

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will discuss the research methodology used in this research, including research methods, research approach, data analysis method, a summary of research methodology, operational framework, theoretical framework, conceptual framework, research structure and the conclusion of the whole research method topic.

3.2 Research Method

This research uses the qualitative method as this research is based on social science field and the qualitative research is primarily exploratory research. It is used to understand underlying reasons, opinions and motivations and to describe people's experiences and internal feelings (Abedsaedi J, 2015). It provides insight into the problem or helps to develop ideas or hypotheses for potential quantitative research. It is also used to uncover trends in thought and opinions and dive deeper into the problem. Qualitative data collection methods vary using unstructured or semi-structured techniques. Some standard methods include focus groups (group discussions), individual interviews and participation or observations. Qualitative research is designed to reveal a target audience's range of behaviour and the perceptions that drive it regarding specific topics or issues. It uses in-depth studies of

small groups of people to guide and support the construction of hypotheses (Susan E. Wyse., 2011).

But, for Islamic Studies area has its style of research methodology. According to Dalhat (2015), Islamic Studies comprises six major themes; a) Quran Studies, b) Hadith Studies, c) *Uşul al-Dīn* (principles of faith), d) *Fiqh* (jurisprudence), e) *Sirah* (biography), and f) civilization. These areas are summarised into three branches. The first branch studies the general laws and rulings concerning the Islamic legal provisions on matters of Ibadat. Its primary areas of study are Islam's five pillars, dealing with concepts such as Shariah law, economic relations and family laws. The second is *Usul al-Din*, which studies matters of belief in Islam. The third branch is served as the instruments and means to the Shariah provisions, supporting or allowing a better understanding of the Islamic Studies subjects.

These subjects are the means through which the accuracy and precision of Shariah provisions are known. It studies subjects such as *usul al-Fiqh* (principles of jurisprudence), classical Arabic language, morphology, *Sirah*, the science of hadith, and sciences of the al-Quran and *tajweed*. The last branch is concerned with civilization, which addresses questions such as Muslim political thought, economics, education and other social aspects of human life (Dalhat, 2015). So, this research is located in the third branch, Fiqh and Shariah provision, to explore and study the application of membrane water treatment from *Fiqh* perspective.

3.3 Research Approach

The qualitative method in this research includes two approaches; document analysis and interview. Then, the researcher also used two sources of data in this research: primary and secondary data.

3.3.1 Document Analysis

A systematic technique for assessing or evaluating documents, both printed and electronic material, is known as document analysis. Like other qualitative research methodologies, this technique necessitates the examination and interpretation of data to extract meaning, gain insight and develop empirical knowledge (Bowen, 2009). Document analysis is used in this study to gain data related to *fuqaha* opinions toward water treatment and purification process by referring to the *Kitab* (books) and documents related to the research topic, such as guidelines, fatwa, journal articles and so on. These books and documents are accessed by using a computer and library repository.

The data collected from the documents will be read, analysed, and summarized to answer the research questions and objectives. The method of collecting data through a review of the documents related to the issues is called the documentation method. The document analysis findings help the researcher analyse the methods in line with *Fiqh* or vice versa. This content analysis method is crucial in this research for gaining valid and suitable data practised and applied in the industry. The data also will be supported by using the interview method.

3.3.2 Interview (Experts in *Fiqh* and Water Technology)

The interview can be defined as a two-way conversation aimed at collecting data for study (Piaw, 2006). There are three types of interviews; i) structured interview, ii) semi-structured interview and also iii) unstructured interview. Next, for the interview methods, Piaw (2006) has stated two methods that can be used in collecting data; i) face-to-face interviews by having individual or group interviews and ii) non-face-to-face interviews by using phone or computer interviews. So, for this research,

the researcher chooses face-to-face and non-face-to-face interviews through call phone to interview the informants. The researcher has done a semi-structured interview with the preparation of interview protocol before the interview and the addition of prompt questions during the interview. The interview implemented in this research is directed towards the *Fiqh* experts and water technologists. The details of the interview informants are as follows:

