

CHAPTER IV

WATER CRISIS SOLUTIONS IN THE QUR'AN AND SCIENCE

A. Water Quantity Crisis Solutions

A water crisis at the quantity level, or often referred to as water scarcity, is a condition of limited access to water caused by an institution or state's failure to ensure the water supply or caused by a lack of adequate infrastructure. Water scarcity has occurred on every continent. The increasing of water use is more than doubled population growth in the last century, and more areas have exceeded the limits of their distributable water supply, especially in dry areas.¹

Water scarcity is a problem that needs to be considered and solved together. In this case, the author divides the solution to the water crisis in quantity into two major points: optimization of water management and even water distribution.

1. Optimization of Water Management

The quantity of water in nature does not increase or decrease. The amount of water is permanently fixed, but the use and management of water sources will determine the adequacy or shortage of water in an area.² This is as indicated in the following Q.S. al-Ra'd/13: 17.

أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَسَالَتْ أَوْدِيَةٌ بِقَدَرِهَا فَاحْتَمَلَ السَّيْلُ زَبَدًا رَابِيًا وَمِمَّا يُوقِدُونَ عَلَيْهِ فِي النَّارِ

أَبْتِغَاءَ حِلْيَةٍ أَوْ مَتَاعٍ زَبَدٌ مِثْلَهُ كَذَلِكَ يَضْرِبُ اللَّهُ الْحَقَّ وَالْبُاطِلَ فَأَمَّا الزَّبَدُ فَيَذْهَبُ جُفَاءً وَأَمَّا مَا

¹Team of Writer, "Water Scarcity" (UN Water, n.d.), 2.

²Ainiyatul Latifah, "Optimalisasi Manajemen Air dalam Al-Qur'an (Studi Surat Al-Ra'd Ayat 17)," *Jurnal Prosiding Konferensi Integrasi Interkoneksi Islam dan Sains 2* (2020): 49–50.

يَنْفَعُ النَّاسَ فَيَمُوتُ فِي الْأَرْضِ كَذَلِكَ يَضْرِبُ اللَّهُ الْأَمْثَالَ

“He sends down water from the skies, and the channels flow, each according to its measure: But the torrent bears away the foam that mounts up to the surface. Even so, from that (ore) which they heat in the fire, to make ornaments or utensils therewith, there is a scum likewise. Thus doth Allah (by parables) show forth truth and falsehood. For the scum disappears like froth cast out; While that which is for the good of mankind remains on the earth. Thus doth Allah set forth parables.”³

The word *audiyatun* in the verse is the plural form of the *mufrad* form *wâdin* which means the valleys.⁴ The use of the form of *nakirah* (indefinite) for this word aims to describe various valleys in terms of size, length, width, and narrowness.⁵ The places where the water flows have been adjusted to how much or less water flows in it.⁶ According to linguists, *wâdî* is the singular form of *audiyah*, a lowland in the mountains and hills with fast-flowing water. Meanwhile, Al-Suhrawardi said that a place is called *wadî*, if there is a water flow in it.

As for the word *biqadarihâ*, it means the amount of something that can be accommodated, as defined by al-Wahidi based on the habit of using these words in everyday life. The fragment of the verse *fasâlat audiyaḥ biqadarihâ* can be interpreted as “the water flows in the valleys according to its size.” Small valleys can only hold a little water, while large valleys can hold more water,

³Abdullah Yûsuf 'Alî, *The Holy Qur'an* (King Fahd Holy Qur'an Printing Complex, n.d.), 678–79.

⁴Wahbah al-Zuhailî, *Tafsîr Al-Munîr*, vol. 7 (Damaskus: Dâr al-Fikr, 2009), 157. Also look at Muḥammad al-Thâhir Ibnu 'Âsyûr, *Tafsîr Al-Tahrîr a al-Tanwîr*, vol. 13 (Dâr al-Tunîsiyyah, 1884), 118.

⁵M. Quraish Shihab, *Tafsîr Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, vol. 6 (Jakarta: Lentera Hati, 2002), 252.

⁶Muhammad Hasbi ash-Shiddieqy, *Tafsîr Al-Qur'anul Majid an-Nuur*, vol. 3 (Semarang: Pustaka Rizki Putra, 2000), 2082.

according to the size of the valley.⁷

According to Zuhailî The word *biqadarihâ* can be interpreted into two kinds, namely in the form of quality or quantity. In the form of quality, it means that flowing water is useful water, while in the form of quantity, it means that the flow of water is a lot or a little.⁸ The water Allah sends down is according to the valley's capacity. If the valley is small and narrow, there is little water flowing, while if the valley is wide, then the water flowing is a lot.⁹

The verse above implies that Allah has sent down rain with appropriate and fixed rules, so humans are tasked with managing the water that has been sent down in a fixed amount so that it can be used for the common good. Things that can be done to optimize water management in daily life include water saving and making drainage.

a. Water Saving

The simplest water management that can be done by everyone is to use water wisely. This is generally stated in Q.S. al-Isrâ`/17: 26-27.

وَعَاتِ ذَا الْقُرْبَىٰ حَقَّهُ وَالْمِسْكِينَ وَابْنَ السَّبِيلِ وَلَا تَبْدِرُوا مَالَكُمْ كَانُوا إِخْوَانَ

الشَّيْطَانِ وَكَانَ الشَّيْطَانُ لِرَبِّهِ كَفُورًا

*“And render to the kindred their due rights, as (also) to those in want, and to the wayfarer: But squander not (your wealth) in the manner of spendthrift. Verily spendthrifts are brothers of the Satans. And the Satan is to his Lord (Himself) ungrateful.”*¹⁰

⁷Muhammad al-Râzî, *Mafâtîh Al-Ghaib*, vol. 10 (Beirut: Dâr al-Fikr, 1995), 41–43.

⁸al-Zuhailî, *Tafsîr Al-Munîr*, 2009, 7:157.

⁹Latifah, “Optimalisasi Manajemen Air dalam Al-Qur’an (Studi Surat Al-Ra’d Ayat 17),”

¹⁰Yûsuf 'Alî, *The Holy Qur'an*, 783.

Tabdzîr (waste) is not just synonymous with wasting something in terms of quantity. Waste assessment standards are also related to the quality of giving, seen in the object of the charity (*infaq*). This assessment refers to the interpretation of Ibn Mas'ud and Ibn 'Abbas, as quoted by Sayyid Quthb, that those who waste are not those who spend all their wealth for the truth, but those who spend their wealth not for the truth, even if only one *mud*. The nature of *tabdzîr* is closely related to the devil's disbelief to Allah (*wa kâna al-syaithânu lirabbihî kafûrâ*) which mentioned at the end of the verse. The disbelief addressed to the devil, in line with the nature of the wasteful person who disbelieves in the blessings of Allah.¹¹ The same provision is also mentioned in Q.S. al-An'âm/6: 141.

