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MAHMUD YUNUS AND THE MODERNIST PARADIGM IN QUR'ANIC INTERPRETATION: A FOUNDATIONAL STUDY OF SCIENTIFIC EXEGESIS IN INDONESIA

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Abstract: *Tafsir Qur'an Karim* by Mahmud Yunus is recognized as the first complete modern-style exegesis of the Qur'an in Indonesia. One of its notable approaches is the integration of scientific perspectives into the Qur'anic verses. This study aims to examine how Mahmud Yunus interprets verses of the Qur'an related to science. This research employs a qualitative library research method, using *Tafsir Qur'an Karim* as the primary source, alongside various books, and scholarly articles as a secondary sources. Data related to Mahmud Yunus's scientific exegesis were collected from a specific section at the end of his tafsir titled *Kesimpulan Isi Al-Qur'an*, which features scientific themes, particularly verses concerning natural phenomena such as physics, chemistry, and earth sciences. Based on these themes, we conducted a close reading and analysis of his interpretation of relevant verses. The findings highlight two main points: (1) Mahmud Yunus engaged in scientific exegesis earlier than the commonly recognized introductory phase of the 1960s, positioning him as one of the pioneers of scientific exegesis in Indonesia; (2) his model of scientific exegesis includes references to scientific theories from European scientists, such as Newton and various astronomers, aiming to provide a broader explanation that strengthen faith, as illustrated in QS. Al-An'ām (6): 96. In several instances, he attempts to harmonize *kawniyyah* (cosmological) verses with scientific findings to highlight the miraculous nature of the Qur'an, as seen in QS. Al-Anbiyā' (21): 30. Thus, his approach to scientific exegesis can be categorized as both apologetic and descriptive-informative, rather than theoretical critique.

Keywords: Mahmud Yunus; Scientific Exegesis; Tafsir Qur'an Karim

Introduction

Science is one of the instruments to validate the truth of the Qur'an in the modern era (Shihab, 2021). This may explain the emergence of scientific exegesis as one of the defining features of modern tafsir in the early 20th century (Afandi & Abd Razzak, 2021; Anhar et al., 2018). Such an approach is necessary, considering that scientific and technological developments encourage enriched interpretations of the Qur'an by presenting scientific verses in dialogue with scientific knowledge (Azizy & Syarifuddin, 2014). Another important aspect of scientific exegesis, often referred to as scientific interpretation, is the effort to reconcile Qur'anic verses with scientific progress, ensuring that no contradiction arises between them (Firmansyah et al., 2023). In essence, the development of science cannot be separated from religious values (Umar & Nimah, 2020), and is in harmony with Qur'anic exhortations to *tadabbur*, *tafakkur*, *tażakkur*, *al-'ilm*, and *ta'aqqul* (Sya'rawi, 1991). Several examples of scientific interpretations include *al-Jawāhir fī Tafsīr Al-Qur'ān al-Karīm* by Tanṭawī Jauharī, *Mafātīḥ al-Ghayb* by Fakhruddīn al-Rāzī from

the classical era, and *La Bible, Le Coran et La Science* by Maurice Bucaille from the West (Nafisah, 2023).

In the Indonesian context, Muchlisin and Nisa divide the development of scientific exegesis into three phases. The first is introductory phase (1960s), marked by *Tafsir al-Nur* by Hasbi ash-Shiddiqiey. The second is development phase I (1990s-2000s) with works such as *Tafsir Al-Qur'an bi al-'Ilmi: Al-Qur'an Series, Science and Technology* by Ahmad Baiquni (1995), among others. The third is development phase II (2010 onwards), characterized by the emergence of thematic scientific exegesis, such as those by Lajnah Pentashihan Mushaf Al-Qur'an (LPMQ) in collaboration with the Indonesian Institute of Sciences (LIPI) in 2011, resulting in thematic works like *Human Creation, Creation of the Universe, Creation of the Earth*, and others (Muchlisin & Nisa, 2017). Additionally, a team of scientists from the Institut Teknologi Bandung (ITB) produced a scientific exegesis titled *Tafsir Salman: Tafsir Ilmiah Juz 'Amma* in 2014 (El Rahma & Saniyah, 2023). The emergence of scientific exegesis initiated by both Qur'anic scholars and scientists offers new perspective. However, further collaboration between these two disciplines is still needed in order to develop comprehensive frameworks, methods, and systematic approaches.

This mapping reveals that scientific exegesis of the Qur'an has existed far earlier than generally assumed. Long before 1960, some scholars (Afandi & Abd Razzak, 2021; Asnawi et al., 2021; Asnawi & Zubaidi, 2023; Muchlisin & Nisa, 2017) had already classified Hasbi ash-Shiddiqiey's *Tafsir al-Nur* as a work of scientific interpretation. Meanwhile, the name of Mahmud Yunus was not mentioned in that classification. However, it can be shown that he had already engaged in scientific exegesis, as evidenced by his commentary completed in 1938. Syarifah (2020) also states that *Tafsir Qur'an Karim* by Mahmud Yunus includes scientific exegesis, particularly in QS. Al-Fīl (105): 1-5, QS. Fuṣṣilat (41): 13, and QS. Al-Baqarah (2): 22 (Syarifah, 2020). This observation is likely connected to the recognition of *Tafsir Qur'an Karim* as a complete modern tafsir within the context of Indonesian Qur'anic interpretation (Nurtawab, 2021), especially considering that one of the characteristics of modern tafsir is the integration of scientific approaches.

The findings presented by Syarifah indicate that Mahmud Yunus had already engaged in scientific exegesis of the Qur'an earlier than most documented works. However, no prior research has specifically examined Mahmud Yunus's scientific exegesis in *Tafsir Qur'an Karim*. In the broader landscape of Indonesian Qur'anic exegesis, several studies have addressed scientific exegesis in general (Asnawi et al., 2021; Siregar et al., 2024), while others have focused on specific figures or institutions, for example, the Ministry of Religious Affairs of the Republic of Indonesia (Fajar & Mulyana, 2021), as well as individual scholars such as Nazwar Syamsu, Achmad Baiquni, Muhammad Quraish Shihab, and Agus Purwanto (Supriadi, 2018), and even *Tafsir Al-Azhar* by Hamka (Syed Bidina et al., 2017). Among these, only Syarifah has brought up Mahmud Yunus's scientific exegesis, though her discussion was limited to outlining the pattern of his interpretation, without a more in-depth exploration (Syarifah, 2020).

Accordingly, this study aims to fill that research gap by investigating how Mahmud Yunus developed a scientific exegesis within *Tafsir Qur'an Karim*. Further examination of his interpretation is warranted, especially since he explicitly includes a section at the end of his exegesis titled *Kesimpulan Isi Al-Qur'an*, in which he groups verses related to science

under major themes. These include topics such as natural sciences and chemistry, earth sciences and astronomy, zoology, anthropology, botany, and geology. Each theme is accompanied by specific surahs, verse numbers, and page references, which together resemble an index (Yunus, 2003). The initial findings on these three verses along suggest that the inclusion of this index-like section highlights Mahmud Yunus's intention to foreground scientific content in his exegesis. This underscores the importance of re-evaluating other scientific exegeses, considering that interpreting scientific verses requires continuous enrichment with insights from ongoing scientific developments.

Therefore, this study addresses several key questions, which verses are scientifically interpreted in *Tafsir Qur'an Karim*? How does Mahmud Yunus interpret these scientific verses? And what is the position and significance of Mahmud Yunus's scientific exegesis within the broader framework of his commentary? These questions are intended to explore how Mahmud Yunus integrates a scientific approach into his interpretation.

This research focuses on the theme of scientific exegesis in *Tafsir Qur'an Karim* by Mahmud Yunus. It aims to uncover how scientific verses are interpreted and to clarify Mahmud Yunus's position regarding scientific exegesis. The study employs a library research method, using *Tafsir Qur'an Karim* as the primary source and supported by relevant secondary literature. Data were collected through documentation techniques, tracing and elaborating on verses with scientific content that are then interpreted scientifically by Mahmud Yunus. The data were analyzed using the framework of Miles and Huberman (Huberman, A. M., Miles, M., 2014): data condensation, data reduction, data display, and conclusion drawing. Data condensation was used to trace all verses related to scientific themes. Data reduction then helped filter out the verses that were explicitly interpreted from a scientific perspective, while also mapping the reasons why some scientific verses were not addressed in that way. These results were subsequently organized and displayed for comprehensive presentation and concluding analysis.

