real world environmental policy making as there

seems to be a lack of experienced personnel. Training for this could be provided from NGOs or experts abroad on EIAs. It is not that Malaysian’s do not know how to demand a better environment; it’s that their culture suppresses their emotions when they feel threatened. Malaysia needs to be better engaged globally.

Governance determines who has power, who makes decisions, how other players make their voice heard and how account is rendered.[1]

Chapter 4

Growing Green

Singapore a former British colony grew, because of local capitalist middle class as a direct by product of economic development.[2] This impacted the political atmospheric process of the country. We can see this from interest groups who want political participation, multicultural politics, environmental cleanup and a more free press.[3] Economic and social sustainability depends on commitment to nature conservation and environmental protection. Some scholars argue that the city state of Singapore does not obey the basic rules of political science in being an actual liberal democracy. They are more of a one party ruled, semi-authoritarian regime that has maintained long term economic growth.[4] Huidobro argues that this has created a middle class that has not developed a capable opposition or full democracy for or to the party in power[5]

Huidobro proposes in her study that Singapore's environmental governance is undergoing a process of liberalization from the inclusion of NGO's in policies related to

[1] http://iog.ca/en/about-us/governance/governance-definition accessed 12/16/2011

[2] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp3

[3-5]Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp4

the protection of the environment and nature conservation.[6] Huidobro says, “A governance approach where the state, civil society, government-NGO relations, and environmental protection have characteristics that are part of her study tool of analysis.”[7]

Governance is a tool Huidobro says is used for analyzing the process of liberalization in Singapore’s environmental politics, because of its recognition of CEO’s and collaboration among these involved. A governance approach will recognize various types of members of different domains, giving a different type of governance. Finally, Huidobro calls Singapore, “disciplined governance”[8] Next she states that Singapore tries to be democratic in nature, but that they are in fact, “illiberally or limitedly democratic and overtly paternalistic.[9] Next, she argues that NGO’s are and increasingly prominent feature of governance. NGO’s are usually more, “confrontational, active and free.”[10] Even though NGO’s cooperate with states, they are somewhat held back by the strings of one state.[11]

Last, Huidobro proposes the idea that a governance approach to environmental

[6,7] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp6

[8,9] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp6-7

[10,11,] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp7-8

protection, often favors the protection of the environment and nature. In disciplined governance conservation should be second and opposed to economic growth. Huidobro says, “Environment and its champions win some skirmishes, but normally lose the overall protection battle.[12] There is no doubt that NGO’s and civil society members are on the rise, they just remain weak due to the idea that they don’t want to be seen as challenging the governments dominance. Huidobro states that there has been an increase in the number of public volunteerism. These volunteers, civil societies, and NGO’s are already and are willing to continue to be involved in policy making and governance.[13]

UNESCAP defines Governance as :

the process of decision-making and the process by which decisions are implemented (or not implemented). Governance can be used in several contexts such as corporate governance, international governance, national governance and local governance.[14]

Governance is the process of decision making and the process by which decisions are implemented. Analysis of governance focuses on the formal and informal actors involved in decision making and implementation. Government is one of the actors in governance. other actors may include influential land lords, associations of peasant farmers, cooperatives, NGOs, research institutes, religious leaders, finance institutions political parties, the military etc. [15]

[12] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. 7

[13] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp9

[14,15] http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp accessed 5/11/2012

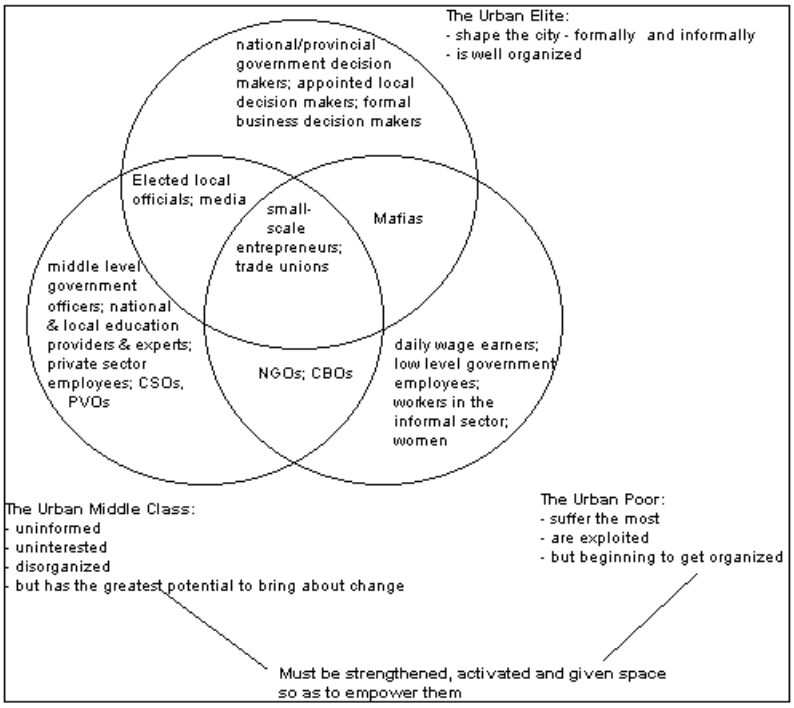


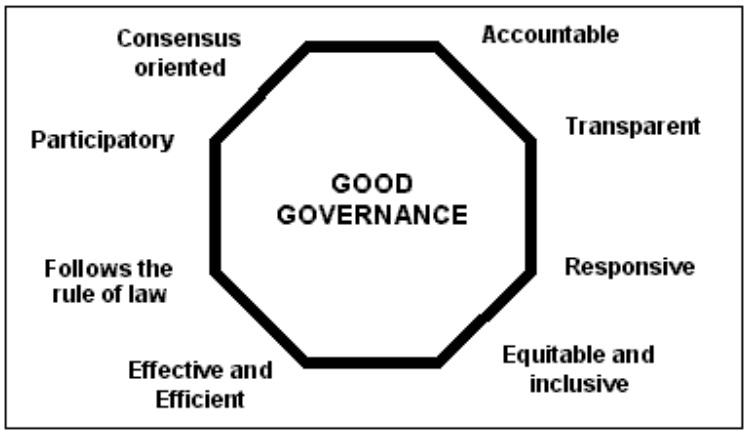
Chart 2 Urban governance

The figure provides the interconnections between actors involved in urban governance. At the national level, in addition to the above actors, media, lobbyists, international donors, multi-national corporations, etc. may play a role in decision-making or in influencing the decision-making process. Similarly formal government structures are one means by which decisions are arrived at and implemented. At the national level, informal decision-making structures, such as "kitchen cabinets" or informal advisors may exist. In urban areas, organized crime syndicates such as the "land Mafia" may influence decision-making. In some rural areas locally powerful families may make or influence decision-making. Such, informal decision-making is often the result of corrupt practices or leads to corrupt practices. [16]

The UNESCAP website says that ‘Good governance’ has 8 major characteristics. They include; participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. These characteristics look to fight corruption, and looks to hear the views of the public.

[16] http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp accessed 5/11/2012

Fig.8 Characteristics of good governance



Participation

Participation by both men and women is a key cornerstone of good governance. Participation could be either direct or through legitimate intermediate institutions or representatives. It is important to point out that representative democracy does not necessarily mean that the concerns of the most vulnerable in society would be taken into consideration in decision making. Participation needs to be informed and organized. This means freedom of association and expression on the one hand and an organized civil society on the other hand.

Rule of law

Good governance requires fair legal frameworks that are enforced impartially. It also requires full protection of human rights, particularly those of minorities. Impartial enforcement of laws requires an independent judiciary and an impartial and incorruptible police force.

Transparency

Transparency means that decisions taken and their enforcement are done in a manner that follows rules and regulations. It also means that information is freely available and directly accessible to those who will be affected by such decisions and their enforcement. It also means that enough information is provided and that it is provided in easily understandable forms and media.

Responsiveness

Good governance requires that institutions and processes try to serve all stakeholders within a reasonable timeframe.

Consensus oriented

There are several actors and as many view points in a given society. Good governance requires mediation of the different interests in society to reach a broad consensus in society on what is in the best interest of the whole community and how this can be achieved. It also requires a broad and long-term perspective on what is needed for sustainable human development and how to achieve the goals of such development. This can only result from an understanding of the historical, cultural and social contexts of a given society or community.

Equity and inclusiveness

A society's well being depends on ensuring that all its members feel that they have a stake in it and do not feel excluded from the mainstream of society. This requires all groups, but particularly the most vulnerable, have opportunities to improve or maintain their well being.

Effectiveness and efficiency

Good governance means that processes and institutions produce results that meet the needs of society while making the best use of resources at their disposal. The concept of efficiency in the context of good governance also covers the sustainable use of natural resources and the protection of the environment.

Accountability

Accountability is a key requirement of good governance. Not only governmental institutions but also the private sector and civil society organizations must be accountable to the public and to their institutional stakeholders. Who is accountable to whom varies depending on whether decisions or actions taken are internal or external to an organization or institution. In general an organization or an institution is accountable to those who will be affected by its decisions or actions. Accountability cannot be enforced without transparency and the rule of law.[17]

In 1970 came the Anti-Pollution Unit. In 1972 came the Ministry of the Environment, which looked after issues of sanitation, public health, and water pollution. By 1983 the two merged. By the end of the eighties, much of the basic infrastructure to meet environmental needs, such as removal of solid waste, wastewater and storm water, were in place. Air and water pollution were controlled through stringent land-use planning controls and tightly enforced emission standards. Living conditions within the city were pleasant, incidence of infectious diseases had declined and the health indices

[17] http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp accessed 5/11/2012

such as average life expectancy and infant mortality rate were comparable to that of the advanced countries.[18]

In the late 80's , global environmental issues, like protection of the ozone layer, global warming, preservation of biodiversity and endangered species and pollution of the sea were taking on higher importance. Consensus was growing on an international level and the need for action on these global became more important. International conventions and protocols on many environmental issues were discussed, and agreed upon. Since Singapore took part in many of these conventions and adapted regulations, these ideas began to impact life and business in the early 1990's in Singapore.

Again in 2002 the National Environmental Agency was established to look after environmental policy and implementation. The ENV and NEA managed environmental planning and preventative control[19] The biggest problems they face deals with land scarcity, air and water pollution, handling of management of toxic waste, waste water management, and controlling vehicular emissions.[20]

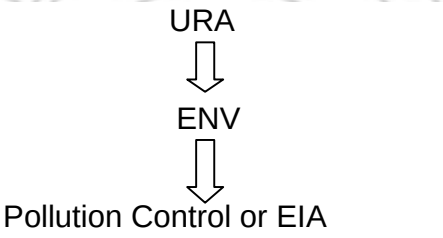
[18] http://dr.ntu.edu.sg/bitstream/handle/10220/2513/AMIC_1994_APR8-9_12.pdf?sequence=1 accessed 12/17/2011

[19-21] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp150

Land Use

Another issue plaguing Singapore is the subsequent challenges regarding land use. There is not available space to create a necessary buffer zone between industrial and residential areas.[21] There are two solutions given by Huidobro for this. One is to use environmental controls as a factor in land use and planning. There is usually a sequence that follows the URA to consult several offices.

Fig. 7 Sequence of Land use Planning.



The URA consults the ENV who checks the impact of any new developments and compatibility for land use. The ENV can therefore decide if it's necessary and will create pollution control requirements and perhaps an EIA.[22]

Next is to establish building control which can be considered after development has been granted and planning approval. Huidobro argues that Singapore is active in environmental and technological approaches, but it is, "done through end of the pipe

[22] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp151

approaches that deal with cleaning up rather than preventing and seeing damages to the natural environment through development."[23] Huidobro uses Briffet and Ho's 2002 paper to show that planning should mediate between protection of the natural environment and the development of land in three stages.

First, Strategic planning of the whole country, this offers the earliest possible opportunity for the environment to be registered as an issue of importance placed with other policy concerns. Government planners may only have limited knowledge or experience in ecological conservation. They should try to intercommunicate across government departments or with nongovernmental experts. Next, every bit of detail regarding large infrastructure and instillations should be considered with the environment in mind. Finally, when deciding on environmentally unfriendly developments like landfills, locations should be considered.

The second step involves regional planning. Members who are involved in regional planning are part of the URA that has different levels of expertise and interests in environmental conservation. They work in and ad hoc manner which results in a broken up planning approach.

The third step involves local planning guidelines for developers. Developers use tools like land use, plot ration, building height, urban design, and urban conservation and road networks. Owners and developers tend to ignore issues that emerge from these guidelines. Such examples include soil condition, vegetation, and wildlife habitats. Briffet and Ho say that before permission to build is given, NGO's should have a chance to look at the plans and give any assessment and comment. They argue greater

[23] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp157

transparency and more educated concerns for planning is needed. Last, they argue that opportunities for conservation are lost with expensive landscaping substitutes that are inadequate for the area they planned.[24] Land Policy also seems to neglect using Environmental Impact Assessments. They are used to predict the range and intensity of a development project's impact on natural resources but, are not required by law in Singapore. They are decision making tools that bring environmental considerations into the project development process.[25] They should be used alongside other tools to plan cost benefit analysis reports on social and political implications of the project, and scientific reports.

