

WATER POLLUTION POLICY IMPLEMENTATION IN CHINA AND JAPAN:

LESSONS AND CHALLENGES.

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ACRONYMS

AFP:	American Foreign Policy
APFDP:	Albania Private Forestry Development Program
ADB:	Asian Development Bank
EIA:	Environmental Impact Assessment
EPA:	Environmental Protection Agency
GWS:	Global Water security
MDG:	Millennium Developmental Goal
NGO:	Non Governmental Organization.
NEPA:	National Environment protection Agency.
OECD:	Organization for Economic Cooperation and Development
USEPA:	United State Environmental protection Agency
UN:	United Nation
UNDP:	United Nation Development Program

ABSTRACT

This research focuses on the challenges and lessons of water pollution policy implementation in China and Japan. It specifically outlines the techniques and tools used by Japan and China in controlling water pollution.

The research used the qualitative methodology which employs descriptive analysis. It relies on literature of some researchers, reports, books, journal articles and online publications. The research findings show that Japan and China have been successful in water pollution management due to their stringent legislation system, strong institutional capacity, introduction of innovation into the controlling of water pollution which relates to science and technology; cooperation with the NGOs, the stakeholders and the local communities. The following are recommended for South Sudan and other developing countries

1. There should be a strict legislation system that would serve as a base for monitoring the implementation of water pollution policy.
2. The government should allocate enough budgets in environmental projects
3. There should be strong environmental institutions with its departments and agencies strengthened to perform their function effectively.

CHAPTER ONE

INTRODUCTION

Water is considered as one of the important resources on earth. Human beings and animals throughout history have settled along water bodies for the purpose of promoting their developmental activities. Cities, towns and villages have been located near streams, rivers and other sources of water. Recently the demand for water has increased rapidly to catch pace with increasing population, increasing livestock population and the rise in multiple uses of water for agriculture, recreation, industry and non ingested personnel consumption.

World Bank report (2003) on water assessment across the world predicted that the rate at which water bodies are dying out especially in developing countries, should concern all and sundry and that the next world war would be fought on water, as a result of water pollution.

Water pollution is one of the main environmental issues which need more attention than before. The causes of water pollution have been attributed to agricultural, sewage, oil spills and municipal waste. It has been observed that industrial pollution remains one of the major causes of water pollution across the globe. The management of Water pollution differs from one country to the other.

To minimize this problem water pollution policies become necessary in order to manage and control the water from the current massive pollution from different sources such as industrial, agricultural, oil spills, dumping of waste, chemicals and local sewages.

As stated by Omer (2007) water pollution is determined where human activities continue to influence the environment which include farming, harvesting trees, constructing building and roadways, mining and disposing of liquid.

While some countries have water pollution policies, implementation still remains a pressing challenge. This research examines the challenges and lessons of policy implementation in China and Japan, and proposes recommendations that can help enhance the management of water pollution.

1.1 Statement of the problem

Most developing countries face challenges of policy implementation, water pollution policies do exist but the issue of implementation remains the major problem. For instance lack of public sector involvement, the stakeholders, awareness and the local government in the policy

implementation process. Other factors such as training of staff, cooperation and communication remain some of the issues that lead to failure of policy implementation. (Mendoza,1998) .This study will clarify these challenges according to the experience of China and Japan then propose recommendations that can enhance the management of water pollution policy in other developing countries including South Sudan.

1.2 Research Questions

The main question that the research is trying to answer is: What are the main challenges and lessons of water pollution policy implementation? Other questions are as follows:

- Which tools and techniques are applied by China and Japan in controlling water pollution?
- How can we benefit from the experience of Japan and China in water pollution Control?

1.3 Research Objectives

The main objective of the study is to examine the challenges and lessons of water pollution policy implementation in China and Japan with the following specific objectives :

- To identify the techniques and tools used in minimizing the level of water pollution in Japan and China.
- To describe the strategies of implementation of water pollution control
- To propose policies and recommendations that can help enhance the implementation of water pollution policy.

1.4 Significance of the study

This research will be of great significance for the ministry of environmental affairs and the water corporation and agencies in the developing countries particularly, South Sudan. It can also be a document that will be useful in the institute for research in the high institution of learning in most of the developing countries mainly the University of Juba. The study will propose some policies and recommendations for better water pollution implementation through the experience of China and Japan in water pollution management.

1.5 Scope and limitation

The main scope of the study is to determine the nature and lessons of implementation of water pollution policy. It also aims at finding out the factors that contributed to implementation failure.

The research is based on the review of literature on water pollution policy and its implementation in China and Japan. It places more emphasis on industrial pollution as a major cause of water pollution. Even though some studies had been carried out in this area, there were few publications on the subject. The focus will be on the tools and techniques that Japan and China have applied to control water pollution. Most of the information was retrieved from publications online, books, journals and other publications. The researcher could not travel to the field to conduct interviews and questionnaires due to logistical, financial and other constraints. This study will be limited to the materials published by various researchers.

1.6 The Research Methodology

The research methodology is basically the review of published research works on water pollution policy implementation in Japan and China. More emphasis has been placed on how water pollution is controlled through implementation strategies of water pollution policy. Out of the eighty documents researched only fifty documents are relevant for this study.

1.7 Research design

The research is using a qualitative method of study. It is a descriptive study which focuses on the lessons and challenges of water pollution that affect many countries across the globe, especially, Japan and China and make recommendations that will help enhance the management of water pollution. The research will collect most of its information from the review of literature; it will also consider some publications on line, books related to the study, journal articles, magazines and newspapers that will provide relevant information for the study. We can also use some general information to broaden the discussion of the research.

1.8 The structure of the paper

Chapter one: The first chapter will introduce the importance of water, the nature of water pollution, water pollution policy and policy implementation. It will also indicate the objectives of the study, research questions, and statement of problem, the scope and limitation and the significance of the study.

Chapter two: The second chapter is the literature review. It explains the importance of water, the nature of water pollution, the causes and impact of water pollution, the nature of water pollution policy, the implementation process, the elements of implementation, the indicators and processes of closing the implementation failure.

Chapter three: This chapter will introduce the location of the study, its area, population and others

Chapter four: This chapter will introduce the nature and lessons of water pollution implementation in China and Japan. It will also indicate the techniques and tools applied by the two countries in minimizing the level of water pollution.

Chapter five: This chapter summarizes the findings and discussion of the study. It will also clarify the implementation strategies that help in controlling water pollution in the developing countries.

Chapter Six: This chapter shows the concluding summary and general recommendations.

CHAPTER TWO

REVIEW OF LITERATURE

This chapter is going to highlight the main areas of the research discussion. First it will describe the nature and importance of water to humans and other organisms, it will also describe the nature of water pollution and water pollution policy in general point of view. Secondly it will explain the meaning of policy implementation and its process and some theories and methods that are effective in policy implementation. The chapter will also highlight challenges and some reasons behind the failure of policy implementation.

2.1 The role and importance of water

Water is playing a significance role in the whole planet. It provides life to the ecosystems and to the people as well. Without water there is a possibility of no life. Water is use for many activities such as agricultural, industrial, and domestic and many others. As stated by the (Global water society, 2010)water support the human life, our food and drink, the clothes we wear, the landscapes we enjoy, the societies we live in, the period and quality of our lives. Water plays an essential role in the national life, in energy supply, infrastructure, economic growth, healthcare,

education and culture which makes water the main concern for the national policies. (Global water security, 2010). It's very clear that water has a great importance in our daily lives, our survival and progress depends on the availability and quality of water.

2.2 Water in the Millennium Development Goals (MDGS)

As stated by the UN (2010) The UN Millennium Development Goals (MDGs) was formulated in 2000 and adopted by all 192 UN member states , it establish eight major objectives for international development to be achieved by 2015. The MDGs have become the most widely considered framework for assessing the success of international development. The formulated eight goals are related to: poverty alleviation, universal education, gender equity, children's health, maternal health, HIV/AIDS, environmental sustainability, and global partnership. Each of these broad goals has specific targets. One of the aims for environmental sustainability is related to the number of people with access to safe drinking water and sanitation services. The other objective considers water-related actions as a main strategy for success. These goals are not the responsibility of the private sector, but corporation have to play a great role in supporting global efforts.

According to the UN secretary General Ban Ki moon water and Sanitation are important in achieving the Millennium Development Goals (MDGs) by the year 2015.

He emphasized that without water there is actually no life. He added that there is no indication so far to achieve the millennium development goal on water and sanitation. Therefore we must urgently work very hard in achieving universal access to clean, safe water every day. Everyone should have the access to water and sanitation services that all of us take for granted, (UNDP, 2004).

The statement of the secretary general is so important, especially when most of the responsibilities lie in the hands of individual member nations of the UN, as far as the MDGs are concerned. Therefore more effort is needed to be exerted in collaboration with the local governments, the private sectors even the local community.

2.3 The nature of Water pollution

Water pollution in general is considered as the contamination of water by other chemical and physical substances that will later make it unsuitable for domestic use, agricultural and others.

Water pollution has continued to increase from time to time for several reasons. Industrial waste,

local sewage, pesticides and fertilizers, oil spills and others remain the major causes of water pollution.

According to (Chiras, 2006), Water pollution is any physical or chemical change in water that directly affects the organisms. It's a global problem, the types of pollution differs from one country to the other according to the level of development. For example in the poor and nonindustrial zed countries, water pollution is mainly caused by human and animal wastes, pathogenic organisms, pesticides, and sediment from improper farming and timber practices. The developed countries also suffer from these same problems, but their more stable lifestyles and numerous industries create an additional chance other hazardous pollutants such as heat, toxic, metals, acids, pesticides, organic chemicals and a collection of pharmaceuticals. (Chiras, Environmental science, 2006)

(EPA, 2009) also defined water pollution as one or more substances which have built up in water to such an extent that they create problems for animals as well as people too. Oceans, lakes, rivers and other inland waters can naturally clean up a certain amount of pollution by distributing it harmlessly. (EPA, Environmental protection Agency, 2009)

As stated by the (UN, Water Pollution, 2008) water pollution is on the rise globally even though there is an improvement in some regions of the World. According to their report 80% of sewage

waste in the developing countries is discharged into the water untreatably, polluting rivers, lakes and coastal areas. Many industries which are known to be heavily polluting such as chemicals and leather are moving from high income countries to emerging market economies. (UN Water, 2008)

Water pollution generally is divided into source two:

1. Point source
2. Non Point source

2.3.1. Point sources

Point sources include factories, power plants, mines, oil wells and sewage treatment plants which release huge amount of toxic chemicals into sewers, lakes and rivers, (Chiras, Environmental science, 2006). (Cech, 2003) also defined it as the contamination that occurs through a pipe or other items and their location can be easily identified.