Background and Methodology of *Tafsir Qur'an Karim*

Tafsir Qur'an Karim by Mahmud Yunus (1899-1982 AD) began to be written in 1922 when he was just 23 years old, and was completed in 1938 (Yunus, 2003). According to Federspiel's classification of the development of Qur'anic exegesis in Indonesia, which divides it into three generations, *Tafsir Qur'an Karim* is placed in the second generation. This generation emerged in the mid-1960s and was characterized by improvements to the first generation, such as the inclusion of footnotes, word-for-word translations, and simple indexes (Federspiel, Howard, 1994). However, based on Mahmud Yunus's own statement in the preface, which confirms that his work was completed in 1938, it is more appropriate to categorize *Tafsir Qur'an Karim* within the first generation roughly defined as the early 20th century to the early 1960s. This discrepancy is also noted by Gusmian (2021), who argues that Federspiel may have been inconsistent in assigning certain works, including *Tafsir Qur'an Karim*, to a particular generation. Nevertheless, Federspiel's contribution remains significant in mapping the development of Qur'anic exegesis in Indonesia (Gusmian, 2021).

Regardless of the classification, it must be acknowledged that *Tafsir Qur'an Karim* is one of the pioneering complete 30-juz tafsir works in Indonesia. Besides categorizing tafsir based on historical development, it is also important to analyze exegetical works in light of

the socio-historical context in which they were written. Gusmian (Gusmian, 2015) emphasizes that every work of tafsir is shaped by its own context whether social, cultural, linguistic, or even political. *Tafsir Qur'an Karim* was written when Mahmud Yunus was actively involved in the educational sector (Gusmian, 2015). He was also a prominent figure in the Islamic reform movement in Minangkabau, his native region, and later founded an Islamic educational institution there (Mohammad, 2006).

The background and context of the exegete such as Mahmud Yunus's identity as a socially engaged academic often influence the methodological framework of the tafsir, particularly the interpretive method and style. It is therefore unsurprising that his work reflects a broad intellectual perspective, including the integration of scientific concepts as part of exegetical enrichment. This is supported by Syarifah (Syarifah, 2020), who found that *Tafsir Qur'an Karim* contains various academic dimensions, manifesting in interpretive styles such as scientific, social, and intellectual exegesis. The method used in *Tafsir Qur'an Karim* is *ijmālī* (global or general interpretation). The choice of this method appears to be influenced by the initial aim: to offer Qur'anic guidance in a way that is accessible, practical, and easily understood by the general public. At the time, access to religious education among Indonesian Muslims was limited, making a global style of presentation the most suitable option. This contrasts with the current context, where access to religious learning is far more advanced and diverse (Anwar & Abdul Muhyi, 2022).

The following chart briefly illustrates Mahmud Yunus's exegetical methodology in Tafsir Qur'an Karim, shaped by his social context and educational vision as an Islamic reformer:

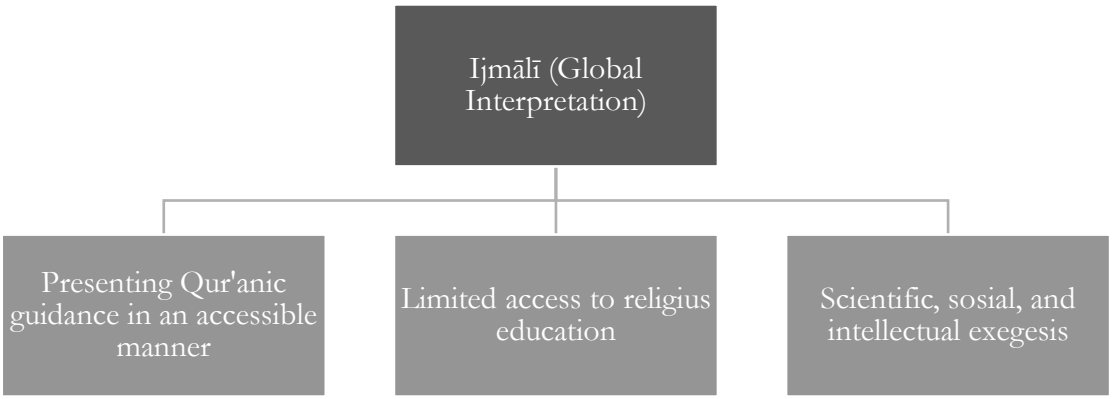

Figure 1. Metodology of Tafsir Qur'an Karim by Mahmud Yunus

The figure 1 provides a concise representation of Mahmud Yunus's exegetical methodology in *Tafsir Qur'an Karim*, highlighting the interpretive framework he employed and the rationale underpinning his approach. Central to this framework is the *ijmālī* method—often translated as "global interpretation"—which emphasizes a general explanation of Qur'anic verses without delving into detailed lexical or juristic discussions.

This methodological preference aligns with Yunus's pedagogical orientation. As an educator deeply involved in Islamic reform and literacy movements in early 20th-century Indonesia, his tafsir was designed to be accessible to a wide audience, particularly ordinary Muslims with limited formal religious training. This accessibility was not merely a stylistic

choice, but a response to the socio-educational limitations of the time, when Islamic education had yet to reach many remote and rural communities.

Moreover, the chart illustrates that Yunus's tafsir incorporates scientific, social, and intellectual elements, reflecting his engagement with modern knowledge and reformist discourse. His work does not confine itself to traditionalist modes of interpretation but seeks to bridge the spiritual and the rational, thereby making the Qur'an relevant to the broader challenges of modern life.

In summary, the chart depicts how Mahmud Yunus's exegetical methodology was not only a reflection of his scholarly choices but also a deliberate strategy shaped by the educational, cultural, and intellectual context in which he lived. His *ijmālī* method served as both a means of simplification and a tool for broader Qur'anic outreach, solidifying *Tafsir Qur'an Karim* as one of the most influential modern tafsir works in Indonesian Islamic scholarship.

Interpretation of Scientific Verses in *Tafsir Qur'an Karim*

To identify the scientific exegesis presented by Mahmud Yunus in his tafsir, this section groups the relevant verses in order to provide a complete and comprehensive view of the scientific themes he addressed. The categorization is inspired by the section titled *Kesimpulan Isi Al-Qur'an* compiled by Mahmud Yunus himself at the end of his tafsir (Yunus, 2003). For clarity and simplicity, the verses are presented in the following table:

Table 1. Classification of Scientific Verses According to *Tafsir Qur'an Karim* by Mahmud Yunus

No.	Themes	Surah and Verse(s)
1.	Verses related to Science	Yūnus (10): 101, Al-Jāthiyah (45): 12-13, Fāṭir (35): 27-28, Al-Zumar (39): 9
2.	Natural Sciences and Chemistry	Al-Rūm (30): 48, Saba (34): 10-11, Al-Ḥadīd (57): 25, Al-Ḥijr (15): 22
3.	Earth Sciences and Physics	Al-Ghāshiyah (88): 18-20, Al-Ra'd (13): 2, Al-Baqarah (2): 22, Al-Anbiyā (21): 30, Yūnus (10): 5, Al-An'ām (6): 96, Nūḥ (71) Verse: 15-16

Interpretation of Verses Related to Science

QS. Yūnus: 101. In this verse, as interpreted by Mahmud Yunus, God commands His servants to observe everything in the sky, such as the moon, sun, and stars as well as what is on earth, including natural resources like gold, silver, charcoal, kerosene, tin, and others. This command to "observe" is not merely a call to look, but a directive to study these phenomena as signs (*āyāt*) of God's creation. According to Mahmud Yunus, this verse encourages the study of various branches of science, such as astronomy, botany, zoology, chemistry, and the natural sciences in general as a way of cultivating awareness of divine creation. Studying these fields, in his view, leads to a deeper theological understanding of the universe. Therefore, he suggests that these sciences should be taught in religious schools as part of fulfilling this Qur'anic command (Yunus, 2003). In this interpretation, Mahmud Yunus integrates theology and science by linking the act of scientific observation with the recognition of God's greatness. He highlights how the observation of the natural world, particularly the heavens, is not only a scientific endeavor

but also an act of *tawḥīd* (affirming God's oneness). The same integrative approach is evident in his interpretation of QS. al-Jāthiyah (45): 12–13, where he writes:

> *"Dalam dua ayat ini ditegaskan, bahwa Allah memudahkan bagi kita mempergunakan hutan untuk berlayar dengan perahu dan kapal guna mencari rezeki Allah. lni patut menginsafkan kita kaum Muslimin Indonesia yang pulau-pulau kita dikelilingi oleh lautan yang luas, supaya sebagian kita mengusahakan pelayaran dan perkapalan, untuk kemajuan perekonomian kita, karena selama ini semuanya itu terpegang di tangan bangsa asing. Sekarang haruslah semuanya itu terpegang di tangan kita bangsa lndonesia. Dengan jalan begini baru berarti kemerdekaan Indonesia. Begitu juga Allah memudahkan bagi kita memperguna kan apa-apa yang di langit (di atas kepala), seperti untuk kapal terbang dsb. dan apa-apa yang di bumi semuanya seperti tanah tempat bertanam-tanaman, barang-barang tambang, seperti emas, perak, batu, uang, minyak, timah dsb. Semuanya itu dimudahkan Allah untuk kita ambil dan kita pergunakan, tetapi kita selama ini lengah dan lalai tentang demikian. Sebab itu haruslah kaum Muslimin khususnya dan bangsa lndonesia umumnya mengusahakan demikian, sebagai menurut anjuran kitab suci kita Al Qur'an."* (Yunus, 2003).

This passage illustrates how Mahmud Yunus extends his scientific exegesis to incorporate ethical and socio-political reflections. While interpreting the verses about the sea and the skies, he draws attention to Indonesia's geographical reality, an archipelagic nation surrounded by vast oceans, and critiques the fact that these natural resources have historically been controlled by foreigners. For Yunus, scientific exegesis does not only explain natural phenomena through science but also addresses contemporary socio-economic issues, urging Muslims, especially Indonesians, to take ownership of their resources in accordance with the Qur'anic worldview (Azizy et al., 2022). By connecting scientific themes with national development and self-reliance, Mahmud Yunus turns his tafsir into a medium of social awareness, blending scientific insight with religious and nationalistic ethics. QS. Fāṭir: 27-28:

> *"Allah menurunkan air hujan dari langit (awan), lalu ditumbuhkanNya berjenis-jenis tumbuh-tumbuhan, bermacam-macam warnanya dan berlain-lain rasanya, sebagai bukti atas adaNya Allah yang mahakuasa. Allah menjadikan manusia, binatang-binatang dan ternak yang berjenis-jenis dan bermacam-macam bentuk dan warnanya, semuanya cukup untuk jadi dalil atas adaNya Allah bagi orang yang mau memperhatikan demikian. Begitu juga di antara gunung-gunung itu ada yang mempunyai jalan-jalan yang terang (jalan raya) seperti sekarang jalan oto, kereta api dsb., ada juga jalan-jalan yang kurang terang, seperti untuk jalan kaki saja, bahkan ada pula yang mempunyai batu-batu yang sangat hitam yang tak dapat dilalui orang. Semuanya itu berfaedah untuk manusia. Sesungguhnya yang takut kepada Allah, hanya alim ulama yang mengetahui kebesaran Allah dan kekuasaanNya dengan dalil-dalil tersebut. Di sini nyata, bahwa yang takut kepada Allah, ialah ulama yang mengetehui bagaimana sunnatullah (peraturan Allah) tentang kejadian manusia, hewan ternak dan tumbuh-tumbuhan yang berjenis-jenis dan bermacam-macam itu. Bertambah tinggi ilmu mereka tentang kejadian alam yang dijadikan Allah, bertambah takut mereka kepada Allah. Berlain dengan setengah orang, bila bertambah ilmunya, bertambah ingkarnya kepada Allah. Tak ubahnya seperti orang yang hanya mengetahui alat-alat arloji serta pandai memperbaikinya, lalu ia sombong dan lupa kepuda orang yang pandai membikin arloji itu."* (Yunus, 2003).

These verses discuss the diversity of God's creations, including how rainwater gives rise to various types of plants with differing colors and tastes, as well as the creation

of humans, animals, and livestock in various forms and hues. Mahmud Yunus explains that such differences are part of the divine plan and evidence of Allah's power. He also interprets the phrase regarding "bright paths in the mountains" as an allusion to highways or transportation routes: such as paved roads for automobiles and trains, less well-lit paths for walking, and even dark, rocky mountain paths that are impassable to humans. Despite their difficulty, he states, these paths also hold benefit for human survival. This interpretation emphasizes the value of understanding the natural world not only through passive observation, but also through active exploration and education. The verse concludes by affirming that those who truly know the signs of creation are the ones who fear Allah; the scholars (*'ulamā'*). For Yunus, scientific knowledge is a means to cultivate this reverent awareness.

QS. Al-Zumar (39): 9:

"Samakah orang yang taat dengan orang yang durhaka? Samakah orang yang berilmu dengan orang dungu? Tentu tidak sama. Adapun yang dimaksudkan dengn ilmu disini, bukanlah ilmu perkara sembahyang, puasa (ibadat) saja, melainkan terkandung olehnya semua macam ilrnu pengetahuan yang berfaedah untuk dunia dan akhirat, seperti ilmu alam, ilmu bumi, dsb. Sekarang nampak benar perbedaan orang yang berilmu dengan orang yang tidak berilmu. Maka kapal terbang, kapal selam, bercakap-cakap antara timur dan barat dengan radio, mendirikan bermacam-macam pabrik, semuanya itu ialah dengan berkahnya ilmu pengetahuan. Orang yang dungu tentu akan menggelengkan kepala saja, karena takjub melihat keganjilan yang banyak itu".

Mahmud Yunus expands this understanding of knowledge to encompass not only religious sciences but also modern disciplines such as natural sciences, geography, engineering, medicine, agriculture, commerce, and law. He emphasizes that the progress of modern civilization are all blessings of scientific knowledge, such as airplanes, submarines, radio communication, and the establishment of factories. He critiques ignorance by stating that those who are uneducated will merely shake their heads in amazement, unable to comprehend the wonders of modern life.

He further writes:

"Oleh sebab itu mestilah kita menuntut ilmu pengetahuan, meskipun sampai ke Eropah atau Jepang Nabi Muhammad ada bersabda: Tuntutlah ilmu itu mulai dari dalam buaian (waktu kanak-kanak sampai ke dalam lahad (kubur)". Adapun menuntut ilmu itu ada dua macam: a. Menuntut ilmu di sekolah dengan perantaraan guru, yaitu sekolah bangku namanya, maka kewajiban kanak-kanak, sekurang-kurangnya di sekolah rendah, dan orang-orang yang berkesanggupan dan berotak tajam hendaklah sampai ke sekolah tinggi, umpamanya: Sekolah dokter, sekolah insinyur, sekolah hukum, sekolah pertanian, perniagaan, pertukangan dsb. yaitu menurut kemauannya masing-masing. b. Menuntut ilmu dengan sendirinya saja, yaitu kewajiban tiap-tiap orang, mulai dari sekolah sampai meninggal dunia. Maka tiap-tiap kita hendaklah belajar bermacam-macam ilmu pengetahuan dengan perantaraan buku-buku, surat-surat kabar, majalah-majalah, dan dengan pergaulan dan pengalaman. Orang yang tidak mau belajar dengan sendirinya akan tertinggallah di belakang dan tidak dapat nanti menempuh masyarakat baru kerena dunia sekarang selalu berputar dan berubah-ubah. Kaum guru, dokter, insinyur, maester dll.nya akan tertinggal di belakang; jika tidak mau berstudi dan menambah pengetahuannya, karena tiap-tiap ilmu itu selalu bertambah-tambah dan profesor-profesor selalu mengeluarkan pendapat baru. Salain dari pada itu orang jangan lupa mempelajari ilmu agama Islam, yang amat sesuai dengan masyarakat dunia sekarang".

He distinguishes between two kinds of learning:

a) Formal education through structured schooling with teachers, from elementary to higher education, such as in medical, engineering, legal, and vocational schools.
b) Self-directed learning which is the lifelong responsibility of every individual, pursued through reading books, newspapers, journals, and engaging in social interactions and experiences.

According to Yunus, individuals who refuse to keep learning will be left behind in an ever-changing world. Even teachers, doctors, and engineers must continuously update their knowledge, as science keeps evolving. Moreover, religious education should not be neglected, since Islam itself promotes progress and intellectual pursuit.