Huidobro says that EIA's will also work to facilitate participation.[26] "Practices elsewhere have shown that public involvement at early stages of development process not only facilitates acceptance by stakeholders affected by the project, but also taps on the community's know-how."[27] In Singapore public participation in planning is limited as noted by Briffet and Ho who say:

"It is suggested that increased opportunities are identified for responsible groups to comment on proposed developments. The development guide plan process of a public forum system could perhaps be usefully extended by circulating development plans, for all individual developments occurring in close proximity to existing nature areas, to appropriate professional groups and responsible NGO's for comment."[28]

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[24] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp151-152

[25,26] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp152

[27] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp152-153

[28] Briffet, C. and Ho Hua Chew. The *State of the Natural Environment in Singapore.* Singapore: Nature Society Of Singapore, 2002.

Problems also arise with issues like air and water. The ENV uses the "polluter pays" principle for emission and effluents.[29] The polluter pays principle is an environmental law, enacted to make the party responsible for producing pollution responsible for paying for the damage done to the natural environment. It is seen as a regional custom because of the strong support it has received in the Organisation for Economic Co-operation and Development's (OECD) and European Community (EC) countries. In International Environmental Law it is mentioned in Principle Sixteen of the Rio Declaration on Environment and Development. This states:

Principle 16. Internalization of Environmental Costs

> National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

The polluter pays principle uses environmental policy like Eco-tax, which, if enacted by government, discourages and essentially reduces greenhouse gas emissions.[30]

Polluter pays is also known as the "extended polluter responsibility" (EPR). This is a concept that was said to be drafted by the Swedish government in 1975. EPR seeks to shift the responsibility dealing with waste from governments to the entities producing it. In effect, it internalizes the cost of waste disposal into the cost of the

[29] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp153

[30] U.S. Environmental Protection Agency (EPA). Washington, DC (1996)."The Buck Stops Here: Polluters are Paying for Most Hazardous Waste Cleanups." *Superfund Today* (newsletter). Document No. EPA-540-K-96/004. June 1996. Accessed 12/18/2011

product, meaning that the producers will improve the waste profile of their products, hoping for a decrease in waste and increased possibilities for reuse and recycling.

OECD defines EPR as:

A concept where manufacturers and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product life-cycle, including upstream impacts inherent in the selection of materials for the products, impacts from manufacturers' production process itself, and downstream impacts from the use and disposal of the products. Producers accept their responsibility when designing their products to minimise life-cycle environmental impacts, and when accepting legal, physical or socio-economic responsibility for environmental impacts that cannot be eliminated by design.[31]

There are four policies that address these issues:

Monitoring air. Air is monitored from fifteen nature stations linked to a central control station at the ENV. Standards are approved by the WHO and the US EPA. Water in streams and is monitored by ten sampling points on a monthly basis.

Water and air being used as a preventative measure. Water and air quality is preventive as a part of planning for development.

Checking. Third is the enforcement of compliance with clean air regulations and trade effluents for water.

Cleaning. Finally, the last policy is to clean the Singapore River and Kallang Basin. [32]

[31] Organisation for Economic Cooperation and Development (OECD). Environment Directorate, Paris, France (2006). "Extended Producer Responsibility." Project Fact Sheet.

[32] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp153

The Singapore River

The Singapore River flows from the Central Area, which lies in the Central Region in southern Singapore before emptying into the ocean. The upper divide of the River is known as the Singapore River Planning Area. As the Central Area is treated as a central business district, nearly all land surrounding it is commercial.[33]

Starting in the 1880's, there was heavy traffic on the Singapore River due to rapid growth and expanding trade. This brought in water pollution caused by the disposal of garbage, sewage and other by-products of industries located along the river's banks. The sources of water pollution into the Singapore River and Kallang Basin included waste from pig and duck farms. Riverside activities such as transport, boat building and repairs were also found along the Singapore River. Singapore River and Kallang Basin reservoir cover about 1/5th of Singapore's total land area. Since the founding the Singapore River and Kallang Basin degenerated into an open sewer and rubbish dump as all forms of waste were indiscriminately discharged into them. Over seven hundred lighters were found along the Singapore River and Kallang Basin By1977. Waste, oil spills and wastewater from boats added to the pollution of the river.[34]

In 1977, Prime Minister Lee Kuan Yew, called for the government to clean up the Singapore River and Kallang Basin, "and in ten years let us have fishing in the Singapore River and Kallang River. It can be done"[35] By October, an action plan on The Clean-up of the Singapore River and Kallang Basin was submitted to the Prime Minister. By late October, the government was starting to take action to clean up the river. The

[33] http://heritagetrails.sg/content/521/Boat_Quay.html accessed 1/10/2012
[34] http://apfed-db.iges.or.jp/dtlbpp.php?no=23 accessed 1/10/2012
[35] http://www.unescap.org/drpad/vc/conference/bg_sg_14_csr.htm accessed 1/10/2012

plan involved the development of infrastructure such as housing, industrial workshops and sewage; massive resettlement of squatters, backyard trades and industries and farmers; re-siting of street vendors to food centers; and phasing out of pollutive activities. Industries located by the river were removed and squatters were resettled into flats. Refuse was collected daily for incineration, while vendors were issued licenses and provided specified areas with proper sewerage amenities. The digging of the river bed and the removal of hundreds of tons of debris which had been piled up restored marine life to the river.

1) Objective of the practice

To clean up the rivers such that clean water can flow in our rivers and support aquatic life.

2) Outline of the practice

The Ministry of the Environment drew up an Action Plan in 1977. The plan included resettlement of more than 16,000 families living in squatter colonies into public housing estates served by public sewerage system and waste storage and removal facilities, and the relocation of 2,800 pollutive backyard trade industries to new industrial workshops in new industrial estates. About 5,000 street hawkers were relocated into food centers premises provided with public sewer and waste disposal facilities. Some 610 pig farms and 500 duck farms were either phased out or relocated to other areas. Pollutive industries and trades were also resisted to other areas with proper pollution control facilities. In addition, extension and provision of sewer facilities were extended to the entire Singapore River and Kallang Basin catchment. After the sources of pollution were removed, work was started to improve the physical appearance of the rivers. The

river was dredged to remove tonnes of bental deposit at the riverbed. Quay steps and rubble along the river waterfront that had deteriorated were repaired. The riverside walkway along the Singapore River were tiled, turfed and filled with bushes to add colour and greenery to the riverside scene. Physical improvements to the 3km stretch of the beach along the Kallang Basin were also carried out. Facilities such as river walls, piers, shelters and benches were provided to turn the surrounding area into a riverside park.[36]

Ten years later in 1987, the clean-up of the Singapore River and Kallang Basin was completed.

The Singapore River describes an action that the Singaporean government had undertaken to combat environmental wrongdoing for decades. The River which was the life of the island nation felt the blunt beating of how rapid urbanization and economic growth, had become nothing more than a toilet/junkyard for unwanted or discarded items, by-products, or even ship refuse. The action taken by the government flipped the ignored river back to a beautiful scenic area and popular tourist attraction.

The Singapore River is now one of the country's most popular places to visit, as it is located right in the center of Singapore's Central Business district. It has not always been this way. In fact in the 1970's it was seen as an "irreversible environmental disaster by a United Nations expert."[37] With the support of the government, this so

[36] http://apfed-db.iges.or.jp/dtlbpp.php?no=23 accessed 1/11/2012

[37] "SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

called irreversible disaster would grow to become lively again.

From the time the "Father of Singapore" Sir Thomas Stamford Raffles landed in the country through to the time of independence in 1965, the Singapore River has been seen as an icon for economic strength and nationality. Post-World War II life in Singapore focused on educating youngsters as Singapore was under the British Colonial power, environmental policy was not a topic of daily discussion or concern. It was a key area of transportation and commerce and would later fall to the mercy of those who used and abused it. Known for its vast aquatic life, human activity and pollutants left the river for dead. The lack of fresh oxygen killed off all life that thrived on the rivers existence by the 1970's.

Since this river was almost the heart and icon of the nation, there was no doubt that something had to be done to restore this. This would also be a cause that the people of Singapore could get behind, as well as be a force that could instill the idea of sustainability within the minds of those involved and around it. It would also create an image that would be positive of the government and those top politicians involved. Just cleaning the river would not be enough to save the river and its reputation. It would take, "a culmination of street-smart engineering and tactful human relations spanning across a decade."[38] This would be the biggest clean-up in Singapore's history.

Post-World War II saw the Singapore Riverside as a focal point for trade and economic stability. This would be the epicenter for the growth of Singapore's economy in terms of industry, entrepreneurship, and transportation. Here cargo would come and

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[38] "SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

go on barges of different sizes. While this added the element of economic growth, it brought with it boatyards, squatters, street hawkers, and farming.[39] As this area grew Singapore's early immigrants saw the river as a place for employment and basic needs. This reliance and impact on the river turned the river into an environmental hazard which would only hurt human health and biodiversity.

Since the 1970's brought a large number of immigrants to Singapore, the development plan prepared by the previous British colonialists was not thorough enough to keep up with the growth that Singapore was undergoing. The Singaporean government took this opportunity to turn their small developing nation into a modern city. This would require the stench filled and abandoned river to be given a second chance at life.

Then Prime Minister Lee Kwan Yew took the initiative on February 27th, 1977 to clean up the river. He stated:

"It should be a way of life to keep the water clean, to keep every stream, every culvert, every rivulet, free from unnecessary pollution. In ten years let us have fishing in the Singapore River and fishing in the Kallang River it can be done."[40]

The government saw this as an opportunity to attract foreign investment for the economy. Prime Minister Lee saw how big this project was and saw the difficulty in solving this situation, this was more than anything they have ever seen or imagined before.

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[39]"SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

[40] SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

This project involved two components. First, all activity around and causing pollution to the river had to be put to a halt. Activities that impacted the river included dumping of trade effluents from industries near the river, human waste from settlers nearby, and litter from upstream connection rivers.[41] Second, the river would need a heavy cleaning. This called for the removal of all garbage from the water, removal of contaminated materials.

"the dredged material was contaminated with heavy metals and other toxic sediments, Its removal was thus critical in invigorating the river and ensuring that it became a suitable for aquatic life again. The refuse was transported to incineration plants. Subsequent ash by-products were landfilled. Within a month, 260 tonnes of rubbish was collected. Sunken boats were also discovered in the process."[42]

This required cooperation between vast government agencies such as:

- Ministry of the Environment
- Ministry of National Development
- Ministry of Trade and Industry
- Ministry of Communications and Information
- Ministry of Law
- Housing and Development Board
- Urban Redevelopment Authority
- Jurong Town Corporation
- Primary Production Department

[41,42]"SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

• Port of Singapore Authority

• Public Works Department

• Parks and Recreation Department[43]

An issue involving those squatting or settled near the river. What was to be done with them? These people were already highly dependent on the river. If they were not relocated, the plans for cleanup would fail if this situation was not handled correctly as those closest to the river were the most responsible for its downfall. This situation required resettlement.

The government in this case roped in the resources it could and worked to create the new settlements, industries, and farms for those displaced by the cleanup.

Fig. 8 Singapore River Developments

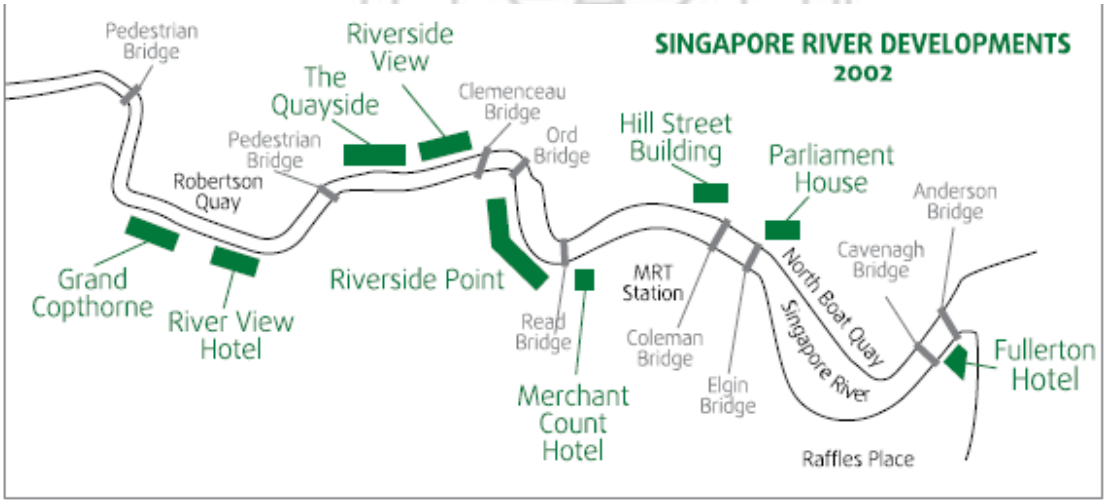

Fig. 9 Singapore River Developments for 2002[44]

[43,44] "SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

[45-47] SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

For the most part the relocation of 26,000 families was a success as those that were re-settled had access to a more hygienic way of life.

