1. Introduction

The Earth's climate has been changed many times during the planet's history, with events ranging from ice ages to long periods of warmth. Historically, natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy released from the Sun have...
affected the Earth’s climate. Beginning late in the 18th century, human activities associated with
the Industrial Revolution have also changed the composition of the atmosphere and therefore
very likely are influencing the Earth’s climate.

Scientists have observed that some changes are already occurring. Such observed effects
include sea level rise, shrinking glaciers, changes in the range and distribution of plants and
animals, trees blooming earlier, lengthening of growing seasons, ice on rivers and lakes freezing
later and breaking up earlier, and thawing of permafrost. Another key issue being studied is how
societies and the Earth’s environment will adapt to or cope with climate change.

Climate, climate variability and climate change have very relative and concrete consequences
for daily human life. These consequences of climate change and possible adaptation, have to be
consulted to come up with results that are more than “academic”, (Lange et al., 2008).

Future climate change will be widely affected such as coastal flooding, water supply, food
production, and lose of important ecosystem (Met office, Hadley center). The significance of
climate change is the top most among the current hot issues. David King (Chief Scientific Advisor
to the UK Government) narrated it as “Climate change is the most severe problem we are facing
today, more serious even than the threat of terrorism” (King, 2004). One of the most threatening
aspects of global climate change is the likelihood that extreme weather events now will become
variable, more intense and more frequent (Klaassen et al., 2006). Climate relates to many sectors
of the human economy, and to many aspects of the world’s natural ecosystem (Kates, 1985).

In this study different research articles have been reviewed. These studies are related to the
fields, agriculture, sea level rise, livestock, tourism, water resources, air quality, heritage,
migration, and population movement.

2. Climate Change and Agriculture

Agriculture is highly sensitive to climate variability and weather extremes, such as droughts,
floods and severe storms. Recent studies indicate that increased frequency of heat stress, droughts
and floods negatively affect crop yields (IPCC, 2007). During the last decades, a large number of
climate change impact studies on agriculture have been conducted. Climate change adaptation for
agriculture is an important aspect of sustainable economy. The work done by Wall and Smit
(2005), Climate change adaptation in light of sustainable agriculture, is a precise study about
climate change and adaptation strategies for sustainable agriculture practices. The purpose of this
study is how sustainable agriculture practices and climate change adaptation strategies mutually support each other. The implications of policies of sustainable agriculture and climate change risk management are both studied in this article. This study concludes also a supportive relationship between sustainable agriculture and climate change.

Changes in average climate conditions and climate variability have the significant consequences on agriculture. A study on the theme of agriculture vulnerability and adaptation in developing countries of Asia Pacific region has been done by Luo and Lin (1999). This study is a review article of different studies of agriculture and future climate. Luo and Lin (1999) have analyzed the different studies of future vulnerability and adaptation in the region of Temperate Asia, Tropical Asia, and Arid Asia. According to his study, in 2050 future scenario China warming will increase of 1.2 degree Celsius. In this scenario yield of several crops will projected as rice -78% to +15%, wheat -21% to +55% and maize -19% and +5%. In the region of tropical Asia, the crop of rice in Bangladesh will be affected by drought, floods and salinity. Thailand, Malaysia and Indonesia will lose the farming income of US$10 to US$130 per year. Indonesia, Sri Lanka and Philippines’ agriculture showed negative yield in future scenario. In arid Asia, Pakistan and Uzbekistan are the important countries for agriculture production. Future scenario showed decrease wheat production in Uzbekistan and cotton in Pakistan. The results are included in this study, pointed out weak resolution of used models, and should be mentioned importance of different agro-climate characteristics, normal variations, and fertilizer.

Forecast of climate or weather is an important in every field of life especially in agriculture. Determine benefits of climate forecast using farmer participation in rural area is most important. For targeting climate forecast a study has been done by Arthur (2003). In this study he developed a methodology to characterize smallholder production systems and identified the indicators of climate information in sub-Saharan Africa. Moreover, identified the farmer groups, who may has adapt and benefit from climate forecasting in sub-Saharan Africa. Kenya was treated as a case study area. Data got from Kenya agriculture research institute. This data is the part of the project KAMPAP (Kenya Agricultural Marketing and Policy Analysis Project). This project carried out from 1995 to 1997. Adaptation of climate forecast was classified into three categories, high probable, probable, and low probable. These parameters have developed for commercialization of agriculture. The usability of climate forecast for different crops and respective adaptations also has been analyzed in this study.

