

CLIMATE CHANGE A REAL THREAT ON IRAQ AND THE MIDDLE EAST

By

Mushab, Afteham, Al-Janabi

THESIS

Submitted to

KDI School of Public Policy and Management

in partial fulfillment of the requirements

for the degree of

MASTER OF PUBLIC POLICY

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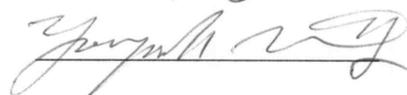
MASTER OF PUBLIC POLICY

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Abstracts

Climate change is a common term now and everyone knows even a little bit about it. These two words are simple in terms of the theory but it is huge in the reality. The world as a entirety is facing this problem, even if it is caused more by some of us, but it affects all of us.

This study will go over the worldwide problem by explain the impacts of climate change on the economic sectors, and the threat on all fields. The second step is to look close at the Iraq case. Does it have any bad involving on the economy, if so? When, how and how much it affect the economy there? And does it affect it really or it's over reacted words.

All this will be answered by using many scientific and theoretical opinions from the parties involved in these issues. Such as the studies provide from different sectors shows some damage attribute to new phenomena in the weather.

TABLE OF CONTENTS

1 .Chapter one: Introduction -----	6
Purpose of study-----	8
Limitation -----	9
Significance-----	10
Chapter two: Literature Review -----	10
Introduction-----	10
Background Information on Problem-----	11
The stakeholders-----	14
Iraq case-----	17
Research questions-----	19
Conclusion-----	19
3. Chapter three: Methodology-----	21
Introduction-----	21
Research Design-----	22
Source of information-----	22
Analysis of information-----	22
Conclusion-----	23
4. Chapter four: Research question-----	24
Sector's highlight-----	26
Land and water resource -----	26
Public health -----	27
Agriculture-----	28
5- Chapter five: recommendations-----	43
6. References-----	49

LIST OF TABLES

1. Agricultural outcomes for exporting corps	33
2. Water share of the total recourse for Tigris River	38
3. The percentage of the outcomes for the two rivers	39
4. Food and water vector-borne disease in Iraq	41

Acknowledgement

In a short word I carry with me all the hearts that beating for me,

KDI library: the place that I love the most

My professors; they were like a stars in my sky, make them my leading point,

My family; Mother, brothers, and sisters who smile in my face while they facing death back home, their mighty faces

My friend, who gives me a motivation to go, feed me with love.

Korea; the country, who believes in me and gives me a big chance,

For all this and more give with love my efforts.

Afteham,

List of graphs

- | | | |
|----|---|----|
| 1. | Simple idea of what is GHG greenhouse effect | 14 |
| 2. | Variations of the Earth's surface temperature during the last 140 years | 18 |

Definition of Terms and Acronyms

The SFCCD (strategic framework for climate change and development)

(IPCC): Intergovernmental panel for climate change

(AFP): Agency France-press

(GATT): the general agreement on trade and tariff

(MOA): the ministry of agriculture

(MWR): the ministry of water resource

(MOH): the ministry of health.

(IAI): Iraqi atmospheric institute

(FAO): Food and Agriculture Organization, UN

-Chapter 1:-Introduction:

Proving Climate change as a fact, it is an argument has a long history, but ultimately all agree that the earth atmosphere has been changing in a sensible way, and it is clear through the increase of temperature, odd weather events, and shortage of rain, Lacking of river levels, and rising of sea levels. All those together, scientists give it a name known as “climate change”. So climate change is what? Climate change it is “any change in climate over time, whether due to natural variability or as a result of human activity.”¹.

How can this changes be measured, there is some variables to find out that. Attentiveness of greenhouse gases, as well as carbon dioxide, methane, nitrous oxide , fluorinated gases , and water vapor, such as hydrofluoric carbons, per fluorocarbons, and sulfur hexafluoride, in the Atmosphere are fundamental for life to exist on Earth². Climate change is one of the significant global challenges of our time, and addressing it requires the urgent formulation of comprehensive and effective policy responses.

Climate change affects nearly every sector of the world’s economy and with other major environmental threats such as population growth, desertification and land degradation, air and water pollution, loss of biodiversity, and deforestation.

⁽¹⁾U.S. Government Accountability Office (GAO) report, “Financial Risks to Federal and Private Insurers Coming Decades are Potentially Significant,” March 2007, p.2 (based on IPCC definition), available at: <http://www.gao.gov/new.items/d07285.pdf>.

⁽²⁾U.S. Environmental Protection Agency (EPA), “Climate Change, Greenhouse Gas Overview,” available at: <http://www.epa.gov/climatechange/emissions/index.html>.

To date, most of the international attention directed toward combating climate change has been strikingly insufficient and focusing primarily on the industrial and energy sectors. Rather than The agriculture, forestry, and other land user sector. the number of the people who was against before , now they admit this truth and this numbers more and growing every day. It is a very hot issue for everyone. And it has a good impact if it is used to influence the people and get their attention from different side.

Climate change has many wings such as the scientific, humanistic, economical, and political. Instead of starting with the climate change and working out toward impacts, this paper will not attempt to figure out if there is climate change or not but simply acknowledge it, and study the other side which the effects of it on the shareholders and then consider what the geophysics of climate change may do to them.

This approach has two benefits. First, it limits the number of logical steps necessary for thinking about the impacts of climate change. Second, it cuts across directly to give a new framework for thinking about what climate change, based on studies, will mean for their present and future, based on studies that are already preformed .The climate change is a real and growing problem for the entire world.

However, Iraq is a different case or situation because the Iraqi government does not care about this and Iraq is also having serious conflicts which are more important than climate change for Iraqis to be considered. At the same time there are many individual studies about the main factors to prove the change in the climate, the increase of temperature and the decrease of rain levels. As a result for the decrease of rain, the Iraqi government has collaboratively started a new

project with AL-MSTANSEREA University to seed the clouds (artificial rain)⁽³⁾ aiming to have more rain in order to improve the agricultural sector. This project was successful but it did not last long due to the lack of finance and the project was ended because the government and the public did not think it is a serious problem comparing to the problems that Iraq is having now. Agriculture outcomes (food supply), the water resources (the two rivers), the air pollution and others will be used as separate resources for each part, and one more time, not to prove the climate change existence because we agree there is climate change in the whole world, and looking for it is effects on the economic growth and the productivity of the people, by comparing between two different outcomes with different times for like the last two decades or more,

-The purpose of study

Climate change has become one of the most heavily researched subjects in science, as many as the humanity research, and that really proves climate change is a serious topic. That is why Iraq should join the global efforts against the climate change as a part of the world. To start anything in the right way, it should be first addressing the problem and then putting plans or policies to solve it. Yet the study of the impacts of climate change remains very low as those policy makers think it is not useful for them. They are not accurately predictive to be actionable against it, and they, in turn, spend on wars while spending on wars for one year is more than spending on this issue for ten years. On the other hand they make this issue even worse by creating wars, so they pay to pollute the weather not the opposite.

(3) Iraqi atmospheric institute report (IAI) “the project proposal by Mustansrea Univ. clouds seeding, March, 2005~2007” GOV data base

So how we can change their ideas? Or how can we prove to them our ideas before they become serious? Anyway, this is not the main purpose for this research paper; it is only raised to demonstrate that problems of climate change around the world are the same. Nevertheless, we should learn from the European heat wave that killed thousands of people which was caused by global warming, stated by many scientists..This shows that we are still vulnerable to those types of direct effects.