"*Apa tidakkah sabda Nabi Muharnmad yang menyuruh menuntut ilmu itu, suatu bukti atas agama Islam, sebagai suatu agama yang menyuruh berkemajuan?"* (Yunus, 2003).

Through this interpretation, Mahmud Yunus presents a vision of Islam that is forward-looking, integrated with modern science, and socially transformative. His scientific exegesis blends religious ideals with a progressive call for educational reform and intellectual growth among Muslims. It is a clear example of how he positions knowledge as central to both faith and the advancement of society, not just theological but also empirical.

The foregoing analysis has shown how Mahmud Yunus interprets selected Qur'anic verses by integrating scientific knowledge with theological reflection. These interpretations demonstrate his pedagogical intent to bridge religious understanding and empirical inquiry. To provide a clearer overview of his approach, the table below summarizes the key scientific themes, the relevant verses, and the exegetical insights offered in Tafsir Qur'an Karim.

Table 2. Scientific Interpretation of Selected Verses in Tafsir Qur'an Karim by Mahmud Yunus

No	Qur'anic Verse	Scientific Focus	Exegetical Insight by Mahmud Yunus
1	QS. Yūnus (10): 101	Astronomy, Natural Resources	Encourages observation of the universe (moon, sun, stars) and natural resources as signs (*āyāt*) of God's creation; supports teaching science in religious education.
2	QS. Al-Jāthiyah (45): 12–13	Marine and terrestrial science	Links divine facilitation of sea and land resources to Indonesia's geography; urges Muslims to reclaim economic control of national resources.
3	QS. Fāṭir (35): 27–28	Botany, Zoology, Geology	Interprets diversity in creation (plants, animals, mountains) as signs of God's power; true scholars (*'ulamā'*) are those who reflect on nature.
4	QS. Al-Zumar (39): 9	Epistemology, Science and Civilization	Distinguishes the knowledgeable from the ignorant; science (e.g., aviation, radio, industry) as blessings that must be pursued through formal and self-directed education.

The table 2 above captures more than just the alignment between selected verses and modern scientific themes—it highlights Mahmud Yunus's exegetical consistency in presenting science as an avenue for enhancing both faith and social awareness. While each verse addresses different scientific domains, a shared interpretive thread emerges: science is not treated as neutral data, but as a moral and theological catalyst.

Particularly striking is Yunus's ability to contextualize scientific references within Indonesia's sociocultural landscape. In interpreting QS. Al-Jāthiyah (45): 12–13, for instance, he does not stop at a general reflection on divine blessings in nature; instead, he advances a call for economic self-determination, linking religious knowledge with national development. Similarly, his treatment of QS. Al-Zumar (39): 9 expands the definition of knowledge beyond ritual to include technological advancement and critical thinking.

This pattern suggests that for Mahmud Yunus, scientific exegesis is not merely an intellectual exercise, but a strategic effort to foster Islamic reform, civic responsibility, and educational renewal. By capturing these dimensions in tabular form, the structural logic of his interpretive model becomes more apparent—bridging scripture with science, faith with function, and interpretation with nation-building.

Interpretation of Natural Science and Chemistry Verses

QS. Al-Rūm (30): 48:

> *"Dalam ayat ini Allah manerangkan, bagaimana caranya turun air hujan dari langit (awan), yaitu Allah mengirim angin, lalu dihalaunya awan, hingga terkembang di atas langit (awang-awang), kemudian bertumpuk-tumpuk, maka tak lama, engkau lihat air hujan keluar (turun) dari sela-sela awan itu sampai ke bumi. Dalam ayat ini dengan tegas diterangkan, bahwa air hujan itu turun dari awan, karena memang awan itu dinamakan juga langit, karena ia di atas kepala kita. Maka adalah arti langit dalam Qur'an itu banyak, di antaranya awan, awang-awang (tempat yang kosong), bintang-bintang, tempat peredarannya (falaknya), Ioteng rumah d.s.b. Demikian itu dapat dipahamkan menurut susunan kalimat ayat-ayat itu. Setengah ahli tafsir menyamakan saja arti langit itu, sehingga tak sesuai dengan pendapat ahli-ahli ilmu pengetahuan modern. Sebenamya Qur'an tidak bertentangan dengan ilmu pengetahuan itu, hanya tafsir setengah ulama itulah yang bertentangan"* (Yunus, 2003).

This verse explains how Allah sends down rain from the sky. Mahmud Yunus interprets the term sky (*samā'*) in this context as referring to clouds. He describes the rain process as follows: Allah sends the wind, which then gathers and drives the clouds across the sky; the clouds then accumulate, and eventually rainwater falls from between them. He emphasizes that the clouds are the direct source of rain, and that in the Qur'an, the word sky can have multiple meanings depending on context. These include: clouds, the upper atmosphere (as an empty space), stars, their orbits, or even the attic of a house, among others. Mahmud Yunus criticizes certain classical commentators who interpret the word sky in overly narrow or rigid terms, leading to conflicts with modern scientific knowledge. He argues that the Qur'an itself is not in contradiction with science; rather, it is the misinterpretation of the Qur'an by some scholars that results in apparent contradictions.

QS. Saba' (34): 10-11:

> *"Allah telah memberikan kurnia kepada Daud, yaitu gunung-gunung dan burung-burung sama-sama tasbih dengan dia memuji Allah. Menurut kata setengah ulama, bahwa gunung*

itu sebenar-benarnya tasbih dengan perkataan seperti manusia, karena Allah memandaikannya bercakap-cakap waktu itu sebagai mu'jizat Nabi Daud (perkara luar biasa), dan begitu pulalah tasbih burung-burung. Tetapi 'ulama yang lain berpendapat, bahwa arti tasbih gunung-gunung itu ialah tatkala Nabi Daud tasbih dengan suara yang merdu bunyinya, lalu suaranya itu berbalik dari gunung, sebagai balasan bunyi suara yang biasa kedengaran dari gunung-gunung, bila kita bercakap-cakap disana, yaitu yang dinamakan gema (sipongang). Adapun tasbih burung-burung itu ialah dengan keadaannya saja dari suara yang biasa kita dengar dari padanya. Selain dari pada itu ada lagi kurnia Allah kepada Nabi Daud, yaitu ia pandai melunakkan besi dan memperbuat baju dari padanya. Maka adalah Nabi Daud itu orang yang mula-mula pandai memperbuat baju besi dan mengetahui bagaimana mengatur tenunannya. Dengan apakah Nabi Daud melunakkan besi itu? Itu tidak diterangkan dalam ayat Qur'an, malahan terserah kepada pikiran pembaca. Menurut biasanya, yang telah diketahui manusia, ialah dibakar dengan api, sehingga ia menjadi lunak lembut dan boleh diperbuat bermacam-macam perkakas dari padanya. Inilah paham yang terang dan mudah diterima oleh pikiran kebanyakan orang. Tetapi kebanyakan 'ulama menafsirkan, bahwa Nabi Daud melunakkan besi itu, bukanlah dibakar dengan api, melainkan dengan tangannya saja, sehingga besi itu seperti tanah liat yang boleh dibentuknya menurut kesukaannya, yaitu sebagai mu'jizat baginya." (Yunus, 2003).

The explanation of this verse begins by highlighting the miracles granted to Prophet David, including his ability to communicate with mountains and birds. Another miracle mentioned is his capacity to soften iron for crafting armor. Mahmud Yunus elaborates that this process involved heating the iron with fire until it became malleable, allowing it to be shaped into various tools, including armor. However, he also acknowledges an alternative interpretation by some commentators, who believe that Prophet David was able to soften the iron with his bare hands, without the use of fire, thereby emphasizing the miraculous nature of this divine gift. This interpretation further reinforces the view of his prophetic status and the extraordinary support granted to him by God.