Table 3.1: Interview Informants List

Informants		
Shariah & Fiqh Experts	Membrane Water Technologies	Water Membrane Industry
Informant 1: Academician	Informant 4: Academician	Informant 6: Industry Practitioners
Informant 2: Academician	Informant 5: Academician and Advisor	
Informant 3: Academician and Advisor		

Source: Researcher (2019)

Next, the findings help the researcher to analyse the water purification methods that is in line with *Fiqh* or vice versa. This interview method is crucial in this research to gain valid, and relevant data practised and applied in an actual situation. Further, the researcher will explore the previous study's findings, then analyse the data and develop the model of membrane water treatment and purification. The secondary data sources will also be gained from internal or external sources. These numerous data will be collected, analysed and discussed to obtain a sufficient understanding of the research conducted.

3.4 Method of Data Analysis

Data is the material that can be used to prove or disprove a fact. There are several methods for data analysis like analysis of the subject matter under study, which includes:

- i. Typology
- ii. Taxonomy
- iii. Constant Comparison/Grounded Theory

Next, according to Abdul Karim (2009), speech analysis methods include i) narrative analysis and ii) discourse analysis. Then, the text analysis is divided into:

- a) Literal analysis (including content analysis);
- b) Grammatical analysis;
- c) Metaphorical analysis

Based on the explanation above, this research is done using content analysis by finding the meaning of the text, document or speech and the result which has a logical appearance (Abdul Karim, 2009). So, the text and content from the books or related documents are analysed to find the meaning as data and input for this research. The data is analysed according to their theme (thematic analysis). Next, descriptive analysis is also used to explain the concept and method of water treatment and purification in Islam by referring to al-Quran, al-Hadith and *Fiqh* books. The articles from authorised journals also are referred to the study of water treatment methods from a scientific view. In comparison, a comparative analysis is used in this research to study the comparison of water treatment from *Fiqh* and science perspectives. Then, narrative analysis is used to analyse data from the interview.

3.5 Data Collection

The data collection phase is divided into three phases; pre-data collection, data collection, and post-data collection.

3.5.1 Pre-Data Collection

Data collection of document analysis is done by choosing several famous *thurath* books by four *madhhab*; Hanafi *madhhab*, Maliki *madhhab*, Shafie *madhhab* and Hanbali *madhhab*, contemporary *Fiqh* books and related journals. Water guidelines are also identified, especially from the Department of Islamic Development Malaysia or JAKIM, the Department of Environment (DOE), the World Health Organisation (WHO) and the related bodies.

While for the interview method, the process interview chose experts from the *Fiqh* area and water technology experts, including the water industry. The items for the interview was methodically planned by the researcher based on the literature review found in chapter 2. Then, the items were validated by two validators from each field: from *Fiqh* and Shariah field and the water technology field. After receiving the feedback for the interview items, the researcher reviewed and improved the correction and improvement.

Table 3.2: The Interview Items Validation Process Information

Informants	Date
Validator 1 (USIM) (<i>Fiqh</i> area)	February 2019
Validator 2 (UTHM) (Water technology area)	March 2019

Source: Researcher (2019)

3.5.2 Data Collection

These *turath* books by four *madhhab* in *Fiqh* are chosen and analysed for content analysis approach in this study as follows:

- Hanafi *madhhab* : *Badāi' al-Ṣanāi' fī Tartīb al-Sharāi'* (Al-Kasaniyy, 1998)
Maliki *madhhab* : *Al-Mudawwanah al-Kubra* (Al-Asbahiyy, 1994)
Shafie *madhhab* : *Kifāyah al-Akhyār fī Halli Ghāyah al-Ikhtiṣār* (Abu Bakr, 2008)
Hanbali *madhhab* : *Al-Mughni* (A. Ibn Qudamah, 1997)

Other *Fiqh turath* books also have been referred such as *al-Fiqh al-Maliki wa Adillatuhu*, *al-Tashīl*, *al-Umm*, *Fiqhu Manhaji* and *al-Majmū' Sharh al-Muhadhdab* by al-Nawāwiyy and so on.