The main purpose of this paper is to highlight the sectors that have been damaged climate change, provide some kinds of policy or conclusions after accepting the fact of climate change, help to communicate the effects of climate change worldwide, and learn from what happened concerning climate change globally. It will be a big challenge for this kind of study in Iraq because it needs to create new policy to deal with such effects in which the government thinks it is not important to waste time as it is not dangerous. This issue will catch attentions of some academicians only, especially those who are familiar with this kind of problem. So this study will focus on suggesting any exhortation as a stepping-stone for dealing with climate change and be ready to fight for change by implementing our own parts.

-Limitation

This research paper has its own limitation as it is impossible to get the real budget of Iraqi government due to confidential reasons and I also could not dive into any Iraqi case regarding climate change because this issue is not concerned. Equally important, lacking of data and information may negatively affect the result though I can find some information.

-Significance

The new proposal that will be given by this study is the comprehensive policy that will be a try to solve some of a problem that has destroys many efforts of the normal people and the specialists' ones. That problem is not addressed yet in a country like Iraq, and going throw many bad and critical situations for the last three decades. Providing one policy to deal with the linked problems, in one hand to each other, and in other hand linked to the economy.

-Chapter 2: Literature review;

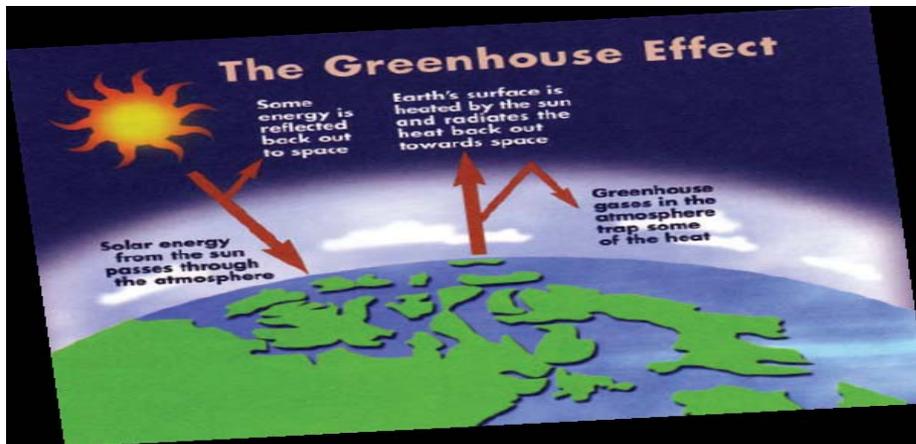
First; the introduction, Second; the background of the climate change and global warming, briefly explain this big issue which intervene in the important economic concerns, Third; theoretical background, the global divided in two groups; (with and against). Some believe there is global warming, and some say it is just an overreaction about normal and small changing in the temperatures. Fourth; synthesis; In this thesis the research and the studies from two big international bodies work on similar subjects, like World Bank, which provide study about Climate change impacts directly on the World Bank's mission of poverty reduction, the *SFCCD* (strategic framework for climate change and development) it also provided some of similar studies on the climate change impacts on the economic and the humans wrights and what the good way to save our plant from impendent disaster, finally the conclusion

-Introduction;

The back ground; what is the climate change? The term climate change is often used interchangeably with the term global warming, but according to the National Academy of Sciences, "the phrase 'climate change' is growing in preferred use to 'global warming' because it helps convey that there are [other] changes in addition to rising temperatures."

And here is the simple explanation for the global warming; the solar radiations in form of light comes to the earth, passing through the atmosphere and that waves heat up the earth, this radiation is fairly constant. This radiation comes like a short wave, 30%of it reflected back to the space by clouds, atmospheric aerosols and bright, reflective areas of the Earth's surface, such as deserts. The remaining 70% of the incoming radiation to be absorbed by lands and oceans, normally it will warm it up and some of it back to the space by earth in the form of infrared waves and some of the outgoing infrared radiations is trapped by the layer of the atmosphere and hold inside the atmosphere, that's basically it's a good thing, because it keeps the atmosphere of the earth within certain boundaries, keep it relatively constant and livable. But the problem is this layer which is originally thin; this layer of the atmosphere is being thickened by all of the global warming pollution has been put up there, and what that dose is it thicken this layer of atmosphere, more of the outgoing infrared is trapped, so the atmosphere heats up. But in a simple idea it's like this;

Graph (1): simple idea of what is GHG greenhouse effect



Sources: government of Canada climate change website”

This global warming it is the main reason for the climate change or it is the same. For many people the climate change is has a big harm on the whole humanity in all perspectives, for some it is more harmful than the terrorism, it might be even more dangerous. “Climate change is the most severe problem that we are facing today-more serious even than the threat of terrorism” (King, 2004)⁽⁴⁾

The theoretical back ground

Climate change may(or may not) be a central issue for the world economy for the last years, and the melting of the ice caps, rising sea levels and extreme weather patterns aren't the only potential consequences of climate change

(4) (Sir David King,(2004)“Climate change science: Adapt, mitigate, or ignore? *Science*. 303. 176-7. August 16, 2009, available on: <http://www.commondreams.org/headlines04/0109-02.htm>

There is no debate on the huge impact on the economic growth and vice versa. Scientists are warning that changes in global climate may also endanger public health by increasing the spread of diseases and other health problems.

There are many scales for measuring the change in the climate (temperature, precipitation, sea level). To understand these effects, one can distinguish two possible ways high temperature could affect economic activity: first, involving in the intensity of output, for example by affecting agricultural surrenders, and two, involving economy's ability to grow, for example by affecting investments or society that influence productivity growth. In some places climate change cost lives, millions killed because of flood water or because of lack of water, high temperature or low temperature.

This paper takes descriptive approach. Rather than identifying mechanisms one-by-one and summing up, we examine the effects of temperature and precipitation on a single aggregate measure: economic growth. Specifically, there are many results show large, negative effects of higher temperatures on growth, but only in poor countries.

Climate change may result from: Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit (natural processes), *or*, Human activities that change the atmosphere's composition, it may affect the whole human life on the long term by expecting a real disasters and the life on this planet will be impossible (as most of the scientists say in their research)

-The stakeholders

-The first holder is the authority (governments) that will take an action agent the climate change in each era. And make the decision to start reducing the gas emissions.

-The World Bank: Why is the World Bank involved in climate change?

According to the World Bank reports, they are facing difficulties in the poverty reduction and attack the health problems and combating malaria and other diseases, child mortality, around the conflicts and poor countries and low income society, and achieve the sustainable development, all because of the climate change which make their goals far and away. "Climate change is clearly a development issue with severe socioeconomic implications, particularly in developing countries", (World Bank Group SFCCD, 2008)⁵

There are many studies talking about the impacts of climate change on diverse spots around the world from many angles' humanity, economics and scientific perspectives. These studies represent the impact of the climate and the strategies that need global efforts not individuals in the same time the biggest powers in the world have more responsibilities than other, why?1

Simply because they produce the lion share of this green gas emission in the world, which is the main cause of the global warming in the world, the US should take to start dealing with the climate change and the global warming affects on the economic growth in all the countries generally and in the US especially, as well encourage other nations to do the same.