وَهُوَ الَّذِي أَنْشَأَ جَنَّاتٍ مَّعْرُوشَاتٍ وَغَيْرِ مَعْرُوشَاتٍ وَالنَّخْلَ وَالزَّرْعَ مُخْتَلِفًا أُكْلُهُ وَالزَّيْتُونَ وَالرُّمَّانَ
مُتَشَبِّهًا وَغَيْرَ مُتَشَبِّهٍ كُلُوا مِنْ ثَمَرِهِ إِذَا أَثْمَرَ وَءَاتُوا حَقَّهُ يَوْمَ حَصَادِهِ وَلَا تُسْرِفُوا إِنَّهُ لَا يُحِبُّ
الْمُسْرِفِينَ

*“It is He who produceth Gardens, with trellises and without, and dates, and tilth with produce of all kinds, and olives and pomegranates, Similar (in kind) and different (in variety): Eat of their fruit in their season, but render the dues that are proper on the day that harvest is gathered. But waste not by excess: for Allah loveth not the wasters.”*¹²

The background of the verse is narrated by Ibn Jarîr from Abu al-'Âliyah, he said, “In ancient times, apart from zakat, people also donated something, then they overdo it. Then, this verse came down.” There is another narration from Ibn Juraij that this verse was revealed about Tsâbit

¹¹Sayyid Quthb, *Fî Zhilâl Al-Qur'ân*, vol. 4 (Kairo: Dâr al-Syurûq, 2003), 2222.

¹²Yûsuf 'Alî, *The Holy Qur'an*, 385.

bin Qais bin Syammâs who fed the people until the afternoon at the time of the date palm harvest. Thus, he did not get a single date for himself.¹³

The verse above states about the companions of the Prophet who gave something excessively. Although charity is a noble act, Allah commands us not to be excessive in everything, including giving charity. In this case, excessive in bad things is more reprehensible in the sight of Allah.

In its implementation with water, water wastage not only concerns the issue of excessive use but also covers the realm of inaccuracies in water use. Although a little, if the water used is not for what is needed, it is included in the waste category. In addition, the command not to be extravagant in eating and drinking is also found in the following Q.S. al-A'râf/7: 31.

يٰۤاَيُّهَاۤ اٰدَمَۃُ خُذُوۤا زِيۡنَتَكُمْ عِنۡدَ كُلِّ مَسۡجِدٍ وَكُلُوۡا وَشَرِبُوۡا وَّلَا تُسْرِفُوۡا اِنَّهٗ لَا يُحِبُّ الْمُسْرِفِيۡنَ

“O Children of Adam! Wear your beautiful apparel at every time and place of prayer: eat and drink: But waste not by excess, for Allah loveth not the wasters.”¹⁴

The term *tusrifû* is *fi'il mudhâri* form from *asrafa* which is a form of *tsulâtsî mazâd fih* from the word *sarafa*. It consists of three basic letters, namely *sin*, *ra*, and *fa*, and the meaning is to go beyond the limits of something and ignore it.¹⁵

The word *tusrifû* tends to be interpreted as an act relating to quantity.

¹³Jalâl al-Dîn al-Suyûthî, *Lubâb al-Nuqûl fî Asbâb al-Nuzûl* (Beirut: Mu'assasah al-Kutub al-Tsaqâfiyyah, 2002), 118.

¹⁴Yûsuf 'Alî, *The Holy Qur'an*, 404.

¹⁵Aḥmad Ibn Fâris, *Mu'jam Maqâyîs al-Lughah*, vol. 3 (Dâr al-Fikr, 1979), 153.

Wahbah al-Zuhailî defined it as an act of exceeding the limits in all matters (*tajâwuz al-haddi*),¹⁶ while al-Sa'dî interpreted it as an act of exceeding the limits that have been considered sufficient (*al-ziyâdah 'ala al-qadr al-kâfi*).¹⁷

The Prophet Muḥammad in one of his remarks on the prohibition of excessive ablution, also uses the same adjective, namely *lâ tusrif*, as an appeal for water conservation. Prophet Muḥammad has shown his friends to always be frugal in using water, even for worship matters such as ablution. This is as written in the following two hadiths.

حدثنا أبو نعيم قال: حدثنا مسعر قال: حدثني ابن جبر قال: سمعت أنسًا يقول: كان

النبي صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ يَغْسِلُ - أَوْ كَانَ يَغْتَسِلُ - بِالصَّاعِ إِلَى خَمْسَةِ أَمْدَادٍ، وَيَتَوَضَّأُ

بِالْمَدِّ.¹⁸

“Abû Nu'aim told us, he said, Mis'ar told us, he said, Ibnu Jabr told me, he said, I heard Anas said: ‘The Prophet used to take a bath with one sha’ up to five mudds of water and used to perform ablution with one mudd of water.’” (H.R. Bukhârî no. 201)

حدثنا محمد بن المصنف الحمصي، ثنا بقية، عن محمد بن الفضل، عن أبيه، عن سالم، عن

ابن عمر قال: رأى رسول الله صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ رجلاً يتوضأ فقال "لا تسرف، لا

¹⁶Wahbah al-Zuhailî, *Tafsîr Al-Munîr*, vol. 4 (Damaskus: Dâr al-Fikr, 2009), 546.

¹⁷Abd al-Rahman al-Sa'dî, *Taisîr al-Karîm al-Rahmân* (Riyadh: Dâr al-Salâm, 2002), 322.

¹⁸Muḥammad bin Ismâ'îl al-Bukhârî, *Shahîḥ Al-Bukhârî* (Damaskus: Dâr Ibn Katsîr, 2002),

تسرف.¹⁹

“*Muhammad bin al-Mushaffâ al-Himshî told us, from Muhammad bin al-Fadhl, from his father, from Sâlim, from Ibnu 'Umar, he said: 'The Prophet shallallahu 'alaihi wa sallam saw a man performing ablution, then he said: do not overdo it, do not overdo it.'*” (H.R. Ibnu Mâjah no. 424)

b. Making Waterways (Drainage)

Drainage means the removal of water masses, either natural or artificial, from the surface or subsurface of a place. Based on the manufacture, drainage is divided into natural and artificial drainage. Natural drainage occurs by itself without human intervention. This can happen if the ground slopes enough so the rainwater will flow by itself, enter the ditch, and eventually into the river. In addition, natural drainage can also occur in porous soil, which has a large number of pores, so the ability to absorb water is high. Artificial drainage is designed and constructed for a specific purpose adapted to water management.²⁰

In the Qur'an, the command to make this drainage is implied in Q.S. Hûd/11: 44 about the story of God's punishment to the people of Prophet Nûh who disobeyed Him.

وَقِيلَ يَا رِضُّ أَبْلَعِي مَاءَكَ وَيُسْمَاءُ أَفْلَعِي وَغِيضَ الْمَاءِ وَقُضِيَ الْأَمْرُ وَأَسْتَوَتْ عَلَى الْجُودِيِّ

¹⁹Muhammad bin Yazîd al-Qazwîni, *Sunan Ibnu Mâjah* (Dâr Ihyâ` al-Kutub al-'Arabiyyah, n.d.), 147.

²⁰Achmad Syarifudin, *Drainase Perkotaan Berwawasan Lingkungan* (Palembang: Andi, 2017), 3–4.