Point source pollution is easy to identify and their impact can be easily evaluated. The main sources of point source pollution are considered to be the factories and waste water treatment plants. The increase of population near the manufacturing centers can contribute to large amount discharge of waste. (Cech, 2003)

2.3.2 Non-point sources

The non point sources include farms, forests, lawns and urban streets. Both sources can create a lot of problems (Chiras, 2006). Non point source pollution is so broad, it's so difficult to identify due to its large quantity into the source. They enter rivers, lakes and other water bodies through the movement of surface and ground water and also through precipitation from the atmosphere. Non point source pollution usually occur due to chemical use on lawns, gardens and golf courses, agricultural practices, street refuse, construction activities and other rivers and reservoirs. It is always difficult to identify, regulate and quantify due to such large and general uses it has. (Cech, Principles of water resources, 2003)

2.4 The causes of water pollution

There are several sources that contribute to water pollution. The most known all over globally remains industrial waste, agricultural waste that resulted from the pesticides and fertilizers, municipal waste, the oil spills that are dumped into the water by the ships, flooding and illegal dumping of waste into the water source.

There are many causes of water pollution including sewage and fertilizers contain nutrients such as nitrates and phosphates. (Kifferstein, 1996)

Water Pollution is also caused when silt and other suspended solids, such as soil, wash off plowed fields, construction and logging sites, urban areas, and eroded river banks when it rains.

Also Under natural conditions, lakes, rivers, and other water bodies undergo Eutrophication, an aging process that slowly fills in the water body with sediment and organic matter. When these sediments enter various bodies of water, fish respiration becomes impaired, plant productivity and water depth become reduced, and aquatic organisms and their environments become affected.

(Kifferstein, Water pollution and society, 1996)

There are so many causes of water pollution, below are five of them which are considered as the major causes of water pollution globally.

2.4.1 Industrial pollution

Industries remain the major cause of water pollution in most countries of regions in the globe.

They produce large amount of waste causing pollution of rivers, lakes and other water bodies, which is transported directly into the water source then it cause water pollution.

water pollution is the result of industrial waste and municipal waste. Industrial waste can be divided into two categories, The organic and Inorganic waste. Most of the inorganic waste are mineral and chemical in nature which have added greatly to water pollution problems. The Waste

that contains metals such as nickel, iron, copper and chromium; salts such as compounds of sodium, calcium and magnesium; Acids such as sulphuric and hydrochloric and several other compounds. The inorganic waste originate from pickling, acid mine drainage, metal finishing and plating and from the mining, processing and manufacture of a wide variety of metal and chemical products (Schwartz, 1966)

This shows that when the concentration of industries in a region may increase the amount of water pollution, leading to increase in cancer and other water borne diseases due to the presence of chemicals in the water.

2.4.2 Agricultural Pollution

Agricultural activities such farming, commercial livestock, cultivation with the use of fertilizers and pesticides can contribute in one way and the other in agricultural pollution. Over cultivation, over irrigation and over use of fertilizers can cause agricultural pollution.

Agricultural activities contributes to almost 60% of the surface water contamination. Fertilizers, animal waste and crop residues remains the major sources of nitrogen and phosphorus that leads to agricultural pollution. (USEPA, 1993)

2.4.3 Sewage pollution

One of the causes of water pollution is sewage which comes from households. Since no one wants to live in a polluted area, near a dumpsite or landfill, the wastewater and untreated sewage are usually carried away from the home polluting different bodies of water. Most of the developing countries are practicing this type of sewage disposal. Even some developed countries carry poorly treated sewage to canals which leads to major bodies of water and causes pollution.(Google search)

There is an estimation of over 8 million people facing a major problem of sewage waste. Many people are still lacking clean water and basic sanitation such as hygienic toilet facilities in the developing countries. Sewage disposal affects people immediately in the environment and it can lead to water related diseases such as diarrhea that always kill 3-4 million children every year. (EPA, Causes of water pollution, 2009)

2.4.4 Oil pollution

Oil pollution is caused by the ships and boats that travel over the large bodies of water such as ocean, seas, lakes and rivers. Over 70% of oil pollution at the sea comes from continues shipping and also from oil that people pour down illegally down on the land and later it will be transported into any water source. (Google search)

2.4.5 Plastic Pollution

Plastic pollution is common in the areas where there are so many tourism activities; the plastic waste is usually thrown by tourists into the rivers, lakes, sea and other water source which later cause water pollution. For instance, in a typical community in a developing country plastics release into the environment are common substances, which end up in the rivers or water bodies. The most probable reasons may be that it is light and easily transported into the sea and the rivers. A plastic bottle can survive in the marine environment for a long period of time before getting dissolve into the water and then later cause pollution. (Google search)

2.4.6 Thermal pollution

It's the process through which warm or hot water is dumped into the cooler waters of the surface of the earth. When the warm and cold water mixed it will disrupt the organisms which are living in the water. It reduces the dissolved oxygen content of water and also at the same time it increases the metabolic rate of fish and other aquatic animals. Thermal pollution is common in the United States. (Chiras, Environmental Science, 2006)

2.5 The Impact of water Pollution

The main impact of water pollution is mainly water borne diseases, diarrhea, typhoid, cancer and others which will lead to death. Since population depend on water mostly for our survival, water pollution is a threat to our lives. The impact of water pollution is a connected process, for instance if the water is polluted it will have an impact on the organisms in the water as well as the humans who mostly depends on the organisms as their source of consumption.

Polluted air, water and soil can cause acute illness such as respiratory and cardiovascular disease, or cancers and neuro- developmental and hormonal disorders and can also lead to death. Even though water and air pollutants are generally high regulated, OECD countries are still significantly affected by these environmental health risks (Muller, 2007)

2.6 Water pollution policy

In order to minimize water pollution, creation of water pollution policy is necessary. Water pollution policy helps in the process of management, prevention and water quality. The existence of policies can help reduce the level of pollution but only if they are implemented accordingly.

Water pollution policy is understood as a legal policy that control or manage water pollution.

In other words it supports water management and governance. Water policy is considered by all government efforts to define the rules, intent, research, and instruments for managing water resources. It considers not only the legal and regulatory dimensions, but also the planning, allocation and the implementation practices by water managers and other stakeholders in support of the management system. (compact, Guide to responsible business engagement with water policies, 2010)

Water pollution policy is also defined broadly as initiatives that involve interaction with government bodies, local communities, and the civil society organizations with the goal of achieving two main objectives: 1) responsible internal management of water resources within direct operations and supply chains in line with policy imperatives and 2) the sustainable and equitable management of the catchment in which companies and their suppliers operate.

2.7 History and evolution of water pollution policy

Water pollution prevention had started long time ago in most of the countries across the world. It started with traditional rules and regulation in protecting the river or water bodies at the community level then later the government intervened. The history of government's involvement

in controlling water pollution started with the refuse Act of 1899.(source) The main purpose of this act was to stop waste from being thrown into any navigable water because it's unlawful to do so in the United States.

The first federal legislation that started to deal with the different forms of water was the water pollution Act of 1948. The act authorized the government to engage in research, investigation and surveys dealing with water pollution issues. The water pollution act which was amended in 1956 established a federal program of direct grants to the municipalities to help in the costs of constructing sewage treatment facilities. This act also at the same time established the enforcement conference as a tool for imposing clean up requirements on individual discharge, If incase a serious water pollution problem occur, the public health service could conduct a meeting of state and local officials, major polluters and other interested parties to give recommendations as to who should clean up and how much. (Weller, 2001)

2.8 Water pollution policy process

According to Hespanho (1997) there are some general principles that can be considered in water pollution policy process, these include:

- A water pollution control policy normally should be seen as part of a logical policy framework ranging from overall statements that can be found in government statutes, constitutions, etc.,
- The policy making process should incorporate consultations and seek consensus with all the ministries which are responsible for water resources management, including organizations responsible for overall economic development policies.
- Policy statements must be realistic. Good intentions shown in statements such as “No pollution of surface waters shall occur" cannot be applied in practice and therefore become meaningless in the context of an operational policy.
- The statements in a policy document need to be relatively long lived because they must pass an exhausted political adaptation process. Thus, detailed guidelines, which may need regular adaptation to the country's actual development level, should be avoided and placed into the more strong parts of the legislation system, such as the regulation framework, that can be amended at short notice

2.9 Public water policy

Public water policy is often understood strictly as the legislation and regulations that supports water management. This short definition focuses on the principles, policies, and legal framework

that govern water management, including, for example, broad strategies for infrastructure development, water rights laws, environmental protection, human rights laws, and research funding. (UN Compact 2010)

2.10 Water policy engagement

Water policy engagement includes local communities, civil society organizations, and stakeholders which expands the scope of possible engagement actions. This expanded scope can also include companies engaging communities while forming internal water policies, supporting academic research on new technologies and management practices, and cooperating with civil society groups to ensure environmental and basic human needs are met. (UN Compact 2010)

2.11 Policy implementation

Policy implementation is the process through which policies are implemented in a certain institution successfully or not. It is the process through which the laid plans, goals and objectives are put into consideration.

Policy implementation was defined by Pressman and Wildavsky (1973) as the process of interaction the goals which are set and the actions equipped to achieve them. They further

emphasized that implementation means to carry out, accomplish, produce, fulfill and complete.

A policy according to them is a process of cause and effect of initial conditions and predicted consequence.

(Iglesias, 1986) also highlighted that policy implementation is a strong change process of policies and plans into specific programs and projects. It is also considered as the process of carrying out programs that have been adopted by legislation or executive or judicial orders

(Ruskefsky, 1990) he further stressed that it is that stage in the policy process that answers for example questions like. Did the poor benefit? Did the social reform agenda achieve its attended results? So by answering these questions is considered as policy process

(Sabatier, 1983) also label implementation as an operation of goals through a number of organizational activities that are influenced by the environment. It is also defined as a strategic management process involving arrangement of strategy, structure, process and environment

Policy implementation is also described briefly by Williams (1996) as the stage between decision and operations. It's the next difficult step after decision which involves efforts to be put into consideration, make it operational on what has been decided

Policy implementation is a process in which decisions and actions are directed towards putting them into consideration. (Gossum, 2008)

Policy implementation can impose the strategies and instruments which are necessary in achieving the intended policy goals. In order to upgrade policy coordination and objectives the policy must become the central part of the whole national plan of the country. (Ministry of foreign affairs, Liberia 2003)

Some scholars said policy implementation is that stage in the policy cycle where formulated policies, intentions, plan, visions are put to operation. That means policies become meaningless after its formulation if they are not implemented properly. It's easy to form policies but without proper implementation it makes no sense.