The Singapore River Clean-up was a successful project that lasted for 10 years. Over 4,926 street hawkers were moved to food centers built by the HBD, URA, and MOE.[45]

In May of 1985, two years before the scheduled completion, the Singapore River Concept plan was made up, with 3 objectives.

1.To give the river a new economic role.
2. To initiate a sustainable revitalization process.
3. To omptimise the use of land along the riverbanks whole preserving the rich architectural heritage along the river.[46]

The URA saw many Quay's such as the Clarke Quay as development zones. The idea was to link these continuously by a 15 meter walkway along the river. Each zone would have a different theme focused on living, working, and for entertainment. 2007 saw completion of the project.

The NEA states that the real success was possible for two reasons. The first was curbing the human sources of pollution, and clearing existing waster matter in the river and basin.[47] Clean water was abundant again. From 1986-1990, over one million fish were put back into the river in order to repopulate. Now over 200 have been noted in the

river. The cost of cleaning the river without re-settlement fee's totaled about $300 million Singapore dollars.[48] The Singapore River cleanup has taught Singapore that prevention is always less costly than rectifying an environmental catastrophe. While this cleanup was not cheap by any means, the country believes that it was in fact an investment in the future, as it benefited urban planning, economic activity, quality of life, health, sanitation and biodiversity.[49]

An Interview with Singapore's early environmental leader Lee Ek Tieng, in the January 2011 issue of Envision publication, showed some more background about what went on further in the minds of those politicians and leaders involved in the Singapore River cleanup. The article seems to show that after Prime Minister Lee announced his plan to clean-up the Singapore River, what followed seemed to be the necessary steps to get the job done. When asked about being given the responsibility of the river cleanup Lee said:

Mr. Lee wanted a cleaned-up environment in 10 years. It came as a surprise, but our chaps felt that from a technical point of view it could be done. What concerned us more was the social and political dimension. How are you going to clear squatters and bumboats? How are you going to clear street hawkers and motor vehicle repair workshops? Technically, there were solutions, but we were unsure whether the government had the political will to get it done. [50]

[48,49] SINGAPORE RIVER CLEAN-UP:AGAINST THE ODDS REVIVING THE SINGAPORE RIVER" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

[50]A PIONEER SPEAKS A DIALOGUE SESSION WITH ONE OF THE KEY MINDS BEHIND THE SINGAPORE RIVER CLEAN-UP," *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

It would seem that Lee knew that the only way to fix this clearance problem would be to use political tools to solve the situation. Next, Lee was asked about relocating settlements, and finding the balance between human realities that people faced and national priority. Lee Stated:

It was a straightforward solution. The way the government approached the whole thing was to set down policies and objectives, but it didn't evict anyone from their squatter huts or from the streets. It always gave an alternative. For instance, it built hawker centres to house food hawkers. You must think of the era in the 1960s and 1970s — people were happy to move out of slums and into new HDB flats which had proper infrastructure, sanitation, garbage collection and water. The secret of success was providing people with that alternative. For example, one of the things we did in the early days was to register all street hawkers. Everyone else who came after that was considered illegal. Once they were licensed, they were eligible to move into hawker centres. The engineering challenge was just to build the infrastructure fast enough to keep up with policy demands. There were people who resisted change, especially those who had really good business at street corners. They felt moving even a few hundred yards could be bad for business. As civil servants, we didn't get too involved in the political dimension. The politicians, such as the respective Members of Parliament, were all quite positive and helpful in assisting us. That left us to get on with our work[51]

Mr. Lee points out that the government issued policies and objectives. However, they never took the steps to evict anyone. While one might read this and think that people did not object, because of traditional culture, perhaps the idea that they wanted a better lifestyle with more modern utilities is a true enough answer. The government also planned to combat those who resisted by creating a registration for street hawkers. Those who were licensed within the period of time were given benefit over those who resisted and missed the opportunity and were later working against the government.

[51] A PIONEER SPEAKS A DIALOGUE SESSION WITH ONE OF THE KEY MINDS BEHIND THE SINGAPORE RIVER CLEAN-UP," *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

Lee would later say that the government was most effective for those who did not want to go with the cleanup because, the government provided infrastructure and stated that waste water had to go to the sewers. The government also provided sanitation and garbage removal and took steps to increase education on the issue. Those who went against the government were punished with fines and court citations. In terms of political support, Lee also notes that the politicians were eager and willing to help those developers carry out their plan.

Third, Lee was asked about key technologies or infrastructural improvements used for this plan, as well as the use of local labor and or expertise. Lee mentions that they only could use technology and tools that they had then. Also, that many of the tools that were somewhat innovative at the time were more expensive. Lee also stated that they also used local workers and did not use many experts or consultants:

> We knew what the objectives were, the solution, and the desired outcomes. We just did basic engineering work. External advisors don't always understand the local context and environment. We did have some experts who helped us identify sources of pollution and some possibilities of what could be done. For example, we hired an Australian air pollution consultant to take a basic inventory of air pollution sources in Jurong industrial estate, after which we followed up and implemented the solutions. Landed properties in those days were also designated with specific washing areas that linked directly to the sewer. You don't need high technology.[52]

While Lee states that his country knew what their solution and outcomes were, Lee makes a point that advisor or experts don't always understand the local atmosphere. Use of one expert advising about air pollution did help the country make up their own

[52] A PIONEER SPEAKS A DIALOGUE SESSION WITH ONE OF THE KEY MINDS BEHIND THE SINGAPORE RIVER CLEAN-UP," *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

solutions. One might argue that Singapore while getting the job done could have gone a step further to ensure its success with more experts or expert oversight.

The Singapore River flows from the Central Area, which lies in the Central Region in southern Singapore. This area has been and is still seen by many as the center for many business and tourist attractions. Activity using and around the river has been a requirement for those immigrants who first came to Singapore's shores for work. The flow boats in and out, trading, farm and waste disposal into the river killed off all life and left what was left of the river foul and unsafe to those around it. Prime Minister Lee took the necessary steps to call for the cleanup of the river. As he saw the opportunity for it as a tourist attraction, and for the opportunity for bringing back to life the iconic logo of what the river once stood for.

Pooling the necessary funds and cooperating with several departments of the government, Singapore unveiled their plan to repair the lifeless river. Armed with the plans and the guidance of Lee Ek Tieng, Singapore first resettled over 26,000 families, hawkers, and squatters away from the river. Next they licensed those that had resettled and punished those who did not with fines and court dates. Those that were resettled were given more modern conveniences like running water, and more sanitary living conditions. Fish were stocked in the river after pulling up all the muck from the bottom of the river. The waste pulled up would be hauled away and later incinerated.

Singapore used local labor, the technology they had and could afford, and followed their initial goal to finish by 2007 at a cost of over $300 million Singapore Dollars. They used some experts and advisors, but seemed to rely merely on local know how. While the job got done, one can argue that their task should have used more

experts and monitored by perhaps outside NGO's or environmental experts. Now the river, which is back to life draws attention from visitors, locals, and many other urban developers who see it as an example for their own cities back home.

i. Toxic Waste and Wastewater treatment

A third area of concern is the handling of hazardous and toxic wastes from development. Policies related to this go through the administration of environment's health regulations, which require industries that collect and dispose of waste to have the necessary licenses.

Wastewater treatment is also of great importance as there are few water resources and storage maintained is of large importance to the city. Policies for this relate to prohibit industries from generating pollution to be within the perimeter of water storage areas. Polluted water of all sorts is collected and treated at six centralized treatment works plants before going back to sea.

Vehicular emissions are an issue where policy is already in place. In 1984, Singapore adopted the UN's Economic Community European Regulation number 15, or the Consolidated Emissions Directive, Which states:

"Transport of dangerous goods needs to be regulated in order to prevent, as far as possible, accidents to persons or property and damage to the environment, the means of transport employed or to other goods. However, with different regulations in every country and for different modes of transport, international trade in chemicals and dangerous products would be seriously impeded, if not made impossible and unsafe. Moreover, dangerous goods are also subject to other kinds of regulations, e.g. work

safety regulations, consumer protection regulations, storage regulations, and environment protection regulations.

In order to ensure consistency between all these regulatory systems, the United Nations has developed mechanisms for the harmonization of hazard classification criteria and hazard communication tools (GHS) as well as for transport conditions for all modes for transport (TDG). In addition, the UNECE administers regional agreements that ensure the effective implementation of these mechanisms as far as transport of dangerous goods by road, rail and inland waterways is concerned."[53]

Carbon Monoxide emissions were regulated through the United States code of Federal Regulations for Motorcycles.[54]

Waste Removal

The ENV has daily trash collection, and large commercial and industrial waste, is contracted to licensed contractors under the ENV's supervision. Three incinerators burn over eighty-five percent of waste with ashes going to landfills and energy from it used for electricity.

Two other policies exist for waste disposal. First is minimization through segregation and recovery, which started in 1999. Second, is environmental labeling, this idea labels products that are environmentally friendly, and maybe can be therefore promoted more by retailers or by the government themselves. This can have a direct impact on producers to compete in order to keep up with needs of consumers and the environment.

[53] http://www.unece.org/trans/danger/danger.html accessed 3/13/2012
[54] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp154

A New Approach

In order to combat these five areas of concern the Singaporean government launched The Singapore Green Plan-Towards a model Green City in 1992, and The Singapore Green Plan- Action Programme in 1993. The plan outlines broad strategies for action, and is operationalized through action plans. In his view Yeo Boon Leng of the Strategic Planning and Research Department, for the Ministry of the Environment said:

"The Green Plan is the master plan for action for the environment for the nineties and beyond. In the Plan, new areas for action have been identified and the action programmes formulated to implement the Plan in these new areas are discussed. One key area is environmental education, to build

an environmentally aware and proactive population so that all would be involved in the protection and improvement of the environment. Other new areas in which action would be taken under the Green Plan are the conservation of resources, minimisation of waste, and the promotion of clean technologies, ie. new processes and technologies that produce less pollution. For the improvement of the quality of life, attention would be focused on noise management, while nature conservation is also an area looked into under the Green Plan. The development of Singapore into a regional centre for environmental technology will also be promoted."[55]

Previous environmental infrastructure, supported by environmental legislation, was insufficient to meet the challenges of the time. Increasingly, environmental issues were impacting industry and society. In order to better preserve and improvement the environment, the need would require participation by all those affected by environmental

[55] http://dr.ntu.edu.sg/bitstream/handle/10220/2513/AMIC_1994_APR8-9_12.pdf?sequence=1 accessed 12/19/2011

requirements. Integration across many platforms also required cooperation with the Ministry of the Environment, public awareness and incentives to work with legislation and fines for those who do not.

Yeo Boon Leng, stated that considerations were taken by the public in order to account for other more pressing issues regarding environment, and a firmer hold of national resources. When taking this so called, “consultative approach” implementation of measures would be better accepted more widely.[56]

Singapore’s Green Plan would have new strategic directions that could be implemented if goals and targets were reached. They are from many different industries and require cooperation to work together. According to their title they are called, “Action Programmes.” These programmes were made up of workgroups with people from both public and private sectors and organizations that can use their expertise. These three are often called Singapore’s 3P. Workgroups were aimed at environmental education, environmental technology, resource conservation, clean technologies, nature conservation, and environmental noise.[57] Yeo Boon Leng felt that action programmes would be likely to represent the best possible compromise that can be reached, given the many conflicting demands.[58]

Environmental Education

Environmental Education was aimed at being a goal for the long distant future. Steps would be taken to include it into the formal education process. Education would

[57-58] http://dr.ntu.edu.sg/bitstream/handle/10220/2513/AMIC_1994_APR8-9_12.pdf?sequence=1
Accessed 12/19/2011

also be achieved through awareness in demonstrations, exhibitions, and the media. The armed forces, national services, community centers, and other groups with influence, like corporations, would be looked at to spread the word about information and obligation towards the environment.

ECO-labeling

Eco-labeling, or the Green Labeling plan was also a way to provide was also a plan to get better attention. This would increase public awareness on those products that took the pledge to be more environmentally friendly. Action Programmes also reflect the need for an Environmental Resource Centre.[59] This would be a place for reference on all things relating to the environment.

Resource Conservation

Action Programmes in this category will look to watch the increase in energy demands through energy efficiency. It will also aim to stop a trend of increasing waste generation. Being that the industrial and commercial industries are the biggest guzzlers of energy. Action Programmes look to promote the use of more energy efficient technology.

In terms of waste, industry and commercial sectors made up over 50 percent of waste, while domestic is about 49 percent. The aim for Singapore at this time was to reduce as much as possible. This would be achieved by promoting habits that see less packaging, more recycling. The need for recycling systems and plants would be highly encouraged.