QS. Al-Ḥadīd (57): 25:

"Kami menurunkan besi, yang menyebabkan kekuatan yang sangat dan berguna untuk manusia, bukanlah arti ayat ini bahwa Allah menurunkan besi dari langit, melainkan mengadakannya dalam bumi dan menganugerahkan akal pikiran kepada manusia untuk mengeluarkannya, sehingga dipergunakannya untuk kekuatan dalam medan peperangan. Sebenarnya besi itu besar sekali faedahnya untuk kemajuan masa sekarang, sehingga negara-negara yang banyak mempunyai tambang besi, akan memperoleh kekuatan dan kekayaan, karena boleh dikatakan kemajuan masa sekarang ialah dengan banyaknya paberik-paberik, sedang paberik-paberik itu diperbuat dari besi. Sebab itu dalam Qur'an ini ada suatu surat yang bernama Al-Hadid (Besi), supaya kaum Muslimin insaf, bahwa besi itu besar sekali faedahnya. Sebab itu wajiblah mereka berusaha mengeluarkannya dari dalam tambangnya, supaya mereka dapat menyamai umat-umat yang lain" (Yunus, 2003).

This verse discusses iron, which Allah is said to have "sent down" from the sky. This expression is not meant to be understood literally, but rather refersto its presence within the earth. Mahmud Yunus interprets this to mean that iron, though embedded in the earth, can be extracted and utilized by those endowed with intelligence. One of its essential uses, he notes, is for warfare and defense. Yunus then connects this verse to contemporary realities, emphasizing that a country rich in iron resources holds great power and potential wealth. He highlights how iron plays a crucial role in industrial advancement,

particularly in the construction of factories, which are largely made from iron materials. In modern times, the abundance of such factories is considered one of the main indicators of national progress. Because of its significant benefits to human civilization, the Qur'an includes an entire chapter titled Surah *al-Ḥadīd* (Iron). According to Mahmud Yunus, the naming of this surah reflects the remarkable importance of iron in various aspects of life. He emphasizes that the verse should serve as an encouragement for Muslims to actively explore and utilize iron resources in order to compete with other nations and contribute to socio-economic development.

QS. Al-Ḥijr (15): 22:

Dalam juz yang ke 13 hal 150 telah kita terangkan, bahwa Allah menjadikan tumbuh-tumbuhan itu ada yang jantan ada yang betina. Sekarang marilah kita uraikan, bagaimma jalannya percampuran (perkawinan) yang terjadi di antara bunga jantan dan bunga betina pada tumbuh-tumbuhan itu. Dalam sekuntum bunga ada beberapa tangkai sari bunga yang halus-halus seperti benang. Pada ujungnya ada kotak yang berisi tepung sari yang sangat halus (lumat). Selain dari pada itu ada pula setangkai sari yang agak kasar dari pada yang lain-lain. Ia tiada mempunyai kotak tepung, melainkan di ujungnya semacam tapak bulat yang bergetah. Apabila kupu-kupu, kumbang atau lebah datang ke bunga itu hendak mengambil madu yang manis dari dalamnya, lalu ia hinggap, sedang kakinya merayap kian kemari, sehingga terbuka olehnya kotak tepung sari itu, lalu melekat tepung itu pada bulu-bulu kakinya. Kemudian ia terbang pergi hinggap ke bunga yang lain. Di situpun kakinya meraya-rayap pula, sehingga terpijak olehnya tapak bulat yang bergetah itu, lalu melekat di situ beberapa butir di antara tepung sari itu. Maka di situlah butir yang amat halus itu segera hidup menerbitkan tunas, lalu ia tumbuh melalui tangkai sari itu, mengejar kepada salah satu benih (biji) di pangkal bunga itu. Tiap-tiap benih yang dimasuki tunas tepung sari itu, lalu hidup menjadi biji. Kemudian bertambah-tambah besar, akhirnya menjadi masak. Biji buah yang masak itu, jika diletakkan ditanah yang subur ia menjadi tumbuh-tumbuhan yang baru (anaknya) yang sebangsa dengan dia. Begitulah jalannya percampuran (perkawinan) jantan dan betina pada tumbuh-tumbuhan, sehingga ia menghasilkan anak. Di sini dapatlah kita ketahui, bahwa kupu2, kumbang, atau lebah yang hinggap di bunga itu, buat mencari makanannya, dengan tidak disengajanya, telah mengawinkan (mempercampurkan) antara bunga-bunga yang jantan dan bunga-bunga yang betina. Selain dari pada binatang-binatang itu, ada pula yang mempercampurkan antara tepung sari dengan tapak bulat yang bergetah itu, sebagaimana yang termaktub dalam ayat ini, yaitu angin yang bertiup. Angin itu menerbangkan tepung sari itu, lalu ia hinggap di atas tapak bulat yang bergetah itu, kemudian terus hidup, sampai menjadi buah. Sebenarnya keadaan percampuran bunga jantan dan bunga betina dengan perantaraan binatang-binatang atau angin itu, ialah pendapat ulama-ulama Eropah baru. Tetapi Qur'an telah lebih 1000 tahun menerangkannya, lnilah suatu bukti pula, bahwa Quran ini ialah wahyu dari pada Allah yang mengetahui isi alam ini semuanya." (Yunus, 2003).

In his interpretation of this verse, Mahmud Yunus explains that Allah created plants with both male and female reproductive parts. He describes how the interaction between these parts occurs through agents such as insects, like butterflies, bees, and beetles, as well as through the wind, ultimately resulting in pollination and fruit-bearing. Yunus appears to draw upon the views of contemporary European scientists to support his explanation. Interestingly, he points out that what modern scholars have only recently discovered was, in fact, already revealed in the Qur'an over a thousand years ago. For him, this serves as clear evidence that the Qur'an is a divine revelation containing knowledge

about the natural world and its phenomena. His explanation, along with his interpretation of other scientific verses, tends to be informative in nature. By integrating scientific insights into his commentary, Mahmud Yunus offers a broader understanding of the verses using a simple yet effective scientific approach.

To consolidate the analysis of verses related to natural sciences and chemistry, the following table presents a thematic overview of Mahmud Yunus's scientific interpretation within *Tafsir Qur'an Karim*:

Table 3. Scientific Interpretation of Natural Science and Chemistry Verses in Tafsir Qur'an Karim by Mahmud Yunus

No	Qur'anic Verse	Scientific Focus	Exegetical Insight by Mahmud Yunus
1	QS. Al-Rūm (30): 48	Meteorology, Hydrology	Describes rainfall process scientifically (wind gathers clouds, rain falls between them); criticizes classical tafsir that contradicts modern science.
2	QS. Saba' (34): 10–11	Acoustics, Metallurgy	Explains echo (tasbīḥ of mountains) and iron processing by Prophet David; balances miraculous and natural explanations (fire-based metallurgy).
3	QS. Al-Ḥadīd (57): 25	Material Science, Industrial Development	Interprets "iron sent down" as iron extracted from the earth, used for strength and warfare; promotes resource development for national progress.
4	QS. Al-Ḥijr (15): 22	Botany, Pollination	Describes wind-assisted plant reproduction (pollination); emphasizes Qur'an's precedence over modern botanical discovery as a proof of divine origin.

The table 3 above highlights Mahmud Yunus's strategic use of Qur'anic verses related to natural phenomena not only to explain the observable world but also to promote a reformist mindset toward science and development. While the verses are rooted in cosmological and biological processes—such as rainfall, metallurgy, and pollination—Yunus's interpretation expands their significance beyond descriptive accounts. He consistently transforms these scientific references into moral, educational, and even nationalistic messages.

A distinctive pattern emerges: Yunus often interprets scientific verses as evidence of the Qur'an's timeless relevance, thereby countering the notion that Islamic texts are outdated in the modern scientific age. He balances between literal, rational, and miraculous dimensions—at times appealing to contemporary science (e.g., cloud formation), while in other instances allowing space for divine intervention (e.g., Prophet David's softening of iron). This balanced interpretive style enables readers to appreciate both the natural order and the spiritual symbolism embedded in creation.

Moreover, Yunus's commentary implies that science must not be isolated from ethics and purpose. His integration of technical explanation with calls for industriousness, self-reliance, and intellectual openness shows that tafsir, in his view, is not a static reading

of scripture but a dynamic vehicle for civilizational growth. By presenting this synthesis in tabular form, we observe that Yunus's engagement with science is as much about empowering Muslim identity as it is about theological affirmation.