-The SFCCD (strategy framework for climate change and development), so what is the SFCCD? The Strategic Framework on Climate Change and Development (SFCCD), It is a strategy being established by the world bank, it is a strategy that developed by the World Bank Group as a way to deal with development challenges in the background of climate change. The SFCCD will

(5) World Bank Group SFCCD, environment and climate change ,2008

cover activities in different sectors, like transport, urban development, water, energy, agriculture, forestry, industry, economic policy, and public protection, given the development and economic significance of climate change. Almost all of research from the SFCCD focusing on the real impacts of climate change on economic growth and dealing with the policy of the developing countries which have a problem to hurt the worldwide to deal with expected disaster.

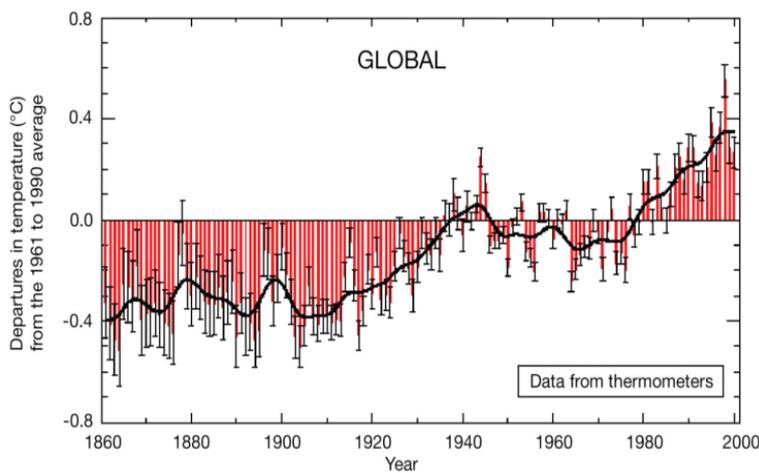
The US government already has taken action about it by putting a climate change technology. This technology means the adoption of measures to control the polluting activities in the US first and in the world next. As the US share from the gas emission it is 25% from the total green house gas (GHG) emission in the world.

The conclusions depend on a range of statements together with some other things like the efficiency or inefficiency of the monitoring responses to energy price signals, the accessibility of less carbon “backstop” energy techniques, the way that the countries can trade least-cost alternatives for carbon dioxide reduction, how to deal with the revenues from carbon fuel’s taxes which used to inferior other taxes, and outer settlement of reducing carbon dioxide, together with reducing the air pollution in the ground levels are considered as one of the threats. These concerns are the main pillars for the new technology. Addressing the climate change problems and but the correct strategy is the only way to deal with it. This approach cannot fully overcome these challenges; as there will be further evolution for the long term climate effects. and that’s mean’s global land temperatures have risen nearly 1°C since 1970 (Brohan et al. 2006)⁽⁶⁾²but countries have not warmed equally. Therefore, there are many ways to study the climate change

² (6) Brohan, P., J.J. Kennedy, I. Harris, S.F.B. Tett and P.D. Jones, 2006 Uncertainty estimates in regional and global observed temperature changes: a new dataset from 1850, *J. Geophysical Research* **111**

in different sides such as; Economics of climate change, Studies of Global Climate Change, study the Long and the short term ecological Effects. The attentiveness of (GHG) in the atmosphere now days is higher than it has been for the last 650,000 years* .For showing the increase in the world temperature,

Graph (2): Variations of the Earth's surface temperature during the last 140 years (1860~2000).



Source: IPCC 2001, p, 263

-Iraq and the Climate Change issues

The environment in Iraq suffers a lot through the last years, from delinquency for many reasons we will not go through it all. The most important two is reparative functioning it was high level political decision was always be difficult (or) and impossible for the environmental authority to take, to fix real circumstance admission new concepts. That's leads the infrastructure with the time be inferior year after year. Within times it was critical for the world in terms of the

climate problems and the growing population, where the populations become four times more in the beginning of the 21 century. And mess located, haphazard immigration to the cities, where a report of the ministry of planning shows more than 80% from the population located in the big cities like Baghdad, Basra and Mosel in the year 2000 (MOP 2007)⁷. That makes the mission more difficult to keep the good and efficient healthy drain system in these cities.

And missing the efficient environmental policies and urban planning, there is not really low to decide which and where the areas are protected by the environmental law from the construction crawling or contamination. Where many industrial facilities and encampments been build on exuberance lands, without any care or responsibilities about the environment health from any authority. On another hand from the Iraq side of the problem, some time ago some countries claimed that Iraq as a oil exporter to all the world its participant in the climate change in the world In the period of the Iraq-Iran war, and for now Iraq has taken its first step for enter or flowing the international efforts to fight climate change in the worldwide.

That started in Jan 23, 2008, when the Iraq presidential council approved the law on Iraq's accession to United Nations Framework Convention on climate change, known as the Kyoto protocol. The goal for these according to the (AFP 2008)⁽⁸⁾ is to join Iraq's participation to the international community to stabilize (GHG) in the atmosphere at a stage that avoids risks anthropogenic intrusion with the climate change system, as well as adherence to a level to all United Nation conventions and networking with the international community.

(7), Iraq, Ministry of planning, "statistical data for the annual human report, 2007" ministry data base, Baghdad, 2007,

(8) (AFP): Agency France-press

For the Iraq case this paper will take some of the prove research which finds that the climate was changed and affected the economy in many ways (agriculture, water resources, the precipitation, the forests, and ecosystem)

“ Climate change may have additional long-run effects, like changes in water tables, soil quality, and sea level, producing larger impacts” (IPCC, 2007)⁽⁹⁾although higher temperatures give agricultural outcomes in poor countries bad impacts , it is also lead to contraction in industrial output and aggregate investment and to increased political instability.

These outcomes underline technique that’s showed the interrelation between the economy and climate. And also many result showed that with the time going the gab will be bigger between the rich and poor countries, so far many countries go toward poverty because of the bad conditions of climate, “other things equal. Further work is needed to identify precise causal mechanisms. This paper suggests such analysis is of first-order importance, as the economic effects in poor countries appear large” (Dell & Olken, 2008)⁽¹⁰⁾

4-Research questions

- 1- What are the sectors that affects by climate change in Iraq?
- 2- How climate change effect this sectors (industry, electricity, agriculture)
- 3- How to get over these bad impacts

⁽⁹⁾ (IPCC): Intergovernmental panel for climate change

^{4 (10)}(Dell & Olken) CLIMATE CHANGE AND ECONOMIC GROWTH: EVIDENCE FROM THE LAST HALF CENTURY, NATIONAL BUREAU OF ECONOMIC RESEARCH 1050 Massachusetts Avenue Cambridge, MA 02138 June 2008,

This paper will focus on some of these questions which is directly related to the Iraq's case, in other words, will take more attention than the others

-Conclusion

The climate change is an actual and growing problem for the entire world. As urgency around the issue continues to grow, so too does the scientific consensus that changes to Earth's climate will enormously affect the planet's future and the future of all who inhabit it. So we need to look closely and carefully for a quick action against it,

Anthropogenic climate change is now generally measured to likely not just to cause huge differences in the weather conditions, but also to make major cut-offs in many complex normal and individual systems, such as ecosystems, economies, human resolution, and even political foundation.