Guidelines and fatwa regarding the reuse of treated water also are used as the documents that are analysed in this research. Related documents are as follows:

- i. Guidelines from the Department of Islamic Development Malaysia or JAKIM
 - Malaysian Halal Management System (MHMS) 2020
 - Malaysian Halal Certification Procedure Manual (Domestic) 2020
 - Sertu Guidelines
 - MS 2200-1:2008-Islamic Consumer Goods Part 1: Cosmetic and Personal Care-General Guidelines

**Part 1- involves practical guidelines and basic requirements for halal cosmetics and personal care industry, trade or business in Malaysia following Shariah Law. The standard should be used together with the Guidelines of Control of Cosmetics Products in Malaysia and Guidelines on Cosmetic Good Manufacturing Practice by the National Pharmaceutical Control Bureau*
 - MS 2200-2: 2013 – Islamic Consumer Goods Part 2: Usage of animal bone, skin and hair – General guidelines

**Part 2 - involves guidelines on the usage of animal bone, skin and hair in consumer products following the Shariah Law*

- Halal Chemicals for Use in Potable Water Treatment - General Guidelines
- ii. Guidelines from the Department of Environment (DOE)
 - Groundwater Quality Index (*Indeks Kualiti Air Tanah*)
 - National Groundwater Quality Standards (*Standard Kualiti Air Tanah Kebangsaan*)
- iii. Guidelines from World Health Organization (WHO)
 - Guidelines for Drinking-water Quality. Third Edition Incorporating. The First and Second Addenda. Volume 1. Recommendations
- iv. Recent fatwas regarding the treated water used for religious purposes

Then the data is collected by forming the themes related to the objectives of this study or called thematic analysis. For the interview method, this approach is made by making an appointment with the informants about the date and time to do the interview. The details information is as follows:

Table 3.3: The Interview Process Information

Informants	Date and Time
Informant 1 Universiti Tun Hussein Onn Malaysia (UTHM)	23 May 2019
Informant 2 (Advanced Membrane Technology Research Centre (AMTEC), Universiti Teknologi Malaysia (UTM)	5 September 2019
Informant 3 Universiti Sains Islam Malaysia (USIM)	22 February 2019
Informant 4 Universiti Malaya (UM)	22 March 2019
Informant 5 International Islamic University Malaysia (IIUM)	22 March 2019
Informant 6 (Industry)	February 2019

Source: Researcher (2019)

The interview process was done face to face with the five informants except for informant 2 that had the interview by phone call as the researcher was in a confinement period during that time. The interview was carried out with the permission of the informants to be recorded during the interview session.

3.5.3 Post-Data Collection

After collecting the data, several steps are conducted for the post-data collection of the interview phase. Thematic analysis is done by having specific steps to produce the related themes regarding this research's topics. The steps are as follows:

- i. Familiarization with the data.

The interview data is transcribed first into text for the following steps. Then, the transcript data is reviewed and familiarized by the researcher.

- ii. Generating the idea.
- iii. Searching the themes.
- iv. Review the themes.
- v. Defining and naming the themes.
- vi. Produce report.

After the themes were produced, the list of the themes is given to the informants by email to validate the data and the correction and improvement by the informants are implemented. Then the researcher does the report, as in the sixth chapter of this thesis. Next, the researcher triangulated the interview data with the document analysis data to know the research data's reliability.

3.6 Validity and Reliability of the Research

Qualitative method research also needs to be validated and know the collected data's reliability to strengthen the data by several steps and methods.