Clean Technologies

[59] http://dr.ntu.edu.sg/bitstream/handle/10220/2513/AMIC_1994_APR8-9_12.pdf?sequence=1 Accessed 12/19/2011

As Singapore grew with factories, high rises, people and buildings, emissions also followed the same path. This already created a negative impact not only in Singapore, but of course the world, as it hurts air quality. Under the Green Plan, the idea would be to maintain air quality through control of sulfur oxide emission from factories, and stricter standards for industries, plus the promotion of the use of cleaner fuels. Other controls would involve the use of cleaner methods of transportation. Action Programmes would also be well equipped with the knowhow and tools to get rid of the ozone depleting substances.

Technology

With the international call for a better environment, the need for better, cleaner technology, management, and services is required. It is also demanded. Singapore, according to Yeo Boon Leng, increased in their ability to provide expertise in environmental management over the last 20 years prior to the 1992-1993 plan. Singapore looked to promote itself as a regional focal point for environmental business and research and development on the environment.

The Green Plan looks to conserve some of Singapore's most important places of natural beauty and biodiversity by providing 5 percent of total land will be set aside as nature conservation areas. The plan also looks at 19 locations for the National Parks Board to monitor and coordinate. Alongside this would be better promotion for nature.

Environmental Noise

Noise is also an issue that is looked at in the 1992-93 Green plan. Maintaining noise ordinance, says Yeo,

“To maintain noise levels within acceptable limits as Singapore develops

further require that action be taken for an integrated pro-active approach to noise management. The Action Programmes for environmental noise call for a unit to beset up to harmonise policies and standards and coordinate between authorities on implementation of controls and for a monitoring programme to identify noise abatement measures for areas with high noise levels."[60]

Implementation

All control and implementation for the Green plan will require cooperation as seen by Action Programmes. A steering committee will help to oversee this. The committee will be made up of ministers whose members are civil servants. It will also be their job to implement and promote all programs as necessary. The hope of the green plan will be to reach the idea of a model green city. After the World Community Rio Earth Summit which was a major United Nations conference held in Rio de Janeiro from June 3rd- June 14th 1992. The issues included:

systematic scrutiny of patterns of production — particularly the production of toxic components, such as lead in gasoline, or poisonous waste including radioactive chemicals

alternative sources of energy to replace the use of fossil fuels which are linked to global climate change

new reliance on public transportation systems in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smog

the growing scarcity of water[61]

Involving the Public in improvement

[60] http://dr.ntu.edu.sg/bitstream/handle/10220/2513/AMIC_1994_APR8-9_12.pdf?sequence=1 Accessed 12/19/2011

[61] http://www.un.org/geninfo/bp/enviro.html accessed 11/20/2011

On July 27th, 2005 the government again went to the people to try and create a forum for collecting information for a plan to fix the air, climate change, clean water, conservation, waste reduction, and over all nature and public health. This would stem the Green plans of December 2005 and a revision in 2006. It took aim at three problems facing Singapore. These are clean air, clean water, and clean Land.

Singapore has three levels of legislation:

The constitution of the republic

Acts from parliament

Subsidiary legislation in the former regulations and orders.

Singapore's constitution carries no requirements for the environment. There is also no framework law on environmental protection and management. EIA's are required by law but only for certain select projects which are up to the ENV to decide. Tan argues that, "Environmental protection in Singapore is almost exclusively administrative in nature." Huidobro through Tan states, "There are two general categories of environmental legislation. The first, being the regulation of wastes and emissions from industries, which involves pollution control laws. Second, deals with the protection of natural habitats and wildlife, and involves nature conservation laws."[62] Tan then goes on to state that, "legislation and implementation have problems, because there is a dilemma of dispersed authority versus centralized planning and implementation.[63]

There are many agencies involved in environmental matters and the enforcement and administration of environmental legislation is also scattered throughout various

[62] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp156-157

[63] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp157

departments. The dispersed authority problem is partially mitigated by Singapore's comprehensive and integrated planning process that brings together representatives from all agencies involved in the process. Interaction between agencies involved is a common practice. Dispersed authority is then offset by a highly centralized planning and implementation process, which is facilitated by a strong, small, one sided government.[64] Despite efficiency of the centralized planning system, various groups are calling for "Umbrella legislation" or a common legislative framework that regulates numerous professions under one statute, hoping to improve coordination of policy formulated and implemented.[65]

A second dilemma comes from land scarcity versus the protection of natural areas. The Singapore Green plan outlines general guidelines for nature conservation which includes five percent of total land. Currently, Singapore has two National Parks and four nature reserves that are protected by the National Park Act. NGO's have been pushing for the importance of protecting the little undisturbed wildlife and natural areas remaining.

A third problem presented by Tan has to do with the lack of legislation making EIA's mandatory. EIA's have already been used for highly polluting development projects, and thinks that it can be used for any future development

The last issue Tan presents has to do with no legislation to govern soil contamination or leakage. Huidobro notes that while Singapore has achieved world standards in terms of

[64-66] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp157

environmental hygiene and urban landscaping. Vegetation is mostly cultivated and not natural. The few remaining spots are constantly being threatened for development and have no legal protection.[66] In the 2012 Singapore Plan 3 out of 5 percent of land planned for conservation will be protected. Huidobro believes that a framework for environmental law will facilitate, coordinate, and create emphasis on nature conservation.[67] Huidobro goes back and acknowledges Tan to say that Environmental NGO's have shown a fair amount of activity in recent years. Also, that they are usually the link between the government, industry, and the community.[68]

A lack of NGOs

Many argue that Singapore does not have environmental movements. Huidobro states that groups such as green peace, friends of the WWF are nowhere to be found in Singapore. C & Stengel argue that with the exception of the NSS and SEC there are no independent environmental NGO's concerned with mainly environmental issues.[69] Singapore does have other NGO's, but they have no concern for the environmental. These groups are various and include the Singapore Zoo and Cathay Pacific. They are not recognized by the ENVOR SEC. These groups were also not formed voluntarily, and were not aimed at preserving the environment. Huidobro argues that environmental NGO's in Singapore compared to the west, differ in that Singapore's NGO's are more

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[67-69]Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp 159

like outsiders, whereas NGO's of the west are more like insiders that have links to the government, and are considered and consulted on as experts. Outsiders like Singapore work independently trying to create public opinion against government proposals in order to declare change.[70]

Mekani and Stengel give some recommendations to environmental NGO's which include:

Be Constructive, not destructive;

Use your expertise;

Do your homework or what is called "constant revision of positions and updating of data";

Use the existing channels such as grassroots organizations, unions, consumer associations, the army, religious bodies, to educate the public on environmental awareness;

Be professional, but not insensitive;

Be clear and Precise;

Be Pragmatic and flexible;

See companies as allies not enemies; and

Be firm, but not dogmatic, vocal but not noisy.[71]

[70] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp160

[71] Mekani, K. and Heike G. Stengel. "The Role of NGOs and near NGOs". In *Environment and the City: Sharing Singapore's Experiences and Future Challenges,* edited by Ooi Giok Ling. Singapore: Times Academic Press 1995

Mekani and Stengel think that environmental groups have an important part in protecting the environment. They should take on the challenge of opposing government proposals without being censured.[72]

A study on Environmental Sustainability Index (ESI) by the World Economic Forum and shown in Newsweek magazine in late 2000, showed a study compiled an index based on 67 factors, and rated Singapore among the worst 10 in a ranking of the environmental sustainability of 122 countries.[73] Two months later Singapore was re-rated again as their situation was somewhat unique given size and capabilities. They ranked #65 out of 122.[74] In February 2001 The Green Business Times.com listed Singapore as the Top in Building Policy, and Water Management. They further said, "Singapore is among the top four in a new study ranking Asia-Pacific cities in terms of their 'greenness'."[75] The study, prepared by the consultancy firm, Solidiance, looked at economic, environmental and social factors that contribute to how eco-friendly each city is. The criteria included carbon dioxide emissions, renewable energy use, waste output and management, public transport ridership and water management. The study highlighted that the urban population has been rising rapidly in the region in recent years, driven by economic growth.[76]Singapore came in No. 1 in terms of water management and green building policy, a further nod to its efforts in these two areas.

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[72] Francesch-Huidobro, Maria. *Governance, Politics and the Environment*. Pasir Panjang: ISEAS Publishing, 2008. pp162.

[73] http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

[74,75] http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

Last September, the World Green Building Council, based in Canada, gave Singapore high marks in green building efforts and water efficiency in a climate change report.[77]

Renewable Energy Usage

Singapore fared poorly in terms of renewable energy usage, coming in last in the Solidiance Report, though its renewable energy investment ranked third, suggesting that it is working to catch up in this area. Singapore also came in last among the 10 cities in terms of overall waste management. It fared poorly both in terms of waste produced per capita and municipal recycling ratio.

Associate Professor Wong Nyuk Hien, a design and environment researcher at the National University of Singapore said, “We are quite constrained in this area because of our size and geography. Solar energy is currently the only option but panels are very expensive now.”[78] The study pointed out that the global demand for environmental sustainability in sectors ranging from agriculture to energy has created “huge opportunities’ for business. Traditionally, products and services are based on what consumers want and need. However a new market has emerged that is dictated by what consumers do not want – climate change.”[79] The clean technology sector has been identified as a major pillar of growth for Singapore. It is expected to contribute $3.4 billion to gross domestic product by 2015 and provide 18,000 jobs.

[76,77] http://www.greenbusinesstimes.com/2011/02/13/singapore-tops-in-building-policy-water-management-news/ accessed 1/10/2012

The Singapore Green plan for 2012 looks to:

Go beyond Clean and Green, towards emphasising the sustainability of the Singapore development process. We aim for the environmental consciousness that was borne out of the first Green Plan to mature into personal responsibility for and civic commitment to the environment. Conservation and clean technology remain important, but there are two additional areas of focus: greater innovation, and collaboration with strategic partners.[80]

[78-80] http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

Fig 9. SGP 2012 Areas and Targets

Waste Management	• Raise the overall waste recycling rate from 44% to 60%. • Extend the lifespan of Semakau Landfill to 50 years, and strive towards “zero landfill” needs. • Reduce the need for new incineration plants, from the current one every 5 - 7 years to one every 10 - 15 years.
Conserving Nature	• Keep nature areas for as long as possible. • Verify and update information on indigenous flora and fauna through biodiversity surveys. • Put in place new parks and park connectors. • Set up a National Biodiversity Reference Centre
Clean Air	• Strive for the Pollutant Standards Index to be within the ‘good’ range for 85%of the year, and within the ‘moderate’ range for the remaining 15%. • Meet 60% of Singapore’s electricity needs through use of natural gas. • Extend use of natural gas in transportation beyond public buses and taxis. • Enhance public transportation as an attractive alternative to private cars
Water Supply	• Increase catchment areas from 50% to 67% of Singapore’s land surface. • Increase supply of water from non-conventional sources, such as desalination and water reclamation, to at least 25% of Singapore’s water demand. • Ensure that water quality continues to meet international standards.

Public Health	• Become a leading regional centre in epidemiological surveillance and research on environment-related infectious diseases. • Retain low incidence of environment-related infectious diseases. • Develop a syndromic reporting system for the early detection of emerging infectious diseases. • Take pre-emptive action against international health problems reaching Singapore.
Community Partnership	• Step up public education on environmental protection and nature conservation. • Strengthen joint 3-P (public, private and people sector) ownership of Environmental concerns. • Build stronger 3-P partnerships for environmental protection.
International Collaboration	• Continue to work closely with ASEAN neighbours on common environmental concerns. • Increase capacity-building partnerships with developing countries. • Intensify collaboration with partners at regional and global levels to tackle environmental challenges. • Remain committed to international environmental efforts and obligations under international environment treaties.
Innovation	• Enhance the environmental management industry in Singapore through greater use of technology. • Stay at the forefront of innovation and adopt best practices from the world to achieve environmental sustainability.[81]

[81] http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

Singapore wants to be a nation that uses their limited land to the best of their ability. It is Singapore's Hope to pursue a "zero landfill" target.[82] The hope would be to reach 60% recycling by 2012. This would mean that there would be recycling locations closer to both the home and the work place. This would also require a need to reduce waste and the building of incineration plants.

Finding the balance

Next Singapore would like to find the balance between developing and conservation. There needs to be effort from multiple areas in order to achieve this ideal. This includes government agencies, the private sectors, and public organizations, as well as individuals. Native plants and animals need to be monitored, noted, and protected. Protection also needs to go as far as to set aside land for reserve, especially those native ecosystems. Currently Singapore is protecting four nature reserves.

The Bukit Timah Nature Reserve,

The Central Catchment Nature Reserve,

The Sungei Buloh Wetland Reserve

The Labrador Nature Reserve.[83]

Third, Singapore is concerned with making sure the air is safe to breathe. Singapore true to other ideals has created a network of broad laws and strict enforcement. Singapore is already promoting itself as having air that is comparable to the best in the

[82,83] http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

world.[84] With the increase in the standard of living, potential pollution risk also is on the rise. By promoting existing laws, it will not be enough to keep up with the increase. Therefore Singapore is looking to beef up greater efficiency through cleaner fuel sources and cleaner technology. The labeling plan introduced in the 1992-1993 plan seems to have also made its way to into the new plan. It has been improved to include labeling efficient equipment and appliances.