2.12 Policy implementation process

Policy implementation process is mainly the action through which the policy is implemented. It involves all the assigned parties such as the government, local community, stakeholders and the private sector in order to achieve the laid objectives.

Van Meter and van Horn (1975) defined implementation process as those actions by the public or private individuals which are directed to achieve the set objectives according to policy decisions

Policy implementation process also involves cooperation and coordination between the government, the local community and the stakeholders.

2.13 The importance of implementation in the policy process

(mendoza, 1998) argued that once a policy is formulated, enacted and adopted, it should be implemented. However some studies initiated by Pressman and Wildavsky and other scholars pointed out that this assumption is not always valid, policies do not implement themselves. It need action, in addition, there are situations where something can go wrong on the way to policy implementation. Therefore there is a need to study implementation, what is the policy about, how does it succeed and fail, and how policy is changed during the process of implementation. It's also important to focus on the nature and concern of the policy implementation process

As stated by the scholars successful implementation is not easy, many things can go wrong. Public policies do not turn out as original planned some of them are bad and others produce negative consequences. Others succeed well beyond their expectations. These are some of the reasons behind it:

1. It's difficult to specify details in advance

2. Implementation permits matching of local goals and services to local preferences
3. Implementation does not always agree with policy objectives specified in alternatives.

2.14 Policy Implementation Failure

Policy implementation failure simply means failure to implement policies in an expected manner.

In other words it means improper implementation of laid down policies, goals or objectives.

As argued by (Jordan, 1996) implementation failure is normally top down accounts of implementation to describe the shortfall between the goals represented in particular directives in their effect on the member state.

Implementation also involves strong political involvement between the technocrats who formulate the policy and the implementers. It is disturbing that there is no coordination between policy making and implementation, (Jordan 1996).

According to Mendoza (1998) it's the difference between an arrangement and the actual situation, a prediction and observation and a clear objective of what has actually been achieved.

(Atherton, 1993) suggested that the failure often occur when an organization does not resolve conflicts that arise between cyclical, linear and the continues process. He further argued that a gap is a difference between what was planned, developed and how it is used. It may result into the lost of time, opportunities, money and the strategic plan.

According to (Caddy, 1997) implementation gap which distinguished implementation policy occurred in central Europe due to lack of institutional capacity for implementation and enforcement in terms of both formal and informal institution.

2.15 Policy failure due to non implementation

(Hogwood, 1984) explained that the non implementation is a case when a policy is not properly put into consideration as intended due to several reasons, among them are those involved in its execution have been uncooperative, or their best efforts couldn't overcome obstacles to effective implementation because they had little or no control (Brian Hogwood 1984)

When policies are unsuccessfully implemented automatically they will fail and affect the country's progress in that specific institution

(Mendoza, 1998) stated that unsuccessful implementation or non implementation occurs when a policy is carried out in full under external circumstances and unfavorable condition. Policy fails to produce the intended results or outcomes.

According to (Caddy, 1997) there are many obstacles as far as the implementation of environment policies are concern, among them are, little public finance resources, low public awareness and concern such as unemployment and improper environmental monitoring systems.

He further stated that the most significant barriers to successful implementation are the nature of institution as shown in their poorly design policies and institutional framework, the absence of better system of information management and control as well as a lack of clear allocation of environmental responsibilities between different branches of the national government such as the Ministry of environment, public health and agriculture between national ministries and environmental agencies and also between national , regional and local authorities

2.16 Success and Failure factors of policy implementation

There are reasons behind the success and failure of policy implementation in all institutions.

Provision of adequate resources and provision of instructions were identified by some scholars as factors of implementation. Sabatier and Mazmanian (1979) and Ham and Hill's (1984) highlighted the following factors:

1. The nature of policy, see that it is unclear
2. The implementation structure, keep links in the chain to minimum
3. The prevention of outside influences
4. Control over implementing actors

Ham and Hill (1994) further explain the features of less problematic policy that facilitate successful implementation

Table 2.1: Less and more problematic implementation of a policy

Less Problematic (facilitates)	More Problematic (impedes)
Simple technical features	Complex technical features
Marginal change from the status	Comprehensive change from the status
One actor target	Multiple actor target
One goal objective	Multiple goal objective
Clearly stated goals	Unclear and ambiguous goals
Short duration	Long duration

Source. Mendoza 1998

SUCCESS requires the following ingredients:

S-Social acceptability, social preparation

U-Unity of purpose, understanding and agreement among implementers and the beneficiaries

C-Capability to implement, presence of a critical mass of supporters and critics, an organized community.

C-Communication, commitment, coordination, clarity of purpose and direction

E-Efficient and effective implementation, empowerment

S- Suitability of successful solutions

S-Sufficient resources and support

FAILURE on the other hand occurs because of:

F-Fund shortage, feelings of inadequacy, helplessness or insecurity

A-Aims, targets are not well defined; attitudes of clients and implementers are problematic

I-Intervention of politicians

L-Limited resources, information and support, laziness on the part of some implementers

U-Unpreparedness, unity of purpose and personal interests are not achieved

R-Reliance or dependency on outside institutions and support

E-Exploitation or distortion of the concept of public welfare(Mendoza, 1998)

2.17 Elements of policy implementation failure

The elements of policy implementation failure are as follows:

2.17.1 Lack of resources

Most of the policies failed because the funds earmarked for the implementation of the policies are usually not enough to complete the projects for the realization of the policy outcomes.

The above problem agrees with Mendoza, (1998) findings that shortage of resources has been the main problem that is affecting the implementation of environmental and its related policies. Lack of resources include human, financial and material, capable to carry out the policy to its logical conclusion. Low salaries in the public institutions have led to a significant loss of intellectuals from the country, thus they are not motivated to take up positions in the public sector to make clear changes to improve the standard of living with reference to water pollution

Governments, donors and NGOs, local and international private sectors and other water associations should work together to increase and improve funds that are allocated for water issues. (Kraeme, 2001)

2.17.2 Lack of training of staffs/implementers

Policies succeed when all the implementers are well trained and educated, with proper assigned duties and responsibilities. Most of the policies fail in the implementation stage because most of the staffs or implementers are not well trained to deal with the policy process.

2.17.3 Lack of Compliance

Lack of compliance by the populace can result in the failure of policies, if there is a disposition of policies or in other words if the responsibilities are not assigned appropriately a gap will occur in the implementation process. Institutions are tested of their effectiveness regarding their degree of compliance with environmental standards. The core to water pollution control or management is basically the strengthening of law enforcement bodies to enhance compliance by industries and other wastes which are discharge into the water bodies. (Bank, 2009)

2.17.4. Lack of Communication and cooperation

Communication and coordination is a core in any process of policy implementation. There is always poor communication between the local staffs on the ground and the national government, the private sectors, stakeholders and others to achieve the intended goals.

Communication is considered an important tool in the process of policy implementation. The workers have to communicate with each other including the local community, the stakeholders and the government. K. Naka et al. (2000) stated that when there is jealousy among the government agencies and there is no proper channel of communication for the implementers to do their work.

According to (Mendoza, 1998) some officials are not considering communication to withstand implementation. There are many reasons behind it, such as disagreement with policies, selective perception of policies, and lack of confidence in the quality of the implementation. Decentralization is also complicating coordination and cooperation by adding more steps in the

transmission of information, so it should precede hand-in-hand with the development of communication channels.

The involvement of community based organizations and other associations are considered as an important principle in water resources protection. (Kraeme, 2001)

2.17.5 Lack of monitoring and follow-up

Follow-up and monitoring is very important in any process of implementation; those who assign the responsibilities should make sure that there is constant follow up to the implementation process of the policies in order to result into a successful implementation.

2.17. 6 Lack of public participation

Most of the policies failed because the national government thinks that they are wise enough to implement every area in the policy by themselves. Participation of the local community in policy implementation plays a great role in successful policy implementation. The public might have

some experience on the ground which the government authorities lack; there their participation will enhance the level of implementation to its betterment.

According to Maria (1998) the greater the opportunities for citizen to participate, the more likely that implementation will be successful. However, in Albania, policies and projects, including the AFP and the APFDP, are formulated and enforced from the top, without the active participation of local people and institutions. The involvement of limited number of people in the formulation process restricts their ability of the public to understand the background, or consequences of a decision, especially when they are working under time pressure. Local tradition and knowledge are often underestimated due to their low status in the public.

New participatory approaches need to be form through operating procedures that involves consultation, public hearings, adequate publicity, and time for affected people to evaluate the policy and express their own opinion. In order for implementation to be successful, the government officials, NGOs and international donors must support the local group and the community leaders to participate in decision making. (Mendoza, 1998)

As stated by (Zhou, 2009) Public participation is a way to maintain residents and it's their right in participation, supervision and decision making. He further noted that it can improve the quality of the environmental policy making, it can also improve the public awareness about the environment, and it can also act as a pressure to the polluters.

Public participation is so helpful to adjust policy to local situations, and also to improve the social welfare and utility of resources uses and also to protect the vulnerable groups. It's considered as an important part of integrated water management and as a driving force for other stakeholders in order to fulfill their duties in water pollution management. (World Bank 2009)

2.17.7 Lack of policy tools or framework

Provision of a clear framework and programs in policy implementation is of great concern because it can ease the achievement of the policy. The implementation of the policy becomes effective when its process, tools and framework is set clearly to the implementer.

According to (Mendoza, 1998) to increase the chances of implementation success, the formulation of policies should bring in more active involvement of government officials and

other interested groups in the discussion of technical, economic, and political consequences of the identified policy options. Such options should be discussed in meetings, workshops, and expert exchanges at the national and international level. The process should also include the evaluation of costs and risks involved importance and magnitude of expected benefits, institutional capability, and wider implications for assigning priority in the selection and implementation of a policy objective.

2.18 Policy instruments

Successful implementation of a policy needs the creation of better institutional and legal framework towards the following:

1. Improving access to information and the environment
2. Harmonizing better legal instruments
3. Monitoring and evaluating the impact of the policy decisions in the environment and water pollution sector in particular.
4. Improving the scientific base of environmental decisions which are appropriate for the environment.

5. The assessment of the impacts of the public and private projects on the environment and which contribute to national environmental process.

6. Establishing and implementing better standards, so that the level of public health and environmental protection are acceptable. (Liberia, 2003)

2.19 Theories of policy implementation

There are two types of implementation tools, the top down and the bottom up approach.