The last few years or during all the last two decades climate change turned out to be one of the most researched subjects in many fields. Still, climate change impact studies at the low end of utility for policymakers, they are not prognostic enough to do a real change because of the correct nature of the events that will hit the planet for long and short term the where's, when's, and how's of climate change still both unknown and unknowable.

Instead of starting with the climate change and working out through its impacts, we focus on that are by now generally susceptible first, and then believe what the geophysics of climate change could affect it. Through that we can get some benefits like limit to number of logical steps essential for finding out the impacts of climate change, allow more confident approaching and conclusion.

And it cuts across analytic stovepipes and gives local specialists a structure for thinking about what climate change will mean for their particular areas, based on expertise they already have.

We are not convinced that there is sufficient public awareness of this issue. Any public misperception on these issues could threaten the political feasibility of getting plans of action put into effect. If climate change is as serious as most scientists claim, and as the Government accepts, then it is important to convey the complementary message that the action to tackle it will also have to be serious and potentially life-changing. It is better to be honest now than to shield the public from the economic realities inherent in the more pessimistic forecasts. Using what appointed already that get effected by changing the climate in Iraq as a case study, this study will provide a technique policy to deal with that what effecting the economic sectors subject of research here, as recommendations .

Chapter 3: Methodology

-Introductions

The Methodology chapter will show how this paper sizes up the big changing in the environment, water resource precipitation (rain) and rivers levels. Flowing with the design for the research which prevail on it both qualitative and quantitative methods. To explain what kind of data it uses, the validity and reliability will be ahead of the last part which is the conclusion.

-Research design

The goals for this paper are to give the right answer for the questions or even give the most nearest solutions. This study chose to depend on other studies to show the effects of the climate change in Iraq rather than do a study to prove that, for two reasons. First; there is no debate on there is climate change in the whole world. Second this definitely will need a scientific model to prove it and it is so far from the public policy. in the same time this issue it take good attentions in the world hot issue map beside the financial crisis and the poverty and other things. So it is good to strike it. The main approach is qualitative more than quantitative design. We take the data it is already settled from credible sources, and analysis this information according to other similar cases, and liking this information make it serve one aim. And start a policy to serve this aim.

-Sources of information

The efficient way to prove your point and to get the validity is to depend on the official documents. The data will come from some previous studies. The world bank is also one of the resources for worldwide information, along with *The SFCCD* (strategy framework for climate change and development), The ministry of the water resources in Iraq, The ministry of the agriculture also in Baghdad, and the public institution of the atmospheric in Baghdad, internet websites information's, This data will be compared by the time for the following items. The agriculture products during two decades or more for the same area, the levels of the rain in the areas that depend on the rain in irrigation, the levels for the two rivers for the same two decades.

For all that, the policy that will be providing to the government it will be supported by many parties scientific and theoretical evidence.

-Analysis of information:

The climate change and global warming in the world has many sides' effects. To analyze this data in this study, starting with some researches, worked on the same issue in Iraq, and fit them to this purpose. These ideas will be backed up with the international bodies' findings as well as the analyzed data to find out the substantial evidence to make the policy this study will provide. This paper will first get the problem from wide scope and then start to narrow it down to get to the Iraqi case, so the national information serves the global problem. In the same criteria, the regional information serves the regional problem. The international policy to deal with the problem will be the lessons that can be drawn from the regional one.

-Validity and Reliability:

This study will use the government official documents and data base in Iraq. These official papers will provide the needed information about how the government deals with this problem. In addition, it uses the research papers from the international bodies. These are considered as the foundation information providers in the world. The thesis and the intellectual studies supply the same purpose. so the academic studies , the international institutes , government documents , books for some authors, and facts advocated by scientific opinions, will all improves the credibility and the reliability for this study, to reach the international standards. This study will depend on the international facts, factors and measures. By following the same path to reach the same goal which is prove the dangers of climate change and global warming on our lives.

-Conclusions:

This study will make an effort to change the government policies in order to reduce impacts of climate change on human health and the environment through reduced or at least improved the methods to deal with it, and it is not a simple task. There are a series of influential actors that display complex relations within themselves. In the same time targeting this issue will have some an acceptance from many sides, especially Iraq and the whole world interring a new and critical situation through the war against terrorism, so the general idea about the climate is much more less importance than terrorism,

Nevertheless, this study managing to identify some elements of approaches to agriculture and some economic policies that potentially reduces negative side-effects from climate change at least in some area in Iraq. , The resulting policy conclusions take into shown in a country case study and the possible future development that could have an impact on economy policies. The government also has provided concrete example of specific policies and programs, some of this experience under specific needs. The policy will conclusion later are based on analytical results and aim at promoting environmental and economic sustainability. *

-Chapter four: Research questions

Global warming is at the present become unarguable generally agreed to be inevitable, though there many differing assessments as to how much temperatures will rise and at what speed. All countries are now urgently examining the potential impact of climate change on their water situation and on society as a whole. The Middle East, like other regions, needs to urgently examine the way in which potential change may affect its present and future water supply and this in turn means examining the inter-relationship between climate variations, water supply,

land use, economic planning and demographic change. Such questions cannot be dealt with on the basis of national interest only but demand cross-border and cross-disciplinary cooperation.

Looking for solutions for the problems which climate change may cause in relation to water can best be achieved by integrated management plans, focusing not only on technical matters but on the interrelationship of water systems with land use, climate and the environment. The conference invites researchers to contribute to an assessment of the likely impact of climate change on water supply and identify synergies in their approach to the problems to be faced. Significant decisions have to be taken which require well based interdisciplinary research, the results of which must be made available to decision makers in time for them to act effectively.

Climate change is likely to act as a 'multiplies threat' exacerbating water shortage and problems over water within and among countries sharing water resources, geography, and linked by political borders(Iraq, Syria, turkey) Poor and weak populations, that live in major statistics all the way through the county, will be more threaten by lack of water , which it lead to mass migration to the cities, the root of this problem in Iraq returning to the early 70s. when it start to show off it is ugly face, and it make working in agriculture seems to be a not really worthwhile, and that's when start the random immigrant to the cities.

Climate change might damage the region's water supply. The impacts of Climate change on water in the Middle East plus less precipitation caused water shortages; extreme weather events, such as drought and floods; and rising sea levels.

So what comes in to mind that few questions about this?

1- What are the sectors that affects by climate change in Iraq?

2- How climate change effect this sectors (industry, electricity, agriculture)

3- How to get over these bad impacts

-Sector Highlight: Agriculture

Agriculture for all regions provides food stability, specially for the poor nations. It is the most fundamental needs for any people, and having system well enough to make this mission much easy for the governments.

In Iraq as well as around the world suffer from the bad or the big changing in the weather through the last decades, in Iraq this case was a nightmare for many farmers makes them lose the hope of having their old jobs that's the only thing they do long-lived. Because the life cycle for the crops will likely to changes more rapidly, and face more failures. High temperature will decrease cattle production through the hot seasons. That affects the whole income at least for this flake of society.