Public transportation is looking to become cleaner. This will be done through more use of compressed natural gas. On April 22nd, 2002 the first natural gas bus and fuel station opened. Overall many industries are making the switch to cleaner gas.[85]Conservation will be heavily focused on one of the most important utilities in Singapore. Water Management policy is a serious issue that Singapore is out to solve. Singapore has instituted mandatory water saving devices, water use audits, and nationwide education. Half of Singapore's land surface is now capable of collecting water. Singapore wishes to increase this ability to two-thirds by building more drains, reservoirs, and canals to catch more rain.[86] Singapore also plans to recycle water in two plants. The water labeled NEWater is a product made by Singapore's Public Utilities Board. NEWater is treated wastewater that has been purified using dual-membrane and ultraviolet technologies, in addition to the normal water treatment processes. The water is potable for consumption, but is mostly used for industry requiring high purity water. By

[84-86]http://app.mewr.gov.sg/data/ImgCont/1342/sgp2012.pdf accessed 1/10/2012

2012, NEWater will account for 15percent of water demand in Singapore. [87]

Public health is a concern that Singapore also holds as important. They believe the farther away disease is, and the promotion of high standards of public health, will make Singapore even better. Singapore was certified clear of Malaria from the WHO in 1982.[88] Singapore will continue to protect public health by strengthening disease surveillance systems, which monitors the spread of disease, is to establish patterns of progression. The main role of disease surveillance is to predict, observe, and minimize the harm caused by outbreak, epidemic, and pandemic situations.[89] Singapore looks to increase knowledge as to what factors might contribute to such circumstances. A key part of modern disease surveillance is the practice of disease case reporting. Singapore hopes that they can catch disease outbreaks, taking action to prevent international health problems from reaching their country from better disease monitoring.

ii. Building Partnerships

Creating Partnership between people, private, and public sectors is an important idea for Singapore. This partnership makes a nation that is environmentally aware and therefore more responsible for their actions. Singapore's Green Plan in 2012 says that NGOs like the Singapore Environment Council, Nature Society, the Waterways Watch Society, and the Habitat Forum help instill environmental awareness to Singaporeans.

87-89http://www.webcitation.org/5LKEYsrRT accessed 1/10/2012

The Ministry of the Environment is said to be a connector and looks to create more partnerships among a wide range of Singaporeans about the environment.

The Singaporean school system is said to incorporate environmental issues into the teaching curriculum. A second method of involvement from schools involves participation from the MOE and the Singapore Environment Council. This idea hopes to instill an importance on environmental education.

Singapore on a national and international field looks to be a leader for environmental skills and management training. This helps not only local industrial needs, but it creates a building block for the exchange of ideas and know-how. Last this idea hopes to make Singapore a respected and educated leader in environmental technology.

Environmental Problems now do not need visas nor do they stop at the border. This means there must be a larger need for cooperation at both the regional and international levels. It is Singapore's hope to work strongly with the necessary partners, in order to fight the environmental problems facing the globe.

Singapore claims to already be working closely with many countries that are both developed and developing from all sides of the globe. Cooperation of experience includes the use of clean technology, water recycling, hazardous chemical management, and air quality monitoring. Singapore already is offering its experience as a small and developing island nation. Examples include the Singapore Co-operation Programme, which shares with other developing countries the technical and systems skills that Singapore has learned and acquired over the years.[90] The Singapore Technical Assistance Programme for Sustainable Development, "was set up under the SCP as

[90] http://app.scp.gov.sg/ accessed 1/10/2012

part of Singapore's efforts towards assisting Small Island Developing States (SIDS) to achieve sustainable development. Through close collaborations with development partners and recipient countries, it aims to foster mutual learning, cooperation and friendship amongst countries to promote sustainable development and the achievement of the Millennium Development Goals."[91] Singapore also takes part in many environmental forums regionally and internationally. This is the stage that Singapore likes to use to share their experience and knowledge the best way possible.

Innovation for Sustainability

The last priority in Singapore's Green Policy, involves innovation for sustainability. Singapore has taken up the idea that it can use the experiences of the world around them, to come up with solutions for their own basic needs. Singapore hopes to make a move towards more environmentally friendly fuels like compressed natural gas and others like hydrogen, and solar power. The SGP 2012 plan states that Singapore is working internationally with companies to research hydrogen based fuel cells. Singapore has also gone as far as to set up an Environmental Sustainability Fund to help finance innovations for Singapore to reach its environmental sustainable goal. "The IES fund is a $20 million seed funding to encourage and assist Singapore-registered companies to undertake environmental protection and public health related projects that would contribute to the long-term environmental sustainability of Singapore. The IES fund is targeted at projects at the applied research and test-bedding/demonstration stages of technology developments.

[91]http://www.sidsnet.org/partnerships/succes-stories/singapore-cooperation-programme-scp-%E2%80%93-small-island-developing-states-tec accessed 1/10/2012

The proposed IES projects shall target to achieve at least one of these following objectives:

Initiatives that speed up environmentally sustainable applications;

b. Innovative proposals that have the potential to create new value and capabilities of NEA; and

c. Projects that offer long-term solutions to specific environmental problems faced by Singapore."[92]

Singapore is not only trying to promote itself as an environmentally friendly hub, they are also trying to be a technological hub. This technological part of course would use their environmentally friendly environment to their benefit making them a possible regional leader.

While all of these ideas are good to benefit Singapore, it is also important to notice what exactly Singapore has already accomplished. In terms of garbage, Singapore's Environmental Magazine entitled *Envision* has pointed out that:

Singapore Generates more than 17,8000 tonnes of waste every day. That translates to over 6.5 million tonnes in a year.[93]

Waste Management in Singapore has been an important part of the countries public health policy and keeping the country environmentally strong. This may lead it to

[92] http://app2.nea.gov.sg/funds_ies.aspx accessed 1/10/2012

[93] "Big Rubbish Issues Keeping Singapore's waste management challenge in check." *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

Becoming a regional leader.

Large growth in industrialization and urbanization has forced Singapore's government to take a stance in managing the effects of such growth. Singapore crams over 5 million people into a so called tuna can that is about 710.3 square Kilometers.[94] Singapore has found some way to balance economic growth with environmental balance. It is without a doubt not an easy feat to overcome. Singapore's top leaders had to find cost effective waste reductive and well planned, methods to solving this situation.

A big part of success comes from recycling. According to the current rate of recycling is about 58%, which was a large increase from 40% in the beginning of the 21st century.[95] That is because; Singapore found a way to recycle items like construction and demolition waste, and metals. Singapore also hopes to make advances in recycling things like plastic, food waste, horticultural waste, wood, and paper.[96] Singapore hopes to reach 65% recycling by 2020 and 70% by 2030. They have as a country set the following goals.

Formation of the Waste Management and Recycling Associations of Singapore(WMRAS)

[94-97] "Big Rubbish Issues Keeping Singapore's waste management challenge in check." *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

$20-million Innovation for Environmental Sustainability (IES) Fund

Extensive educational drives (e.g. Annual recycling week and National Recycling Programme)[97]

The National Recycling Programme or the NRP was introduced in 2001 to create knowledge and the growth of recycling of items. Private contractors approved by the government, are responsible for distributing the necessary bags. These bags are retrieved nightly. The amount of public recycling bins has increased to over 6,000 across the island. This has boosted recycling by 18%.[98]

Waste minimization is one of the NEA's top priorities. Their goal would be to focus on reducing waste, directly at the source. This will hopefully lead to new and better resources. The NEA does not bully policies towards people. Instead, it encourages corporations, to be more responsible of their environmental footprint. This in turn makes the companies more responsible for their product after it passes the checkout counter. This falls under the Singapore Packaging Agreement.

"The Agreement, which came into effect on 1 Jul 2007, provides a platform and structure for industries to collaborate with the government to reduce packaging waste over a 5-year period. The Agreement is voluntary, so as to provide flexibility for the industries to adopt cost-effective solutions to reduce waste."[99]

[98,99] http://app2.nea.gov.sg/topics_packagreement.aspx accessed 1/10/2012

SPA has a total of three core objectives:

Chart 3 SPA objectives

To Reduce packaging waste arising from consumer products
To raise community awareness on packaging waste minimisation
To introduce supply chain initiatives that foster the sustainable use of resource in packaging.[100]

A question that was often raised regarding the amount of waste was often, where can we put it? So in 1999 Semakau landfill blueprints were made. It is 8 kilometers off the southern coast of Singapore. The landfill gets about 1,500 tonnes of incinerated garbage daily and 500 tonnes of non incinerable waste daily.[101] The NEA believes that the landfill will last anywhere between 2030-and 2040.

The NEA has also taken steps to convert waste to Energy. Electricity is generated through trash incineration which produces steam that helps to turn turbines. This process also reduces waste by 90%.[102] Garbage is collected in residential areas

[100] "Signing off to less packaging" *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

[101] "Big Rubbish Issues Keeping Singapore's waste management challenge in check." *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

[102,103] "Big Rubbish Issues Keeping Singapore's waste management challenge in check." *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

from 120-litre bulk bins. Business can have the same sized bins up to 1,100-litres. Garbage is collected on a daily basis from the curb.[103] Singapore's EPHA works hard to push the policies of the NEA. There is a license requirement for the use of proper waste vehicles and equipment associated with waste collection. Singapore looks forward to the future of waste collection with hopes of innovation for ideas like mechanical biological treatment (the sorting and breaking down of garbage and recyclable items) garbage based fuel, pyrolysis/gasification(which uses chemicals to break down organisms, and incineration.) The NEA also hopes to help to continue to educate the public through tools like social media and environmental awareness. Targeting and reaching the goal of Zero waste will come through The Sustainable Singapore Blueprint, with ideas such as:

Chart 4 Sustainable Singapore Blueprint

1. MINIMIZING WASTE UPSTREAM • Engage industries to find ways to reduce packaging materials through the voluntary Singapore Packaging Agreement • Provide co-funding to help companies redesign process to reduce waste in their production of goods.
2. FACILITATING HOUSEHOLD RECYCLING • Increase recycling facilities in housing areas • Pilot the use of separate chutes for recyclables in more housing

estates.

3. TARGETING MAJOR SOURCES OF WASTE

- Promote the recycling of large sources of waste that now have low recycling rates(e.g. plastic and food waste)
- Study the feasibility of mandating the recycling of such waste in long term

4. EXPANDING OUR LAND RESOURCE

- Apart from reclaiming more land and building more intensively, Singapore will also develop an underground land-use master plan that identifies potential uses for this space.

5. ENHANCING LAND-USE PLANNING

- The Urban Redevelopment Authority will further refine its urban land-use planning framework to develop Marina Bay and Jurong Lake district into a new generation of sustainable high-density areas. [104]

Aside from the SGPs and other ideals to further environmental sustainability, Singapore has created the following policies which are constantly updated and revised:

Chart 5 Environmental Policies

Policy Name	Policy Aim
Cattle Act(cap) Ordinance 15 of 1964 Control of Vectors and Pesticides (Registration, Licensing and Certification) Regulations, Reg 3	To provide for the licensing of places used for the keeping of cattle, the control of the movement and transport of cattle and matters incidental thereto for the purpose of the preservation of public health.

[104] "TOWARDS ZERO WASTE A MORE SUSTAINABLE FUTURE THROUGH WASTE MINIMISATION AND RECYCLING." *envision*. 1 (2011): 7-11. Web. 20 Mar. 2012. <http://www.nea.gov.sg/cms/sei/Envision_11Jan_Issue1.pdf>.

Control of Vectors and Pesticides Act Original Enactment: Act 24 of 1998 Environmental Protection and Management (Boundary Noise Limits for Factory Premises) Regulations, Reg 1 Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, Reg 2 Environmental Protection and Management (Fees for Licences) Regulations, Reg 3 Environmental Protection and Management (Hazardous Substances) Regulations, Reg 4 Environmental Protection and Management (Trade Effluent) Regulations, Reg 5 Environmental Protection and Management (Vehicular Emissions) Regulations, Reg 6 Environmental Protection and Management (Composition of Offences) Regulations, Reg 7 Environmental Protection and Management (Air Impurities) Regulations, Reg 8 Environmental Protection And Management (Energy Conservation) Regulations, Reg 10 Environmental Protection And Management (Exemption from Labelling) Order 2009 Environmental Protection and Management (Prohibition on the Use of Open Fires) Order 1999 Environmental Protection and Management (Ozone Depleting Substances) Regulations, Reg 9 Environmental Protection And Management (Registrable Goods) Order, Order 2	To consolidate and amend the law relating to the destruction of vectors and the control of vector-borne diseases; to provide for the control of the sale and use of pesticides and vector repellents; to provide for the registration, licensing and certification of persons engaged in vector control work, and for matters connected therewith.
Environmental Pollution Control Act Original Enactment: Act 9 of 1999 Environmental Public Health (Public Cleansing) Regulations, Reg 3 Environmental Public Health (Cooling Towers and Water Fountains) Regulations, Reg 7 Environmental Public Health (Swimming Pools) Regulations, Reg 10 Environmental Public Health (Toxic Industrial Waste) Regulations, Reg 11 Environmental Public Health (General Waste Collection) Regulations, Reg 12	To consolidate the laws relating to environmental pollution control and for purposes connected therewith.