Top down and Bottom up approaches of implementation

2.19.1 Top down implementation

As stated by (Mendoza, 1998) the top-down interpret the role of training, training activities are designed to provide the needed information to workers to do their jobs in accordance with the policy planned. In this conception, the role of the worker is to receive the information, to learn it, and to act appropriately. Such a model of training may be realistic when legislation is not capable as well as clear, so that the information communicated to the worker can be easily

understood and carried out, the worker would have no uncertain feelings about the work to be done, resources would be available for the worker to act in accordance with the policy's intent, and implementation would not challenge the worker's professional or personal ethics.

According to Peter Van (2008) the top down approach begins with the authoritative policy decision at the top central level of the government and continue downwards through the hierarchical administrative structure in order to examine the extent to which the policy's legally mandated objectives were achieved and procedures followed. (Gossum, 2008)

2.19. 2 Bottom up implementation

The bottom up implementation focuses on what is actually happening at the recipient level and understanding the main causes of that influence action "on the ground". The interaction between the worker in the bureaucracy and the client is central in defining the nature of policy implementation. (Mendoza, 1998)

Regarding Bottom uppers the analysis should focus on the street-level bureaucrats the real implementers of the policy. The bottom up approach starts with an analysis of the many actors

that interact at the operational level and works backwards to map the outcome and the impacts of policy in terms of strategies which were adopted by the relevant actors in response to the particular Policy choice. (Gossum, 2008)

2.20 Indicators and variables of policy implementation

According to (Mendoza, 1998) the following are the main variables that can lead to a success or failure of policy implementation:

1. The nature of the policy itself
2. The implementation agencies or organizations
3. The target groups or clients
4. The environment.

She stated in the developing countries, the most important variables are:

1. The impact of the strong leadership
2. The level of the resources constraints

3. The treatment of qualitative uncertainty in the environment
4. The use of non-monetary compliance strategies
5. The inter-organization coordination, both vertical and horizontal
6. The private and non-governmental sectors compliance and support to the public policies.

2.21 Closing the implementation failure

In order to close the implementation failure, the following steps are needed:

- Creating a centralized environment inspectorate with powers to investigate alleged breaches and levy fines.
- Developing justice to the national level by allowing citizens to take action in national courts
- Making greater use of regulations rather than directives.
- Improving the legal and technical drafting of directives.(Mendoza, 1998)

CHAPTER THREE

COUNTRY OVERVIEW

3.1.1 Location and size.

China is located in East Asia; it borders to the east by China Sea, Korea bay, yellow sea and South China Sea between North Korea and Vietnam. The border countries are Afghanistan, Bhutan, Burma, Hong Kong, India, Kazakhstan, North Korea, Kyrgyzstan, Laos, Mongolia, Nepal, Pakistan, Russia and Vietnam. It has an area of 9,596,960 square kilometers. It's divided into 22 provinces, 4 municipalities, 5 regions and two administrative regions. Beijing is its capital at the same time it's cultural and education center of china. (Ruilin, 1992)

3.1.2 Population

China is one of the developing countries in Asia with the estimated population of 1.2 billion people and 9.6 million square kilometers of territory. (Zhang Kunmin 2001)

It comprised of 56 ethnic groups. Han Chinese (delete a word) consist of 91.9% while Zhuang, Uygur, Hui, Yi, Tibetan, Miao, Manchu, Mongol, Buyi, Korean and other groups make up 8.1

percent. The majority of the population fall between ages 15 and 64. 25% of the population is at the age of 14 and below, 7% is in the range of 65 years and above. The life expectancy at birth in 2000 is estimated at 71.4 years (Ruilin, 1992)

The map below shows the geographical outline of China

Figure 3.1. The geographical map of China



Source: Google search

3.2 Japan

3.2.1 Location and size

Japan is an island in East Asia. It is located on the eastern Korean peninsula. It has an area of 377,835 square kilometers. Japan is bordered by the Pacific Ocean on the north and east, on the south by Philippine Sea and East China Sea and on the west Japan Sea. It has a coastline of 29,751 kilometers. The major cities are Tokyo, its capital; Yokohama its major port, Kyoto, Osaka and Nagoya. It has four major islands, Honshu, Kyushu, Hokkaido and Shikoku. (Gonhegue, 2011)

3.2.2 Population

The population of Japan is estimated at 126.5 million people in 2000. Japan is considered as a zero population growth state, its population is expected to drop by 2015 to 126 million. The estimated birth rate was 9.96 per 1000 population and estimated death rate of 8.15 per 1000. The Japanese population is very old, 17% of the population is 65 years old and is expected to rise to 24.6 in 2015. (Gonhegue, 2011)

Figure 3.2. The geographical map of Japan



Source: Google search

CHAPTER FOUR

WATER POLLUTION POLICY IN CHINA AND JAPAN

4.1 Introduction:

China is a country with the largest population in the world of about 1.2 billion people has been experiencing serious problems of water pollution in the recent years. Even with the rapid economic growth in the last decade, the problem of water pollution still remains a concern. The situation of water pollution in China was serious but the government has been playing a great role in reversing the situation for better. (Bank A. d., 2011)

The large water pollution incidents occurred from one time to the other in the recent years. There are two types of water pollution which occurred in China. The first one is the discharge of pollutants within a short period of time; a typical example is of Songhua River in November 2005 through toxic spills, the second type is the accumulative effect of pollutants discharge after a long period of time which later causes a severe effect of water pollution. The drinking water

source pollution in Wuxi by algae in Tai lake which took place in May 2007 is a clear example.

Once water pollution occurred it pressure the Chinese government to take action.

The first environmental policy of china was formed in 1979. These policies are made by more than 20 authorities from the central government to make sure that there is proper implementation.

(Robert, 2001)

In the recent years due to the experience of China and other countries, China had a great achievement in water pollution policy implementation; they are able to minimize the high level of water pollution due to some mechanism which we are going to discuss in the following.

(World Bank, June 2007)

4.2 Policy Challenges in China

Since the reform policy was launched in 1979,China has been experiencing new socio-economic, political and environmental challenges .Even though environmental issues were not taken as primary concerns by the central government in the 1980s, the Chinese leaders began to pay increasing attention to the effects of environmental hazards, such as floods,

desertification, and water pollution and air pollution. Water has received more attention than any other issue because of its importance to humans, economic development (for instance for electricity and navigation), daily life (for drinking water and sewers), and the risk of natural disasters (such as floods and droughts). In terms of the total volume of water resources, China is water rich. However, there are some causes that prevent China from enjoying its substantial water resources. These include the massive population of over 1.2 billion, the high variability of seasonal rainfall, and the uneven geographical distribution of water resources.

Rapid urbanization and industrialization in the reform period has release severe pollution into the water bodies and which has contributed to the difficult task of managing China's water. In the early summer of 2005, more than 500 flood deaths were reported in the southern part of China, and in 2006 the typhoon Saomai hit Zhejiang and Fujian rendered more than 100 casualties. Even though with all these challenges, China overcame these difficulties and experiences (Lee, 2006)

4.3 The achievements and Success experience of the Chinese government

4.3.1 The role of the government

Water pollution management is considered the responsibilities of the government whose purpose is to protect the environment for the betterment of the public. (Richard, 1997)

The central government of China has played a great role in minimizing the level of water pollution in the country. Regarding the water management challenges they started by constructing a range of water service facilities on the major river basins for municipalities and other rural areas. In addition, the government has established a set of laws and regulations including the water law of 1988 and 2002 and the environmental protection law 1979 and 1989 and has sought to implement policies based on the multi ministerial system. The government also had some policy success such as the inclusion of sustainable development principles in 2006-2010, also the establishment of integrated water bureaus and the environmental impact Assessment (EIA) success of the state Environmental protection Administration (China, 2000)

The government has made some achievement in water pollution prevention in the recent decade through their experience and performance as follows:

1. They improved the laws and regulations on water pollution and prevention.
2. The program of water pollution prevention has been enhanced and put as a priority also the action plans has been identified.
3. The policies and measures of water pollution prevention have been put in transit.(Government of China 2000)

The government of China looked at the following measures based on the existing policies.

1. To control the total amount of pollutant discharge. The local governments and other sector control the total industrial and urban domestic sewage discharge in an active way in connection with the industrial restructuring;
2. To implement strictly the Environmental Impact Assessment and deal with the new construction projects that does not fit in with the environmental requirements and industrial policies;
3. To withdraw out and close down a number of production capacities processes, products and enterprises with serious environmental pollution and waste of resources;
4. To promote cleaner production in enterprises in connection with technology innovation.

5. To devote great efforts to the development of ecological agriculture and organic agriculture, and the integrated environmental treatment in small river basins;
6. To turn the sewage into resource. The sewage with treatment to certain standards is reused;
7. To speed up the infrastructure construction of urban sewage treatment plants, and promote water pollution prevention with economic instruments. (China, 2000)

4.3.2 Policy implementation

The actual implementation of laws and regulations depend on the effectiveness of the system of monitoring and some incentives that are given in order to use the environmental technologies in a good manner. In China they had established the monitoring system of pollution and the management system over a period of time. Also research and development programs for water pollution control has been well implemented over the last two decades.

The Chinese government has initiated a number of research and development programs which involves the studies of atmospheric analysis and water pollutants, environmental planning, and solid waste, development of advanced technologies and advanced studies of water pollution control. There are a lot of financial and technological support which came from several

international organizations and other foundations such as the United Nations Development Programme (UNDP), the World Bank, Japan, the United States and others. (Kaneko, 2000)

4.4 Emergency prevention and response

The Chinese government with the assistance of the World Bank has played a great role in policy implementation of water pollution. It is necessary to point out in this section the successful experience in environmental emergency response in China. For instance the successful handling of the explosion and chemical spill at the chemical refinery factory in Jiangdu city in December 2005

According to (World Bank, 2007) generally politics, economy, technology, international cooperation and public awareness are major factors that lead to the development of environmental management policy in China.