-Land Resources

The temperature and precipitation fluctuation will very likely to reduce the, plants cover that defends the soil ground from being destroyed by wind and erosion. Lack of rainfall very likely to hade it is bad effects on the quantity and the quality of corps,

-Water Resources

Iraq has a long history for the high quality lands from ever, especially in the two rivers basin and this good land it use to be the main source for the citizens daily live, or food security. Nevertheless, the problem now it is this source been threaten by a new weather patterns and other factors as well. That make the daily work and the yearly expectation for the farmers not so bright, as well as it is effect the total income for these farmers that make them looking around for more beneficiary living sources, which eventually lead to dislocate the citizen map.

-Public health

Public health in Iraq adds a big and heavy duty to the human resource losing besides loses in the unsecured situation, so the last 30 years, the case of having a new kind of illness and infections. In 2005 the ministry of health in Iraq announced around 5000 cholera case in the south, where the weather is more sever and the health situation is bad, where showed that 40% of the death in the youth is because of the extreme weather, like dust storm, heat waves, and the new species and diseases carriers.

-The effect of climate change on Agriculture, Land resources, Water resources and public health

This change is distressing every country climate, part of it Iraq, which is very probable to knowledge warming and changes to temporal and spatial patterns of precipitation over the next several decades. There is a strong scientific agreement that the Earth's climate has changed and it is keep changing according to our activities raise the attentiveness of greenhouse gases (GHG) in the atmosphere.

-Agriculture

The agriculture it is one of the most important parts, which provide the food supply. it one of the most important sectors which affected badly by climate change. Not just in Iraq but in all the Middle East at least, so for the according to the UN this problem affected the poor people in these countries. "As mentioned in a report by UN Food and Agriculture Organization (FAO), entitled Climate change, Implications for Agriculture in the Near East, has said the food security of those who are poor. Malnourished or dependent on local food production could be adversely affected by climate change. Climate change will affect food security in all its four dimensions -

food availability, food accessibility, food stability and food utilization” (Will Killmann, FAO, 2008) For Iraq’s government nightmare is the food security and consumer goods. and according to ministry of agriculture in Baghdad from the reports from 1970-2005 showed that the agriculture’s outcomes throw this three decades it is decline dramatically. Not only in the domestic consuming goods but also in the exports good (wheat, barley, corn, rice) and the most important export’s good (the date) which is alone making almost 40% from food production for export and for domestic products. Why it is declining. What are the reasons caused it? This is so tangled with other issues, which make it difficult to define these problems easily.

Shifts in rainfall patterns could affect crops, particularly rice, wheat, barley and other crops, in many countries in the region, said the FAO report, which has singled out Yemen as being particularly at risk because of its endemic poverty, rapidly growing population and acute water shortages. There is a study attentive that the big gap between a north with flow of water and dry need of water in the south. That made a Hugh unbalanced environment, all this could lead to highlight the circumstance of our situation, what the way to deal with it?

New developments technology, sharing of date effectively, facilitating cooperation between national and local authorities, all will have a part to play in helping to meet the challenge to be faced. Assessment of the present water scarcity of the Middle East leads to the question how long this problem exists, how it is related to climate and land use, how it was addressed by ancient societies, and what can be learned from this. Additionally, knowledge of the environmental history allows for better predictions of future developments and helps to clarify the interrelationship of climate, water systems and land use. The conference targets hydrologists,

geologists, meteorologists, soil scientists and land use specialists, but also archaeologists and historians investigating landscape archaeology and the environmental history.

To understand climate change impacts on every one of these sectors needs screening several features of climate and a wide range of natural and physical answers, In general, this scale could be in one way or another scientific. The way of observing his impacts” if there is any” it is the simple way to understand just by facilitate the results from studies having the same aims. Showing the climate change bad impacts, this system is reasonably able overall to monitor ecosystem change and health. To answer these questions let us go throw it systematically, first; what are the sectors that affects by climate change in the Iraq? Well, it is not easy to collect all this sectors and make sure we didn't left behind any, because not all the sectors it is been under study If we didn't study all this sectors we can't say for sure we did. So this study will highlight few of these sectors, the ones that have direct impact on people, according to the ministry of planning in Iraq(MOP) “the Iraq economic is facing many challenges and bad conditions such as the war which had the biggest impacts during the last American occupancy. However, in the same time, we cannot ignore totally other factor that helping with destroying the country's economic such as, the dramatic decrease in the water resources and the last one engaged with the agriculture and food security for the individuals. Moreover, the bad health conditions exude from the war activities and the extreme weather patterns during the last decades. What make it worse to address and solve it the careless from the governments and the e people's ignorance, so this study will focus on “Agriculture sector, Water resources and the public health” as important and effected badly by the extreme weather and all kind of pollution.

-The agriculture sector has special importance to the Iraqi economy and plays a fundamental role in providing foodstuff for the population. Since the start of time, agriculture has been the main economic incomes of the people of Iraq. In 1976, agriculture contributed about 8 percent of Iraq's total GDP,” U.S. Library of Congress (Iraq agriculture) ⁽¹¹⁾. Moreover, it was one of the earliest and most developed nations in the history, because it has the most fertile land and water resources. The agriculture, it is one of the most important parts that provide the food supply, It is the sectors which affected badly by climate change. Not just in Iraq but in all the Middle East at least. From the ancient time Iraq has very long history of abundant agricultural productivity. Iraq known as the “bread basket for the Middle East” the land and the water is the most plentiful ones in the Middle East region. From the plentiful land there more than 30% of it, it is suitable for plantation. Half of this good land it is fed by rain water and the other half by the very residential system of irrigation, which fed almost 3.5~ 4million hectares of agriculture land. Most of these water resources come from the two rivers stream,5 which around 77billions cubic meters. Both ways of irrigation with various Iraq’s climate zones, that’s give the most diverse agricultural productions in the region. In the north mainly is rain fed system, the main products basically wheat and barley. In the south and middle region that it is produce approximately 70%of the agricultural, it is mostly irrigation system in Tigris and Euphrates’s basin.

Iraq’s agricultural exports are mostly consisting of vegetables, fruits, dairy, meat and grain. And we cannot ignore the most important part which is the date, inasmuch Iraq is the biggest producer of the data in the world, Most of the Iraq’s neighbor’s country imports these diverse

(11): Helen Chapin Metz, ed. *Iraq: A Country Study*. Washington: GPO for the Library of Congress, 1988.

products. And according to the ministry of agriculture (Baghdad), this information has been changed in the last two decades. According to the UN reports this problem affected the poor people the most in these countries, that's because they have the so primary way to maintain their way to live, with their jobs as a farmers, According to the UN Food and Agriculture Organization (FAO). Entitled Climate change: Implications for Agriculture in the Near East, has said the food security of those who are poor, malnourished or dependent on local food production could be adversely affected by climate change. Climate change will affect food security in all its four dimensions - food availability, food accessibility, food stability and food utilization" (Will Killmann, FAO, 2008)*. For Iraq's government the nightmare is the food security and consumer goods. and according to ministry of agriculture in Baghdad from the reports from 1980-2005 showed that the agriculture's outcomes throw this three decades it is decline dramatically. Not only in the domestic consuming goods but also in the exports good (wheat, barley, corn, rice) and the most important export's good (the date) which is alone making almost 40% from food production for export.

(12)(Will Killmann, FAO, UN Food Agriculture organization, entitled Climate change, 2008)

Table (1) the outcomes of the important agricultural corps for 10 years.