Environmental Public Health (Corrective Work Order) Regulations, Reg 15 Environmental Public Health (Food Hygiene) Regulations, Reg 16 Environmental Public Health (Quality of Piped Drinking Water) Regulations 2008 Environmental Public Health (Cemeteries) Regulations Environmental Public Health (Crematoria) Regulations Environmental Public Health (Employment of Enviromental Control Officers) Order	
Environmental Public Health Act Original Enactment: Act 14 of 1987	An Act to consolidate the law relating to environmental public health and to provide for matters connected therewith.
Hazardous Waste (Control of Export, Import and Transit) Original Enactment: Act 13 of 1997 Hazardous Waste (Control of Export, Import and Transit) Regulations, Reg 1	An Act to provide for the regulation of the export, import and transit of hazardous and other wastes, and for related purposes.
Hydrogen Cyanide (Fumigation) Act Original Enactment: Ordinance 28 of 1947	An Act to regulate the fumigation of premises and articles with hydrogen cyanide.
Infectious Diseases Act Original Enactment: 2003	An Act relating to quarantine and the prevention of infectious diseases.
National Environment Agency Act Original Enactment: Act 4 of 2002	An Act to establish and incorporate the National Environment Agency, to provide for its functions and powers, and for matters connected therewith; and to make

	consequential and related amendments to certain other written laws.
Radiation Protection Act Original Enactment: Act 27 of 2007 Radiation Protection (Non-Ionising Radiation) Regulations, Reg 1 Radiation Protection (Ionising Radiation) Regulations, Reg 2 Radiation Protection (Transport Of Radioactive Materials) Regulations, Reg 3 Radiation Protection (Transit And Transhipment) (Exemption) Regulations, Reg 4	An Act to control and regulate the import, export, manufacture, sale, disposal, transport, storage, possession and use of radioactive materials and irradiating apparatus, to make provision in relation to the non-proliferation of nuclear weapons and to establish a system for the imposition and maintenance of nuclear safeguards, and to provide for matters connected therewith.
Sale of Food Act Original Enactment: Act 12 of 1973	An Act for securing wholesomeness and purity of food and fixing standards for the same; for preventing the sale or other disposition, or the use of articles dangerous or injurious to health; to provide for the regulation of food establishments.
Smoking (Prohibition in Certain Places) Act Original Enactment: Act 6 of 1992 Smoking (Prohibition in Certain Places) (Composition of Offences) Regulations, Reg 1 Smoking (Prohibition in Certain Places) Notification	An Act to prohibit smoking in specified places and vehicles and to provide for matters connected therewith.

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[105] http://app2.nea.gov.sg/legislation.aspx accessed 5/13/2012

Conclusion

Singapore, a so called special democracy grew from their capitalist middle class. Huidobro labels Singapore as a disciplined governance. Despite the growth of NGO's the state still pulls many of the strings behind the scenes it needs to in order to be successful. NGO's will continue to appear, but slowly as they do not want to upset the balance by being seen as challenging the government.

With the emergence of the MOE, Singapore took more than baby steps in becoming more environmentally sound. Singapore joined action on the international level in the 80's and 90's in recognition of global environmental issues. The 2002 establishment of the NEA began to create policy and was responsible for its implementation.

Singapore's small size and land use also created an unnecessary elephant in the room like problem for the country that needed to be tackled. Huidobro states that despite their success, Singapore seems to act in a reactionary manner instead of a preventative one. This can be seen with the cleanup that was needed for the Singapore River and the Kallang Basin. Huidobro calls on better communication on many levels as she believes that those that are responsible are somewhat inexperienced. This will later result into solutions that seem to only be partly solved.

Next, planning guidelines by many developers tend to ignore issues like soil condition and wildlife habitats. NGO's should be given a chance to assess urban planning. Singapore should also take the necessary steps to invite in international experts to better educate local developers and to work with many departments in

creating a sounder environmental framework. Singapore takes the steps in teaching many developing countries how to be successful. However, they can be stronger if they follow the same path and learn to improve themselves and learn from others. The more widespread use of EIAs is a necessity that is limiting success in Singapore. The requirement of its use will make them a more powerful leader of environmental ability not only in the region, but well into others. EIAs work on a second level, because they help to facilitate cooperation.

The 1992-93 Singapore Green plan thrust more responsibility on the level of Singapore's environmental awareness. This also helped Singapore establish itself as an environmental leader. The 2012 plan looks to continue to set forward ideas of the first plan and add more elements like innovation and cooperation on vast levels from local to global. Innovation with ideas like NEWater, better recycling, better waste management, environmental education and awareness, and a focus on becoming better through the use of IES funding and SPA are innovations that are only strengthening Singapore for the future.

Chapter 5

Assessment

In Malaysia energy policy is determined by the government Policy makers include the Ministry of Energy, Energy commission, Green Technology and the Malaysian Energy Centre. The Ministry of Energy and Green Technology name three energy objectives that look to develop their energy sector. These include supply, utilization, and environment. Malaysia also looks to strengthen development of renewable energy through biomass, or plant and animal waste as a 5th fuel resources for the countries Fuel Diversification Policy. The Small Renewable Energy Program will allow producers of energy with up to 10 mega watts to sell their electricity output back to power grids thought government linked energy companies. It is believed that the government has 33 years of natural gas, and 19 years of oil reserves left. Therefore, the government needs to find more renewable energy options for the future.

Singapore is a small island country that relies heavily on imported energy. Singapore has also taken the initiative to ratify the UN convention on climate change and sign the Kyoto Protocol. Clean energy usage is also encouraged wherever possible.

From Dieter Helm, we learned that environmental policy making require clean objectives and objectives that can be derived from policy making. Despite some policy being created, the policy created is quite basic and still in its early stages. Helm argues that there are two problems with being sustainable. The first is that we do not understand the environment enough, and second, that politics and economics for sustainability are hot topics. The idea that economic growth versus development is a highly debated issue across the globe, and one that sparks debate amongst policy

makers. We should therefore aim at setting boundaries on what we know, and use the tools we have to solve those issues. This can include ideas for a loss of biodiversity, overpopulation, and greenhouse gas emissions. By doing this we can use our experience and what we learned to take on more pressing, and larger issues.

Helm suggests that we find a way to include the environment into economics and use tools such as EIAs to formulate policies. Helm also introduces an element that was based on the 1990 UK Environmental Act. This is the idea of a command-and-control regulation. In this the government regulates from a licensing framework. A system sets limits on pollution based on environmental quality and the best available technology. Problems with this do exist and are usually existent with policy makers who are not familiar with the best available technology. Second is that these policy makers have their own interests. Finally, we know that this is hard to enforce.

The next tool that can be used by policy makers is a Cost Benefit Analysis. A Carbon tax can be a weapon of cost benefit, and would push for a switch to the use and promotion of non-fossil based fuels. A carbon tax is an instrument that would be hard to promote as it would have an effect on taxpayers personal income. The only way to implement this would be with a private utility that could later improve not only prices of services, but the services themselves.

Atkinson suggests that if the cost for sustainability is too high like helm says, will leave policy makers hesitant to try to promote and implement it. As we have seen in this paper, a country like Malaysia has an idea that pollution is just an element of growth. While a country like Singapore is willing to make the necessary sacrifice. This would ultimately restrict consumption which can be too radical, undesirable and unnecessary.

Anthony Heyes's chapter discusses the idea of enforcement and compliance. Heyes states that usually the cost of enforcement is too costly and left incomplete, which will later mean non-compliance. Heyes suggests that policy producers can take the required steps to report how much they are emitting. Failure to do this would lead to higher pollution taxes or penalties. Heyes unfortunately does not include the tool of Polluter Pays or Pigouvian taxes. Last Heyes suggests that instead of self reporting, which seems too good to be true, firms can face increased inspections. While this concept sounds solid, we have learned from others that it would be hard to enforce. We must also not dismiss the idea that corruption could prevail and void the whole need for such a tool.

CJ Barrow's Book uses the terms environmental management and sustainable development very closely. Barrow also gives various definitions of what environmental management is, but he calls on it to follow three objectives. 1. Identify Goals. 2. Establish a scale of feasibility. 3. Develop and implement what is possible. We learned from Barrow that the idea of sustainable development has no clear universal definition. Also, that the idea of Environmental Management is still a new concept, and will require a proactive approach that needs to work with other ideas to be successful. The non use or incorrect use of environmental management may not only make us less sustainable, but also more vulnerable to environmental disaster. In Atkinson's chapter, he argued, to achieve sustainable development, the requirement might be to restrict consumption. However, Barrow seems to believe that in environmental management, there is a way to balance environmental protection and allow for human liberty. Barrow offered that environmental managers can take some 10 different approaches for managing the

environment. Most of which can be mixed together like the use of tools in creating a successful policy. One key problem that Barrow notes, is pollution. We learn from him and others about two principles that are modern day pollution crime fighters. Polluter Pays which says that polluters must pay for what they emit. This will result in less of a burden on individual tax pays that would be cleaning up others messes. It also hopes to create the idea that companies and firms cannot just pollute all they want and just pay it off. However, in the opinion of this author, it does exactly that. A wealthy company can produce and pollute as they please and write it off. The Polluter Pays policy needs to be tougher if it is going to be used seriously. Those enforcing it should keep a written or viral record of those companies, firms, and individuals who are repeat polluters and increase the amount of money they must pay for each time they emit the same or more.

The second principle aimed at pollution is the Pre-cautionary Principle. This principle looks for the cause of problems in a project or policy and aims at a desirable future or scenario. This can obstruct on future developments as a way for projects to move forward. The principle is a bit too pessimistic to some as it will cause planners to bail out on a bad proposal or policy. Also that this principle require funds to be spent that objectors say can be used for project requirements. The Pre-cautionary principle implements and enforcers should interweave a guideline for a tax break for those planners who use this principle as a means of assessment. Of course this would require building something sustainable, and using sustainable products and technology. The two principles could work together as tools that can be used by policy makers. This would work based on the idea that if the proper Pre-cautionary principle is used their will be less need for enforcement of the polluter pays principle.

As mentioned before, environmental policy making involves numerous instruments. This idea is true for environmental management as well. No two projects are ever going to be exactly alike. Therefore a uniform frame work for creating such a policy is difficult to draft. However, environmental management can be used with three components. 1. Advisory. 2. Economic. 3. Regulatory. These 3 components can be used in a management mix. If they are not properly enforced or people involved are not happy, the results will be limited.

EIAs like other instruments for policy and management have no specific definition or uniformity for usage. Proactive EIA users use a general definition to combine planning, analysis, and public involvement. Many observations can describe EIS through different phases. An EIA is usually an ongoing monitoring report or sometimes a single snapshot of a situation. NGOs, international organizations, scientists, experts, environmentalists, and lawyers should all cooperate in an effort to make one uniformed EIA procedure that can be signed, and ratified by its member countries, and developing countries alike that are serious about sustainable development and green/environmental policy. Next, they should be taught to the countries that sign and monitored by a special task for created by the EIA writers, with penalties for those who do not follow procedures. Another Idea would be to create Private Sector EIA or environmental policy firm that can help to write, implement and enforce policies in a country following their proper assessment. This could also use local knowledge and expert analysis which would involve public participation. Finally, if the private sector brings fear or corruption, there needs to be an environmental organization that can be tasked with the responsibility of data collection, policy writing, enforcement and training.

This organization can use modern technology and media to keep track of companies or individuals that display favorable or unfavorable behavior towards sustainable development. Sort of like an environmental 'Naughty or Nice list'. This would be Something that groups like IAIA can use for international data management. Those working in a positive way can be rewarded with tax breaks and public promotion. Those who don't should be taxed more based on an improved polluter pays principle as suggested before.

Analysis of each countries use of instruments

Singapore can use a cost benefit analysis better than Malaysia as they have more economic stability, and are more active in Malaysia in testing more environmental theories. Malaysia can better use private industry through licensing as they have the most need for developing better technologies. The initial cost may be high, but high demand for items such as clean water, and trash removal will drive prices down and productivity up. This would be that a private company hires skilled workers, which is a problem for Malaysia. The idea of Self Reporting would better work in Singapore, as Singaporeans fear the government more than Malaysians. Malaysians seem to be more corrupt and play favorites to bosses or anyone that will give them a break, as well as rewarding contracts to those who perhaps 'flash the cash'.

A plan like increased inspections sounds like a positive plan on both sides, but Malaysia has a problem with both enforcement and implementation. Both countries would not favor Green Taxes as businesses just won't support the idea. Usually, Green taxes get watered down until they become more of an emissions policy or carbon tax that can be written off. Amongst the two countries Singapore Seems to fit CJ Barrow's

definition of having good environmental management. Which if used properly can lead to better policy writing and usage. Singapore Follows Barrow's three requirements of environmental management. While Malaysia can fulfill most of the first two of Barrow's requirements it is still far from reaching Barrows third goal, thus not reaching his management 'Trifecta' for success. Singapore did follow a plan that used the three goals set by Barrow. This is most obvious with their reconstruction of the Singapore River.