وَقِيلَ بُعْدًا لِلْقَوْمِ الظَّالِمِينَ

*“Then the word went forth: ‘O earth! Swallow up thy water, and O sky! Withhold (thy rain)!’ And the water abated, And the matter was ended. The Ark rested on Mount Judi, and the word went forth: ‘Away with those who do wrong!’”*²¹

In verse above, Allah ordered the earth to swallow water, then continued with the command to the sky to stop the rain. Rain in this verse is interpreted as a water source, while the earth is a place to store water. Based on the two commands that go hand in hand, the verse above suggests that humans should look for or make waterways before looking for water sources so that the water that comes from the water source does not flood.²²

Developing a drainage system in an area aims to provide a channel system that functions to drain surface water due to rain to the nearest receiving water body, such as a river. In its application, the presence of water channels is vital in preventing flooding when there is heavy rain. Along with the population growth in urban areas, the development of various urban infrastructure and facilities is also increasing.²³ Thus, developing a drainage system is significant for the community, especially in densely populated urban areas.

2. Even Water Distribution

The term distribution means (1) the way something is spread or exists over

²¹Yūsuf 'Alī, *The Holy Qur'an*, 594–95.

²²Muḥammad Mutawallī al-Sya'rāwī, *Tafsīr al-Sya'rāwī*, vol. 11 (Kairo: Dār Ikhbār al-Yaum, 1991), 12300–301.

²³Annida Unnatiq Ulya, Endro Sutrisno, and Irawan Wisnu Wardhana, “Perencanaan Sistem Drainase Berwawasan Lingkungan (Ekodrainase) di Kelurahan Sekaran Kecamatan Gunungpati Kota Semarang,” *Jurnal Teknik Lingkungan* 4, no. 1 (2015): 1.

a particular area or among a particular group of people, and (2) the act of giving or sharing something among a number of people.²⁴ In the Qur'an, the concept of water distribution fairly and evenly is contained in several verses, such as in Q.S. al-Qamar/54: 28.

وَنَبِّئُهُمْ أَنَّ الْمَاءَ قِسْمَةٌ بَيْنَهُمْ كُلُّ شَرْبٍ مُّحْتَضِرٍ

“And tell them that the water is to be divided between them: Each one’s right to drink being brought forward (by suitable turns).”²⁵

Ibn Katsîr interprets the fragment of the verse *wa nabbi`hum anna al-mâ`a qismatun bainahum*. At that time, well water was distributed to two parties, the Tsamûd and the female camel belonging to the Prophet Shâlih.²⁶ Allah ordered the Prophet Shâlih to inform his people regarding the distribution of well water between them and the camel, namely a day for the camel and a day for them. Each came in turn to fetch the water from the well.²⁷ This division is based on the camel’s habit of drinking every one-day interval. If the camel has drunk water in one day, she does not drink the next day. On the day when the camel did not drink, the Tsamûd used that to prepare water supplies for the next day.²⁸ This distribution system is done because other animals are reluctant to go to the well if there is the Prophet Shâlih’s camel there.²⁹

²⁴“Distribution,” in *Oxford Advanced Learner’s Dictionary*, July 7, 2022, <https://www.oxfordlearnersdictionaries.com/definition/english/distribution?q=distribution>.

²⁵Yûsuf ‘Alî, *The Holy Qur’an*, 1653.

²⁶Ismâ’îl bin ‘Umar al-Dimasyqî, *Tafsîr al-Qur`ân al-‘Azhîm* (Beirut: Dâr Ibn Hazm, 2000), 1791.

²⁷Team of Writer, *Al-Qur’an dan Tafsirnya*, vol. 9 (Jakarta: Departemen Agama RI, 2004), 577.

²⁸Muḥammad bin Jarîr al-Thabarî, *Jâmi’ al-Bayân fî Ta’wîl al-Qur’an*, vol. 11 (Beirut: Dâr al-Kutub al-‘Ilmiyyah, 2009), 560.

²⁹Muḥammad al-Râzî, *Mafâtîḥ al-Ghaib*, vol. 15 (Beirut: Dâr al-Fikr, 1995), 55.

The meaning of the verse *kullu syirbin muhtadhar* is to be attended by people who have a turn. That is, the camel is present on the day of her turn and is not present on the turn of the Tsamûd, and vice versa.³⁰ The distribution rule made by the Prophet Shâlih at that time was to limit access to water sources only to those who had their turn. No other party was allowed to attend except the party concerned.³¹

This verse can be used as an ideal description of water distribution. Water distribution must take into account the different needs of each party. Parties with small numbers do not always need little water, and vice versa. As in the case of Prophet Shâlih 's camel above, one camel is given a special day to drink water, while the Tsamûd are also given one day to use the water. If it is calculated in quantity, the number of Tsamûd is bigger than the camel, but they are given the same amount of water consumption as one camel.

In addition to the verse, Allah also mentions the fair distribution of water in Q.S. al-Baqarah/2: 60 and Q.S. al-A'râf/7: 160 about the following story of the Prophet Mûsâ.

وَإِذِ اسْتَسْقَىٰ مُوسَىٰ لِقَوْمِهِ فَقُلْنَا اضْرِبْ بِعَصَاكَ الْحَجَرَ فَانْفَجَرَتْ مِنْهُ اثْنَتَا عَشْرَةَ عَيْنًا قَدْ عَلِمَ

كُلُّ أَنَسٍ مَّشْرَبَهُمْ كُلُوا وَاشْرَبُوا مِن رِّزْقِ اللَّهِ وَلَا تَعْتُوا فِي الْأَرْضِ مُفْسِدِينَ

“And remember Moses prayed for water for his people; We said: ‘Strike the rock with thy staff.’ Then gushed forth therefrom twelve springs. Each group knew its own place for water. So eat and drink of the sustenance provided

³⁰Muhammad bin Ahmad al-Qurthubî, *Tafsîr Al-Qurthubî*, vol. 9 (Beirut: Dâr al-Kutub al-Ilmiyyah, 2010), 92.

³¹M. Quraish Shihab, *Tafsir Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur’an*, vol. 13 (Jakarta: Lentera Hati, 2002), 249.

by Allah, and do no evil nor mischief on the (face of the) earth.”³²

وَقَطَّعْنَاهُمْ اثْنَتَيْ عَشْرَةَ أَسْبَاطًا أُمَمًا وَأَوْحَيْنَا إِلَىٰ مُوسَىٰ إِذِ اسْتَسْقَاهُ قَوْمَهُ، أَنْ اضْرِبْ بِعَصَاكَ الْحَجْرَ

فَأَنْبَجَسَتْ مِنْهُ اثْنَتَا عَشْرَةَ عَيْنًا قَدْ عَلِمَ كُلُّ أُنَاسٍ مَشْرِبَهُمْ وَظَلَّلْنَا عَلَيْهِمُ الْغَمَمَ وَأَنْزَلْنَا عَلَيْهِمُ الْمَنَّ

وَالسَّلْوَىٰ كُلُوا مِنْ طَيِّبَاتِ مَا رَزَقْنَاكُمْ وَمَا ظَلَمُونَا وَلَكِنْ كَانُوا أَنْفُسَهُمْ يَظْلِمُونَ

“We divided them into twelve tribes or nations. We directed Moses by inspiration, when his (thirsty) people asked him for water: ‘Strike the rock with thy staff’: out of it there gushed forth twelve springs. Each group knew its own place for water. We gave them the shade of clouds, and sent down to them manna and quails (Saying): ‘Eat of the good things We have provided for you’: (But they rebelled); to Us they did no harm, but they harmed their own souls.”³³

The snippet of the *fanfajarat minhutsnatâ 'asyrata 'ainâ* verse in Q.S. al-Baqarah/2: 60 describes the event of gushing water. The same event is also described in Q.S. al-A'râf/7: 160 with a different word. Twelve springs gushing corresponds to the twelve tribes or groups of Banî Isrâ`îl who lived separately at that time. Therefore, the following sentence of the verse is *qad 'alima kullu unâsin masyrabahum* meaning “Indeed, every tribe has known their respective drinking places.” With the existence of springs available for each tribe, they do not need to fight over the springs, so the unity and integrity of fellow tribes can be maintained.³⁴ The fragments *qad 'alima kullu unâsin masyrabahum* in the two verses above show justice and equity regarding water distribution to the twelve tribes of the Prophet Mûsâ.

