Abstract Template

Climate Change and its Implications on Iraq: A review

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I. Abstract Body

Global Climate Change has become a hot topic nowadays for the media, politicians and world organizations which have conflicting views on its extent and what to do to avoid its impacts. This paper attempts to check how real this change is and the historical evidence of its occurrence and describes its causes and what does this mean for Iraq. Iraq is located in one of the most vulnerable regions of the world and it has felt these effects in the forms of recurrent droughts, disturbed pattern of precipitation in the form of its quantity, intensity and timing, increased desertification and sand storms. This is also manifested by the diminishing of the water resources of both The Tigris and Euphrates Rivers whose catchment areas suffer the same impacts. The paper discusses also some of the performed modelling studies carried out so far to predict the future of these two rivers. The expected sea level rise is also explored and the future effects on Iraq's Gulf shore line, its navel and land installations there and impacts on the deltaic region of southern Iraq explained. Other consequences of future climate change impacts are outlined in terms of water scarcity, farmland deterioration and migration of people with expected grave problems on the social peace. Some recommendations to mitigate and alleviate the situation are given.

II. Reference:

1.National Research Council, 2008. The Committee on grand research questions in the solid-earth sciences. "Origin and Evolution of Earth: Research Questions for a Changing planet". National Academies Press, Washington, D.C., (paperback). ISBN 978-0-309-11717-3. https://www.nap.edu/catalog/12161/origin-and-evolution-of-earth-research-questions-for-a-changing

2 . Muller, R. 2010. "Physics and Technology for Future Presidents". Princeton University Press, Princeton, USA. https://press.princeton.edu/titles/9226.html

3. Muller, R.A. and Jacobsen B. 2010b. "Physics for Future Presidents;". Web page: http://muller.lbl.gov/teaching/Physics10/PffP.html.

4. IPCC (Intergovernmental Panel on Climate Change) 2013. "Assessments Reports", Climate Change: The Physical Science Basis. https://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

5. WMO (World Meteorological Organization).1979 "Frequently Asked Questions; what is Climate Change, Commission for Climatology. http://www.wmo.int/pages/prog/wcp/ccl/faqs.php#q4

6.IPCC (Intergovernmental Panel on Climate Change). 1990 ."Climate Change: The IPCC Scientific Assessment, Introduction. https://www.ipcc.ch/publications_and_data/publications_ipcc_first_assessment_1990_wg1.shtml

7. IPCC (Intergovernmental Panel on Climate Change). 2007. Working Group 1. "Climate Change: Understanding and attributing climate Change, The Physical Science Basis.". Fourth Assessment Report. http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspm-understanding-and.html

8. IPCC (Intergovernmental Panel on Climate Change) 2001. Working Group III "Special Report on Emission Scenarios-SRES.". IPCC-UNEP https://ipcc.ch/pdf/special-reports/spm/sres-en.pdf

9. Zakaria S. Al-Ansari N, Knutsson. 2013. "Historical and Future Changes Scenarios for Temperature and Rainfall for Iraq". J. of Civil Engineering and Architecture, 73, 12, 1574-1594. https://www.diva-portal.org/smash/get/diva2:988358/FULLTEXT01.pdf

10. WRI (World Research Institute) 2005.Earth Trends Data Tables: Climate and Atmosphere. World Resources Institute. Washington D.C. http://pdf.wri.org/wrr05_dt_all.pdf

11.Trondalen, J. M. 2009. "Climate changes- water Security and possible remedies for the Middle East". U.N., World Water Assessment Program, UNESCO.20. http://unesdoc.unesco.org/images/0018/001818/181886e.pdf

12. IPCC(Intergovernmental Panel on Climate Change).2001. Climate Change: Synthesis Repot. "Sea level Change; Q.02.12-19 and Q. 03.9&Q3.13". Synthesis Repot. https://www.ipcc.ch/pdf/assessmentreport/ar5/wg1/WG1AR5_Chapter13_FINAL.pdf

13. IPCC(Intergovernmental Panel on Climate Change). 2007. Climate Change: Synthesis Report. "The Physical Science Basis". Synthesis Report.https://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm

14. Ghoneim E. 2009. “A Remote Sensing Study of Some Impacts of Global Warming". Chapter 3.Arab Environment climate change- impacts of climate change on Arab countries. Edited by Tolba M and Saab N. http://www.afedonline.org/afedreport09/english/char3.pdf
15. Lelieveld J, Hadjinicolaou, P., Kostopoulou, Chenoweth J., El Maayar M., Giannakopoulos C., Hannides C., Lange M. A., Tanarhte M., Tyrlis E., and Xoplaki , E., 2012. “Climate change and impacts in the Eastern Mediterranean and the Middle East”, J. Climate Change,114, 3-4, 667-687. https://link.springer.com/article/10.1007/s10584-012-0418-4
16. Kitoh A, Yatagal A, Alpert P. 2008. “First Super-high-Resolution Model Projection that the ancient will disappear in this century". Hydrological Research Letters, 2,1-14. http://www.hrljournal.org/archives/67#more-67
17. Mark J.J., 2009. “Fertile Cresent”.Ancient History Encyclopedia”.
https://www.ancient.eu/Fertile_Crescent/
18. Weiß, M., Flörke, M., Menzel, L. and Alcamo, J. 2007. Model - Based Scenarios of Mediterranean droughts, Advances in Geosciences, 12, 145-51.
http://www.adv-geosci.net/12/145/2007/adgeo-12-145-2007.pdf
19. Flint A, Flint L, Curtis J, Boesch C. and Buesch D.C., 2010."A Preliminary Water Balance Model for the Tigris and Euphrates River System" USGS.2, 44p.
https://www.researchgate.net/publication/252321941_A_preliminary_water_balance_model_for_the_Tigris_and_Euphrates_River_System
20. Hurell J., Kushnir Y., Ottersen G. and Visbeck M. (eds). 2013. “The North Atlantic Oscillation: Climatic Significance and Environmental Impacts”. Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume 134. ISBN:9780875909943
21. Hemming D, Buontempo C, Burke E, Collins M, and Kaye N. 2010,“How uncertain are climate model projections of water availability indicators across the Middle East?” Philosophical Transactions of The Royal Society, 368, 5117–5135. doi: 10.1098/rsta.2010.0174.
22. Evans P. 2009. “21st-century climate change in the Middle East”.Climate Change, 92, 3-4 , 417–432. https://link.springer.com/article/10.1007/s10584-008-9438-5
23. Cullen H, deMenocal P. 2000. “North Atlantic influence on Tigris –Euphrates stream flows”, International J. of Climatology, 20, 853-863. http://onlinelibrary.wiley.com/doi/10.1002/1097-0088(20000630)20:8%3C853::AID-JOC497%3E3.0.CO;2-M/pdf
24. Walker G. and Bliss E., “World Weather V”, Memoirs of the Royal Meteorological Society, IV, 36, 53-84. https://www.rmets.org/sites/default/files/ww5.pdf
25. Rogers J., 1984. “The association between the North Atlantic Oscillation and the Southern Oscillation in the Northern Hemisphere, Monthly Weather Review,112: 1999-2015. https://journals.ametsoc.org/doi/pdf/10.1175/1520-0493%281984%29112%3C1999%3ATABTNA%3E2.0.CO%3B2
26. Voss K., Famiglietti J., Lo M., de Linage C., Rodell M. and Svensson S., 2013, “Ground Water depletion in the Middle East from Grace with implications for Tran boundary water management in the Tigris-Euphrates – Western Iran region ”, Water Resources Research, 49, 904-914. https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/wrcr.20078
27. kitohweth J, Hadjinicolaou, P, Bruggeman A, Lelieveld J, Levin z, Lange M, Xoplaki E, Hadjikakou M. 2011. Impact of climate change on the water resources of the eastern Mediterranean and Middle East region: Modeled 21st-century changes and implications. Water Resources Research, 47, 6, 1/18. doi:10.1029/2010WR010269
https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2010WR010269
28. IPCC IPCC(Intergovernmental Panel on Climate Change). 2001 Third Assessment Report. “Climate Change 2001: The Scientific Basis”.
https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf
29. IPCC(Intergovernmental Panel on Climate Change).2000. Working Group III “Special Report on Emission Scenarios-SRES”. IPCC-UNEP. https://ipcc.ch/pdf/special-reports/spm/sres-en.pdf
30. Bozkurt D., Sen O.L. and Hagemann S. 2015. Projected river discharge in the Euphrates – Tigris Basin from a hydrological discharge Model – RCM and GCN outputs”, Climate Research, 62, 134-147. http://repositorio.uchile.cl/bitstream/handle/2250/132236/Projected-river-discharge-in-the-Euphrates-Tigris.pdf?sequence=1
31. Hagemann S. and Dümenil L. 1997. A parameterization of the lateral water flow for the global scale, Climate Dynamics, 14, 17-31. http://link.springer.com/article/10.1007/s003820050205
32. Hagemann S. and Gate L. b. 2001. Validation of the hydrological cycle of ECMWF and NECP reanalysis using the MPI of Hydrological discharge model”. J. Geophysical Research,106,2, 1503-1510. https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2000JD900568
33.Dickinson E, Henderson A, Kennedy J. 1993. Biosphere-Atmosphere Transfer Scheme, National Center for Atmospheric Research, August 1993. http://opensky.ucar.edu/islandora/object/technotes:154
34. USAID.2017. Climate Risk Profile: Iraq”. March 2017. https://www.climatelinks.org/resources/climate-change-risk-profile-iraq
35.Adamo N., Al-Ansari N., Sissakian V., Knutsson S., Laue J. 2018. The Future of the Tigris and Euphrates Water Resources in view of Climate Change, J. Earth Science and Geotechnical Engineering, 8, 3, 43- 58. http://www.scienpress.com/journal_focus.asp?main_id=59&Sub_id=IV&Issue=631727
36. Adamo N., Al-Ansari N., Sissakian V., Knutsson S., Laue J. 2018. Climate Change: The uncertain future of Tigris River tributaries, J. Earth Science and Geotechnical Engineering. 8, 3, 75- 93.