If Malaysia follows an Idea that requires trade-offs between current consumption and ensuring the future, they can be more sustainable. Malaysia has failed to do so in many of their Malaysian improvement plans. Singapore has also been successful in winning over the public's approval in creating its Singapore Green Plans. Malaysia has proved better in winning over special interest groups through favored contracts. Malaysia may also follow Barrow's 5 ideals to be better in environmental management adaptation. Singapore has been somewhat successful in all of the 5 except for their shift in ethics. In Singapore, it has been the government that has seen the shift in ethics to better manage their environment.

Environmental Management is also successful if it has multiple goals. This can be seen with the idea of identifying new technology. Malaysia has tried to use other types of materials that can be used as part of renewable energy. Singapore has also used technology to their advantage by making recycled water, and encouraged businesses to make more eco-friendly packaging, and has given money in the form of grants to encourage Singaporeans to undertake environmental protection and public health related projects looking to sustain Singapore in the future. This subsidized

projects has allotted over $20 million for project funding.

There are 10 approaches that Barrows lists for environmental managers to use in constructing and managing their countries plans. Both Malaysia and Singapore have taken an ad hoc approach, and problem solving approaches. Singapore has been more successful in implementation. Singapore has also been more successful with regards to a specialist discipline approach in all categories except for land and urban management. They can improve in conservation of area management procedures. Neither country has been successful in a voluntary sector approach, as neither country really integrates NGOs in planning. In the commercial approach Singapore has been more successful by getting companies to revamp their packaging.

Problems related to environmental management come from inadequate data, technology, and a lack of expertise. This is true not only in Malaysia and Singapore, but also in the rest of the world. Given this problem Malaysia and Singapore should work together to share information and create cooperation on projects regarding shared problems like access to water. Singapore is already doing this with its Singapore Co-operation Programme.

We learn from Arne Naess that Green Movement has two levels of what Green is. Light Green and Deep Green or Deep ecology. Light Green is a more shallow movement, while Deep Green looks to replace the existing status quo with environmentally appropriate scientific usage and supporting politics. Light Green, tries to use ecological principles to ensure better management and control of environment for human benefit. Perhaps Malaysia and Singapore should try to be more Light Green with a hint of Deep Green Ideals like environmentally supported politics. The idea for

management and sustainability can use local expertise and know how to be effective. Singapore has used this to their advantage with regards to creating a Singapore Green Plan and River restoration. Malaysia can also look to use this idea as they have a long history of resource development.

Businesses and corporations can also use management tools. The governments of Malaysia and Singapore can use business management tools like ecological engineering which designs an ecosystem that can process bi-products and waste or get minerals from mine spoils. Next is Pigouvian Taxes. These look to make a manufacturer pay the costs of raw materials from production to final disposal. This is good in theory to Barrow, but he finds a problem that big corporations make big profits can just pay the necessary fees and move on while smaller companies can take a bigger hit. Also, it is hard to asses a company's responsibility if it is no longer producing. Pigouvian fees should be kept a record of and those companies that can improve should get the benefit of a tax break. A tool that can be well used in Malaysia

Green Marketing is a tool that companies can use to look good in the eyes of the public and government as companies have created a better, cheaper, and more easily recycled product. Eco-labeling is a good example of this. The concept first used in Germany and many European countries can create positive advertisement and create better competition for companies participating. This could be especially good for Singapore with a product like NEWater, or a friendlier packaging that the government and companies in Singapore already crate. A problem associated with this does not mean that the factories producing the eco-friendly better packaging are themselves eco-friendly. Part of the requirement for an eco-friendly product should also be that it comes

from an eco-friendly factory. This is where self-reporting in Singapore or increased inspections could come into use. Self-reporting success can come with the result in the decrease in the need for inspections. Pigouvian taxes can work with this because it aims at including the cost of final disposal.

TQM & EMS looks to show obedience to policy through a structured management system. This also allows for third party watch. TQM requires regular updates and publishes their environmental policy. This type of system can be used in Singapore when NGOs become more affluent. Those disagreeing with EMS say that it fails because; it can create easily achievable results that won't challenge companies to improve in a serious manner.

A covenant can create a harsher tool over EMS or TQM. Covenants are a voluntarily written agreement that exists between a government and a company or body seeking regulation. This can be well used in Singapore because of governmental fear. NGOs and 3rd parties are excluded from involvement in this. A Covenant includes pollution control and energy conservation. This plan seems to lack any real punishment for those who run away from their commitment. NGOs view this as leading to looser environmental controls. This would work better in Malaysia if there was clear punishment for non-compliance.

Environmental management participation involves policy making, panning, and enforcement. Barrow says environmental management needs these components. Singapore has done well with these same ideals. The advisory component can be seen with Singapore's education program. Singapore uses its advertising and Media for environmental promotion. It can be stronger if it creates more help lines, websites, or

information kiosks in public places like shopping malls, airports, parks, post offices, or governmental offices. In terms of economics Singapore has done well with grants and aid to create subsidies like the IES. Singapore and Malaysia can benefit through ideas like microloans for environmentally friendly companies. In terms of regulatory/controls Singapore does better than Malaysia, perhaps because of the fear of government that exists.

Management as we know it requires a mixture of components and management stances. Singapore has been most effective in reactive or punitive management. However Both Malaysia and Singapore can do a better job with preventative and compensatory management.

Eco-Audits are tools that both countries can use as they offer many key ideals like effective monitoring, involvement in public, as well as looking for continual environmental improvement. Risk with Eco-Audits come are the expense and revealing of some companies trade secrets. However, if a country is serious about environmental improvement they may use this. In this report we saw the WWFM use this for Malaysia, but it was never actually implemented.

Social Impact Assessments are used to see whether project development will effect air quality, life, well-being and how individuals, groups, and companies can adapt to change. Both Singapore and Malaysia should use SIAs. SIAs compromise tools like surveys, interviews, census date, public hearings, research and marketing. Governments can use this tool to find out what people want and need in the future.

Ecological Impact Assessments consider how organisms other than people are affected by development activities. Ecological Assessments rely on components such

as habitat evaluation. This assessment uses the suitability of an ecosystem for its developmental impact on a habitat. This can be used by Singapore and Malaysia. Singapore should use this to create assessment for land usage for better ecological development or use for Natural Parks. It would be better used in Malaysia as it has already has had a poor history record with developmental wastes. Malaysia may use this to deal with the land they do have for better development.

The next tool, Land Use Planning may follow other tools like EIAs, SIAs, or ecological assessments. This is especially true for EIAs as it helps to compliment sustainable development. The only problem with this tool is that it is poorly integrated. Therefore would not work well in Malaysia. However, if it was integrated and implemented in Singapore properly, it could be a positive tool for later policy development.

The use of the Universal Soil Loss Equation uses an equation to estimate and predict soil loss. This can be well integrated in Singapore as they have problems with planners not using soil ideas and when considering development. This can also be true in Malaysia with problems relating to soil erosion. Other tools like the Farmers System Research and Rapid Rural Appraisal are both tools that can be used in both countries as they aim at ideas like implementation, evaluation, local skill and know how in their usage. Technology has also become a tool of assessment. Previously the USA used their international society ideals for technology to later develop the IAIA.

Assessments need some sort of continuous regulation. This is a problem because we learn that eventually all assessments only point to a brief picture of environments that will soon change. There needs to be better tools for assessing

ongoing assessments. Perhaps this can be completed with more Assessments or EIAs, eventually leading to SIAs, and public maintenance or voluntary public assessments from NGOs or concerned individuals and organizations.

Last is the Strategic Environmental Assessment made through a tiered approach for making a framework for program and policy impact assessments. SEAs while good, must also deal with limited information for planning the existing time period and for the future. Malaysia can better use this tool as they have no set environmental frameworks since the EQA was removed from usage in the 1980's.

Comparing Two countries

After learning what tools, instruments and measures, countries, political leaders, and can use for developing environmental policy, what can we learn? By remembering that a good Policy for Environment needs to be made from:

Recognition of threats

Proper Assessment of the Problems

Assessment of the best and most available technologies, resources, as well as what tools, instruments, and methods can be used.

Planning action- This includes how to implement and enforce policies.

Brain storming for solutions, this includes NGOs, International Organizations, experts, and Public contributions.

Integration- Training, education, advertisement, and awareness on all levels from the top down.

We may use these ideals to create a policy that works for a country's needs. We must remember that no two projects, countries are alike. However, we may use other

countries plans and polices as guidelines for adapting to new ones. The Singapore River cleanup had an effect on not only in Singapore, but it was also used as a point of reference following a visit to Singapore but Taiwanese city planners aimed at a cleanup project for the Danshui River. Looking at these ideals and comparing the two countries we can see which country in its current status can best fit into these guidelines:

Chart 6 Comparing Two Countries

Ideal	Malaysia	Singapore
Recognition of threats	Malaysia has the ability to recognize threats that exist. However, for years the idea was that pollution and environmental damage was just a bi-product of development.	Singapore, a land scarce country has the ability to recognize threats. They face many as they are a country that relies almost 100% on imported energy.
Assessment Of Problems(can include the use of EIAs,SIAs)	Malaysia requires the use of EIAs. However, EIAs used are not properly completed and do not give a true assessment of actuality.	Singapore does not require the use of EIAs.
Planning	The Federal Government	Singapore has a budget

Action(Assessment of resources and best technology, also cooperation with various groups and individuals)	has been successful in singing many international agreements and ideals for environmental sustainability. Problems arise with regards to politicians not knowing the best available technology available or having their own motives for land use. Next Malaysia does not use NGOs or public opinion in policy making.	that is geared towards doing what it takes to solve environmental problems. They sometimes act in an Ad-Hoc manner, and throw money at an issue to pay to solve it. Singapore has encouraged better technological development through the IES plan. NGOs and foreign experts do not have any influence on projects. However with ideals like the Singapore Green plan, the public was asked which problems most plagued them. Singapore has also signed some key international agreements and has even started training developing countries to be greener.
Integration	States In Malaysia have the	Singapore is a much

	right to govern themselves and to decide how to use land. Priority for land is given to economic development. Once policies are made at the federal level, they are rarely integrated properly. Politicians also have their own ideals for how to implement policies at the State level. Contracts are given out based on a 'favorite' ideal of who can be best benefited by rewarding contracts. Unskilled workers also pose a threat to Malaysia.	smaller country with a special democracy. Implementation and enforcing works. However, this might be due to the idea that nobody wants to challenge the government. There perhaps exists a fear of the government that already keeps people in line. Singapore also looks to educate its citizens about environmental responsibility through events like earth and tree planning days, as well as extensive recycling programs. Singapore can better benefit with better land use and better soil planning tools.

Using these Ideals, we can learn some of the problems facing both countries, and use these ideals to learn how they can better develop.

On paper one could argue that Malaysia has had a more historical approach to better environmental policy making. However, their failed implementation and enforcement, corruption and wrong ideals about manufacturing, historically have led them to being way behind the environmental curve. Their failure to meet goals set by the Malaysian plans and the Wawasan plans have only set them back farther. They have not yet realized that they can use the government to grow with them. They have an abundance of land potential that could be better used if technology and assessments, plus planning were better formulated. Malaysia can and will better improve itself when they actually have the need to do so, as the want in this case just does not exist.

From 1909-1939 mining was prevalent and so was 10-26 million tons of sediment deposited into Peninsular Malaysia's river system. As a response the colonial administration introduced the Federated States Mining Act of 1928. The idea would look to oversee mining activities and restore the polluted river. The lack of enforcement for this policy, only led it to failure. Malaysia would also try to manufacture rubber and palm oil and left the liquid floating in the rivers. It was obvious that they or the government did not learn anything from the previous mining problems.

Full scale land conversion came from in the 1950's-1965 with the immersion of the Federal Land Development Authority. The plan converted 100,000 acres of forest land. While seen as a positive economic development, on the environmental side it was exactly the opposite of what needed to be done, as it would lead to hydrological change, erosion, water contamination, pollution, pesticides, and a loss of plant and animal life. The effort to control soil erosion under the Land Conservation Act, would only prove useless under more land clearing for plantation use. From the 1970s-1980s over

230,000 hectares of land were deforested for agricultural and urban settlement use. The 1990s brought manufacturing to Malaysia, and the river would again pay the price as it was again filled with toxic, hazardous, wastes oils, sewage, and grease which caused bacterial contamination. Laws at this time seemed to be useless as they did not aim at solving environmental problems.