³²Yûsuf 'Alî, *The Holy Qur'an*, 24.

³³Yûsuf 'Alî, 452–452.

³⁴M. Quraish Shihab, *Tafsir Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, vol. 3 (Jakarta: Lentera Hati, 2012), 252. Also look at Muhammad Hasbi ash-Shiddieqy, *Tafsir Al-Qur'anul Majid an-Nuur*, vol. 1 (Semarang: Pustaka Rizki Putra, 2000), 117.

According to Muhammad Hasbi Ash-Shiddieqy, the purpose of determining the drinking place of each tribe is to maintain order and prevent commotion and quarrels due to jostling for water.³⁵ The twelve springs also symbolize equality because each spring emits the same water. None emits more water than the other, thus preventing greed from occurring.³⁶

Water distribution is vulnerable to conflict over water resources. One of the solutions is to increase the number of water sources and distribute it evenly as the Prophet Mûsâ did in Q.S. al-Baqarah/2: 60 and Q.S. al-A'râf/7: 160 above. If this is not possible due to the limited number of water sources, then what was ordered by the Prophet Shâlih as a distributor, as narrated in Q.S. al-Qamar/54: 28, can be used as an alternative solution.

This equitable water distribution system is not only related to public behavior in general but must also be supported by government programs. The author divides this water distribution system into two parts, namely the water distribution reservoir and the prohibition of water privatization (remunicipalisation).

a. Water Distribution Reservoir

A reservoir is a building to store clean water before distribution to the community, which can be placed underground or above ground in the form

³⁵Muhammad Hasbi ash-Shiddieqy, *Tafsir al-Qur'anul Majid an-Nuur*, vol. 2 (Semarang: Pustaka Rizki Putra, 2000), 1495.

³⁶Muhammad Mutawallî al-Sya'râwî, *Tafsîr al-Sya'râwî*, vol. 7 (Kairo: Dâr Ikhbâr al-Yaum, 1991), 4397.

of a tower.³⁷ The water distribution reservoir is made because the demand at peak hours exceeds the available water supply. This distribution reservoir is functioned to accommodate water when the water usage is less than the supply and to cover the water shortage when the water usage exceeds the supply.³⁸

The concept of a distribution reservoir by storing water and distributing it during peak hours of water use has been implicitly mentioned in Q.S. al-Zumar/39: 21.

أَلَمْ تَرَ أَنَّ اللَّهَ أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَسَلَكَهُ يَنْبِيعٌ فِي الْأَرْضِ ثُمَّ يُخْرِجُ بِهِ زَرْعًا مُخْتَلِفًا أَلْوَانُهُ ثُمَّ

يَهْبِجُ فَتَرَاهُ تُصْفَرًا ثُمَّ يُجْعَلُهُ حُطْمًا إِنَّ فِي ذَلِكَ لَذِكْرًا لِأُولِي الْأَلْبَابِ

*“Seest thou not that Allah Sends down rain from the sky, and leads it through springs in the earth? Then He causes to grow, therewith, produce of various colours: then it withers; Thou wilt see it grow yellow; Then He makes it dry up and crumble away. Truly, in this, of remembrance to Men of understanding.”*³⁹

Al-Râzî begins interpreting this verse by quoting an opinion that all water on earth comes from the sky. In the process, Allah sends down rainwater and then regulates the distribution of the water by flowing it into springs in the earth's bowels.⁴⁰

In *Tafsîr Hadâ'iq al-Rauh wa al-Raihân*, it is stated that rainwater that

³⁷Novriyan Masombe, Fuad Halim, and Alex Binilang, “Perencanaan Sistem Pelayanan Air Bersih di Kelurahan Bonkawir Kabupaten Raja Ampat Provinsi Papua Barat,” *Jurnal Sipil Statik* 3, no. 11 (2015): 777.

³⁸Intan Agustin Nirmala Sari Abdul Karim, Cindy J. Supit, and Liany A. Hendratta, “Perencanaan Sistem Penyediaan Air Bersih di Desa Motongkad Utara Kecamatan Nuangan Kabupaten Bolaang Mongondow Timur,” *Jurnal Sipil Statik* 4, no. 1 (2016): 711.

³⁹Yûsuf 'Alî, *The Holy Qur'an*, 1401.

⁴⁰Muḥammad al-Râzî, *Mafâtîḥ Al-Ghaib*, vol. 13 (Beirut: Dâr al-Fikr, 1995), 265.

falls is then put into the soil, then the water settles in the ground and becomes groundwater. The groundwater then becomes a spring.⁴¹ The water source can be a river that flows on the earth's surface or water that flows under the earth's layer due to water infiltration from the ground surface.⁴²

Mutawallî al-Sya'râwî, when interpreting the sentence *yanâbî'a fi al-ardhi*, states that rain only falls in certain places. Therefore, Allah sends water to places where it does not rain.⁴³ The sentence *fasalakahû yanâbî'a fi al-ardhi* implies a fair distribution of water. The interpretation of the paragraph above is in line with the concept of a distribution reservoir that emphasizes water supply, namely by storing rainwater in anticipation of a lack of water supply, especially during peak hours of water use.

b. Prohibition of Water Privatization (Remunicipalisation)

Privatization in water resources management means exploiting water resources by involving the private sector or individuals to obtain capital, technology, and efficiency in water services or utilization of potential water resources. Privatization in the water resources management is limited to the use of water resources to meet business needs, among others as raw materials such as those cultivated by drinking water companies and bottled water companies, as a medium or main element such as those cultivated by hydroelectric companies, water tourism, water sports, and also as an

⁴¹Muhammad Amîn al-Harârî, *Tafsîr Hadâ'iq al-Rauh wa al-Raihân*, vol. 24 (Beirut: Dâr Thauq al-Najâh, 2001), 529–30.

⁴²Sayyid Quthb, *Fî Zhilâl al-Qur'ân*, vol. 5 (Kairo: Dâr al-Syurûq, 2003), 3047.

⁴³Muhammad Mutawallî al-Sya'râwî, *Tafsîr al-Sya'râwî*, vol. 21 (Kairo: Dâr Ikhbâr al-Yaum, 1991), 13092–93.

auxiliary material for the production process.⁴⁴

The utilization of water resources managed by entrepreneurs can cause problems for local communities, such as reduced irrigation channels and water for household needs. This is undoubtedly very detrimental considering the function of water is very important in life. The prohibition relating to the privatization of water sources is implicitly contained in Q.S. al-Hijr/15: 22.