http://www.scienpress.com/journal_focus.asp?main_id=59&Sub_id=IV&Issue=633695
37. Holthaus E. 2014. Is Climate Change destabilizing Iraq? "Slate, New America and ASU, Future Tense. http://www.slate.com/articles/technology/future_tense/2014/06/isis_water_scarcity_is_climate_change_destabilizing_iraq.html
38. Sivakumar M. 2007. Interaction between climate and desertification", J. Agricultural and Forest Meteorology, 142, 143-155.
http://www.southwestnrm.org.au/sites/default/files/uploads/ihub/sivakumar-mvk-2007interactions-between-climate-and-desertif.pdf
39. Schwartzstien P. 2015. Iraq's Famed Marshes Are Disappearing-Again", National Geographic. http://news.nationalgeographic.com/2015/07/150709-iraq-marsh-arabs-middle-east-water-environment-world/
40. UNDP(United Nations Development Program). 2009. UNDP helps drought-stricken Iraq combat effects of climate change".
http://www.undp.org/content/undp/en/home/presscenter/articles/2009/12/16/undp-helps-drought-stricken-iraq-combat-effects-of-climate-change.html
41.Sissakian V., Al-Ansari N. and Knutsson S. 2013. Sand and Dust Storm events in Iraq, Natural Science, 5, 10, 1084-1094. http://file.scirp.org/pdf/NS_2013101014315787.pdf
42. UN Iraq (United Nations).2013. Sand and dust storms in Iraq: fact sheet, Joint Analysis and Policy Unit. https://reliefweb.int/sites/reliefweb.int/files/resources/SDS%20Fact%20Sheet.pdf
43. DRI (Desert Research Institute).2013. Integrated desert terrain forecasting for military operations". Division of Earth and Ecosystem Science (DEES). https://www.dri.edu/images/stories/editors/deeseditor/DEESdocs/DTF-web-sm.pdf
44. World Bank. 2013. Water is Focus of Climate Change in the Middle East and North. Africa, Archives. http://web.worldbank.org/archive/website01418/WEB/0__C-151.HTM
45. El Raey M. "Impact of sea level rise on the Arab Region," University of Alexandria. Arab Academy of Science, Technology, and Maritime, 2010. https://www.researchgate.net/publication/266454174_Impact_of_Sea_Level_Rise_on_the_Arab_Region
46. Werrell C.E. Femia F. 2017. Climate Change, the Erosion of State Sovereignty and World Order, The center for Climate Change & Security. https://climateandsecurity.org/2017/06/26/climate-change-the-erosion-of-state-sovereignty-and-world-order
47. Cline W. R. 2007. Global Warming and Agriculture: Impact Estimates by Country, Center for Global Development, Colombia University Press, USA. https://books.google.se/books?id=O0arDQAAQBAJ&pg=PA131&dq=iraq+agriculture+global+warming+climate+change+statistics+appendix+f&hl=en&sa=X&ved=0ahUKEwisobffkfbYAhXJkCwKHcoVDC0Q6AEILDAA#v=onepage&q=iraq%20agriculture%20global%20warming%20climate%20change%20statistics%20appendix%20f&f=false

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