3.6.1 Research's Validity

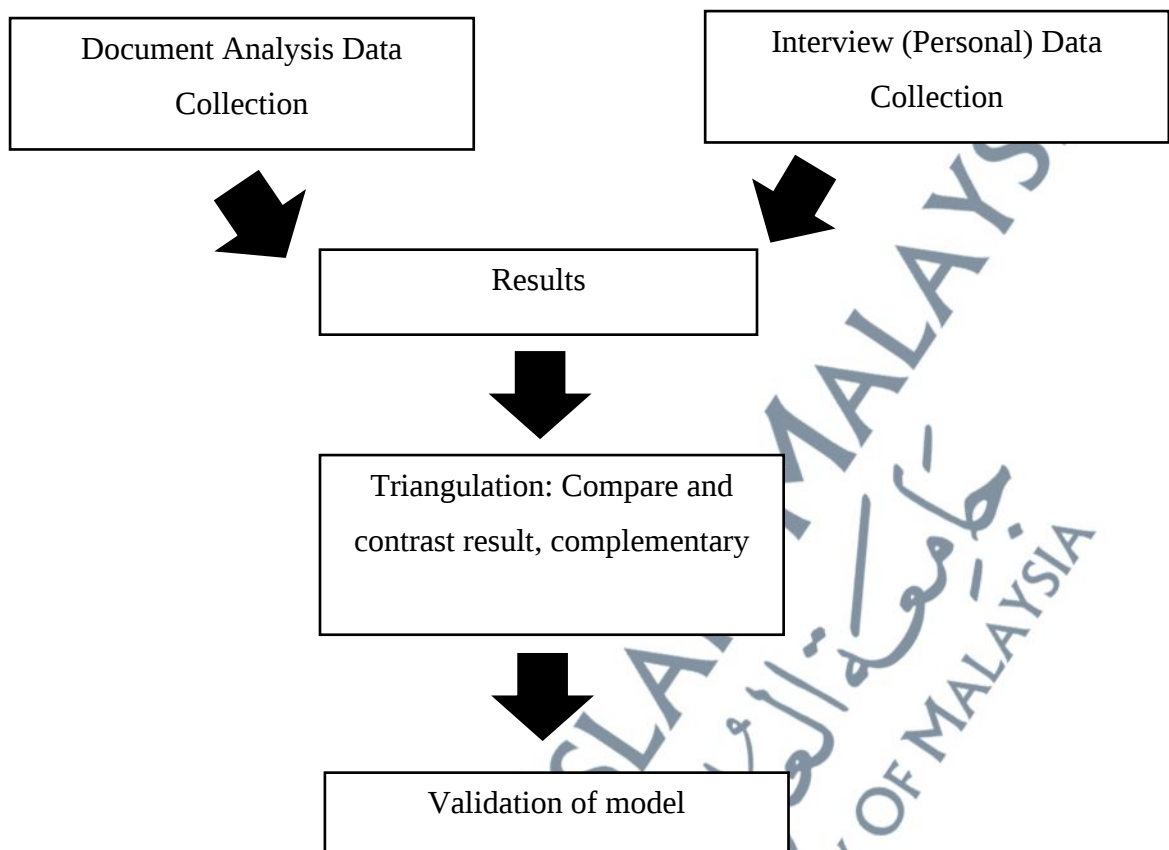
Triangulation is a method to ensure data reliability is high (Maaneen, 1983; Wiersma, 1991). Triangulation of data can be done in several ways; multiple cases or multisite studies (Merriam, 1997), triangulation of interviews that is done with several phases, triangulation of data from interview, observation and document analysis methods, and triangulation of qualitative and quantitative data (Kamarul Azmi, 2012). Creswell (2008) also mentions that triangulation is a process of validating evidence from different individuals, various types of data (field notes of observations and interview data) or various data collection techniques (document analysis and interviews) in providing descriptions and themes in qualitative studies.

So, this research is carried out by triangulation of interview data for six experts, consisting of three experts in Shariah law and two experts in membrane technology focused on water treatment. The other one is an expert from the membrane water treatment industry. Then, the other interview phase is also done to validate the data collected from the previous interview phase and to validate the suggested model of Shariah membrane water treatment.

This research also carried out the triangulation of methods, triangulation is a complementary method deployed under the assumption that weaknesses inherent in one approach will be counterbalanced via strengths in other approaches (Siti Uzairiah, 2016). Various methods or procedures used in triangulation clarify meaning by identifying different approaches to the same phenomenon using multiple sources of

evidence (Denzin, 2006 & Silverman, 2011). So, having more than one method or technique is part of the triangulation strategy. Hence, this research uses two methods for gaining the data: document analysis and supported and proven by data from the interview. The whole process of the research methodology is illustrated in Figure 3.1:





Source: Researcher (2019)