Global warming has a significant effect on agriculture. To investigate the global warming effects on agriculture Alkolibi (2002) carried out a research about the effect of global warming on
agriculture and water resources in Saudi Arabia. This paper aims to examine the impact of possible global warming trends on agriculture and water resources in Saudi Arabia. The data has been analyzed of precipitation and temperature over the period of 1961 to 1997. For assessing the possible impact climate change scenario from GCMs (General Circulation Models) has been used. Major crops of Saudi Arabia are winter wheat, date-palms, vegetables and citrus fruits. These all crops are depended on irrigation. In Saudi Arabia, about 70% vegetables are highly affected by recent change in temperature and rainfall and lake of water. In fact GCMs scenario suggested the negative impact of climate change to agriculture and water supply. Water supply is the constant threat to life and development in Saudi Arabia. There is no permanent river, no surface water except few reservoirs. Recent use of water is 160 cubic meters per person per year. This will be decrease to 50 cubic meters per person per year in 2025. Agriculture, municipal and industry use a big sector for water uses. Government provides to them water at very low price. There is suggested a strict water policy must be applied and water prices should be high. Climatic and non-climatic indicators in Saudi Arabia point to the fact, that respective action must be taken immediately.

Agriculture as a tool of energy is a relatively new and dynamic field of research. Organic agriculture is the production system that is the health of soils, ecosystem and people. A comprehensive study of biomass production for energy is completed by Muller (2008). Research in this sector has found out if the promotion and development of biomass energy continue the greenhouse gas emissions will stop. Different studies and project about biomass energy have been analyzed in this research. European Union has decided bio fuel use for automotive power increase to 5.75% by 2010. This development shows the bio energy importance as a part of global basic energy demand. In this scenario the competition between energy and food crops is important for land. This research emphasis on local situation and many projects can adapt for the local sustainable development, help of the people and reduce the poverty. An estimate of the land area, which is dedicated for bio energy production, will increase around 500 Mha by 2050. Organic agriculture fertile cycle is closed with the composting and green manure. Bio energy from agriculture waste may also be more sustainable, especially due to conventional farming system. Finally, the conventional agriculture may be the only way to produce such bio mass quantities.
3. Climate Change and Sea Level Rise

A large human population living in coastal areas, that would be adversely affected by changes in sea level. About half of the world population lives within 200 km of a coast. As sea level continues to rise, more of these people will be affected by flooding and coastline erosion (Perez et al., 1999). The sea level rise due to climate change is a serious global problem. For developing countries this is more big threat. A study on sea level rise and developing countries has been done by Dasgupta et al. (2008). In this work, they analyzed the sea level rise of 84 countries. GIS software has been used to overlay the best global data elements, land, population, agriculture, urban extent, wetlands and GDP (gross domestic production). Data has been used from various public sources, including CESR, CIESIN, CIAT, IFPRI, NASA, NOAA and The World Bank. The analysis proceeded in different steps. In first step has constructed a base elevation data set for the identification of different zone. The second step was to construct a country indicator surface for each of the elements at risk. The results indicate that almost 0.3% of the 84 developing countries would be impacted by a 1 meter sea level rise and this would increase to 1.2% in a 5 meter sea level rise scenario. In first case 56 million people may be affected under 1 meter sea level rise and in second case 89 million people will be affect under the impact of 5 meter sea level rise. Vietnam, The Bahamas, Egypt, and Guyana are on severe threat. About 10.5% of the national population of Egypt would be displaced by 1 meter sea level rise. Nile delta has discussed as treated case study area. Two important implications were found finally, ten million people of developing countries to be displaced by the sea level rise and remaining countries will face severe economic and ecological problem. The second one, international resource allocation strategies must recognize the serious impact distribution.