وَأَرْسَلْنَا الرِّيحَ لَوْفِحَ لَوْحٍ فَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَسْقَيْنَاكُمُوهُ وَمَا أَنْتُمْ لَهُ بِخَازِنِينَ

“And We send the fecundating then cause the rain to descend from the sky, therewith providing you with water (in abundance), through ye are not the guardians of its stores.”⁴⁵

The passage from the verse *wa mâ antum lahû bikhâzinîn* emphasizes that humans have absolutely no power in managing rainwater, including the creation of rainwater, the process of its descent, and the water level turn from the sky.⁴⁶ Therefore, it can be understood that Allah is the one who stores water and has the power to send it down and hold it.⁴⁷

From a theological point of view, humans have no power to regulate the falling of rain and the amount of water that is lowered. The right to manage water from the sky to the earth is the right of Allah alone. When the water falls to the earth, there is no more water privatization.

⁴⁴Erina Pane, “Hak Guna Air dalam Hubungannya dengan Privatisasi Pengelolaan Sumber Daya Air,” *Pranata Hukum* 3, no. 1 (2008): 16.

⁴⁵Yûsuf 'Alî, *The Holy Qur'an*, 715.

⁴⁶Shihab, *Tafsir Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, 2002, 6:444.

⁴⁷Muhammad bin Ahmad al-Qurthubî, *Tafsîr al-Qurthubî*, vol. 5 (Beirut: Dâr al-Kutub al-'Ilmiyyah, 2010), 14.

Water is essentially a human right and is regulated in the constitution. The community will have to pay to get water if water is privatized. This violates the concept of human rights itself because people will find it difficult to get water. The state as a service provider needs to have non-governmental organizations or institutions that monitor their performance. These institutions must be critical, and every decision related to water management is carried out transparently and responsibly. In addition, non-governmental institutions or organizations, civil society organizations, and even local communities should be empowered to make decisions so that good water management can be implemented.⁴⁸

The water right is public ownership, as in one of the words of the Prophet Muḥammad.

حدثنا علي بن الجعد اللؤلؤي: حدثنا حريز بن عثمان عن حبان بن زيد الشرعبي، عن رجل من قرن؛ ح: وحدثنا مسدد: حدثنا عيسى بن يونس: حدثنا حريز بن عثمان: حدثنا أبو خدّاش وهذا لفظ علي: عن رجل من المهاجرين من أصحاب النبي صلى الله عليه وسلم قال: غزوت مع النبي صلى الله عليه وسلم ثلاثاً أسمعته يقول: المسلمون شركاء في ثلاث في

الكلاّ والماء والنار.⁴⁹

⁴⁸Pane, "Hak Guna Air dalam Hubungannya dengan Privatisasi Pengelolaan Sumber Daya Air," 28.

⁴⁹Sulaimân bin al-Asy'ats al-Sijistânî, *Sunan Abî Dâwûd* (Riyadh: Dâr al-Salâm, 1999), 502.

“‘Alî bin al-Ja'di al-Lu`lu`î told us: *Harîz bin 'Utsmân*, from *Hibbân bin Zaid al-Syar'abî*, from a man in a time, Musaddad told us, 'Îsâ bin Yûnus, *Harîz bin 'Utsmân* told us, *Abû Khidâsy* told us, and this is 'Alî's narration: from a man of *Muhâjirîn*, the Prophet's companion, he said: *I was in a war with the Prophet, three things I heard he said: 'Muslims are partners in three things: grass, water, and fire.'*” (H.R. Abu Dâwûd no. 3477)

In water privatization, private companies often place water as an economic commodity, causing losses to the community, especially the poor. The problems that occur in water privatization are very diverse, such as corruption, manipulation of tariff formulas, renegotiation of systematically raising prices, delays in revising investment commitments, and overestimating the required investment. Global developments have shown that water privatization has failed to distribute water evenly to the community. Therefore, remunicipalisation or full return of private assets into the hands of the government or the public is considered a logical mechanism to end the water crisis.⁵⁰

B. Water Quality Crisis Solutions

The water crisis at the quality level is often referred to as the clean water crisis, a condition where the water is not suitable for use because it is polluted for food or hygiene needs. The author proposes five solutions that can be done to prevent and overcome the clean water crisis, namely reforestation, watersheds conservation, controlling water pollution, biopore infiltration holes, and rainwater harvesting.

⁵⁰Emanuele Lobina and David Hall, “Water Privatisation and Remunicipalisation: International Lessons for Jakarta,” *Public Services International Research Unit*, 2013, 4.

1. Reforestation

Reforestation is the act of planting new trees in an area where there used to be a forest.⁵¹ According to Yûsuf Qardhâwî, one of the ways to protect the environment proposed by Islam is by planting trees and reforestation. This is known from the many verses that mention reforestation through planting and farming activities, including Q.S. al-An'âm/6: 99 and 141, Q.S. al-Ra'd/13: 4, and Q.S. al-Nahl/16: 10-11.⁵² The verses successively read as follows.

وَهُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ نَبَاتَ كُلِّ شَيْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُخْرِجُ مِنْهُ حَبًّا

مُتْرَاكِبًا وَمِنَ النَّحْلِ مِنَ طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّاتٌ مِّنْ أَعْنَابٍ وَالزَّيْتُونَ وَالرُّمَّانَ مُشْتَبِهًا وَغَيْرَ مُتَشَبِهٍ

أَنْظُرُوا إِلَى ثَمَرِهِ إِذَا أَثْمَرَ وَيَنْعِهِ إِنَّ فِي ذَلِكُمْ لَآيَاتٍ لِّقَوْمٍ يُؤْمِنُونَ

*“It is He who sendeth down rain from the skies: with it We produce vegetation of all kinds: from some We produce green (crops), out of which We produce, close-compounded grain out of the date-palm and its sheaths (or spathes) (Come) clusters of dates hanging low and near: and (then there are) gardens of grapes, and olives, and pomegranates, each similar (in kind) yet different (in variety): When they begin to bear fruit, feast your eyes with the fruit and the ripeness thereof. Behold! In these things there are signs for people Who believe.”*⁵³

وَهُوَ الَّذِي أَنْشَأَ جَنَّاتٍ مَّعْرُوشَاتٍ وَغَيْرِ مَعْرُوشَاتٍ وَالنَّحْلَ وَالزَّرْعَ مُخْتَلِفًا أَكُلُهُ، وَالزَّيْتُونَ وَالرُّمَّانَ
مُتَشَبِهًا وَغَيْرَ مُتَشَبِهٍ كُلُوا مِن ثَمَرِهِ إِذَا أَثْمَرَ وَعَآئُوا حَقَّهُ، يَوْمَ حَصَادِهِ وَلَا تُسْرِفُوا إِنَّهُ لَا يُحِبُّ
الْمُسْرِفِينَ

“It is He who produceth Gardens, with trellises and without, and dates, and

⁵¹“Reforestation,” in *Oxford Advanced Learner’s Dictionary*, August 8, 2022, <https://www.oxfordlearnersdictionaries.com/definition/english/reforestation?q=Reforestation>.

⁵²Yûsuf al-Qardhâwî, *Ri’âyah al-Bî’ah fî Syarî’ah al-Islâm* (Kairo: Dâr al-Syurûq, 2001), 58–59.