4.4.1 Public Awareness

China in 1987 established some regulations for reporting incidents of environmental pollution and damages. The local government provides incentives to the local people in order to improve

the environmental situation and monitoring and control water pollution. Public awareness on the environmental protection was the most important factor that contributed to the success of water management. The implementations of all the policies need the support of the public in which they can also influence the government's decision making in some areas.(World Bank 2007)

Public awareness, education and distribution of water culture are important elements of sustainable water pollution prevention strategy. (Kraeme, 2001)

4.4.2 Legislative framework

The Chinese laws and policies have an initial legislative effort which contains the pollution emergency prevention and response requirements. For instance the water pollution prevention and control law has an amendment in article 28.The law consist of simple clause on the responsibilities of the polluters, disclosing of information and reporting. In other laws such as Marine environmental protection law not only the polluters who take the responsibility but the environmental protection agencies and the local government are addressed.(Bank, 2007)

4.4.3 Organizations involved in Pollution Management.

The incidents of water pollution should always involve the government, companies, private sectors and the public. In China there is different set up, the groups which are involved are public

security bureau, the state Administration for work safety, the administration of quality supervision, the local police, the fire brigade, local departments of environmental protection, water, transportation, construction, planning and the river basin commission. The involvement of all the groups can help in easy implementation of the water pollution laws/ policy existing. The responsibilities are well defined to all the departments working under the environmental protection which made things easier and contributed to the success as follows.(World Bank 2007)

Departments

Responsibilities

Ministry of water resources

Concern with surface and ground water, also management of river basin, flood control and conservation of water and soil

The state Environmental protection Administration

Prevention and treatment of water pollution

The Ministry of construction

Industrial and urban water use

Ministry of Agriculture

Water use for agriculture, prevention of fishery aquatic environment and non source pollution

State Forest Bureau

Conservation of water set ecology and water

	resources
State electric power company	Construction and management of large and mid scale hydro power projects
State Reform and Development commission	Participation in the planning of water resources development and ecosystem building, coordinate water conflicts between ministries.
Ministry of Transport	Pollution control related to in land navigation of ships on rivers
Ministry of Health	Management and supervision of drinking water standards.

Source: modified based on Feng, He and Kinne (2006)

4.5 China's experience in environmental Pollution protection

The state of protection of environment has been progressing in China in its modern stage even with the environmental problems which are caused by the modern industries. The main reason for China's success in environmental protection in the development process is due to the adaptation of Environmental protection as the fundamental policy of the state, following the strategy of coordinated development between the environment and the economy and acquiring a

number of positive measures based on environmental pollution control and ecological environmental protection (Kunmin, 2001)

The following are some of the measures in enhancing management:

4.5.1 Laying emphasis on the comprehensive management of urban environment and the prevention of industrial pollution.

The role of EP is to succeed in protecting the urban environment and also to make sure that industrial pollution is under control. Specific documents and methods for examinations have been formulated to guide the urban environment. There was a regular inspection, comparison and assessment in which the results were made public throughout the country and within each of the province. Regarding the industrial pollution, the strategy include 3,000 enterprises representing 65% of the nation's total pollutant volume which is discharge, 6,000 companies accounting for 75% of the total pollution and 9,000 comprising 85% of the total.

4.5.2 Conducting environmental education and increase public environmental awareness:

The protection of the environment is the responsibility of the general public, the departments of EP and other relevant agencies.. There was a policy which was put forward since 1973 regarding

relying on the masses and the participation of all, at the same time preserving the environment for the benefit of all the people. A lot of remarkable efforts have been made.

4.5.3 Relying on steady scientific and technological progress and increasing environmental investment.

The EP principle was meant to enhance management of the environment in collaboration with other relevant national institutions have helped China to progressively progress in environmental management in 1980s. This practical experience from China indicated that environmental quality depends on successful progress of sufficient investment and technology. (Kunmin 2001)

4.5.4 Taking part in extensive international cooperation and to promote domestic environmental protection

China's active role in international affairs on the environment indicates importance the government attaches to environmental issues. As a member of many international conventions such as Montreal protocol, Basil convention, Vienna convention, Biodiversity convention and the framework convention on climate change, China has played significant role in campaigning for the protection of the environment through its technical and management capabilities. (Kunmin, 2001)

4.6 The major legal/administrative measures for the implementation of environmental policies in China

According to Xin Zhou (2009) there are eight legal administrative measures for the implementation of environmental laws in China. Firstly the Environmental Impact Assessment, three simultaneity system, pollution levy system, emission permit system, enforcement of pollution abatement for non compliance, pollution discharge reporting system, total emission control system, enforcement of shutting down, merging and transferring.

4.6.1 The Environmental impact Assessment system

It is specified as an important system and necessary to focus and evaluate the negative effect in the environment and give out some prevention measures to the companies before starting their construction project. The main purpose of EIA is to prevent environmental pollution, control pollution sources, encourage public participation, ensure proper development and promote sustainability. Regarding the procedures the local government should submit a report to EIA and the administration authority should examine these reports and then make final decisions. (Zhou, 2009)

4.6.2 The three simultaneity system

The three simultaneity systems that were meant for the implementation of all projects which have environmental hazard, it was aim at designing and constructing the facilities for pollution control. This system together with EIA system carries out the concept of prevention as the first priority. The EIA system focus on making pollution prevention plans where as the three simultaneity system focus on the implementation of those plans. Regarding the procedure the organization in charge of the projects should implement the construction of pollution control facilities and environmental administrative authority should participate in the designing and acceptance check. The three simultaneity systems were first approved as legal provision in the environmental protection law established in 1989. Later, major pollution prevention and control laws were introduced.

Some regulations such as ordinance on Administration for environmental protection of construction projects were established to support the implementation of the system. The three simultaneity systems over the last thirty years have made a great contribution to pollution control of newly built industrial point pollution source. Large and medium size projects enjoy sound

implementation rate of over 95% since 1980s. Some private enterprise however especially TVEs do not conduct EIA or three simultaneity due to low environmental awareness. (Zhou, 2009)

4.6.3 Pollution levy system

Pollution levy system is meant to charge on enterprises for pollutant emission beyond the limits of emission standard and waste water discharge into the water. There are two types of levy system, first is the punishment on pollution emission which exceeds standards such as levy on waste water, waste gas, solid waste, noise and radioactivity. Second one is resource occupation fee such as waste water discharge fee. This system is the first economic measure for pollution control with the purpose of encouraging enterprises to make a proper environmental management within their companies and getting stable exacting source for point source pollution abatement. The main target of this system is enterprises which discharge pollutant directly into the environment. Regarding the procedure, the environmental administrative authority collects fees according to monitoring data. In 1984 pollution levy was approved as legal provision in the water pollution prevention and control law. Provisional measures for better use of special fund of pollution source treatment are established to support the implementation. The administrative regulation on pollution discharge levy was enacted by the state council in 2003 which marked the completion of the system. Since then the pollution levy changes from over standard levy to

total emission levy and the price change from low level to full cost charging. The total pollution levy grows so rapidly since 2003 and reaches 14 billion RMB in 2006. (Zhou, 2009)

4.6.4 Pollution discharge reporting system

This system deals with all the organizations that discharge pollutant directly or indirectly into the water source. Their task is to report the quantity and the concentration of the pollutants to the local government. The main aim of the system is to build a basic data base on environment pollution. (Zhou, 2009)

4.6.5 Emission permit system

This system is specified to all organizations that discharge pollutant into the environment only if they have a emission permit issued by the environmental protection authority. Regarding the process of issuing the permit the enterprises have to report to the authorities the amount of pollutants that they will discharge then I will be decided upon. (Zhou 2009)

4.6.6 Total emission control

It refers to the total control of pollution emission within the area of environmental carrying capacity based on the characteristics of the environment and the individual purification. As known long period of concentration can't stop the pollution control. The Chinese government started implementing this system since 1996. (Zhou, 2009)

4.6.7 Enforcement of pollution abatement for non compliance by designated date

It refers to the companies or organizations that pollute the environment seriously or they are located at the special areas where most of the population resides, therefore they should reduce their emission according to the agreed date otherwise they will be fined and shut down.(Xin Zhou 2009) The system of implementation of setting date lines to enterprises for water pollution control has been proved to be so effective in reducing and controlling water pollution sources.(Ruilin, 1992)

4.6.8 Enforcement of shutting down, merging and transferring

Their main duty is to stop high environmental pollution level which has high impact on the daily life of the nearby residents. Companies of low resources utilization and high environmental

pollution especially small size such as the paper making, chemical industry and printing etc. The main purpose of this system is to improve the water quality in a short period of time and helps to promote the structure of the companies and also can improve the allocation of resource.

These eight major policies have helped a lot in enhancing the situation of water pollution in the country; it's also a good experience that the Chinese government has applied which worked successfully. (Zhou, 2009)

4.7 Policy Principles in China

4.7.1. The polluter pays principle

The polluter pay policy aims at dealing with the point sources control. A national plan was formulated by the state departments with the aim of exercising control over the gross emission of twelve primary pollutants. Since 1996, China has been implementing the transcentury green engineering program which concentrates on three rivers, three lakes, two zones, one sea and one city. The central measures of this program include the control of total amount of pollutants discharge, pollution fee policy and energy policy. These policies have promoted pollution

treatment by enterprises, urban environmental infrastructure construction, and have contributed to the improvement of environmental quality in most areas of China (Kunmin Zhang, 2007)

4.7.2 The cleaner production principle

The cleaner production initiative was enacted into law in 2003 with the aim of restricting the development of high resources cost which is heavily polluting the environment and technologically back warding industries. China is able to carry out a number of pilot projects through the loans from the World Bank. China went on to shut down 15 heavy polluting industries in order to minimize redundant production capacities 43,000 small coal mines, 3069 small cement kilns, 187 small glass production lines, 111 small refinery plants. Nearly 800 small power generation units and 103 small steel plants were shut down. Almost 90% of the enterprises across the country have met the required emission standards. These successes have been the result of these policies which were designed to reduce the pollution at its sources. (Kunmin Zhang, 2007)

4.7.3 Turn away from an Administrative management based approach to Legal and economic instruments based –approach Principle

China already had an environmental protection law at the national, regional and state levels. These laws and regulations have contributed to the environmental policy framework in China. The power of monitoring and supervision goes with the law of enforcement agencies, these departments and institutions are responsible for making sure that industrial polluters take measures to control the pollution. The administrative and regulatory framework has been updated to improve effectiveness. For instance to provide economic incentives in accordance with the principles *of polluters pay, user compensate, developer protect and destroyers recover* , other departments also have improve upon their environmental protection in the areas of capital construction, comprehensive utilization, taxations, credit and loans and introduction of foreign investment. Efforts of regional environmental governance and support through acts of policy and finance have been provided by the central government of China. (Kunmin Zhang 2007)

4.8 The role of Local government

The environmental protection bureau under the local government in china has played a great role in the area of water pollution management by enhancing the first implementation of environmental policy on the ground. The mechanism for this motivation was facilitated by local level elections. The second one is by expanding the environmental protection bureau. The political influence played a great role by monitoring and controlling environmental problems. The local elections helped in contributing to the local leadership which is very important in the management of the environment, this serves as a connection between the central government and the local government in the water pollution policy implementation. (Weller, Environmental cultures and policy implementation in China, 2001)

4.9 The role of the NGOs and private sectors

They started this initiative during the UN Fourth world conference on woman in the implementation of water pollution policies. The central government laws/policies allow all NGOs to register and cooperate with the government especially those who are concern with

environmental issues such as WWF(Water purification process) and Global village Beijing. Their role and duty was to preserve the endangered species, protect the habitat from deforestation and also provide media outlets for environmental complains that will arise. None of these NGOs can take adverse measure against the government. They played a great role in the successful implementation of environmental policies. (Robert P. Weller, 2001)

4.10 Measures for maintaining water quality

4.10.1 Strengthen comprehensive control of urban water environment

There was a rapid increased in the treatment rate and reuse of urban waste water. The department of water environment protection has played a great role in this area. For instance in 2000, the total water supply in China is 46.9 billion m³ which increase by 0.2 last year, to increase access to water in the cities to 96.7%, 0.4% higher than the figure of the previous. The treatment rate for urban waste increase to 34.2%, 2.3% higher than previous rate of 31.9%. Thousands of water plants or supply water stations were constructed in the rural areas to increase access to tap water has improved. (Kunmin Zhang 2001)

4.10.2 Increase investments to water pollution treatment.

All the projects in the Trans century green project plan which are almost 836 have been completed and almost 409 projects are in implementation accounting to 87.7% in general. The main water environment protection is a) water pollution treatment project in the reservoir area of the three Gorges. b) Water pollution treatment project in the Xiaolagdi reservoir area and in the middle of Yellow River, a lot of investments will be put into the treatment plant when there is a serious water pollution situation. c) Urban sewage treatment plants construction in three rivers of Huaihe, Haihe, and Liaohe and in three lakes such as Taihu, Chaohu, and Dianchi. d) The project of Green water and Blue skies in Beijing.