Perez et al. (1999) has written an article on climate change and Philippines costal sector. The main objectives of the study were focus on the sea level rise of Manila bay and ecosystem, socioeconomic activities and sea level rise, adapted planning, coastal zone management plan and policies about sea level rise of Manila bay. The methodology of this study was borrowed by the IPCC (1990), in seven steps. This common policy is known as Coastal Zone Management Subgroup (CZMS). This policy is adapted in the program of CALABARZON program. This program is a considerable program for all provinces of Manila bay, Bataan, Pampanga, Bulacan, Cavite and metro Manila. In sea level rise scenario of 2100, these all regions are at high risk of 1 meter sea level rise. By this sea level rise of 1 meter by the year of 2025 the estimated 2, 3 million people will be affect. They analysis shows Manila bay is under the sea level rise due to natural and man
mad factors such as socio-economic. There is an urgent need to revise all policies between problem and all stakeholders.

Schirmer and Schuchardt (2001) has assessed the impact of climate change on the Weser estuary region as an interdisciplinary approach. This study is an integrated project related to the hydrological, socioeconomic and ecological issues of the inner Weser estuary and marshes are. This integrated study has two parts, one is the related to the island of Sylt and other on the region of the Weser estuary in northern Germany entitled as KLIMU. The aim of this study is an integrated analysis of climate change in the respect of hydrology, ecological and socioeconomic issues of the inner Weser estuary. For this interdisciplinary approach, a major group with 8 subgroups started the project together. For the rich integration structured was stepwise, and there are many multi-level systems which were used to integrate the different groups and also used an integrating GIS tool. The KLIMU scenario for 2050, has properly defined the sea level rise by 55cm, tidal increase amplitude by 30cm, temperature rise by 2.7°C, precipitation increase by 10%, but these assumptions are too high according to present model results.

Lange et al. (2008) gave an overview on the project of BALANCE (Barents Region: Linking Arctic Natural Resources, Climate Change and Economic). This project started for Barents Sea in 2002. The main purpose of this project has to understand the climate change and affect on the region respectively vegetation, culture and economics. Regional climate model for individual impact on future scenarios has been developed by Jacob (2001). This regional model and LPJ-GUESS (for vegetation) has been used in the BALANCE project. The results of LPJ-GUESS indicate an increase of boreal needle leaved evergreen forest migration and tundra decrease by 14 to 19% and new tundra will move to Arctic desert areas. Three sectors have investigated, fishery, forestry and reindeer herding. This project started by 15 stakeholders including six European countries and related group of scientists. GIS is the major tool for the purpose of visualization of climate change impact in research area. This system can use all stakeholders of the region, respectively fishery, forestry, reindeer herding, political decision makers, scientists, and public. This study covers to extensive findings of researchers of the BALANCE project.

4. The Impact of Climate Change on Livestock

The performance, health and well being of cattle are strongly affected by climate. Sirohi and Michaelowa (2007) studied sufferer and causes of Indian livestock and climate change. This work,
they have reviewed the livestock production and climate change effects. In the respect of sensitivity, the performance of livestock has strongly affected by climate, due to direct and indirect effects. Local cows, Haryana cows and Sahiwal cows showed a decline in productivity and milk due to increase in temperature and humidity. Extreme climatic events also affects the livestock, like in 1978, due to drought 168 million cattle were affected in India, 18 million in Gujrat, and 34.5 million in Rajasthan. Livestock is an important sector of India and this contributes 26% to agriculture GDP and having employment of 18 million people. Methane emissions by livestock has related to level of intake and digestibility, high methane production high intake.

Zockler et al. (2008) concluded the potential impact of climate change and reindeer density on tundra indicator species in the Barents sea region. The problem have evaluated through the vegetation and reindeer study. In this paper have the estimate present open land and preserved by 2080 as a grazing land for reindeer. For vegetation behave LPJ-GUESS model has been developed. This research work was started under the basic data of (IPCC-SRES B2) after that ECHAM4/OPYC3 models were developed and later on for present study REMO has been developed by (Jacob, 2001), and then REMO was turn to drive the LPJ-GUESS (for vegetation). Reindeer distribution for 2080, were compared to vegetation model. The results showed of greatest influence of reindeer within model and stabling their succession at tundra stage, because LPJ-GUSSE indicates the domination of deciduous forest. Vegetation model projects the big change of tundra vegetation with associated species. Eight species show results more than 20% by 2080, but may be these species are not threatened at present time.