⁵³Yûsuf ‘Alî, *The Holy Qur’an*, 370–71.

tilth with produce of all kinds, and olives and pomegranates, Similar (in kind) and different (in variety): Eat of their fruit in their season, but render the dues that are proper on the day that harvest is gathered. But waste not by excess: for Allah loveth not the wasters.”⁵⁴

وَفِي الْأَرْضِ قِطْعٌ مُتَجَاوِرَاتٌ وَجَنَّاتٌ مِّنْ أَعْنَابٍ وَزُرُوعٌ وَخَيْلٌ صِنَوَانٍ وَعَيْرٌ صِنَوَانٍ يُسْقَى بِمَاءٍ وَاحِدٍ

وَنُفُضِلُ بَعْضَهَا عَلَى بَعْضٍ فِي الْأَكْلِ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّقَوْمٍ يَعْقِلُونَ

“And in the earth are tracts (diverse though) neighbouring, and gardens of vines and fields sown with corn, and palm trees-growing out of single root or otherwise: watered with the same water, yet some of them We make more excellent than others to eat. Behold, verily in these things there are Signs for those who understand.”⁵⁵

هُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً لَّكُمْ مِّنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ يُنْزِلُ لَكُمْ بِهِ الزَّرْعَ

وَالزَّيْتُونَ وَالنَّخِيلَ وَالْأَعْنَابَ وَمِنْ كُلِّ الثَّمَرَاتِ إِنَّ فِي ذَلِكَ لَآيَةً لِّقَوْمٍ يَتَفَكَّرُونَ

“It is He who sends down rain from the sky from it ye drink, and out of it (grows) the vegetation on which ye feed your cattle. With it He produces for you corn, olives, date-palms, grapes, and every kind of fruit: Verily in this is a sign for those who give thought.”⁵⁶

The content of Q.S. al-An'âm/6: 99 is still a continuation of the main theme of Surah al-An'âm, namely the proof of God's power and the inevitability of the Day of Judgment.⁵⁷ Likewise, Q.S. al-An'âm/6: 141, which is still in the same surah, also discusses God's power.⁵⁸ Not much different from Surah al-An'âm,

⁵⁴Yûsuf 'Alî, 385.

⁵⁵Yûsuf 'Alî, 672–73.

⁵⁶Yûsuf 'Alî, 733–34.

⁵⁷Shihab, *Tafsir Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, 2012, 3:573.

⁵⁸Shihab, 3:695.

the content of Q.S. al-Ra'd/13: 4 also explains Allah's greatness and power.⁵⁹ As for the Q.S. Nahl/16: 10-11, which is included in the *Makkiyyah* surah, its content cannot be separated from the issue of divinity, revelation, and resurrection.⁶⁰

There is no verse that specifically and directly orders reforestation. However, according to Wardani, several texts implicitly mention planting trees, fruits, and vegetables. This can be indirectly related to the recommendation to use vacant land (*ihya` al-mawât*) in the form of greening (*takhdhîr*) and reforestation (*tasyjîr*). Effort to use this vacant land is one of the efforts to prevent the occurrence of water crisis disasters in the form of floods and landslides.⁶¹

2. Watersheds Conservation

Watersheds are land areas that are an integral part of its tributaries, which accommodate, store, and drain water from rainfall to lakes or sea naturally. The upstream watershed is often the focus of planning in watershed management because of its essential function as a water catchment area.⁶²

The problems found around watersheds can be summarized into four problems as follows:⁶³

- a. Protected areas are converted into residential, agricultural, livestock and

⁵⁹Shihab, *Tafsir Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, 2002, 6:212.

⁶⁰Shihab, 6:517.

⁶¹Wardani, *Islam Ramah Lingkungan* (Banjarmasin: IAIN Antasari Press, 2015), 158.

⁶²Fajar Dwi Hastono, Bambang Sudarsono, and Bandi Sasmito, "Identifikasi Daerah Resapan Air dengan Sistem Informasi Geografis (Studi Kasus: Sub DAS Keduang)," *Jurnal Geodesi UNDIP* 1, no. 1 (2012): 1.

⁶³Muhammad Fadhil Imansyah, "Studi Umum Permasalahan dan Solusi DAS Citarum serta Analisis Kebijakan Pemerintah," *Jurnal Sositologi* 11, no. 25 (2012): 20.

industrial areas.

- b. The increasing number of critical land areas due to poor planning and supervision.
- c. Rivers' pollution by domestic waste originates from settlements, agriculture, livestock, and industry.
- d. The level of groundwater abstraction is out of control which causes land subsidence and increases the potential for flood-prone areas.

Regarding the problems around watersheds, the Qur'an mentions the earth's prosperity in Q.S. Hûd/11: 61.

وَالِىٰ ثَمُوْدَ اٰخَاهُمْ صٰلِحًا قَالَ يٰقَوْمِ اَعْبُدُوْا اللّٰهَ مَا لَكُمْ مِّنْ اِلٰهٍ غَيْرُهُۥ هُوَ اَنْشَأَكُمْ مِّنَ الْاَرْضِ

وَاسْتَعْمَرْتُمْ فِيْهَا فَاسْتَغْفِرُوْهُ ثُمَّ تُوْبُوْا اِلَيْهِۗ اِنَّ رَّبِّيۗ قَرِيْبٌ مُّجِيْبٌ

*“To the Thamûd People (We sent) Shalih, one of their own brethren. He said: ‘O my People! Worship Allah: ye have no other God but Him. It is He Who hath produced you from the earth and settled you therein: then ask forgiveness of Him, and turn to Him (in repentance): for my Lord is (always) near, ready to answer.”*⁶⁴

Al-Râzî interpreted the word *wasta'marakum (isti'mara)* to two meanings. First, it means to inhabit. This meaning is closely related to the management aspect. In one hadith, it is stated that the kings of Persia were given a long excess of life, and they used it to dig rivers and plant trees. Allah calls them *a'mar*, the basic form of the word *wasta'mara* in verse above. The second meaning is the aspect of time. The meaning of the expression *wasta'marakum* is to prolong

⁶⁴Yûsuf 'Alî, *The Holy Qur'an*, 600–601.

life.⁶⁵

Thanthâwî Jauharî interpreted the phrase *wasta'marakum* as Allah's request to His servants to prosper the earth by inhabiting and maintaining it. This verse fragment can also be interpreted as the giving of power by God to humans in the form of the ability to regulate and manage the earth. Looking at the two interpretations presented by Thanthâwî Jauharî, the concept of prospering the earth mentioned by Allah is not just managing the earth to meet human needs alone. There is also an element of maintenance in the concept of earth's prosperity.⁶⁶

The prosperity of the earth mentioned by Allah through the story of the Tsamûd is not only interpreted as land management projects so that it can be used by humans, but must consider the impact generated by the project on the environment. There must be harmony between creating the earth's prosperity and doing God's commands, one of which is by considering the balance of the natural ecosystem so that it is not damaged.⁶⁷ This is in line with the guidance of the Qur'an in Q.S. al-Baqarah/2: 11 regarding the prohibition of doing damage on earth.

In the context of overcoming the water quality crisis, the actualization of the word *ista'mara* as an effort to prosper the earth in the sense of the verse can be done by preserving watersheds and water catchment areas. The development of residential areas (boards), industry (clothing), agriculture and livestock (food)

⁶⁵Muhammad al-Râzî, *Mafâtîh al-Ghaib*, vol. 9 (Beirut: Dâr al-Fikr, 1995), 18.