4.10.3 Promote water conservation

The conservation of water can lessen the pressure on water supply and it will also decrease the discharge of waste water. For instance in Haihe River the ratio of water per 10 thousand yuan of industrial production is 51m cubic, the rate of reuse water is 79% while in Beijing and Tianjin its high almost 87%, the industrial water has improved effectively and its structure and distribution was adjusted.(Kunmin Zhang, 2001)

4.10.4 Improve the managing mechanism of water

The exploitation and utilization of water cover a lot of concern, the supply and use and real time allocation was implemented and the mechanism of water was reformed.

4.10. 5 Promote high efficient Agriculture

Agriculture is one of the major ‘consumers’ of water in China, it is used to irrigate arable land.

The Chinese academy of engineering proposed three options,1) water supply is determined by demand and farm irrigation was supplying 4 trillion m cubic water, in 2030 there will be a shortage of 27.7- 30.6 billion m cubic in the whole country.2) water demand is determined by demand supply balance.3) Reduce part of farm irrigation.

4.10.6 Strengthen International communication and cooperation

Some countries such as Japan and Israel have experiences in water saving and water resources conservation which China has copied. Scholars in China have been keeping their eyes on some of the progress in one of the lake in Japan. (Zhang Kunmin 2001)

4.11 Evolution of environmental policy in China

Before the Stockholm conference on human environment in 1972, China has began putting measures in place to control industrial pollution and environmental quality. The institutions to implement environmental policies are well equipped with both qualified human and material resources. China started to implement environmental policy and sustainable development since 1992. (Kunmin, 2001)

4.11.1 Law and regulations

According to (Kunmin, 2001) There are already six environmental laws in China. The laws include environmental protection, forest law, criminal law and resource conservation. The council of state introduced 28 administrative acts such as cleaner production and total amount of pollutants control, in addition also 427 environmental standards and 900 local environmental regulations were been established. The environmental laws of China came into effect due to the existence of these laws, regulations and standards in principle.

4.11.2 Strengthening administrative management

The government of China pays great attention to supervision and management of the environmental protection. Three policies and eight institutions for environment management were constituted in 1980s. They combined prevention and control, and law enforcement on environmental management. The eight institutions include environmental impact assessment, pollution levy, and responsibility for environmental protection goal, quantitative examination of the comprehensive improvement urban environments, pollution discharge permits, mandatory pollution control and centralized pollution control. All these laws has been implemented in the country, it had lead to the sustainability of environmental management.

4.11.3 Encouraging public participation

The National environmental protection Agency (NEPA) in Dec. 1996 issued a national Action program for Environmental publicity and Education. It emphasized on public awareness for environmental protection and environmental education as means to improve the degree of civil morality, science and culture and international cooperation and capacity building.

NGOs working for environmental protection such as Friend of the Nature, earth village were more active. Legal position for public opinion was added to the document in order that the public will play a major role in the decision making.

4.11.4 Applying economic instruments

Pollution levy system has been practicing in china for many years now and it has gained a root of success. Currently many of the departments are now resolve to abide by government policies on environmental management, including infrastructure construction, comprehensive use of the wastes, finance and taxation, and the introduction of foreign investment in accordance with the polluters pays, user compensates, exploiter protects and destroyer restoration principle. Adequate support on policy and fund to regional pollution control was provided by the central government, for example it subsidize one sixth of the construction expenses for municipal sewage treatment plants and landfill farms.

4.11. 5 infusion of science and technology into the environmental management

China has been active in improving the new technology on pollution prevention, cleaner energy and biodiversity conservation, cleaner production, increasing the efficiency for resource and energy use, in enhancing R & D for dust abatement, desulfurization, sewage treatment and noise control. The policy of technology directory was brought into effect by the government. For instance in July 2000 the Ministry of construction , state Environmental protection Administration and Ministry of science and Technology have jointly issued technology policy on Municipal sewage treatment and pollution prevention.(Zhang Kunmin 2000)

4.12 JAPAN

4.12.1 Introduction

Japan as one of the developed countries in the Asia pacific region has gone through a lot of challenges which includes the Minamata disease prevention, water pollution control, the aging population and the utilization of the financial resources appropriately, but through its dynamic workforce they are able to overcome them in a positive manner. The issue of water pollution

started to occur before one hundred years ago, according to historical records the first major incident was recorded in 19 century.(Akira, 2002)

The main cause of water pollution was untreated discharge of mining waste waters from the Ashio copper mine into Watarase River which caused a lot of poison into the agricultural products and the local people (Akira, 2002). Following the world war two the issue of water pollution occurs again such as the organic mercury industry which caused the Minamata disease. It was first known in 1956, for instance it regulates the drainage of soluble nutrients such as phosphorus and nitrogen into the lakes and closed waters, they are also able to regulate the drainage system to prevent over pollution into the designated areas such as Tokyo bay, Ise Bay and seto inland sea. (Akira, 2002)

The government of Japan, the private sectors and the local community has played a great role in water pollution management; we can look into how they are able to collaborate in water pollution policy implementation

14.12.2 Environmental Issues and environmental policies in Japan

In Japan, top priority environmental issues include air pollution, solid waste, eutrophication, environmental protection, and climate change.

In order to keep the local environments clean, municipalities are empowered to implement ordinances that are strict with emissions standards than those imposed by Japanese National Law. Accordingly, many municipalities have more stringent standards than the national versions. In addition to regulations imposed by the country or municipality, pollution control agreements has played an important role as a government measure for environmental management. If regulations are not sufficiently effective to improve the regional environment, municipalities often make agreements with newly established facilities, in order to protect the environment by setting more stringent contracts than regulations on emissions of contaminants. By the late 1990s, more than 30,000 facilities which were sources of pollution had made agreements with their local municipality. These agreements cover air pollutants, water pollutants, vibration, noise, and waste, and often include special limits on emissions, utilization of the best possible technologies that are available, and reporting obligations. (Akira, 2003)

4.12.3 The Challenges of water pollution policy implementation in Japan

Even though Japan is considered as one of a powerful nation in terms of policy implementation, it still faces some challenges that need to be address.. The user and pollution charges and environmental taxes are not sufficiently used to internalize the environmental costs. The financial assistance programs in Japan are used to implement environmental policy and their cost effectiveness is not evaluated. Also the application of polluter pays and user pays principle is still incomplete especially in the area of waste water and waste services.

Although, these problems are not fully resolved, Japan has made some gains in user charges that cover household waste services, there is still a long way to go. Japan needs to improve upon mitigation measures and greater role to the public and the NGOs. The declining ageing population represents a new challenge for both economic and environmental policies (OECD ,2010)

4.13 The success experience and achievements in Japan

4.13.1 The Role of the central government.

The central government of Japan has the overall responsibility for the implementation of all environmental policies; they ensure that the laid down policies and procedures are followed to the later.. They formulate and plan the policies and the local government also gets involved in the operation, maintenance and management of water areas, water treatment facilities and water utilities according to the framework of the national policy. Five related ministries that belongs to the national government such as Ministry of Land Transport and infrastructure, Ministry of Environment, Ministry of Health Labor and welfare, Ministry of Economy, Trade and Industry, Ministry of Agriculture Forest and Fisheries all take part in various administrative areas and they also cooperate with each other in formulating water pollution policies.(World Bank 2006)

4.13.2 Success experience of water pollution prevention in Japan:

Japan's successes in water pollution prevention cannot be underestimated. According to Okada (2000) the government's prefectures have been assigned great role in water pollution management. They set up standards, inspect factories, and regulate effluents discharged from factories; they also implement environmental water quality monitoring programs within their departments. Apart from the prefectures city governments dealing with water pollution control policy are empowered to regulate and check water waste from the factories in their located areas.

The prefectural government measures for water pollution control include:

1. Regulation of factories based on laws
2. Constructing and maintaining the sewage treatment plants
3. Combine Sagami Lake
4. Purifying the waters in a better way.
5. Controlling the pollution from the high technological industries such as the electronic companies.

Other lessons learned and success experience includes:-

1. The role of the legal system
2. The environmental impact assessment system
3. The relationships between industries and governments
4. The relationship between the central and local government
5. The role of voluntary pollution agreements
6. Self monitoring system by the industries
7. Economic and financial incentives
8. Regulatory instruments
9. Training and dissemination of technologies
10. Collective treatment of urban and industrial zoning
11. Pricing policies for water resource and energy.

Other factors that improved the Japanese success includes:

- Decentralization of decision making
- Strong and democratic local government system
- Sufficient labor force
- An educated population

- Freedom of press. (Okada,(2000))

4.13.3 More efficient implementation of environmental policies in Japan

The environmental legislation of Japan was further developed in 1990s. The instruments used to implement environmental policy is highly effective. The regulations are strict, well enforced and based on strong monitoring capacities. Strict standard setting and financial support for research and development on new environmental technologies and treatment methods have had a positive technological force effect which helps the implementation in time. Currently there are some advantages, nationwide discharge limits are made more specific at the regional and local when needed through agreements negotiated by prefectures and municipalities with industries.