Mech (2004) has been concluded a comprehensive and brief account on Wolf reproduction in the high Arctic in Canada. The study area selected for this paper is in north of Eureka, 960km from the North Pole. Wolves groups from 1986 to 1997 were active and they preyed on Oxen and Hares, and produced new population. Due to low temperature and high precipitation from last six summers (1996-2002) groups of wolves dropped in the area. The data of snowfall of 1997 to 2002 showed a heavy snowfall and destroyed the foraging by this snow. Their results claim that the shortage of food of hares and oxen causes adversely reproduce population of wolves rapidly dropped.

5. Climate Change Impact on Different Field of Studies

Tourism a major sector of the global economy, and it is strongly influenced by climate. Tourism
a multi-dimensional groups of business and its clients that include the airline industry, travel agents, tour operators, car rental companies and reporters. Gossling and Hall (2006) has conducted a research on uncertainties in predicting tourist flow under scenario of climate change. In 2005 a model developed by Gossling and Hall (2006) and this research has pointed out some draw back of this model. Temperature is a dominant parameter in this model. The non-climatic factors included political instability, health problems and role of unseeded events such as terrorism or any natural disaster. For case study Eilta, Israel and Zanzibar, Tanzania has been selected. Wind and cloudiness had a significant influenced on the tourist perceptions. Both studied places results confirmed that the role of climate, in destination choice is more complex and difficult than assumed in current models. The behavior of tourist attitude of travel, weather conditions, travels costs, distance of destination, economic wealth and political conditions of destinations are particular to explain in start. This model has not been expressed in a wide range for comprehensive results and travel motives and might not showed separately such as visiting relatives and friends or the visit of an heritage site or a travel for natural beauty to mountains.

Tyson et al. (2002), pointed out the changing gradients of climate change in southern Africa during the past millennium, implications for population movements. The records of both regions Makapansgat valley in South Africa and Lake Naivasha in Kenya, has discussed on same resolution. Both record of Makapansgat and Naivasha high responses in hydrological system on decadal to century scale. The period of droughts induces famine, political instability and large scale human migration between 1390 to 1429, 1560 to 1625 and 1760 to 1840. This migration is associated with low level of lake Navasha, but when lake level were high, the age of prosperity, agriculture and population growth can be seen easily from the mid of 16th, mid of 17th and the mid of 18th centuries. Gradient of climate change between east Africa and South Africa have varied regularly over the last Millennium. Cultural and environmental factors influence the people in South Africa in the first tow millennium AD. It does not mean that climate is the single one factor to determine the human migration.

Cassar and Pender (2005) presented a study of climate impact on cultural heritage, and also analyzed the evidences and responses. This research was based on UKCIP02 climate scenarios and the impact on natural conservation and gardens. UKCIP02 is the output of the regional climate model HadRM3 resolution is 50km over Europe, model run over the period of 1961-90 and 2070-2090. Confidence projection model for 2080 in UK has experience rising temperature, warm summer and wetter winter, and decreases snowfall. Methodology of this study is very interesting i.e., try to make empirical evidence and more strong by cross checking of data. For
data collection a questionnaire was prepared, around 18 questions had set for information. Policy makers analyzed the data and focus on five issues like, temperature, soil moisture, extreme rainfall and wind, river flooding and coastal flooding. They pointed out a number of recommendations i.e., how cultural heritage adapt to a climate change. For historical site one department cannot stand alone, there is a need to be collective efforts, share all things and speak with unity.

Morgan (2007) has estimated the impacts of a growing world population on climate change. The rapid growth of population is alarming impact on climate change. Every nation has started the race of development, for follow up this development a huge amount of greenhouse gases released into the atmosphere. The development of medical sciences, living standards, safer foods, safer transports, and purify water program responsible for the rapid growth of population in 20th century. Two component sex and age are most important for population growth and effect indirectly on climate. Agriculture is the primary activity of the people, and the people are going to adapt the trend of intensive agriculture, but the intensive agriculture is the primary responsible for the increased methane gas as well as waste management. Developing countries are affected seriously by this problem. For the reduction of this problem there are immediate actions required by the private sectors, government policies, advance technologies and energy alternatives. If these suggestions can implement then the growing human population reduces its affect on climate change.