⁶⁶Thanthâwî Jauharî al-Mashrî, *Al-Jawâhir fî Tafsîr al-Qur`ân al-Karîm*, vol. 3 (Beirut: Dâr al-Kutub al-Ilmiyyah, 2016), 203.

⁶⁷Wardani, *Islam Ramah Lingkungan*, 73–75.

as part of efforts to meet basic human needs is indeed not prohibited as long as the balance of natural ecosystems is considered, such as river pollution by domestic waste from various business sectors.

3. Water Pollution Control

Water pollution control aims to maintain and restore the quality of water that enters and resides in water sources by preventing the entry of water pollution into water sources and water source infrastructure. Water pollutant sources consist of various types of waste that occur due to natural processes or human activities, which include:⁶⁸

- a. Domestic waste includes sanitary wastewater, toilets, kitchens, restaurants, hotels, hospitals, and laundry, disposed of in drainage channels or rivers.
- b. Industrial waste containing chemicals such as acids, alkalis, oil, phenol, and mercury that can enter or be absorbed into the food chain of aquatic plants and animals and enter the human body.
- c. Agricultural waste due to excessive use of fertilizers, pesticides, and herbicides in agriculture.
- d. Sediment or silt, due to soil erosion carried away by surface runoff into a canal or river systems, can cause water turbidity, reducing the sunlight's penetration into the water.

Concerning water pollution, the Qur'an implies a description of the ideal springs like the heaven's springs, one of which is in Q.S. al-Ghâsyiyah/88: 12.

⁶⁸Team of Writer, *Modul Konservasi Sumber Daya Air* (Bandung: Pusat Pendidikan dan Pelatihan Sumber Daya Air dan Konstruksi, 2017), 14.

فِيهَا عَيْنٌ جَارِيَةٌ

“*Therein will be a bubbling spring.*”⁶⁹

In the Qur'an, the teû جرى (*jarâ*) with all its derivations mentioned 64 times with the division of the foû جرين (*jaraina*) mentioned once, form تجرى (*tajrî*) mentioned 51 times, form تجريان (*tajriyân*) mentioned once, form يجرى (*yajrî*) mentioned four times, form جارية (*jâriyah*) mentioned three times, form الجوار (*al-jawâr*) mentioned three times and form مجرها (*majrâhâ*) mentioned once.⁷⁰

Allah mentions the image of heaven in many places in the Qur'an. This description of paradise is often followed by the expression *jannâtin tajrî min tahtihâ al-anhâr* meaning “heavens under which rivers flow” which is mentioned 38 times in the Qur'an.⁷¹ Water is said to flow from these verses, meaning it has dynamic properties. This is an ideal picture of water in life because flowing water is cleaner than water that only stays in a place. This is reinforced by the statement of al-Thabarî that one of the descriptions mentioned in the Qur'an about the rivers in heaven is about flowing water.⁷²

Flowing water is not only a solution to water pollution, it is also a source of peace. Muḥammad Mutawallî al-Sya'râwî when explaining the content of Q.S. al-Ghâsiyah verse 12 stated that for Arab people, springs symbolize something big and majestic. In order to meet the needs of water, wells are sufficient for

⁶⁹Yûsuf 'Alî, *The Holy Qur'an*, 1944.

⁷⁰Muḥammad Fu`âd 'Abd al-Bâqî, *Al-Mu'jam al-Mufahras li Alfâzh al-Qur`ân al-Karîm* (Kairo: Dâr al-Kutub al-Mishriyyah, 1945), 167–68.

⁷¹'Abd al-Bâqî, 167–68.

⁷²Muḥammad bin Jarîr al-Thabarî, *Jâmi' al-Bayân fî Ta`wîl al-Qur`an*, vol. 1 (Beirut: Dâr al-Kutub al-Ilmiyyah, 2009), 143.

Arab people who live in the middle of a hot desert. Therefore, according to Mutawallî al-Sya'râwî, the mention of "flowing springs" as one of the descriptions of heaven shows that heaven is not only a matter of satisfying needs alone, but through flowing springs that can provide tranquility through its splash, movement, and flow.⁷³ Likewise in life in the world, besides being used as a means of tourism and recreation, springs that flow clear water are very urgent to meet the needs of housing, clothing, and food.

4. Biopore Infiltration Holes

Massive population growth and the ongoing development of life requires changes in land use that continue to expand. Expanding land for residential settlements causes a reduction in green open land which initially served to absorb rainwater. The effort to infiltrate rainwater into the ground aims to maintain soil moisture under the building. Another goal is to increase groundwater reserves needed to meet water needs for life and various purposes.⁷⁴

Utilization of rainwater aims to increase the amount of groundwater infiltration and save groundwater use. One way to use rainwater is to make biopore infiltration holes.⁷⁵ Biopore infiltration holes have enormous benefits, including increasing water absorption, preventing flooding, improving

⁷³Muhammad Mutawallî al-Sya'râwî, *Tafsîr Juz 'Ammâ* (Dâr al-Râyah, 2008), 337.

⁷⁴Basuki Setiyo Budi, "Model Peresapan Air Hujan dengan Menggunakan Metode Lubang Resapan Biopori (LBR) dalam Upaya Pencegahan Banjir," *Wahana Teknik Sipil* 18, no. 1 (2013): 1–2.

⁷⁵Firlawanti Lestari Baguna, Fadila Tamnge, and Mahdi Tamrin, "Pembuatan Lubang Resapan Biopori (LBR) sebagai Upaya Edukasi Lingkungan," *Kumawula: Jurnal Pengabdian Kepada Masyarakat* 4, no. 1 (2021): 132.

groundwater quality, landfilling organic waste, converting organic waste into compost, utilizing the role of soil fauna and plant roots activities, overcoming problems caused by waterlogging, and helping to prevent global warming.⁷⁶

Making biopore infiltration holes is an environmentally friendly technological solution to overcome the availability of groundwater by utilizing organic waste through small holes in the soil. Garbage is often a source of environmental pollution, even though waste has the potential to save the environment if used wisely.⁷⁷

Disposal of waste by irresponsible humans is certainly one of the factors polluting the environment, including water and soil pollution. The impact of natural damage due to human actions is also mentioned in the following Q.S. al-Rûm/30: 41.

ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُمْ بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ

*“Mischievousness has appeared on land and sea because of (the deed) that the hands of men have earned, That (Allah) may give them a taste of some of their deeds: in order that they may turn back (from evil)”*⁷⁸

The word *al-fasâd* means something is broken or out of balance, either a little or a lot. In a narrow sense, *al fasâd* means damage such as polytheism or murder. Meanwhile, contemporary scholars understand it broadly, namely damage on land and sea, such as the earth's temperature getting hotter, the dry

⁷⁶Nurhenu Karuniastuti, “Teknologi Biopori untuk Mengurangi Banjir dan Tumpukan Sampah Organik,” *Swara Patra: Majalah Ilmiah PPDSM Migas* 4, no. 2 (n.d.): 66–67.

⁷⁷Corry Yohana, Dientje Griandini, and Said Muzambeq, “Penerapan Pembuatan Teknik Lubang Biopori Resapan sebagai Upaya Pengendali Banjir,” *Jurnal Pemberdayaan Masyarakat Madani (JPMM)* 1, no. 2 (2017): 298.