Environmental Impact Assessment is applied to major projects systematically and consultation of the public, regional and local authorities has improved. The Japanese industry has been establishing environmental management and reporting systems and several branches has taken initiatives to reduce their environmental foot print. (OECD Environmental program 2001)

4.14 Regulation of Effluents

The central and local government of Japan has been cooperating to protect the quality of water based on these three laws (water pollution control law, law concerning special measures for conservation of environment of the seto inland sea and law concerning special measures for conservation of lake water quality). The laws have many provisions which regulate the level of pollutants. The factories are required to measure the level of their discharged waste and keep records of the measurement under the ministry of environment. The Ministry of environment, prefecture governors and mayors require the factories to hand over report and other commercial facilities on their effluents and also conduct some inspections when necessary. If it is found that any effluent violates the standard of pollution a punishment will take place. There was also an order that was issued to change the construction of facility or the system of wastewater treatment (Midori, 2010)

4.14.1 Policy measures for household waste water:

Effluents that come from household activities such as cooking, bathing and laundry are considered as major cause of water pollution in the public waters. To deal with this issue the government encourage the building of sewerage system which increased the population of those with access to sewerage system to 71.7%. For those rural communities who are staying at the mountainous areas without sewerage system called “Johkaso” has been developed to raise the population with access to sewerage system to 83.7% in 2007. This policy has limited the level of water pollution in Japan. (Midori, 2010)

4.14.2 Monitoring and publicizing water quality

The local government played a great role in monitoring the quality of water in the seas, rivers, lakes and groundwater as stipulated by the ministry of environment. The ministry of environment collects and publicizes the results and other information concerning water quality in order to raise public awareness and also encourage further actions that help in protecting and monitoring the environment.

Policies on non point sources, river management and drinking water: These policies were formed in 2005 with the aim of reducing water pollution that arise from the non point sources such as

agriculture and others. For instance it encourages better use of fertilizers in areas designed under the law to minimize the flow of nitrogen and phosphorus to the lake. The policy also includes measures to maintain lake shores which is considered as important for enhancing the water quality. (Midori, 2010)

4.14.3 The role of the public ‘public attitude’

Public attitudes contributed a lot in the success of policy implementation in Japan. Public attitudes have a great role in the formulation and implementation of effective water pollution policies. Public beliefs are very important in the public policy process. Most of the Japanese public is cooperating in one way or the other with the government in the implementation of environmental laws. The demands for the government to address a particular policy also arise from the public with organized interest from the general public. Other demands for immediate action depend on the role of the public and its representative for effective policy implementation (Lovrich, 1985)

4.14.4 Public participation and Compliance “The case of Minamata disease”.

Public awareness and empowerment of the public is considered as basic requirements for effective collaboration between the factories and the central government. The case of Minamata disease is considered as one of the Japanese experiences in preventing water pollution. The standard of technical opinion and basis of information is determined and there was a complete compliance. Building up trust between the government and the operating industries has been shown in Japan as a better example of effective environmental management. (World Bank, 2009)

4.14.5 Establishment of environmental pollution prevention policy

This policy was established under the water quality control law; it aims at declaring basic principles of anti pollution measures and to make sure that they are implemented sufficiently.

The policy indicated that prevention of water pollution is very important for securing the health and cultural life of the citizens, also establishing the polluters pay principle and the environmental standards which are considered as administrative.

The national government of Japan made some efforts in considering measures against water pollution since the law was formed. The ministries are in charge of all these laws. The government established water pollution control office under the leader of the prime minister in 1970, new efforts were made as legal system for water pollution prevention. These laws helped a lot in minimizing the level of water pollution in Japan. (Lwasaki, 1999)

4.15 The role of the Industries

4.15.1 Anti pollution management system

Most of the industries don't have a satisfactory system of management to prevent water pollution. The law to improve water pollution system in specific factories was established in 1971, forcing them to form a committee with experts in controlling water pollution.(Iwasaki, 1999)

4.15.2 Pollution control Agreement

Many enterprises, municipalities and citizens organizations are obligated to sign water pollution prevention agreements. This agreement provides strict regulation standards better than the one of the government. This agreement is encouraged by the government and other stakeholders due to their experience in dealing with the difficulties of cooperating with the communities located near the factories and ability of avoiding unwanted protests after joining the agreement. (Iwasaki 1999)

4.15.3 Increase in investment for anti pollution measures:

The enterprises investment for anti pollution measures started to increase continuously due to the long term and low interest fund and payment of taxes policies were also put into consideration also it include reduction of fixed asset tax on anti pollution facilities.(Iwasaki 1999) .

4.15.4. Implementation of water pollution control strategies: Lessons of experience

The Japan Environment Agency (1991) managed to estimate the national economic impact of water pollution control legislation and associated interventions. Japan's GDP was in progress in 1960 and 1970 similar to other industrialized countries when the government decided to create

some decisions of water pollution control. The aim of Japan's economic policies was to eliminate the bottlenecks to high economic growth, in 1960s they were spending Yen 50 billion per year which later they increase the budget to 1 trillion. It was estimated that 0.9 of the total GDP was spent only on the water pollution control. The Japanese Environment Agency through stricter environmental protection and associated major investment in water pollution control the little effect on the overall economy of the country. The allocation of huge financial resources also helped the water and human health quality improved. (Lodh, 2001)

CHAPTER FIVE

FINDINGS AND DISCUSSIONS

5.1 Summary of the research findings:

5.1.1 Similarities in the strategies of water policy implementation between Japan and China:

1. The central government of Japan under the ministry of environment is responsible for the implementation of water pollution policies
2. Both countries has a concern in the area of water pollution, they allocate huge financial resources to minimize the problem as part of their annual budget
3. Both countries are cooperating with NGOs, companies, private sectors in water pollution policy implementation
4. Both countries use the science and technology in combating water pollution
5. Both countries have a legal framework (laws) that govern and prevent water pollution.
6. Both countries have public awareness and empowerment to the local population in order to prevent the environment.
7. Both countries have polluter pay principle to fine polluters.

8. Both countries have a strong international relationship with other power countries such as USA, Russia and Germany.

9. Both countries have monitoring and management system of minimizing water pollution.

Table 5.1: Summary of research findings

Policy strategies	China	Japan
Differences	<p>1. The Environmental Impact Assessment(EIA) is an important tool in evaluating the negative effect in the environment and give out some prevention measures</p> <p>2. The Chinese government encourages public participation and offer environmental education to the public.</p> <p>3. The NGOs are allowed to operate prior to registration. They work with the central government</p>	<p>1. The Environment Impact Assessment (EIA) is an important tool use for preparation process of pollution control.</p> <p>2. The Japanese government also encourages public participation, but to a lesser extent. They select the educated personnel, environmental officers and others.</p> <p>3. Most industries and private sectors don't have satisfactory system of management to prevent water</p>

	<p>especially in dealing with environmental issues.</p> <p>4. The legal framework for water pollution control is not strictly followed.</p>	<p>pollution. They sign agreements with the government which provide strict regulatory standards.</p> <p>4. Have a strict legislation system in all areas of water pollution policy implementation.</p>
<p>Strengths</p>	<p>1. The government of China has exerted much effort to minimize the high level of water pollution in the country.</p> <p>2. China has established integrated water bureaus, environmental institutions and Environmental impact Assessment system.</p> <p>3. China has an effective monitoring system. Incentives are provided to control water pollution.</p> <p>4. There is availability of financial support in which 3% of the country's GDP is allocated in water</p>	<p>1. Japan has strong legislation system and strong monitoring capacity.</p> <p>2. The government has established all the environmental institutions.</p> <p>3. Have a good policy implementation strategy.</p> <p>4. Adequate utilization of financial resources.</p> <p>5. The instruments and tools used to implement environmental policy are highly effective.</p>

	<p>pollution prevention.</p> <p>5. Public awareness on environmental protection was one of the major factors in success of water pollution management.</p>	<p>6. Cooperation between the local and central government, and the public is strong.</p> <p>7. The Japanese media, TV and radio has played great role in public awareness</p>
Weakness	<p>1. Weaknesses in the capacity of water pollution personnel led to failure of water pollution management in the 1980s.</p> <p>2. There are difficulties of controlling environmental hazards, floods, desertification, and water and air pollution due to the lack of capacity building.</p> <p>3. They depend on foreign aid from donor organizations such as World Bank, UN, and UNDP.</p>	<p>1. Lack of prompt intervention to solve the issue of Minamata disease.</p> <p>2. The government has budget deficit at the local and national levels.</p> <p>3. The environmental taxes are not sufficiently used to internalize the environmental cost.</p> <p>4. There is lack of continuous evaluation of environmental policy.</p>
Lessons learned	<p>1. The government has an important role in effective implementing national</p>	<p>1. The strong legislation system has played a great role.</p> <p>2. The environment Impact</p>

	<p>policies.</p> <p>2. Government is able to improve its laws and regulations on water pollution prevention.</p> <p>3. The program of water pollution has been enhanced and put as a priority and the action of plans has been identified.</p> <p>4. The policies and measures of water pollution prevention has been put in transit</p> <p>5. The central government of China has been cooperating with the stakeholders, local government and private sectors.</p> <p>6. The promotion of environmentally friendly institutions in conjunction with cleaner innovative technology.</p> <p>7. The conduct of research</p>	<p>Assessment has helped in the implementation of the policies.</p> <p>3. There is a strong relationship between the industries and the government.</p> <p>4. There is strong relation between the central government and the local government.</p> <p>5. The role of voluntary pollution agreements has played a great role.</p> <p>6. Self monitoring system in all the industries.</p> <p>7. The economic and financial incentive has helped.</p> <p>8. Pricing policies for water resources and energy has played a great role.</p>
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	<p>programs has help in easy implementation of water pollution policy.</p> <p>8. The financial support has helped to enhance the implementation of water pollution policy.</p> <p>9. There is strong coordination and communication between the staffs.</p>	
<p>Challenges</p>	<p>1. Massive population over 1.2 billion</p> <p>2. There is high variability of rainfall, uneven distribution of water resources.</p> <p>3. There is rapid urbanization and industrialization which always increase the level of pollution.</p>	<p>1. Economic crisis. There is a deficit in the budget of local and national government.</p> <p>2. Environmental taxes are not sufficiently used.</p> <p>3. The polluter pays system is incomplete</p> <p>4. There is a declining aging population.</p>

5.2: Discussion

5.1 Implementation strategies significant for water pollution control.

In order for all central governments, local governments, Organizations and the civil societies to have a significant implementation of water pollution policy, the following strategies are suggested based on the findings of the study.