Malaysia's policy response acted towards environmental challenges in 4 stages. Stage one established how to deal with environmental problems. Problems in this stage came from enforcement and coordination. This would seem to have and continue to be a common theme for Malaysia. Stage 2 in 1972; saw a protection of wildlife act which gave power to the Department of Wildlife & National Parks to manage wildlife. The EQA in 1974 focused on pollution control. However it would be amended by 1985. Stage 3 tried to recognize the environment as a key component of development. Malaysia aimed to balance development and environmental conservation. A rapidly developing country unbalanced the scale because of preference for economic growth. 1977-1988 saw the beginning of civil society speaking out and the spread of environmentalism. Issues like the Endau Rompin forest reserve, and logging in Sarawak only hurt Malaysia's image abroad. At this time Malaysia also started to feel pressure from NGOs and saw them as a thorn in its side. Malaysia at this time should have opened up to NGO influence and worked with rather than against NGOs.

Forestry polices would emerge to provide guidelines, protection, conservation, and management. These policies were the National Forestry Policy and the National Forestry act. These policies/acts would set aside land and energy policies like the National Energy of 1979. In the long run it would make Malaysia aim towards long term

energy security, and hope for more renewable energy sources. In 1989 Malaysia found a balance for its energy use with its hope for a diversification policy, and the Environmental Quality Act, Malaysia's only general environmental framework would be stopped short because of its small budget, limited resources, and non-bureaucratic support. Enforcement also plagued this act as many other policies since it was left to individual states.

EIAs became mandatory in 1987 and grew from being used in 19 categories to over 1000. Whole this looked to be a positive ideal, only 25% of EIAs are actually filed properly assessing the environment. Malaysia should take steps to offer a better EIA educational system. This can be done by cooperating with international organizations or NGOs that can help create a new EIA program that might be enforced and approved on by Maidin's idea for a one stop center for everything environmental.

We learn from Maidin that Malaysian cultural characteristics prove that they are non-aggressive emotionally suppressive when threatened people. However, one might argue because of Malaysian environmental protest from the 1980's forward, and with the example of the Penan people and other environmental protests, that perhaps Malaysians just need to be encouraged to a little more to stand up for what they believe in. Malaysian policy makers would rather have short term economic growth over long term development. It would be wise for Malaysia to try to find a better balance. As the traditional way of thinking has only led to a list of environmental problems.

Next is the idea that those who do harm the environment or do not use EIAs are hardly tried in Malaysia's courts. The rule of standing and problems with jurisdiction are problems that need to be settled. It needs to be made clear that jurisdiction will fall

under the direction of the federal or state governments. Other problems relating to sectoral framework needs to include un-regulated gray areas. Projects being given to favored groups are a common global problem. Competing for this cannot be just for those who have the most money. It should be given to a company who creates the most environmentally friendly project and who uses proper EIAs. This will create more competition as it will lead to all companies looking to create more environmentally friendly projects. Projects can also try to use the Precautionary Principles, and should implement the polluter pays, pigouvian taxes, or EPR principles.

Malaysia as a country can also improve by being more transparent. Malaysia to Maidin, seems to lack resources but in the opinion of this author they are well endowed with land, and resources. Perhaps it is that they need to use better technology or expert know- how to create more renewable resources and energies. The idea that policy makers usually leave the public sector for the private one is something that plagues many countries. Malaysia needs to be more competitive in dealing with the private sector by giving better benefits, training, retention and room for promotion to those workers who agree to a longer contract, and can show their allegiance to the country. Malaysia worked together with UNSCED on the 1990 National Steering Committee on Sustainable Development. In order to bring more education to policy makers, Malaysia also sought to strengthen interagency cooperation. This could help with ideas like horizontal integration among government agencies. However, it does not seem to help with the missed connections and differently interested implementers.

In 1993, The National Forestry Act emphasized yet again a need for more conservation. This time a conservation study was done by the WWFM for Economic

Planning. The study used an idea similar to eco-auditing/eco-accounting to show that there was a decrease in Malaysia's Forests. This study was never implemented or endorsed. This represents a missed opportunity for Malaysia to use a real assessment for implementation into environmental policy. However, Malaysia did accept the National Policy on Biodiversity and National Policy on the Environment. The DANCED program also showed that Malaysians were willing to accept working with other countries in using technology to become more sustainable.

Maidin lastly believes that Malaysia should create a one stop center for all environmental aspects of Malaysia. Using Maidin's idea this could work with a new framework that allows the federal government to hear cases against the environment, offices for land development, EIA approval, permit, licensing and registration, and an education center for each of Malaysia's states. Singapore saw a need to use environmental policy and management from the beginning with the 1970 Anti-Pollution Unit and the 1972 Ministry of the environment which aimed at sanitation, public health, and water pollution.

These two government agencies would later merge to create infrastructure like solid waste removal, wastewater and storm water. Air and water pollution were controlled through stringent land-use, planning controls, and tightly enforced emissions and standards. One might assume that Singapore was, has been, and will continue to be successful in environment because of strict controls. Singapore like Malaysia in the 1980's joined the rest of the world in joining conventions and adapting policy regulations. This would impact business in Singapore starting in the 1990s.

Policy and implementation would fall under the jurisdiction of the NEA and ENV who would face problems like land scarcity air and water pollution, hazardous waste management and waste water management, as well as vehicular emissions. The Idea of land use being a problem is realistic as there is not enough of a buffer zone with regards to space between industrial and residential areas. Huidobro says this can be solved by more controls for land use and planning that follows a sequence of several office consultations and approvals that can be rejected at anytime. This may seem to be a waste of time and resources for projects that might not even get land use controls in the end. Another idea would be to just create a building and planning control which can be done once development and planning is approved.

A better idea for this might be to include this as a requirement with the use of EIAs, or EIA like assessments since Singapore does not require EIAs. The ENV uses the Polluter pays principle as tools to combat emissions and effluents. Singapore may also consider using Pigouvian taxes or EPR as a way too sure less pollution exists.

The Singapore River represents a case in which the government recognized an ongoing problem, envisioned a solution, required implementation and enforcement, and established public awareness and inquiry. The only improvements that Singapore could have made, would have been to use international experts or NGO supports to help with planning. Next, Singapore could have built a way to use wave power from the river to generate power.

Policy for toxic waste and waste water is made by Singapore's Environmental Health Regulations Department. Current policy requires that industries responsible for collection and disposal must have the necessary licenses to do so. Water regulations

does not allow for any industries that generate pollution to be within water storage area proximity, and requires that water goes through six different treatments before being flushed back out to sea. Vehicular emissions use Singapore's adaptation of the UN's Consolidated Emissions Directive.

Waste removal is done on a daily basis and 85% of garbage is sent to incineration. The remaining ash goes to landfills and energy produced from it goes to electrical power usage. While this sounds like a positive plan, it has this author asking what happens to the effluents produced from incineration. Burning waste only reduces the volume of solid waste. For one ash needs to be disposed by burying it, however, the ash itself is contaminated with heavy metals, and unburned and new chemicals created during incineration. Incineration also creates dioxins which are one of the most dangerous chemicals. The incinerators emit vast pollutants from their stack gases. Filters are also used to clean the incinerator stack gas produces both solid and toxic wastes that also will later need disposal. This problem is not only existent in Singapore. It is existent all over the world. The solution will only come from products that can be better recycled and from renewable energies.

Conclusion

As scientists have warned for years, ideas such as pollution, energy shortages, land shortages, access to clean water, food, and many more, are all problems that the world faces and will face in the future. This should and will require world citizens to create crucial policies, and work together to preserve the earth's well-being for the

future. Policy is required and created everyday all over the globe for many different situations. As global citizens we should demand not only a green or sustainable planet, but also green policy and green or sustainable policies and management.

In this paper we learned that environmental policy is any action deliberately taken to direct human activities with a view to prevent, reduce or diminish harmful effects on nature and natural resources, and ensures that man made changes to the environment do not have harmful effects on humans. We also learned that environmental policy also can encompass a social dimension like a quality of life and economic resource management.

Environmental policy is used by governments to implement their environmental policies from the top all the way down to its citizens. Governments may use tools like taxes, or tax exemptions, EIAs or other assessments, and permits and licenses when developing policies. It is normal for countries to use a mixture of tools to find their own environmental/green policy recipe. Most countries have multiple environmental problems and will require a good mixture of policies and policy tools to find the right balance. Governments must also be careful of the policies or tools that they use will not create tension amongst others or other policies. Other times it is common for tools and policies to overlap each other and create more expense and headache than actually needed.

Malaysia, a mega diverse country, one that is rich in natural resources has found a away to become a developing country. Their development has no forced them to deal with rapid habitat loss because of their attitude that pollution, deforestation, and

environmental degradation is just a bi-product of economic development. This way of thinking is absolutely unacceptable.

Each state in Malaysia has control over its own land use. However, the Federal government has the right to acquire state land. States convert land at any time for economic gains. If the federal government wants states to follow policies implemented they must use better enforcement. The problem is that policies get lost as they move down the government levels from Federal to State levels. Also it is apparent that Policy makers and implementers have their own ideals for what needs to be done.

This can be remedied by the federal government certain financial incentives that it might normally receive. In the United States, much like Malaysia, each of the fifty states has the right to govern its own rules in state. States that make their own rules that differ from Federal law usually face much scrutiny. These ideas do not last long as the Federal Government will use its influence to make state policy makers jump on the Federal bandwagon. Those who do not play ball, usually may see a reduction in the amount of money the Federal government allocates to each state's budget. This will usually gather the troops when money is not there for projects like highway maintenance, or other public works projects. Malaysia may take a similar stance if state governments do not want to play ball and implement and enforce policies, or meet certain environmental requirements.

One might argue that sustainable development was perhaps thrust on Malaysia and not proactively pursued by Malaysia itself. The idea of Diplomacy and the international watching eye pushed sustainability on Malaysia. If Malaysia wanted to be a more active leader in South East Asia and a considered a leading developing country,

then they would have to accept this role, at least on paper and to the public eye of the world. Malaysia could show their new environmental status with agreements like the Langwaki agreement, chairing the G-77 summit, and the UN Commission on Sustainable Development.

If Malaysia could actually commit 100%, not just on paper to environmental advancement they could be a stronger country, a country that could be an economic powerhouse, as well as the Muslim connection to the West and Asia. Malaysia should take the necessary steps to educate their population, as they are claimed by Maidin to be unskilled, their companies, and government into being more sustainable. Malaysia also needs to make sure their policies are being implemented and enforced at the state level. Policies made need to be multi-effective and not overlapping or just piece meal.

Malaysia's traditional mindset of pollution being a bi-product of growth is unacceptable way of thinking, this also includes the idea that preservation comes at the cost of limited development. The government at all levels must work together to cooperate, implement, and enforce policies, not just vertically but horizontally. Malaysia should take the necessary steps to send young citizens or young diplomats abroad to learn about better environmental policy making. Malaysia can also better integrate more programs like DANCED to increase more environmental technological tools. They can also be more engaging globally. If Malaysia can zone in on conservation rather than acting in an ad hoc approach the country will look better and for now and in the future.

Singapore is a country that represents a very special democracy that exists in South East Asia. Huidobro notes that Singapore can use a governance tool to analyze their environmental politics. One Problem with governance in Singapore is that

governance usually requires the cooperation of efforts with NGOs. In Singapore, NGOs while now starting to be prevalent are still weak as they do not want to seem to be challenging the government's dominance.

Singapore encourages environmental labeling, products, and packaging. Eco-friendly products and packages, as we learn from Barrows, does not always mean that the factories that produce them are also environmentally friendly. Singapore can only try to keep encouraging companies to not only keep producing environmentally products and packages, but also to have the companies making them be as environmentally friendly as well.

Singapore has fared well with their Green Plan from 1992-1993, aimed at fighting the biggest threats facing the country. They also hope to be as successful in their continuation of their plan for 2012 and beyond. This will require them to better use ideals like energy development and help from experts and NGOs locally and abroad. Singapore a country that lacks space has formed itself to be a very green city, despite their lack of energy capabilities. There transformation of the Singapore River can be one that looks positive to the untrained eye. The drastic transformation of the river did set goals for Singapore to become less pollutive. However, this approach was more a reactive policy and not so much preventative. It is now that Singapore is barely starting to act more proactively rather than actively. They have found a way to meet the goals of their Green Policies and look to keep going. Singapore has emerged as a leading powerhouse financially and environmentally. However, they still have room to grow with regards to land use and as well as their heavy reliance on imported energy. If Singapore can find a way to produce their own energy, such as the use of

Hydoelectricity generation, or find a way to cut down on imported use, with a program like the IES than they can better lead with dominance in the region. Singapore does need to open itself up to experts and NGOs abroad and within.

Finally, we notice that Singapore is perhaps more successful than Malaysia for two reasons, Space and Population, and dominant control/fear by the government. Malaysia has an abundance of space and resources. However, they do not use these opportunities to their advantage. Nor do they try to. Singapore A smaller country uses their land better than Malaysia does. Despite so problems with soil quality and a lack of space, Singapore is far better at policy implementation than Malaysia is. Malaysian's have not yet learned from their past, and still fail to implement the idea that the government can grow with the environment. Politicians in Malaysia have other interests or favors to pay/repay in exchange for better opportunities for themselves. Perhaps the fear that Singaporean's have makes them more environmentally more responsible than their Malaysian counterparts.

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