Interpretation of Earth Science and Astronomy Verse

QS. Al-Ghāshiyah (88): 18-20 instructs humans to reflect on the natural phenomena around them, including the positioning of the sun, moon, and stars. According to Mahmud Yunus, these celestial bodies do not fall to the earth because of the gravitational force that exists between them. He attributes this idea to astrologers (likely meaning astronomers in the modern sense), who argue that this force allows the celestial bodies to remain suspended in the sky without visible pillars. This idea is further elaborated in QS. Al-Ra'd (13): 2, where the Qur'an states that Allah raised the heavens without pillars that are visible to the human eye. Mahmud Yunus interprets this as a reference to gravitational force, which serves as an invisible support system that holds celestial bodies in place. He writes:

> *"Sesungguhnya Allah meninggikan langit (matahari, bulan dan bintang-bintang) dengan tiada bertiang yang dapat kamu lihat. Semuanya tiada jatuh ke bumi karena Allah telah mengadakan suatu kekuatan tarik-menarik antara bintang-bintang itu, sehingga ia tiada bisa jatuh kepada yang lain. Kekuatan tarik-menarik itu ialah sebagai tiang yang tidak dapat dilihat dengan mata kepala. Orang yang mula-mula mengetahui kekuatan tarik-menarik itu ialah Newton. Maka buah kelapa, mangga dan sebagainya jatuh ke muka bumi, karena kekuatan tarikan bumi sebagaimana tarikan besi berani. Bumi ini juga ditarik oleh matahari. Jika tidak, niscaya terjauhlah ia sejauh-jauhnya dari matahari itu. Allah menjadikan matahari dan bulan, beredar menurut waktu yang ditentukan. Menurut pendapat ahli Falak sekarang, bahwa matahari itu berputar keliling sumbunya sekali dalam 25 hari (24,6). Adapun bulan berputar keliling sumbunya sekali dalam sebulan, begitu juga keliling bumi, Allahlah yang mengatur urusan itu semuanya, mudah-mudahan kamu berhati yakin akan menemui*Nya." (Yunus, 2003).

These verses, according to Yunus, encourage the study of astronomy and earth science. Humans are instructed to contemplate the stability of mountains, the structure of the earth, and how it appears flat from the human perspective. For him, such contemplation should lead to increased awareness of divine power and the natural laws created by Allah.

QS. Al-Baqarah (2): 22:

> *"Bumi ini seperti tikar. Sebagaimana tikar bisa kita duduki, berdiri dan tidur di atasnya, begitu pulalah bumi ini, dapat kita perbuat yang demikian itu. Ada orang mengatakan bumi ini datar sebegai tikar. Tetapi itu menurut pemandangan manusia saja, karena sebenarnya ia bulat. Tetapi karena sangat besar maka memang sebahagiannya menjadi datar. Bertambah besar suatu bulatan bertambah luas datarannya."* (Yunus, 2003).

In interpreting this verse, Mahmud Yunus discusses the shape of the earth and addresses the debate regarding whether the earth is flat or spherical. He draws an analogy between the earth and a mat that both appear flat and are functional for daily human activities. However, he clarifies that the earth only appears flat because of the limitations of human vision and the sheer size of the earth itself. The greater the diameter of a sphere, the broader and flatter its surface appears to the naked eye. Yunus firmly supports the

scientific understanding that the earth is round, indirectly refuting earlier flat-earth theories (Rowbotham & others, 2015). His position aligns with modern scientific consensus, particularly with the observable fact that other celestial bodies, such as the moon, are spherical in shape. Through this interpretation, Mahmud Yunus demonstrates his effort to harmonize the Qur'anic message with established scientific knowledge, making his tafsir both relevant and forward-looking.

QS. Al-Anbiyā' (21): 30:

"Tiadakah orang-orang kafir itu memperhatikan, bahwa beberapa langit dan bumi itu mula-mulanya bertaut (sebuah). Kemudian itu Kami ceraikan keduanya? Artinya beberapa langit itu ialah yang di atas kepala kita, umpamanya matahari, bintang-bintang beredar dan bulan. Maka semuanya itu beserta bumi ini dahulunya sebuah, kemudian diceraikan Allah antara satu dengan yang lain. Dengan jalan demikian itu terjadilah matahari, bintang-bintang beredar, bumi dan bulan. Keadaan ini bersesuaian benar dengan pendapat ahli Falak modern sekarang. Mereka telah menetapkan bahwa bumi ini dan bintang-bintang beredar semuanya berasal dari matahari, kemudian ia lerpelanting (tercerai) dari padanya, lalu beredar keliling matahari dan keliling sumbunya, sedang bulan itu asalnya dari bumi. Waktu bumi ini belum menjadi beku, sedang ia berputar keliling sumbunya dengan amat kencang, lalu lerpelanting (tercerai) bulan dari padanya, lantas berputar keliling bumi dan keliling sumbunya. Jadi semuanya itu asalnya sebuah, kemudian bercerai antara satu dengan yang lain, scbagaimana kitr lihat sekarang ini. lnilah pula sebuah mu'jizat Qur'an dan bukti yang terang, bahwa ia bukan karangan Nabi Muhammad, karena ia tidak belajar ilmu Falak, bahkan orang-orang yang ahli ilmu pengetahuan semasa hidupnya tak ada seorang juapun yang berpendapat demikian. Dari manakah nabi Muhammad mendapat pengetahuan Falak modern ini? Tentu dari pada Allah scmata-mata, yaitu dengan wahyu dari padaNya, bulan dengan belajar atau berstudi, karena ia seorang yang ummi (buta huruf)." (Yunus, 2003).

In interpreting this verse, Mahmud Yunus explains that the heavens and the earth were originally a single entity before being separated by Allah. He interprets "heavens" to refer to celestial objects such as the sun, stars, and the moon, which were once united with the earth. According to Yunus, this verse corresponds closely with the view of modern astronomers who theorize that the earth and the planets were initially part of the sun and then separated (or were ejected) from it, eventually forming independent celestial bodies that orbit the sun. The moon, he adds, originated from the earth itself, thrown off while the earth was still in a molten state and spinning rapidly. This explanation, which aligns with early versions of the nebular hypothesis, is used by Yunus to demonstrate the scientific dimension of the Qur'an. He emphasizes that the Qur'an revealed this cosmic reality long before the development of modern astronomy, and that such advanced knowledge could not have come from the Prophet Muhammad who was illiterate and had no access to such scientific insights, except through divine revelation. This, according to Yunus, is one of the miracles of the Qur'an and serves as clear evidence of its divine origin.

QS. Yūnus: 5:

"Allah mcnjadikan matahari bercahaya dengan sendirinya dan menjadikan bulan menerangi bumi waktu malam, tetapi ia mendapat cahaya dari sinar matahari, sebagaimana sermin bercahaya, jika dihadapkan kepada sinar matahari. Allah mentakdirkan (mengatur) bulan itu berpindah-pindah pada beberapa tempat peredarannya; gunanya, supaya manusia mengetahui bilangan tahun dan perhitungan waktu. Semuanya itu dijadikan Allah, bukanlah sia-sia, melainkan dengan sebenarnya, supaya jadi bukti dan keterangan, bahwa yang mengadakan dan mengatur-nya ialah Allah semata-mata. Begitu juga tentang

pertikaian malam dengan siang dan apa-apa yang dijadikan Allah, baik di langit, maupun di bumi, semuanya manjadi keterangan, bahwa Allah mahakuasa dan mahatinggi. Ada orang mengatakan bahwa Allah tidak ada, karena tidak dapat dilihat atau diperiksa dengan salah satu panca-indera. Maka untuk penolak perkataannya itu, Allah memberi keterangan dengan ayat tersebut, yaitu, bahwa kejadian matahari, bulan, bumi dan bintang-bintang yang berjuta-juta banyaknya, tak dapat tidak mustilah ada yang mengadakannya dan yang mengaturnya. Masakan suatu barang yang begitu besar dan teratur akan terjadi dengan sendirinya dan dengan tiba-tiba saja. Tentu tidak boleh jadi. Menurut akal yang waras, bahwa benda yang besar dan sangat teratur, mustilah yang memperbuatnya Mahabesar dan Mahapandai. Umpamanya orang yang memperbuat jam, lebih pandai dan mulia dari pada orang yang memperbuat bakul. Orang yang memperbuat kapal terbang lebih pintar dan ternama dari orang yang memperbuat biduk. Maka bagaimanakah pikiranmu tentang yang mengadakan bumi, bulan, matahari dan bintang-bintang yang berjuta-juta banyaknya? Tentulah la Mahabesar, Mahatinggi, Mahamulia dan Mahapandai." (Yunus, 2003).