Figure 3.1: Process of Triangulation Data Collection and Analysis

3.6.2 Research's Validity

One method to increase the collected data's validity is through verification and sign by the informant toward the collected data (Bogdan & Biklen, 2003). Besides, the recorded voice is regarded as validating the data. The validation process is done in this research for several processes through this research. Firstly, validation of questions or items of the interview. The validation towards the items' content, sentence and suitability, and general comments for the interview item. The interview items were first validated by two validators from both areas, *Fiqh* and water technology. Next, the validators gave the corrections for the comment and improvement. The improvement given by validator 1, which is from the *Fiqh* area, is as follows:

1. Demografi
 Nama: *soalan perlu di rumah*
 Jawatan: *secara sistematik / ikut dalil*
 Kepakaran bidang: *(a) keperluan manusia t'hadap*
 Institusi: *water treatment ini*
 Pengalaman Bekerja:

2. Apakah maksud rawatan air menurut fiqh?

3. Bagaimana cara rawatan air menurut fiqh?

* 4. Apakah ciri-ciri yang menjadikan produk penapis air patuh syariah?

5. Pernahkah Prof/ Prof Madya/ Dr/ Tuan/ Puan terlibat dalam kajian atau penulisan rawatan menggunakan membran dalam perspektif Fiqh dan Sains? Jika ya, mohon jelaskan.

6. Apakah pandangan Prof/ Prof Madya/ Dr/ Tuan/ Puan tentang gabungan kaedah rawatan dan penyucian air menurut Fiqh dan Sains? Adakah ia suci menurut fiqh?
 - Kaedah Rawatan Air Menurut Fiqh: Menghilangkan bau, rasa dan warna. - *bab*
 - Kaedah Rawatan Air Menurut Sains: antaranya menggunakan kaedah *bermua* membran.

7. Komen/ Cadangan Umum Prof/ Prof Madya/ Dr/ Tuan/ Puan berkenaan isu rawatan air menggunakan teknologi membran.

Apabila soalan tentang model, boleh ditanyas
dan dalil
- apa kaedah yg menghambas
menghalab water treatment ini
(kaedah fiqh)
- itu syarak dalam kaedah water
treatment ini;
2 ① najis?
② penggunaan bahan terlar
- Kenapa water treatment ini perlu?
marlahah? damrah?

Yang benar,

 Prof. Madya Dr Yasmin Hanani binti Mohd Safian
 Tarikh: 18/12/2019 Associate Prof. Dr Yasmin Hanani Mohd Safian
 Faculty of Shariah and Law
 Universiti Sains Islam Malaysia
 71800 Nilai Malaysia

Figure 3.2: The Interview Question Validation Process by the Validator 1

While the comment and improvement given by validator 2, which is from the water technology area, are as follows:

Bil	Soalan	Ya	Tidak	Ulasan
1.	Demografi a. Nama: b. Jawatan: c. Gelaran: Prof/Prof Madya/Dr/Puan/Tuan d. Kepakaran bidang: e. Institusi: f. Pengalaman Bekerja:			Tambahan bah (c)
2.	Apakah maksud membran dalam rawatan air?			Apakah maksud penggunaan teknologi penapisan(?) membran dalam sistem perawatan air.
3.	Apakah pembahagian membran dalam rawatan air?			Soalan 3, 4 boleh digabungkan. Apakah komponen utama serta fungsi yang terdapat dalam teknologi membran yang digunakan dalam sistem perawatan air
4.	Apakah fungsi setiap jenis membran dalam rawatan air?			
5.	Nyatakan jenis-jenis bahan yang biasa digunakan sebagai komponen membran dalam sistem perawatan air dan cara penghasilan bahan tersebut.			Cadangan soalan
6.	Bagaimanakah proses membran dalam rawatan air?			Terangkan prinsip operasi teknologi membran dalam sistem perawatan air.
7.	Sejauhmanakah penggunaan teknologi rawatan air membran di Malaysia?			Sejauh manakah keberkesanan/permintaan pengguna/populariti..atau Bagaimana penerimaan pengguna terhadap sistem perawatan air menggunakan teknologi membran di Malaysia? Atau Adakah anda bersetuju penggunaan sistem perawatan air menggunakan teknologi membran adalah pilihan pengguna di Malaysia, kenapa?
8.	Apakah contoh produk rawatan air yang menggunakan teknologi membran?			
9.	Apakah kelebihan dan juga kekurangan penggunaan membran dalam rawatan air berbanding kaedah teknologi yang dinyatakan?			Cadangan: wujudkan satu soalan sbkm soalan 8. Nyatakan kaedah teknologi selain membran dalam sistem perawatan air masa kini.
10.	Apakah pandangan Prof/ Prof Madya/ Dr/ Tuan/ Puan tentang gabungan kaedah rawatan dan			Soalan 10 menjadi soalan 9. Tambahan soalan: Berdasarkan jenis bahan, kaedah penghasilan bahan dan pengoperasian teknologi membran (rujuk:

