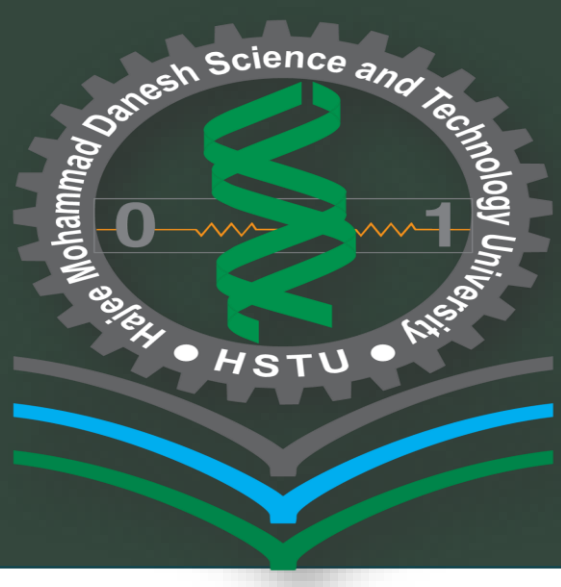




Effects of Climate Change on Irrigation Water Quality in Bangladesh

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INTRODUCTION

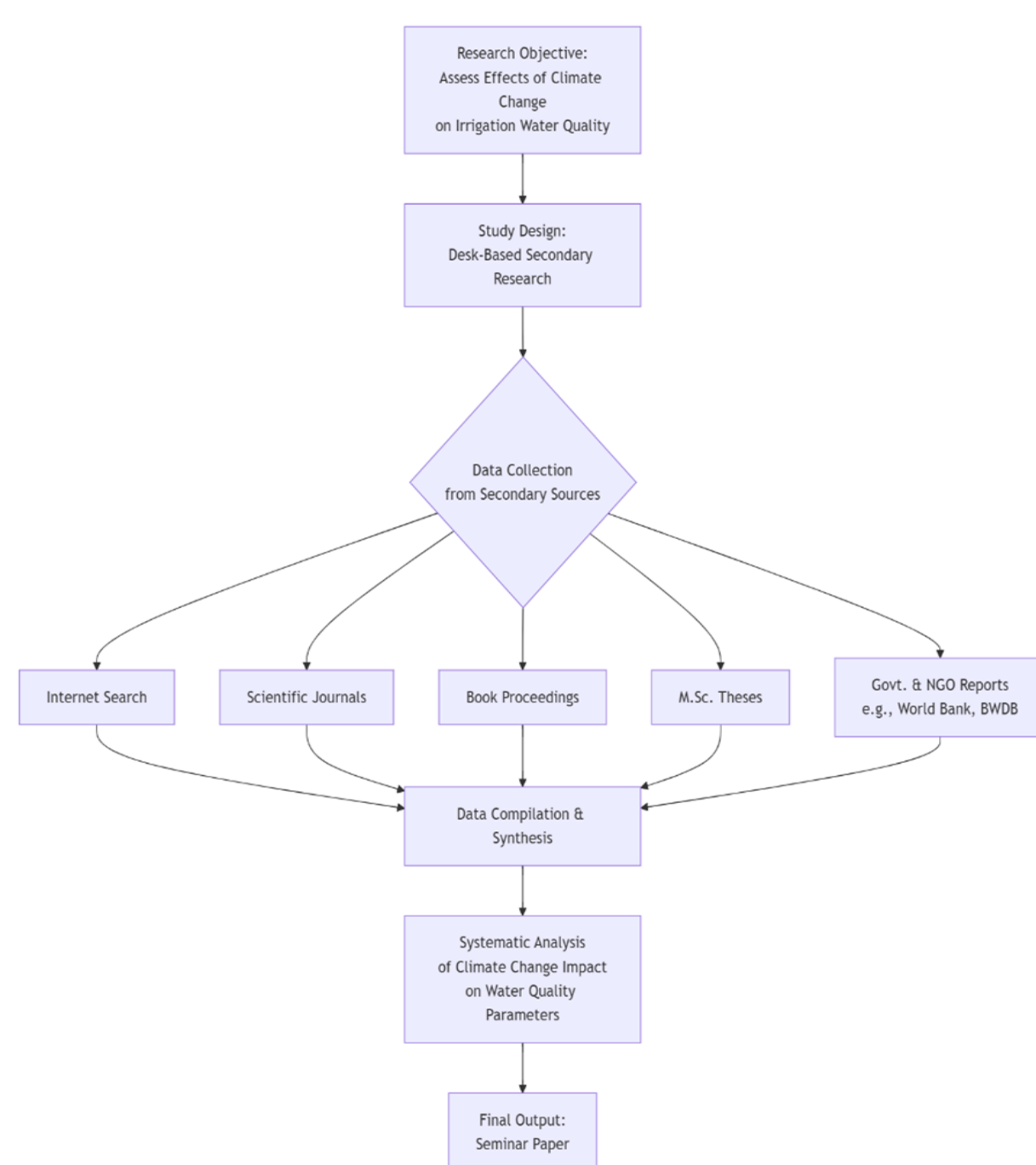
Climate change poses a severe threat to irrigation water quality in Bangladesh, directly impacting agricultural productivity and food security. Rising temperatures, sea-level rise, and erratic rainfall patterns are intensifying salinity intrusion, contaminating water with heavy metals, and promoting microbial growth. With agriculture heavily dependent on irrigation, these changes degrade soil health, reduce crop yields, and endanger the livelihoods of millions.

MATERIALS AND METHODS

This study is a **desk-based research** paper, synthesizing existing data from secondary sources. The methodology involved:

Data Collection: Sourcing information from scientific journals, government reports (e.g., World Bank, BWDB), M.Sc. theses, and reputable online databases.

Systematic Compilation: Carefully assembling and analyzing the collected data to evaluate the effects of climate change on various irrigation water quality parameters in Bangladesh.



RESULT

Climate change is degrading irrigation water quality through several key pathways:

Salinity Intrusion: Sea-level rise is causing saltwater to contaminate coastal freshwater sources, harming crops and soil.

Pollutant Concentration: Droughts and reduced river flows lead to higher concentrations of pollutants like heavy metals (e.g., Arsenic, Lead) and agricultural chemicals.

Increased Contamination: Extreme rainfall events cause runoff, carrying sediments, pesticides, and pathogens into water bodies.

Groundwater Depletion: Over-extraction lowers water tables, increasing the concentration of naturally occurring arsenic and other toxins.

Infrastructure Damage: Cyclones and floods damage irrigation systems, reducing their efficiency

Managing Irrigation Water Quality:

Parameters	Respective values of the water quality parameters	
	Year/2002-03	Year/2003-04
SAR	0.53	0.74
SSP (%)	16.00	41.00
RSC (meq L ⁻¹)	3.26	4.16
RSBC	4.37	4.58
KR	0.18	0.26
PI	0.68	0.78
MAR	24.60	10.74
TH	225.50	195.50
Mg ²⁺ :Ca ²⁺	0.32:1	0.12:1
Na ⁺ :Ca ²⁺	0.23:1	0.29:1

CONCLUSION

The degradation of irrigation water quality due to climate change is a critical challenge for Bangladesh's agriculture. It leads to reduced crop yields, higher production costs, and serious risks to food security and public health. **Urgent action** is required, integrating climate-resilient crops, efficient irrigation technologies, strict water quality monitoring, and sustainable policy reforms to safeguard water resources and ensure long-term agricultural sustainability.

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