⁷⁸Yûsuf 'Alî, *The Holy Qur'an*, 1190–91.

season getting longer, sea water pollution, and ecosystem imbalances.⁷⁹ It is customary for Arabs to use the term *buhûr* to refer to a building or a city built on water.⁸⁰ In general, *fasâd fî al-bahr* (damage at sea) can also be interpreted as a water crisis. As caliphs, humans must obey all God's laws, including not doing damage to existing natural resources. They must also be responsible for the sustainability of life on earth.⁸¹

Biopore infiltration holes is a new method introduced to overcome the water quality crisis. The Qur'an does not explicitly explain a certain way in dealing with the water crisis, but the Qur'an implies that humans try to find solutions when a disaster occurs. This also includes the form of human moral responsibility as creatures who are given reason to think. This innovation has been carried out by the Prophet Nûh in Q.S. Hûd/11: 37.

وَأَصْنَعِ الْفُلَّكَ بِأَعْيُنِنَا وَلَا تُخْطِبْنِي فِي الَّذِينَ ظَلَمُوا إِنَّهُمْ مُغْرَقُونَ

“But construct an Ark under Our eyes and Our inspiration, and address Me no (further) on behalf of those who are in sin: for they are about to be overwhelmed (in the flood).”⁸²

According to Ibn 'Abbâs, the ship's length was one thousand two hundred cubits. Allah commands the Prophet Nûh to build a ship that would be used to save Prophet Nûh and his followers from the flood, while the disbelievers would drown to the earth's surface.⁸³ In the case of the flood in the time of the Prophet

⁷⁹Team of Writer, *Al-Qur'an dan Tafsirnya*, vol. 7 (Jakarta: Departemen Agama RI, 2004), 514.

⁸⁰al-Râzî, *Mafâtîh Al-Ghaib*, 1995, 13:128–29.

⁸¹Team of Writer, *Al-Qur'an dan Tafsirnya*, 2004, 7:516.

⁸²Yûsuf 'Alî, *The Holy Qur'an*, 592.

⁸³Team of Writer, *Al-Qur'an dan Tafsirnya*, vol. 4 (Jakarta: Departemen Agama RI, 2004), 416.

Nûh, he innovated to make a boat to be used for self-rescue when the flood hit, while there had never been and known the buiding method before. The actualization of this verse can be applied in today's life by finding new solutions for disaster management, one of which is by making biopore infiltration holes as an alternative solution to the water quality crisis.

5. Rainwater Harvesting

Rainwater harvesting system (RWH) is a technology for collecting and storing rainwater for human use.⁸⁴ According to Ontario Guidelines for Residential Rainwater Harvesting Systems Handbook, rainwater harvesting is the conventional practice of collecting rainwater and storing it for later use. The rainwater harvesting system consists of a roof catchment, transport network, rainwater storage tanks, pumps, and equipment where rainwater is utilized. Most systems also incorporate technologies to improve rainwater quality before or after storage, and include provisions for water supply periods and overflow times.⁸⁵

The way rainwater harvesting works is that rainwater caught on the roof of the house is channeled through gutters or pipes to the building, divided into several partitions containing various media to filter rainwater from various impurities. The objects that can be used as partitions in the filter media are fibers, sand, gravel, charcoal, red coal, and gravel mixed with limestone and

⁸⁴Swati Ogale, "Rainwater Harvesting System" (Britannica, July 6, 2022), <https://www.britannica.com/technology/rainwater-harvesting-system>.

⁸⁵Veronika Joan, "Arsitektur Tropis: Kajian Penerapan Rainwater Harvesting pada Perumahan di Bandung," *Linkedin* (blog), July 8, 2022, <https://id.linkedin.com/pulse/arsitektur-tropis-kajian-penerapan-rainwater-harvesting-veronika-joan>.

sand. After passing through the last partition, the water will be accommodated in the reservoir. Then the water will flow into the water collection tank. This tub has holes for air circulation so water can be pumped out of the tub.⁸⁶

The concept of rainwater harvesting is in line with the storage of water in Q.S. al-Mu`minûn/23: 18.

وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً بِقَدَرٍ فَأَسْكَنَتْهُ فِي الْأَرْضِ وَإِنَّا عَلَىٰ ذَهَابٍ بِهِ لَقَادِرُونَ

“And We send down water from the sky according to (due) measure, and We cause it to soak in the soil; And We certainly are able to drain it off (with ease).”⁸⁷

The keyword related to the discussion of harvesting water is *fa askannâhu*, which means “We make the water stable and settled in the earth.”⁸⁸ In connection with the verse passage, M. Quraish Shihab as quoting from *Tafsîr al-Muntakhab*, described some of the wisdom contained in the verse, one of which is the will of Allah demands the storage of a certain amount of water in the oceans and seas that can ensure the balance of temperature on Earth and other planets so that there is no long-distance link between summer and winter temperatures that do not match life.⁸⁹

Allah sends down rain from the sky at the required rate, not too heavy or too little, so it is enough to irrigate the gardens that need it. Water can be stored as rivers, lakes, and even partially stored in the earth as deep groundwater. Some

⁸⁶Team of Writer, “Pemanenan Air Hujan,” July 8, 2022, <http://ditjenppi.menlhk.go.id/kcpi/index.php/inovasi/197-pemanenan-air-hujan>.

⁸⁷Yûsuf 'Alî, *The Holy Qur'an*, 980.

⁸⁸Ahmad Mushthafâ al-Marâghî, *Tafsîr al-Marâghî*, vol. 6 (Beirut: Dâr al-Kutub al-'Ilmiyyah, 2006), 275.

⁸⁹M. Quraish Shihab, *Tafsîr Al-Mishbah: Pesan, Kesan, dan Keserasian al-Qur'an*, vol. 8 (Jakarta: Lentera Hati, 2012), 346.

of the water was made by Allah to settle on the earth to fill wells and ditches that function in the field of irrigation, some others serve to fertilize the earth that grows a variety of fruits.⁹⁰

The above verse states that the water falls from the sky always follows Allah's provisions which are called natural laws (*sunnatullah*). While the earth functions as a water reservoir by storing water evenly in the earth's bowels or on the earth's surface such as mountains, rivers, lakes, and seas. The water conservation created by Allah in the water cycle is impeccable. In the rainy season, the abundant water is stored in a water reservoir so that it does not pose a threat of flooding to humans. Meanwhile, in the dry season, the debit of water stored in the water reservoir is a provider of water reserves so that it does not experience drought.⁹¹ In addition, water reservoirs can also be created by humans, one of which is by rainwater harvesting through the roofs of houses so that rainwater does not fall directly to the bottom and cause puddles to flood. In addition, water reservoirs can provide an adequate water supply during drought periods with low rainfall.

⁹⁰Team of Writer, *Al-Qur'an dan Tafsirnya*, vol. 6 (Jakarta: Departemen Agama RI, 2004), 482-483

⁹¹Munawarah, Taufik Warman Mahfuzh, and Rofi'i, "Tafsir Ekologis Al-Qur'an Surah Al-Mu'minin Ayat 18," *Syams: Jurnal Studi Keislaman* 1, no. 2 (2020): 71.