In his interpretation of this verse, Mahmud Yunus explains that the sun and the moon are two celestial bodies that emit light. The sun has its own light to illuminate the earth during the day, while the moon reflects sunlight to shine at night. According to Yunus, the movement of the moon through various positions in its orbit allows humans to determine time, including the number of years and the measurement of days. He further asserts that the precision and regularity of the sun and moon's movements refute the views of those who deny the existence of God simply because He cannot be perceived by the five senses. Yunus argues that the existence of such massive, orderly systems must point to the existence of a Creator, one who is immensely powerful and intelligent. He uses analogies to strengthen his argument: just as a watchmaker must be more skilled than a basket weaver, and a shipbuilder more skilled than a small boat maker, so too must the Creator of the earth, sun, moon, and stars be the most exalted and wise of all beings.

This verse continues the theme from QS. Yūnus (10): 5 regarding the sun and moon as instruments of timekeeping. Mahmud Yunus elaborates by categorizing time into two systems. The first is based on the sun's movement, which determines prayer times, farming hours, and follows the Gregorian (solar) calendar. He incorporates astronomical insights, stating that the earth rotates on its axis once every 24 hours and revolves around the sun once every 365¼ days that causing the alternation of seasons. The second time system is based on the moon's orbit, which governs religious observances such as fasting and the pilgrimage (*ḥaj*). To determine these times, the lunar (Hijri) calendar is used. Yunus cites the astronomers' view that the moon completes an orbit around the earth every 29½ days. Hence, the length of a Hijri month may be either 29 or 30 days, depending on observation and calculation (Yunus, 2003).

QS. Nūḥ (71): 15-16:

"Tidakkah kamu lihat (perhatikan) bagaimana Allah menjadikan tujuh langit bertingkat-tingkat? Adapun arti tujuh langit itu ialah tujuh buah bintang atau tempat peredarannya masing-masing, karena memang tiap-tiapnya itu bertingkat-tingkat. Maka yang hampir sekali ke bumi ini ialah bintang 'Utharid (Mercury), kemudian bintang Zahrah (Venus), Marrikh (Mars), Musytari (Jupiter) Zuhal (Saturn), Uranus dan Neptune. Adapun menurut pendapat 'Ulama lslam dahulu, yaitu sebelum diketahui orang bintang Uranus dan Neptune, maka ganti yang dua ini ialah tempat peredaran bulan dan matahari, karena Allah menyuruh memperhatikan, ialah yang bisa dilihat dengan mata kepala tiap-tiap orang, sedang

> *bintang Uranus dan Neptune itu, hanya yang mengetahuinya ahli 'ilmu Falak, yang memakai teropong (pembesaran). Karena yang tujuh itu terang benar nampaknya dari bumi dan diketahui orang pula perjalanannya, maka itulah sebabnya Allah menyuruh memperhatikannya, untuk jadi tanda kekuasaan Allah. Dalam pada itu Allah menjadikan bulan bercahaya dan matahari sebagai pelita yang menerangi dunia."* (Yunus, 2003).

In interpreting this verse, Mahmud Yunus explains that the term "seven heavens" refers to seven celestial bodies or their respective orbits, arranged in levels. He identifies these as Mercury (*'Uṭārid*), Venus (*Zahrah*), Mars (*Marrīkh*), Jupiter (*Musytari*), Saturn (*Zuhal*), Uranus, and Neptune. According to Yunus, each of these orbits at a different level, which aligns with the concept of "heavens in layers." He also addresses earlier interpretations by classical Muslim scholars who, prior to the discovery of Uranus and Neptune due to the absence of telescopic technology counted the moon and the sun as part of the seven. This interpretation was based on celestial bodies visible to the naked eye, in line with the Qur'an's instruction to observe the heavens, which would naturally refer to phenomena accessible to ordinary human perception. Furthermore, Yunus emphasizes that the Qur'an's reference to the seven heavens serves as a sign of Allah's power, encouraging believers to observe and reflect. He then connects this idea to the role of the moon and the sun, describing the moon as a luminous body and the sun as a radiant lamp that illuminates the world both functioning within a divinely ordained cosmic order.

The preceding analysis has demonstrated how Mahmud Yunus integrates astronomical and geophysical knowledge into his interpretation of Qur'anic verses, often aligning them with scientific theories such as gravity, planetary motion, and cosmological formation. To present this interpretive approach more clearly, the following table summarizes the key verses, scientific domains, and the exegetical insights offered in *Tafsir Qur'an Karim* regarding earth sciences and astronomy.

Table 4. Scientific Interpretation of Earth Science and Astronomy Verses in Tafsir Qur'an Karim by Mahmud Yunus

No	Qur'anic Verse	Scientific Focus	Exegetical Insight by Mahmud Yunus
1	QS. Al-Ghāshiyah (88): 18-20	Astronomy, Gravity, Cosmology	Explains that celestial bodies remain suspended due to gravitational force; introduces Newton's theory as a means to affirm divine order.
2	QS. Al-Ra'd (13): 2	Gravitational Theory	Interprets "invisible pillars" as gravitational pull; attributes early knowledge of this force to Newton, underscoring Qur'anic relevance to science.
3	QS. Al-Baqarah (2): 22	Earth's Shape, Geophysics	Clarifies that the earth appears flat due to its vastness; supports the spherical earth model and reconciles it with Qur'anic descriptions.
4	QS. Al-Anbiyā' (21): 30	Cosmogenesis, Nebular Hypothesis	Interprets the unity and separation of heavens and earth as aligning with astronomical theories of planetary formation; affirms Qur'anic miracle.

QS. Yūnus (10): 5	Solar and Lunar Motion, Timekeeping	Describes sun and moon functions in time calculation; emphasizes precision as evidence of divine wisdom.
QS. Nūḥ (71): 15-16	Celestial Layers, Planetary Orbits	Identifies "seven heavens" as planetary levels; incorporates pre-modern and modern astronomy to show the Qur'an's timelessness.

The table 4 above reveals Mahmud Yunus's sophisticated engagement with cosmological and geophysical concepts in his Qur'anic interpretation. Rather than offering literalist or symbolic readings alone, he constructs a layered exegetical approach that blends classical understanding, modern astronomy, and rational observation. This method reflects not only a harmonization between revelation and science but also a pedagogical ambition to educate Muslims in the epistemology of the natural world.

A notable feature of Yunus's approach is his use of scientific analogies to explain invisible realities, such as interpreting "pillars" in the sky as gravitational force—an abstract concept made accessible through scientific reasoning. His mention of Newton is not merely to validate scripture but to illustrate how contemporary discoveries can serve as ta'wīl (deeper explanation) of the Qur'an's cosmic verses. In doing so, he subtly advocates for a scientific literacy that is theologically grounded.

Moreover, Yunus's interpretation of planetary motion and timekeeping goes beyond factual description; it functions as a spiritual ethic that invites readers to reflect on divine precision, order, and sovereignty. In a world where science is often seen as detached from value systems, Yunus reintroduces scientific knowledge into a Qur'anic worldview that is both empirical and reverential.

Through this integrative lens, Mahmud Yunus positions the Qur'an not only as a source of spiritual guidance but also as a framework for understanding natural laws, thereby empowering Muslim readers to see scientific inquiry as part of their religious contemplation and civic responsibility.

The Position of Mahmud Yunus's Scientific Interpretation in *Tafsir Qur'an Karim*

Mahmud Yunus's scientific interpretation as outlined in his *Tafsir Qur'an Karim* indicates that the integration of scientific elements into Qur'anic interpretation in Indonesia had already begun as early as the 1920s. This claim is supported by the historical fact that Mahmud Yunus began writing his tafsir in 1922 and completed it in 1938 (Yunus, 2003). These findings precede the developmental mapping of scientific interpretation in Indonesia conducted by Muchlisin and Nisa, who categorize its growth into three phases: the 1960s (introductory phase), the 1990s–2000s (development phase I), and 2010 onward (development phase II) (Muchlisin & Nisa, 2017). This fact strongly suggests that Mahmud Yunus can be considered one of the pioneers of scientific interpretation in the Indonesian context.