General Comment

Penapisan air = water filtration ialah salah satu stage dalam sistem perawatan air = water treatment.

Be consistent in using term in both set of questions. Nak guna term penapis atau perawatan ?

Kelaskan/kategori soalan berdasarkan aspek yang ingin dihighlight kan /point

Figure 3.3: The Interview Question Validation Process by the Validator 2

Next, after the interview sessions ends, the recorded voices were transcribed as soon as possible to report the data in the note field. After the transcribing of the

interview data is done, the transcribed text was given to the informants to reread and made the correction from the text. Then, the informants signed the transcribed text after correction is done. This process helps to validate the transcribed data.

3.7 Analysis Data Procedure

Analysing data for the qualitative research method starts when the research plan or proposal is made. It means the analysis of data is implemented before the data collecting process, and this process has occurred and throughout the research until the end of the research or the report is completed (Miles & Huberman, 2003). But, Merriam (1997) stated that there are two phases for the data analysis process, which are when the process of data collection and after the data collection phase. Next, Hin (2007) also says that the data analysis process usually begins at the stage of the data collection process, such as the process of filtering data, selecting, summarizing, abstracting and transforming data so that the data size can be reduced through this step.

Analysing the data in this research was implemented through the thematic analysis approach. So that the selected documents and the transcribed text from the interview approach are analysed to form the themes. There are several processes for implementing these steps, which are as follows:

- a) The process of breaking down, checking, comparing and categorizing data. This process produces a concept that is then collected and categorized, the data that has been classified will then be processed for the next step
- b) The process of regrouping data is obtained in a new form and way after the first step by making connections between categories. This process links from one category to another. The core category further confirms the relevance of each category and includes categories that require further research.

The above steps can be seen through this research process. When the transcribed text is produced, the data is analysed to produce categories and subthemes that are arranged to be the main themes. This process is called the coding process. This coding is done to the transcribed text for each interview's informants. Next, a constant comparison process is implemented: the data is compared, looking for the clue in the text. According to Hin (2007), constant comparison is one of the methods of qualitative data analysis by taking part of the data and comparing it with other data that may be similar or different to identify the relationship between these data. So, that is how the data has been analysed for this research.

3.8 Summary of Research Methodology

Table 3.4: Summary of Research Methodology

and	Research Questions (RQ) Research Objectives (RO)	Methods	Approaches	Instruments	Sample	Analysis
	RQ1: What are water treatment and purification concepts from <i>Fiqh</i> and science perspectives? RO1: To identify the concept of treatment and purification of water (<i>tathīr al-mā'</i>) according to <i>Fiqh</i> and scientific perspectives		Document Analysis		<i>Fiqh turath</i> books, guidelines and fatwas	
	RQ2: What are the status/ <i>hukm</i> of the membrane water treatment and purification technology? RO2: To study the status/ <i>hukm</i> of the membrane water treatment and purification technology	Qualitative	Interview	Researcher	3 experts in Shariah and 3 experts in water technology, including industry)	Thematic Analysis Constant Analysis
	RQ3: How is the membrane water treatment from <i>Fiqh</i> perspective? RO3: To evaluate the membrane water treatment from <i>Fiqh</i> perspective		Document Analysis & Interview			