Year	Irrigation system	Wheat	Barley	Date trees prod.	Total production (1000)tones
1997	Irrigation	2445	2320	98421	35467
	Rained	7022	1970		
1998	Irrigation	9889	2265	99740	36749
	Rained	4860	3234		
1999	Irrigation	82	27	94102	34616
	Rained	10934	2803		
2000	Irrigation	337	25	93154	36463
	Rained	10664	1902		
2001	Irrigation	9234	3287	90679	40194
	Rained	12960	5841		
2002	Irrigation	9894	5686	91947	42095
	Rained	16001	2648		
2003	Irrigation	6471	5188	86839	38292
	Rained	16821	3416		
2004	Irrigation	5234	3853	44838	20321
	Rained	13084	4201		
2005	Irrigation	4094	2685	40403	18284
	Rained	18190	4859		
2006	Irrigation	4864	24903	43236	22863
	Rained	17999	15668		
2007	Irrigation	3698	23838	39801	21028
	Rained	18330	16047		

Sources: ministry of agriculture, Baghdad. Annual report for the year2008

If we have a look on this table we can see easy how the dramatic decrease of the outcomes is effected badly, but we cannot say that's the climate change is the only factor that effect this , but we also have to admit other factors like the bad management and the efficient policy

The agriculture issues tangled with other issue that makes it difficult to define this problem. Which is also related to the climate deforming, like the Shifts in rainfall patterns it is affect the crops,

mainly rice, in many countries in the region, said the FAO report, with the rapidly growing population and climate change caused water shortages. And there are a many studies shows that the big gap between a north with flow of water and dray need of water in the south. That made a big unbalanced environment. All this possibly will lead to high light the event of our situation.

What the way to deal with it? Advances in technology, sharing of date efficiently, good collaboration between national and local authorities; all will have a role to do in helping to face up the challenges. The agricultural Statistics Dep. worked hard through its periodical and non-periodical work program by expanding its application base of agricultural Statistics and surveys to cover the different activities of the agricultural sector using many Statistical methods to provide recent Statistical data to depend on in the planning and developing process for this vital sector. This section includes data reflecting the activities of this sector through the cultivated areas, production of crops and vegetables, and detailed data on dates production, No. of fruit trees and its productions, No. of livestock and its productions, agricultural machinery and fishery. In addition to some indicators on agricultural land, land owner ship, agricultural service and loans .also publishing some important indicators from the results of the general agricultural enumeration of the year 2001. And this department they working on the most efficient way to overcome the big harm of the bad climate conditions by invest in inputs, new machinery and infrastructure there is great affects for development in the sector. Unfortunately all this efforts won't work well without a good planning, "MOA 2001".

Estimation of the present water shortage in the Middle East and Iraq specially, that's we could recognize the shortage in the water for two rivers. Which that may leads us to ask how long this problem exists; of cores it didn't start big. How it is related to climate and land use, how it was

addressed by earliest societies, and what can be learned from this. In addition, information of the ecological evidence allows for better forecasts of potential growth and helps to simplify the close relationship between climate and other sectors, such as water and lands resources. The hydrologists, geologists, meteorologists, soil scientists and land use specialists, but also archaeologists and historian's investigation for lands archaeology and the ecological record. All this basically showed a big difference in the outcomes of the agriculture productions last years as mentioned before, for example, the year 1980 shows a numbers it is almost two times more than the outcomes for the year 2000,

And the forest in Iraq it used to cover a big part almost all the mountains in the north. So for example, in 1970's this forest used to cover more than 1.85million hectares but after 1985 it is only covered 1.5 million hectares "MOA 2002". And nowadays all what can be seen is only separated forest of the oak trees I n the far-off area. Degradation of the forests in the north it is result of the fires out from the bad conditions of the climate and as well we cannot ignore the woodcutting there. All this caused decline and shrinking of the plant cover in the forest north of Iraq. And that have had bad impacts it has turn increased water wearing away causing rich lyre of the soil vanish more and more. If that is mean anything that means it could result of two reasons, bad climate conditions and bad techniques, This effect the quality and the quantity of the agriculture products.

- Water resources

The water quality, level of the two rivers spicily in the years from 1990~2005, Fluctuation in precipitations' levels in the same period at noticeable levels. Low amounts of icefall in the north part for same period, the marshland which it considers as the biggest wetland in the Middle East,

and The quality of the water. Water is live; man can live a few days without food but not without water. In fact the body needs at least 8 classes of water per day to function properly.

Three fourth of the earth is water, and 79.5% of this water is saltwater. The bath way of water in the mountains and forests as also is the bath way of live. As water move down from the forest and mountains to the sea, revisers and lakes replants the earth .For many countries (including Iraq) aside from being a source for food and live, water place an important role for the households.

Water quality in equation globally, for the UN annual report facts to help a dressing this problem worldwide, the facts that 1/6 of the world population which is around 1 billion people around the world they lack clean drinking water. In fact 130 country paint a clear picture of how the problem breakdown worldwide. When the question is are they satisfied or dissatisfied on the quality of water, it is strong dissatisfied. This report and other show that most bad conditions for water resources is mostly on Africa and the best quality is mostly in Europe and US. And we have 79.5% of the world water is saltwater “All regions of the world show an overall net negative impact of climate change on water resources and freshwater ecosystems. Areas in which runoff is projected to decline are likely to face a reduction in the value of the services provided by water resources. The beneficial impacts of increased annual runoff in other areas are likely to be tempered in some areas by negative effects of increased precipitation variability and seasonal runoff shifts on water supply, water quality and flood risks” (IPCC, 2007). 6

(13) (IPCC, 2007),climate change 2007,”impacts, Adaptation and Vulnerability” working group II contribution to the fourth assessment report of the intergovernmental Panel of Climate change,

For the Iraq's case, the scholars and the institutes and ministries that related to this effects they give their conclusion as (we are facing a dry years) this conclusion in other hand it is we have a real problem. We have a situation, hard and dangerous one, from the scientists point view it is just a sequences of the huge changing in now climate.

Water resources it is a word part of the concern of the governments. And for Iraq as a rich country with the water it is also one of the problems there. The advanced system of the irrigation in Iraq started long time ago, bring back to 750PC, and that one of the reasons Iraq has ancient civilization in the world. Where is the most important wealth for the nations is the water beside oil, and manage it wisely insured the health and welfare ,since the agriculture and livestock , plant cover, and in some way for the public health depend on the good water resources . On the other hand it could make the country avidity yard for other nations.

Nowadays there are real and strict alarms about the shortage of water around the world, from many angles around the world it is a big issues, when the water abatement dramatically throw the last three decades. The dryness and water resources problem that Iraq as well as other country suffers from it even if it is multiply, it is a research material for many institutes and scholars, and how can they overcome this problem. So for the ministry of water resource there are around 25 researches including the dames' events, for the importance of this safety, and this issue it have a huge impact on the economic stability for any country not just Iraq. How? Water use efficiency; it can defined as; an indicator of the relationship between the amount of water required for a particular purpose and the amount of water used or delivered.