Gosain et al. (2006) researched climate change impact assessment on hydrology of India river basins. In this study a hydrology model SWAT (Soil and Water Assessment Tool) has been used. About 40 year of the taken data of 12 rivers has been used in this study. The first 20 years data belonging to present time (1981-2000) and the remaining 20 years data has for future climate (2041-2060). The main purpose of this study was quantified impact of climate change on the water resources of Indian rivers. Two rivers have been selected for prediction; one is Krishna river (with flood scenario) and second is Mahandi (with droughts scenario). Weather data determine by the Hadley Center for Climate prediction UK. Overall run off quantity will reduce under the future scenario. One fourth of Gujarat and 60% of Rajasthan shell face water shortage conditions. The basin of the river Mahi, Pennar, Sabarmati and Tapi face also water shortage. Basins belong to Cauvery, Ganga, Narbada and Krishnawill experienced water stressed. River Godavari, Brahmani, and Mahandi are predicted to face severe flood conditions. Vautard and Hauglustaine (2007) concluded a research on the issue of global climate impact on regional air quality. This is a thematic study about climate change and its impact on air quality. This air
quality disturbed the near surface composition and affect the air where we breath. These changes not stay in urban areas, even spread out to suburbs regions. A global increase of all primary emissions is predicted for the end of the century, due to massive economic development and population increase in several developing countries. Predicting the future changes in air quality and results were found negative. The main air quality problems in respective regions arise from the increasing population. The big cities of the future are not located in the center of the developing cluster or exclusive in developing countries. The climate of northern Europe should become wetter, which is favorable to air quality improvement, but that of southern Europe becoming drier, which is unfavorable. The three major causes of changes in regional air quality for Europe are climate change, regional emissions change and global emissions changes. This study provides an overview of the global climate change impact on air quality and its related effects on human health.

Barnett et al. (2004) studied the effects of climate change on water resources in the west part of USA. This is an overview on the Columbia, San Joaquin, and Colorado rivers basin in the western states. This study is the part of the project “end to end” by the state department of energy, USA. The objective of this study was the quantitative assessment of the climate driven environmental impacts and demonstration and to provide useful information to regional states and local decision makers. Special emphasis on the changes over the next 50 years has which indicated to the range of climate variability. Project indicated generally large scale warming over the west. The most affected regions are the northern Rockies, Great Basin and Southwest region. By 2070 the length of the fire season could be increased by two to three weeks in these regions. All individual models should be studied collectively and in future studies, these assessments need serious linked in a consistent end to end analysis to obtain more fine results.

6. Conclusion

This is a brief study of climate change and various field of research. Current knowledge has been summarized in this paper. Agriculture and climate change is an important field of research. Climate variability is highly affected to agriculture, such as droughts, storms and severe floods. Some studies identified the several climate and weather adaptation for sustainable agriculture practices. A few studies are currently conducted in various part of the world to determine the value of climate forecasts. Most of the researchers have used the outputs of GCMs and regional
climate model with climate variability. With the development of science and technology, these models have been developed and have become the main method of analyzing the impact of climate change on agriculture.

The sea level rise is a serious problem, especially for developing countries in south-east Asia. Millions of people will displace by sea level rise within this century. Economic and ecological system will be affect severely also. Various researches showed the international community has a seriously considered the sea level rise and population location and infrastructure planning in developing countries.

Climate change is a huge challenge for the growth rate of livestock. The performance and health of cattle strongly affect by climate. Similar, tourism, cultural heritage, global population, water resources, and air quality are showed the impact of climate change. There are wide range of publications have assess the consequences of climate change and above viewed field of research. However, this study is a brief view of some current knowledge of climate change impact on various fields.

Climate change is a dynamic sector for research field. With the development of science and technology almost all field of studies need micro level research. There is a need to explore different fields of global earth and climate change. Future work should be focused on the integration and comparative to current research for fine and better results.

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