3.9 Theoretical Framework

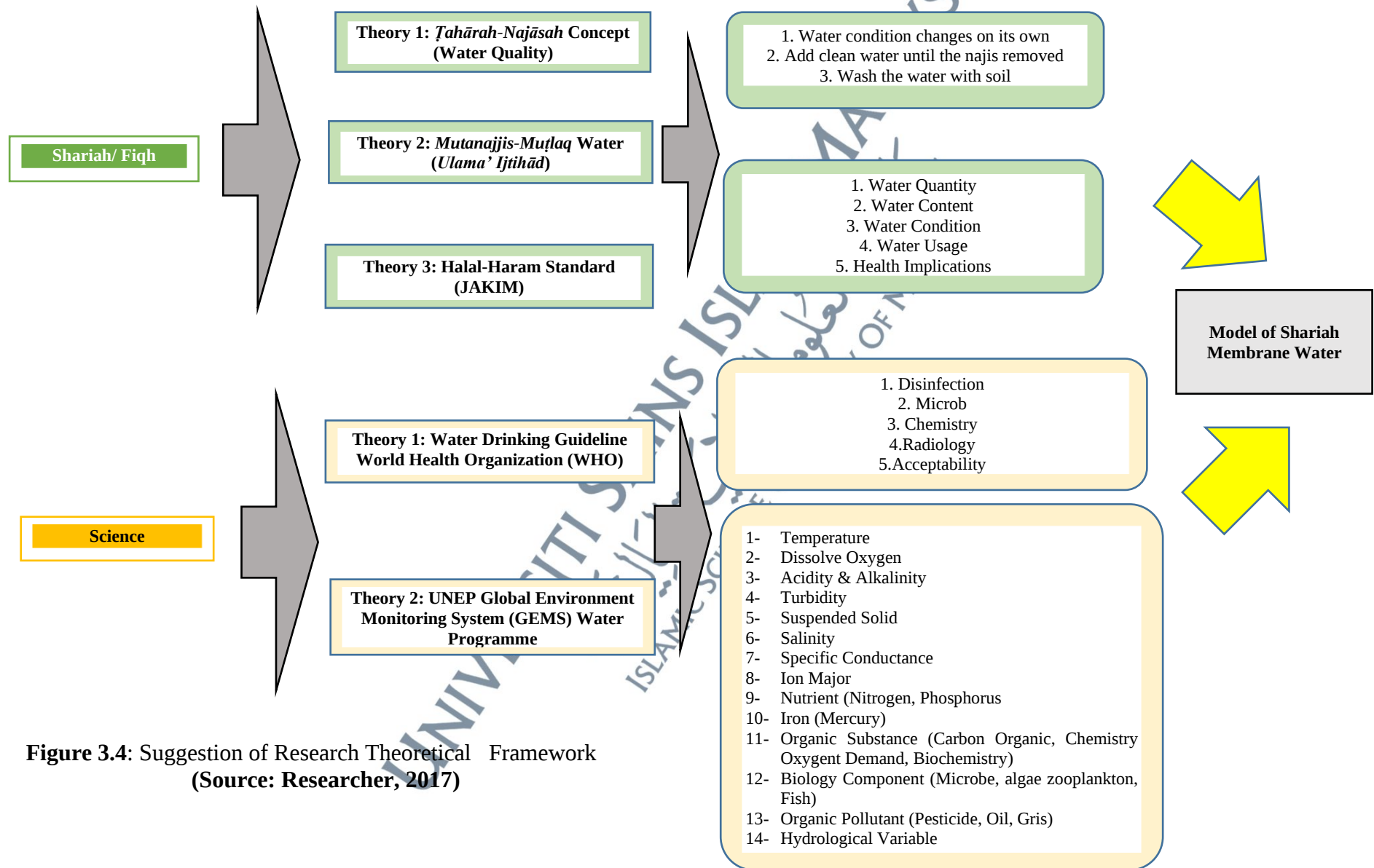


Figure 3.4: Suggestion of Research Theoretical Framework
(Source: Researcher, 2017)