-The surface water resources

Estimation of current water resource for Tigris and Euphrates rivers (1969-2005), these two rivers and their branches is the main resource for surface water in Iraq. And almost all of the supplying basins it is out of the country. The next table shows the general average for Tigris and its tributaries and Euphrates rivers for the years from (1930-1990):-

Table (2): water share of the total recourse for Tigris River 2008

River or brunch	Percentage from inside Iraq	Percentage from Outside Iraq	Annual outcomes
Main river	-	100%	19.43
Kabor (bch1)	42%	58%	2.1
Big Zab(bch2)	58%	42%	14.32
Small Zab(bch3)	64%	36%	7.07
Al-Adeam(bch4)	100%	-	0.7
Deala(bch5)	41%	59%	5.85
Total	32%	56%Turkey 12%Iraq	49.48

Source: MWR (Ministry of Water Resource) Baghdad, 2006

Table (3): shows the percentage of the outcomes for the two rivers for different years.

River	Outcomes for a dray year Millar M3	Outcome for wet year Millar M3	Outcomes for dry year Millar M3
			(1999) 18.06
Tigris	49.48	(1969) 96.85	(1995) 20.35
			(1989) 27.12
			(2005)16.72
Euphrates	27.4	(1969) 63.31	(2001) 9.56
			(2005)8,94
			(1999) 15.06

Risks to human health will increase.

In the facing of global warming scientist saying that we crossed to a far stage, by making a big damage in our planet, though even if we stop the gas emission right now, the earth just like a big ship that's take ten miles to hold and change direction. We still progress along with the same track for a while. In fact, the researchers estimate that it may be a 100 years before we can see improvements in the earth ecosystem. However, we can still save lives and minimize damage by understand the effects of the global warming by take the actions to prepare for them.

With the global temperature reaching record high each year, we are already beginning to see greater incidents of injury, illness and death resulting from heat waves and natural disaster beyond the direct affects of climate change, a host of indirect effects are also being felt including increases in born and tropical diseases and mantel health challenges, and reductions in crop production, longer summer, shorter winter and more frequent heat waves, transfer into larger number of heat related health problems and lost lives.

Nevertheless, these extreme weather patterns, floods, and rising sea levels and hurricanes, bring with them all the damages and homeless people, infectious diseases, which relate to public health so closely. To a large extent, public health depends on safe drinking water, enough food, safe shelter, and good social circumstances. The changing climate is affecting all of these conditions. All the reports by IPCC suggest that this change is likely to have big and wide harms on public health in the same time it could bring some local profits, like reduce the winter deaths in temperate climates, and raising the food production in some areas, especially high latitude, and country. Public services and high health and living conditions could care for some populations from particular harms, in addition it is doubtful that climate change would be a reason for malaria to grow to be again start in northern Europe or America, which the live level is much higher than other regions. However, the health bad impacts of a quickly changing climate are probable to be overpoweringly negative, mostly in the poorest society, which have added least to (GHG). The health is a sensitive issue for human being so when we want to highlight the effects of the climate change we should have a look on this first will miss important part from this issue, so first will have a general look on it from many angles, so when we are talking about this changing globally we can see it clearly may not be the same with Iraq case, because, it is more clear in the country this located on the sea, and tropical countries, back again to the world wide, and in Iraq the ministry of health have the report shows that the number of the cases of many new diseases related to the air and water pollution, extreme temperature, and new kind of insects that take place in the last two decades. The next table shows the last statistical report by ministry of health in Baghdad with a big numbers of infections for a disease was increases in some area to

almost 35~40% within 18 years, some of it caused by a bad health system and many of it because the danger of climate change with all it is sides on health and human being

Table (4): Food and water vector-borne disease in Iraq (1990~2008)

Diseases	1990	1995	1999	2002	2004	2008
Poliomyelitis	0	0	0	0	0	0
Malaria	6	16	25	12	32	34
Diarrhea	9388	9438	11928	13301	15410	17301
NonB.B.D.	90758	111885	135837	195873	184046	196907
Viral hepatitis	3576	4766	5050	4843	4929	5315
Meningitis	804	645	628	522	640	659
Lishmaniasis	19837	24839	21560	28881	26875	2995
Schistosomiosis	81	14	15	5	1	85
Typhoid	5101	5781	4777	4769	4747	4789

Source: MOH, Ministry Of Health, Baghdad. 2008

- **Temperature increases, precipitation changes, and sea level rise**

-Heat Waves: the heat waves are four times more than 20 years ago than now, more heat-related deaths and illnesses caused by the same reason heat waves

-Sea ecosystem changed: between rising in sea levels in some areas and diminishing in other parts make a change in frequency of some dangerous infection like cholera, that the WHO showed the presenting of cholera cases it is increased to a serious number during the last 20years.

-Air pollution: air pollution responsible globally an estimated 200,000 to 750,000 People die each year from ambient air pollution', by respiratory diseases from worsening air quality and the new weather patterns. Where US and china is the biggest producers for the global gas emissions

-Natural disaster: Big numbers of people get killed by the hurricanes storms and floods and infections from flooding of dirt treatment Plants.

- Water quality: water have problem with appearing and un appearing, every day become more contaminated less available, in 2006 WHO showed that 3.5 million people die from unsafe drinking water.

-Saltwater Encroachment in Coastal Aquifers: Greater risk of intestinal illnesses from inadequate water supplies "US climate change science program"

So all this when it is effect the public health that mean in the easy way the government need more budgets on this sector instead of focusing on use this fund in developing the other sectors, doing that by using this budget just for recovering from the damaged that's already occurred, from the basic idea it had a bad effects on the economy out there on the countries which have low income level.

Measures of health effects from climate change can only be estimated. Nevertheless, a WHO quantitative evaluation, focusing only on the subset effects of climate change on health, ant that give a final conclusion as the effects of the climate change that has take place since the mid-1970s may have caused over 1.5 million deaths in 2000. It also told that these impacts are expected to increase in the future. "Identify the possibly complex structural relationships between climate, growth, and other outcomes. For example, higher temperature could lead

directly to political instability by making a population more prone to riot” (Jones & Olkan, 2008)
(14), 7

this study showed the real connection between the climate change and the economic growth, as they go on together side by side and one bush other, we are human being and will always be under this effects which we start it in the same time.

For Iraq case, the health sector have effected by many bad surrounding related and non related to climate change, which have the extreme patterns, the air pollution, sand storms which accord now almost weekly according to (AI, 2007), happened that this storms which not only caused many asphyxias cases spicily among the elderly and the children ,where the report from (MOH, 2007), Baghdad, showed that they are facing a difficult situation in the summer time and hopeless cases from hard allergic and asphyxias kids and elderly mostly And this situation is likely to show in summer moreover, study in 2005 showed the effects of the of Nitrogen oxide which cause children susceptible to respiratory diseases in winters, in severe winter’s days and the dryness waves more often. Air pollution caused almost 30% from the natural death in Iraq from the year 1990 ~2005 “the death rate among the kids in the age less than 5 years it is most caused by the respiratory and genesis diseases, where from 1990 five kids dais every day in Iraq because of the diseases halve of it asphyxias cases” (MOH, 2007). The lung cancer cases in Iraq during the last 20 years growing at ratio more than 200% from the year 1980, according to the

(14):(Jones & Olkan, Climate Shocks and Economic Growth: Evidence from the Last Half Century, 2008), (United States Riot Commission, 1968; Carlsmith and Anderson, 1979)

cancer's centre in Baghdad, the causal effect of the air pollution is so strong, wherever more than 38% of lung cancer caused by air pollution and the rest of the air pollution help on it spicily in the south where the marshland and the wetlands, and the mosquito is more diffusion because of the hot weather and the bad pattern as whole. The measles also is spread during last years among the kids over 5 years, from the age 14~19years old, Caused by water pollution. 8

5-Fifth chapter: the recommendation Climate change give a burden to millions of people from different levels and positions, geographical, humanistic scientifically and politically, give a idea how much this issue is serious, and how fast our action it should be. From

Let's, turn the tied! Can we?

