## Transboundary Aquifers: A Case Study of Indus Basin Aquifer



## **Supervisor for Research Project**

Saadia Zahoor

## **Group Members**

Syeda Masooma Imam

Syeda Zamina Hassan

Komal Shabbir

Submission Date: Fall 2017

**Department of Law** 

Bahria University, Islamabad

# Match Overview

×



View English Sources (Beta)



Transboundary Aquifers: A Case Study of Indus Basin Aquifer





































**3%** 





lī.

2% >











%



PAKIST



%





Supervisor for Research Project

Saadia Zahoor



%









Dedicated to our Parents!

(Syeda Massoma Imam, Syeda Zamina Hassan)

Dedicated to My father and Sister!

(Komal Shabbir)

Special Dedication

Dedicated to my husband, Hussain (Zamina Hassan)

#### **ACKNOWLEDMENT**

First and foremost, we thank Allah Almighty for giving us strength to complete this thesis. This would have not been possible without the help of Allah Almighty. Alhamdulillah!

We express our warmest gratitude to our parents and siblings without their encouragement and moral support it was not possible to complete our research project.

We are thankful to our supervisor Ma'am Saadia Zahoor for her undue efforts, invaluable guidance and dedication that provided us a path to follow. She has been supportive and encouraging throughout this phase that helped us in our research as well as writing this thesis.

We would also like to thank our HoD Ma'am Malieka Farah Deeba and all the faculty members of Department of Law for their support and encouragement.

We also want to show are deepest gratitude to our Librarians, Ms. Rizwana Butt and Ms. Maha Jabeen for their support and help in last five years.

Thank you all!

Research Project for the Degree of LL.B

DECLARATION OF ETHICAL CONDUCT IN RESEARCH

We, as the students of Bahria University, hereby declare that firstly, we have abided

all the research ethics while writing this research project.

Secondly, we have not committed any acts that may discredit or damage the credibility

of our research. These include, but are not limited to: falsification, distortion of research

findings, or plagiarism.

Thirdly, we have submitted this work to Similarity Test before submitting our research

project.

Date: December 8, 2017

Degree: LL.B.

**Department**: Law

Supervisor: Ms. Saadia Zahoor

Name and Signature of Students:

Syeda Masooma Imam:\_\_\_\_\_

Syeda Zamina Hassan: \_\_\_\_\_\_

Komal Shabbir:\_\_\_\_\_

V

## **Table of Contents**

| List of Abbreviations   | ix                |
|---|-------------------|
| List of Cases   | X                 |
| Abstract  | xi                |
| Introduction  | 1                 |
| Literature Review   | 3                 |
| Objectives of Research  | 6                 |
| Research Questions  | 6                 |
| Research Methodology  | 7                 |
| CHAPTER ONE: Fundamental concepts of groundwater and transb0  | Oundary aquifers8 |
| 1. Introduction   | 8                 |
| 1.1 Fundamental Concept of Groundwater                        | 10                |
| 1.1.1. Groundwater in Pakistan                                | 11                |
| 1.1.2. Depleting resources of Indus Basin Ground water        | 12                |
| 1.2. Basic Concept of Aquifers                                | 15                |
| 1.2.1. Major types of Aquifers                                | 16                |
| 1.2.2. Transboundary Impact of Aquifers                       | 17                |
| 1.3. Aquifers Models-Julio Barberis                           | 18                |
| 1.3.1. Models proposed by Gabriel Eckstein                    | 20                |
| 1.4. Application of Watercourse Convention on Proposed Models | 23                |
| 1.5. Indus Basin Aquifer                                      | 24                |
| 1.6. Rules Applicable on Different Types of Aquifers          | 26                |
| 1.7. Conclusion   | 31                |
| CHAPTER TWO: LEGAL PERSPECTIVE ON AQUIFERS                    | 33                |

| 2. Introduction   | 33 |
|---|----|
| 2.1. Development of Laws on Groundwater                                       | 34 |
| 2.2. Current Legal Regime   | 37 |
| 2.2.2 International Law Regarding Ground Water                                | 38 |
| 2.2.2.1. United Nations Convention on the Protection and Use of Transboundary |    |
| Watercourses and International Lakes  | 38 |
| 2.2.2.2. Convention on Non-Navigational Use of Transboundary Water            | 39 |
| 2.2.2.3. Draft Articles of the United Nations                                 | 42 |
| 2.2.2.4. Comparative Analysis of Legal Framework                              | 44 |
| 2.3. Multilateral Treaties on Water   | 45 |
| 2.4. Agreements on Groundwater  | 46 |
| 2.5. Bilateral Treaties on Groundwater  | 48 |
| 2.6. Intra-State Agreements   | 49 |
| 2.7. Environmental Laws on Groundwater  | 51 |
| 2.8. Conclusion   | 53 |
| Chapter THREE: STATE RESPONSIBILITY OF INDIA AND PAKISTAN UN                  |    |
| CUSTOMARY INTERNATIONAL LAW   |    |
| 3. Introduction   | 54 |
| 3.1. Customary International Law on Water                                     | 54 |
| 3.1.1. Equitable and Reasonable Utilization                                   | 55 |
| 3.1.2. Obligation Not to Cause Significant Harm                               | 57 |
| 3.1.3. Obligation to Cooperate and Notify                                     | 58 |

| 3.2. Groundwater in India and Pakistan                     | 60 |
|--|----|
| 3.3. Legal Framework in India                              | 61 |
| 3.4. Water Model Bills                                     | 63 |
| 3.4.1. Analysis of the Laws Adopted by the States in India | 64 |
| 3.5. Conclusion  | 68 |
| Conclusion and Recommendations                             | 71 |
| Conclusion   | 71 |
| Recommendations  | 71 |
| Bibliography   | 73 |

## LIST OF ABBREVIATIONS

| CGWACentral Ground Water Authority   |
|--|
| CGWBCentral Ground Water Board   |
| CILCustomary International Law   |
| FAOFood and Agricultural Organization  |
| ICJInternational Court of Justice  |
| ILAInternational Law Association   |
| ILCInternational Law Commission  |
| ITASIullemeden/Taoudeni-TanezrouftAquifer System                             |
| IWTIndus Water Treaty  |
| MhaMillion Hectares  |
| NARISNubian Aquifer Regional Information System                              |
| PCJPermanent Court of Justice  |
| UNUnited Nations Organization  |
| UNDPUnited Nations Development Project                                       |
| UNESCOUnited Nations Economic, Social and Cultural Organisation              |
| UNESCO-IHPUnited Nations Economic, Social and Cultural Council International |
| Hydrological Programme   |

# **List of Cases**

- Ahmad v. Mirza, (2016) CLC (SHC)176 (PAK)
- Equitable and Reasonable Utilization of Water (Hung v. Slovk),150, I.C.J. 1997
- Mehta v. Nath (1997) SC (IND).
- State of West Bengal v. Kerosam Industrie (2004) SC (IND).

#### **Abstract**

Groundwater is one of the most important natural resources for the survival of human being. India and Pakistan depend greatly on the groundwater as well as transboundary Indus Basin Aquifer. Indus Basin Aquifer being the second most stressed aquifer in the world has been neglected by both the states and neither there is any domestic legislation nor a bi-lateral treaty between both states. Though, there is lack of bi-lateral treaty regulating Indus Basin Aquifer, customary international law is binding in nature, and imposes duties upon both the states to regulate the groundwater. Principles of no significant harm, equitable utilization, mutual cooperation and exchange of information are some of the principles that are binding on both states on both states under customary international law. However, both states should conclude treaty to save aquifers from depletion and better use of precious fresh water resource.