3.10 Conceptual Framework

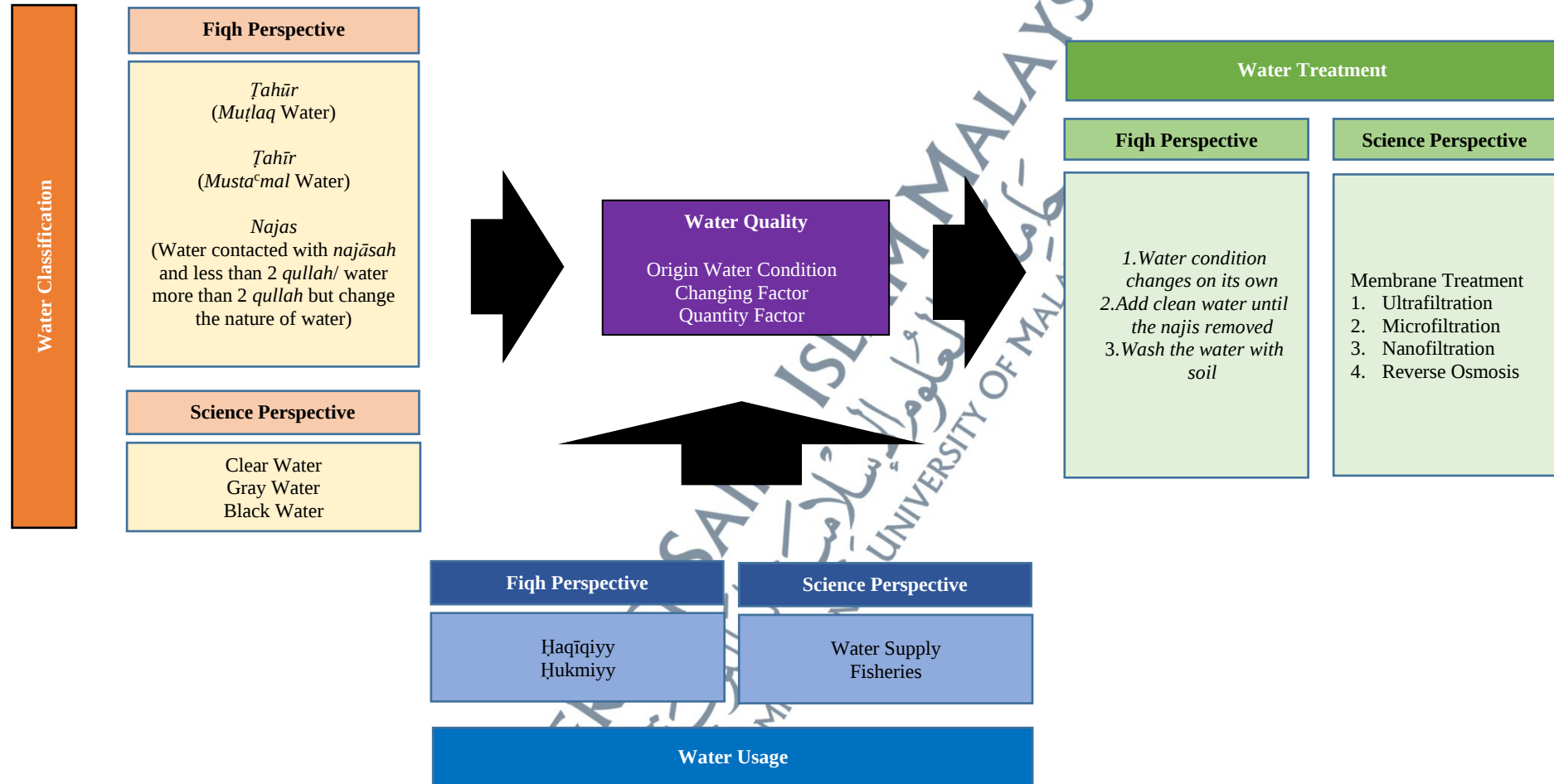


Figure 3.5: Suggestion of Research Theoretical Framework
(Source: Researcher, 2019)

3.11 Conclusion

Planning of research methodology is vital to ensure the smoothness and guided journey of the research. In this research, using treatment water is one of the ways to conserve nature and ensuring the cleanliness and purification of treated water is also essential as this water is not only used for external uses such as bathing, watering and so on but also for internal uses like drinking and cooking that need the clean water to consume for our body healthy. Next, the use of treated water for *ibadah* is also essential to make its purity to ensure Allah accepts the *ibadah*. Hence, the method of membrane water treatment and purification process needs to be promoted for people to use and give the correct information to Muslims to cater for the flawed perceptions toward treated water.