As a conclusion, the climate change affects the economy and threat it as well other sectors, historical relationship between climate fluctuations and economic growth. The relation between these two sides, "We find substantial effects of climate shocks, but only in poor countries. In poor countries, a 1°C rise in temperature in a given year reduces economic growth by 1.1 percentage points on average (Jones & Olkan, 2008)⁽¹⁵⁾

80%from the energy we use, whether for electricity, transportation or heating, it comes basically from fossil fuels like, coal, gas and oil. Burning fossil fuels caused serious pollution, and lead to the emission of ever more greenhouse, like carbon dioxide, during climate change. Energy

(15) (Jones & Olkan, Climate Shocks and Economic Growth: Evidence from the Last Half Century, 2008),

production and transports alone account for ever half of the world greenhouse gas emission over 2,580 million tons in 2006.

Fossil fuel, aren't just dirty there is only but it is costly and it is also limited amount of this fossil fuel. As even more people want to use the fossil fuel, the price of them particularly "oil and gas" will cause more damage to our economies. At the same time the nuclear power is not the solution, the nuclear industry is in decline and any expansion wouldn't only be hugely expensive it would also take for too long to make any real contribution to the redaction in greenhouse so urgently need nuclear remain dirty and dangerous, with problem of harmful, radioactive west and weapon proliferation ever present.

Thankfully, most of the solutions on our climate challenges already exist. The quickest and most cost effective step is to stop wasting energy, all the green orgs around the world request to reduce energy consumption by at least 20% by the year 2020. This information gives us an idea about how serious our problem is, so what can we do? Could we? Start with what first? And start from where?

Implications for policy and sustainable development

Climate change causes a main intangible face up to agriculture and water managers, water resource users in agriculture as well as to policymakers in general, as it is no longer suitable to assume that past climatic and hydrological circumstances will continue into the future. Water resources management clearly impacts on many other policy areas like food security, health, energy, nature protection. Thus, the judgment of adaptation and improve alternatives needs to be accomplished across multiple agriculture, health, food and water dependent sectors.

Sustained development in adaptation in retort to historical only, rather than predictable future circumstances that will contain both inconsistency and change is likely to raise the weakness of many sectors to climate change.

Implications for policy by sectors

- First: water recourses:

1. Arrange and implement a Water Management Plan.: the management here means the scientific and realistic choices for the crops in each land and according to that and to some measure like the land size and the geographic effects. All this decides how many cubic meters the land needs, and put water organize gates on the irrigation canal for each farm and land.
2. Prepare a Water management system, which included all kinds of new technology to deliver the water to the farms, from the canals to the small rivers and system inside the one farm
3. Adopt a new canal system around the area that has problems with water reaching, improving the canal structures to save more water and use it efficiently, and insurance water sustainability.
4. Lining Canal, lining canals with high exudation rates can result in huge water savings. Especially where the groundwater is salty and the water cannot be use again without saltiness.
5. Maintain the accessibility of water services to farmers

6. Improve the way of communications between the water user and suppliers' and organized evaluation for this nets.
7. Estimate the needs for any kind of changing according to it is time in the policies for the institutions where the water issue in subject.
8. For provide satisfactory water to the far end of the farmlands, the irrigation system or the lands needs for water is certain amount, and there is another amount it is shattered off or run off as a tail water⁽¹⁾. The solution for this wasted water is the tail water returns system, which it catches, this runoff and pumps it back to the top field. And this could save a big amount of water in the farmlands.
9. Scheduling the irrigation , the amount of water that apply for the field it has a big impact not only for the saltiness preventing but also has it is impacts on the quantity and quality of crops, and this could be measured depend on many scales on soil, plants and environment measurements. In another words using the scientific methods for to improve water efficient usage.

Basically what comes above give a long term solution to manage the water resources in Iraq, and these problems was a real heavy burden on the Iraqis shoulder for long years.

-Agriculture management

1. For lands cultivation and rebuild the infrastructure, we need to build economic plans and financial programs with technical scientific frameworks specialized watching the agriculture's budget.
2. Maximize the fund for the agriculture bank to give it a bigger role in agriculture development through the agricultural loans with low interest rate or without interest, as what happened last year from the government but in small scale by giving agriculture loans to farmers.
3. The efficient irrigation system , though the over irrigation would cause salinity the lands
4. Support and encourage the farmers who abandon their lands to re-cultivate it again(greening lands)
5. Most of the farms as well as other sectors suffer from energy shortage, start to provide the renewable energy and confess the farmers it is their best choices through educating them it is the best and the safest way to have your needed energy for long terms.
6. In terms of the farm itself, start to build kind of protection fence by planting big trees surrounding the farms to drive back the extreme weather pattern such as frost and cold winds in winter and sand storms and heat wave, which destroy most of the corps.

Prepare the expertise staff in the agriculture sectors by setting up session, seminars and colloquiums by the aim of increasing their awareness and notify other world experiences,

because absence or lack of the expertise when starting agriculture reparation will be hindrance to this mend.

-The public health:

1. the early warning system including; constant monitoring of water by the technical safety program, the quality of water used for drinking and irrigation by using weather forecasting information to predict the connection between the water and health.
2. Vaccine for the infection disease such as cholera and yellow fever it given to the traveler in and outside of the country specially to the infected areas.
3. As there are some educational problems and monitoring for the diseases to prevent them from getting into the country, that should make the mission of controlling and attacking this diseases more efficient.
4. Developing section that can be subject to weather change.
5. It is necessary to provide workers in all fields of the environment with the required capacities, and to provide enough attention to encourage studies regarding the environmental and weather impacts on health in both institutes and universities, supporting the structure of public health requires creating a law to attain that.
6. We need to adaptation a national strategic plan on climate change effects and increase awareness especially within decision makers.

7. Conduct national need assessment through multi coordination and collaboration with other stakeholders.
8. Increases the use of the technical methods that are effective and advanced enough to protect against chronic respiratory disease and to raise the education about the important of using them.
9. It is also recommended that technical measures has to be taken in order to reduce the amount of dust coming out from the factories provided in the air and causing pollution to the surrounding area, hurting both people and animal and plants.

As an overall conclusion for Iraq case we have a lack of budget for this kind of problems just like other developing countries, so with all what come above we have start dealing with our policies for the interconnected economic sectors.

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⁽¹⁾U.S. Government Accountability Office (GAO) report, “Financial Risks to Federal and Private Insurers in

Coming Decades are Potentially Significant,” March 2007, p.2 (based on IPCC definition), available at: <http://www.gao.gov/new.items/d07285.pdf>.

⁽²⁾ U.S. Environmental Protection Agency (EPA), “Climate Change, Greenhouse Gas Overview,” available at:

<http://www.epa.gov/climatechange/emissions/index.html>.

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