- The governments at all levels should be committed to implement the water pollution policies. As demonstrated by Richard (2007) water pollution management is the responsibility of the government whose purpose is to protect the environment for the betterment of the public (Richard, 2007).
- Allocation of financial resources by the central government is of great concern in order to ease the implementation of water pollution policy as part of their annual budget; as illustrated by (Lodh, 2001), Japan has spent Yen 50 billion per year (0.9 of its GDP) on water pollution control. This has helped in minimizing the level of water pollution in the country. As illustrated by the World Bank (2007), China also allocated large amount of

money in the area of environmental protection investment; approximately 3% of its GDP was assigned to fix according to the plan in water pollution prevention.

- Participation is important for local government, the stakeholders, the international organizations, the civil societies and the public to strengthen the implementation of water pollution policy. As stated by Nicholas (1985) the participation of the public has contributed in the success of policy implementation in Japan. Public attitudes have a great role in the formulation and implementation of effective water pollution policies. He further stated that, most of the Japanese public is cooperating in one way or the other with the government in the implementation of environmental laws.
- It's suggestive for all governments in all levels to formulate a strict legislative system that abolishes the industries, agriculturalist and other companies from polluting the environment. Other nations are recommended to emulate Japan as an example of a country with strong legislative system; typical in the solidness of regional and local government which has helped in the development of environmental pollution measures (Nobuko, 1993).

- The use of science and technology is necessary to minimize the waste water; therefore governments are recommended to implement the cleaner technology system. For instance, Zhang (2007) highlighted that China was able to shut down 15 heavy polluting industries in order to minimize redundant production capacities 43,000 small coal mines, 3069 small cement kilns to promote cleaner production (Zhang, 2007).
- Cooperation between the government and the operating industries is necessary. Japan is an active player in international environmental cooperation. It has given more importance to regional and bilateral cooperation in the Asian region. (OECD 2010)
- The issue of environmental education is of great concern given that many people have failed to recognize the importance of environmental protection; the government should conduct training, seminars and educate the public as well as the working staffs. (Kunmin, 2000) also added that environmental education is considered as one of the means to improve the degree of civil morality, science and culture. It will also help the public to play a major role in environment control and decision making.

- The creation of public awareness through various media in many settings has aided public understanding about the importance of environmental protection. Public awareness as demonstrated by (Kraeme, 2001) was the most important factor that contributed to the success of water management in Japan. Therefore, it is imperative that various mechanisms be put in place for effective implementation of all policies, with support from the public in particular.
- The government should have a solid legal framework, establishing all the necessary institutions that will ease the implementation of the laid policies. For instance, the central government of China has established nine institutions; their involvement could help in easy implementation of the existing water pollution laws/policies. Their responsibilities were well defined working under the department of environmental protection (World Bank, 2007).

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Concluding summary

Water is an important resource which all humans and other micro-organisms depend on worldwide. Without water it's hard to live. According to (UN 2004) Water is essential for life, people, animals and plants to live and grow. Water is essential, its use for many activities such as industrial, agricultural, hydro electricity, drinking, washing etc. So it's of great importance to preserve, protect, and sustain it for the coming generation, water security becomes so necessary.

Water pollution is considered as one of the major environmental problems in the World. As stated by (Chiras, 2006) 'Water pollution is any physical or chemical change in water that adversely affects organisms but the types of pollution vary according to a country's level of development'.

There are water pollution policies which exist in many countries across the globe, but the issue of implementation remains the major challenge. These challenges have been successfully dealt with by Japan and China. One of the lessons learned was that, both governments were committed to water pollution management

Japan and China has shown their power and experiences in controlling water pollution through different measures and tools, some of the important tools were: strong established institutions; strict legislation system; adequate allocation of financial resources; awareness creation; and the innovation of science and technology.

On the whole, we can say that even though some countries have better experienced in preventing and controlling water pollution, it still remains one of the major challenges in many developing countries. Water pollution and other environmental disorders will continue to be a major threat in the world if the above policies are not understood, applied and implemented effectively. Developing countries such as South Sudan can learn from Japan and China about the way they manage water pollution.

6.2 General Recommendations

To have a successful implementation of environmental and water pollution policy the following recommendations are necessary to all developing countries and south Sudan in particular.

The Government: All governments should create policies that are more easier to be implemented and understood by the general public. they should support these policies technically and financially by allocating reasonable resources and deploy competent personnel along the water sources such as the Rivers, lakes, reservoirs, wells etc. so that the water quality and sustainability will be maintained.

Awareness and sensitization: The central government, local government, civil societies organizations and the private sectors in particular the ministry of environment and water resource should sensitize the population about water pollution policy on better management system.. There should be a public awareness with the participation of the public and it can be introduce through the National TV, Radios and other private media.

Training and education: The people should be educated to understand what water pollution is and what affects it may cause and also how to implement the existing water pollution policies in a precise manner. The local staff at all levels of the government should be given training and capacity building to help them in the process of water pollution management.

Participation and cooperation: The central government especially the ministry of environment should encourage active participation of the local community, the private sector and the

stakeholders in the process of implementation of water pollution policy; it should be a collective responsibility so that they will achieve their goals.

Monitoring: The ministry of environment and water resources should establish an independent institution that can monitor users and polluters, there should be a network of monitors along the water sources to see what is happening and later report it to the management body in case of any waste dumping in the river, lake, reservoir etc. The monitoring should be regular, awareness creation about benefits of improved water management and ensuring compliance with the legal frameworks.

Cleaner production: The economic and trade commission should promote the cleaner production policies. The operating industries should be given a condition of market economy; all the industries should promote new technologies and new equipments that have less impact on the environment.

Policy Advocacy and governance:

Formulating policies and applying instruments to encourage the sustainability of water use and consumption remain one of the main challenges in industrialized and developing countries.

Therefore it's of great concern to include water in the national policies of each government.

There should be strict laws that combat corruption in the water sector especially in the developing countries where there is an ineffective implementation of protection policies.

Policy formulation and decision making for water pollution prevention should be clear and transparent for the public. (R.Andreas Kraeme 2001)

Financial resources: The governments should allocate enough financial resources in water pollution sectors. The governments, donors and NGOs, local and international private sectors and water user associations should work in collaboration with each other to improve the utilization of funds. The governments should increase their powers and budgets for environmental enforcement.

Legal Reform: provision of legal procedures is of great concern in minimizing the level of pollution. Water pollution should be made a punishable offence. The legal basis should be a priority to all governments where no one violates it.

Integrated water resources management: The integrated water resource management can be successful if the legal and institutional blocks between different sectors are removed. The branches and authorities of the government who are responsible for water policy sector including the water pollution control should be organized and well coordinated.(R.Andreas Kraeme 2001)

Technology: The use of high technology should be encouraged in the developing countries.

Regarding water pollution technology transfer, it should be culturally and locally adapted, especially technologies for sewage treatment. Each technology which is applied should be specifically adapted to the people's socio cultural background. (R.Andreas Kraeme 2001)

Information and capacity building: Governments and international organizations should form some mechanisms for data collection and information gathering. The local communities should be empowered and be involved in the design and implementation of rural and urban water programs. Women especially in the developing countries should have access to information and training on how to improve water pollution prevention at the community and household level. (R.Andreas Kraeme 2001)

International intervention: The government should borrow some ideas from other developed countries that are well experienced in the field of water pollution control/management like China, USA and Japan and apply them in their policy system. They should allow the intervention of international community where ever necessary

Reference

Akira Hibiki (2003) Environmental Policies and firm level management practices in Japan, Toshi

H. Arimur, Sophia University. Tokyo

Atherton M. D. (1993) *.Strategy implementation. Closing the implementation*

*gap*ADB .(2001).*Changes and Challenges. Asian environmental outlook (2001)*, Retrieved on 16/6/2011. Manila.

Brian Hogwood (1984) Policy analysis

Caddy J. (1997).Closing the implementation gap in central Europe environmental policy.

Cech T.v (2003) Principles of water resources.

Daniel D. Chiras. (2006). Environmental Science.: Jones and Barlett , Seventh Edition Colorado, USA.

Gossum P.V. (2008). Forest Policy and economics. Peter van 2008. Belgium.

Gonhegue Z. R. (2011). Asia and the Pacific China. Zhou. 2011, Beijing.

Global water Security. (2010) Water for life. Community water security. The Royal academy of engineering, 3 Carlton house Terrace .London

Hespano R. h (1997) *Water pollution control .A guide to the use of water quality management principles*. Richard Helmer 1997.

Iwasaki H. (1999). *Overcoming pollution in Japan and lesson learn*. Ministry of Environment (MOEJ) Japan.

Irvan Schwartz (1966) Environmental protection, published 2001 by *American institute*. USA

Kifferstein D K. (1996). Water pollution. Water pollution and Society. *American college*, USA

Kraeme A (2001) *Protecting water resources*

Liberia .(2003). *Public health and environmental protection*. Liberian Government 2003.

Monrovia

Lovrich N. P. (1985).*Water pollution Control in democratic societies*.

Maria Fe. V. (1998). *Introduction to public policies and program*. the University of Philippines,

Manila.

Muller Nicholas. (2007). *Measuring the damages of air*

Midori T.(2010). *Japan's environmental policy*. Department of environment. Tokyo.

Nd: *China government policies of pollution prevention. Report by the central government of China. Beijing*

Omer Abdulrahim.(2007).*Effect of Khartoum city for water quality of river Nile*. Linkoping University, Sweden.

Pressman, Jeffrey L. (1973).*Policy implementation, Pressman, California*.

Ruskefsky .(1990). *Public policy in United States , Ruskefsky, Washington*.

Ruilin Z. K. (1992). *A course in china environmental law. Beijing*.

Sabatier M. A. (1993). *Policy Change and learning , Jenkins Smith Hank*.

Shinji Kaneko.(2004). *Environmental productivity in China . Shunsuke Managi . Tokyo*.

Seungho Lee (2006) *China's water policy challenges*. United Kingdom, available at www.ChinaPolicyInstitute.com

Tord Kjellstrom .(2006). *Disease control priorities in developing countries. Second edition. World Bank (2006) Washington*.

United Nations. (2010). *Water issues: contributing to the success of the eighteen and nineteen sessions of the commission on sustainable development*. United Nations, Available at www.UNwater.org

UNDP. (2010). *water governance for poverty reduction*. UNDP, New York, NY 10017.

USEPA (1993) Compilation of ground water modules. EPA may. 1993.

United Nations global compact (2010) *Guide to responsible business engagement with water policies*.

Van meter and V. Horn .(1975). *The policy implementation process*. Published by Sage, and available at <http://aas.sagepub.com>

Weller R.P (2001) *Environmental cultures and policy implementation in China*. retrieved in may, 2011.

Zhou X.(2009). *Water pollution in China, review of laws, regulations, policies and their implementation*. China

Zhang K. (2001). *Policies and actions on sustainable development in China*. American Asia review, New York.