These findings also affirm that Mahmud Yunus was among the Indonesian commentators who actively supported interpreting Qur'anic verses through scientific perspectives, including modern science. This approach echoes the intellectual legacy of

scholars such as Fakhruddīn al-Rāzī, Tanṭāwī Jauharī, and Maurice Bucaille. There are at least two core aspects that support the view that Mahmud Yunus aligns with the scientific interpretation approach. *First*, he interprets several Qur'anic verses explicitly using scientific frameworks as shown in the previous section and supported by the summary he wrote at the end of his tafsir titled *Kesimpulan Isi Al-Qur'an*. *Second*, in employing this scientific approach, he frequently refers to the views of scientists, particularly in fields like astronomy. For example, while interpreting QS. Al-An'ām (6): 96, he refers to astronomical knowledge regarding the earth's rotation. At times, he does not mention specific names, such as in his commentary on QS. Al-Ḥijr (15): 22. However, in other instances, he clearly attributes theories to well-known figures, such as Newton when interpreting QS. Al-Ra'd (13): 2:

> *"Sesungguhnya Allah meninggikan langit (matahari, bulan dan bintang-bintang) dengan tiada bertiang yang dapat kamu lihat. Semuanya tiada jatuh ke bumi karena Allah telah mengadakan suatu kekuatan tarik-menarik antara bintang-bintang itu, sehingga ia tiada bisa jatuh kepada yang lain. Kekuatan tarik-menarik itu ialah sebagai tiang yang tidak dapat dilihat dengan mata kepala. Orang yang mula-mula mengetahui kekuatan tarik-menarik itu ialah Newton. Maka buah kelapa, mangga dan sebagainya jatuh ke muka bumi, karena kekuatan tarikan bumi sebagaimana tarikan besi berani. Bumi ini juga ditarik oleh matahari. Jika tidak, niscaya terjauhlah ia sejauh-jauhnya dari matahari itu. Allah menjadikan matahari dan bulan, beredar menurut waktu yang ditentukan. Menurut pendapat ahli Falak sekarang, bahwa matahari itu berputar keliling sumbunya sekali dalam 25 hari (24,6). Adapun bulan berputar keliling sumbunya sekali dalam sebulan, begitu juga keliling bumi, Allahlah yang mengatur urusan itu semuanya, mudah-mudahan kamu berhati yakin akan menemuiNya."* (Yunus, 2003).

Mahmud Yunus's style of interpretation which incorporates scientific theories, such as Newton's theory of gravity and ideas from European scholars and modern astronomers about earth and sky demonstrates his intention to broaden Qur'anic understanding through empirical knowledge. According to Nafisah, this model of scientific interpretation falls under the first phase of development, wherein scientific knowledge is primarily used to support theological or ideological purposes (Nafisah, 2023). This aim resonates with the Qur'anic perspective that encourages reflection upon the universe and its contents as a means of affirming the existence and greatness of God. Such a theological emphasis is also consistent with Mahmud Yunus's broader exegetical objective: to guide believers to recognize divine order in creation through both revelation and rational inquiry.

It is interesting to note that after analyzing Mahmud Yunus's scientific interpretation, his approach not only aligns with the first phase of scientific interpretation as classified by Nafisah, but also begins to touch on the second phase. In this second phase, interpreters seek to establish relationships between *āyāt kawniyyah* (verses related to the natural world) and scientific discoveries with the primary aim of strengthening both the internal and external miraculous aspects of the Qur'an. This is clearly illustrated in his interpretation of QS. Al-Rūm (30): 48, where he interprets the term sky not merely as the heavens but also as clouds. In doing so, his explanation about the process of rainfall aligns with modern scientific understanding. A similar approach is found in his interpretation of QS. Al-Anbiyā' (21): 30 which describes the initial unity and subsequent separation of the heavens and the earth. Mahmud Yunus asserts that this description is consistent with

contemporary astronomical theories, which once again proves the miraculous nature of the Qur'an. He emphasizes that it would have been impossible for Prophet Muhammad to possess such advanced astronomical knowledge without divine revelation since he was *ummī* (illiterate) as the Qur'an itself states.

What Mahmud Yunus accomplished in interpreting scientific verses cannot be separated from his context as an academic. His scientific interpretation, if categorized, can be seen as combining both apologetic and descriptive-informative models. This can be seen in the way he incorporates scientific explanations extensively without engaging in theoretical critique. Perhaps this was intentional, considering that *Tafsir Qur'an Karim* stands as the first complete modern tafsir in Indonesia. His goal was likely not to critique dominant paradigms, but rather to introduce a broader methodology of interpretation, one that allows for the expansion of meaning through interdisciplinary insights. Mahmud Yunus himself once likened the Qur'an to an ocean full of pearls. If someone uses old, rudimentary tools, they will retrieve only a few pearls. But with more modern and refined instruments, many more pearls can be drawn out yet even then, the ocean's treasures will never be exhausted. This metaphor reflects his belief that the Qur'an, when approached with evolving intellectual tools like science, will continuously yield new layers of meaning without diminishing its divine essence (Astari et al., 2022; Erawadi, 2024).

Based on the analytical exposition above, it becomes evident that Mahmud Yunus's exegetical approach reflects a distinctive model of scientific interpretation—one that integrates modern scientific perspectives to reinforce theological reflection without departing from the normative framework of faith-based reasoning. To synthesize these findings, the following diagram illustrates the key dimensions, orientation, and intellectual position of Mahmud Yunus's scientific interpretation within *Tafsir Qur'an Karim*.

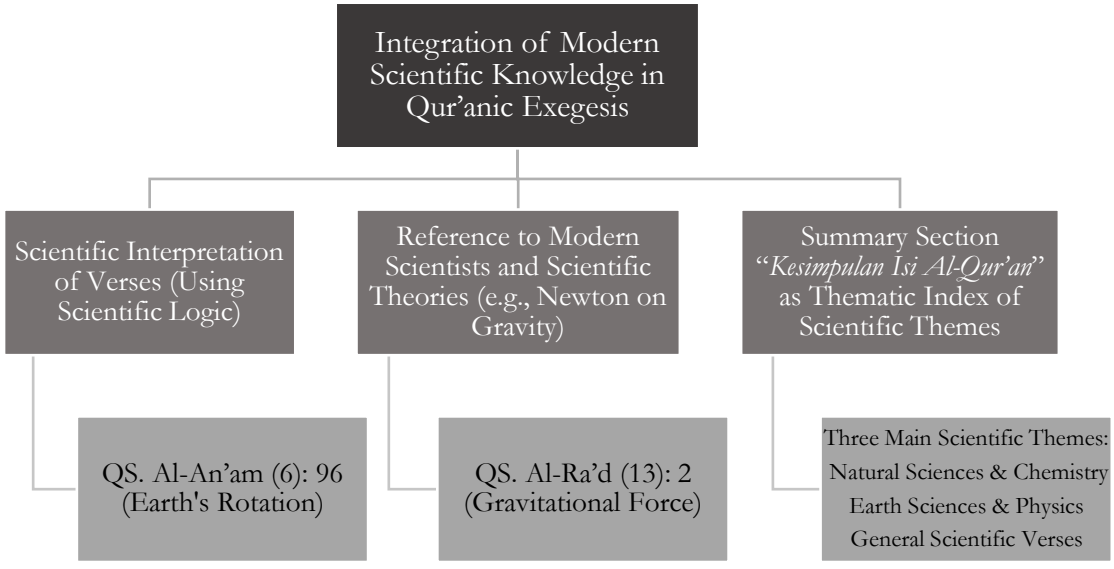

Figure 2. Conceptual Map of Mahmud Yunus's Scientific Interpretation in Tafsir Qur'an Karim

The figure 2 above does not merely map the structural elements of Mahmud Yunus's scientific exegesis; it also reveals the epistemological intention behind his approach. Rather than positioning science as an autonomous authority over the Qur'an, Yunus employs scientific insight as a complementary lens to affirm the coherence of revelation with rational inquiry. His effort to systematize scientific themes, cite empirical

observations, and reference key scientific figures suggests a deliberate move to reorient Islamic hermeneutics in response to modernity—not by confrontation, but by convergence.

Furthermore, the positioning of his exegesis within the descriptive-informative and apologetic spectrum highlights the transitional nature of his work. While not engaging in methodological critique or offering new theoretical paradigms, Yunus's tafsir contributes significantly to the normalization of scientific reasoning in Qur'anic interpretation. In this regard, the diagram serves not only as a conceptual synthesis but also as a reflection of how early Indonesian commentators like Mahmud Yunus laid the groundwork for more integrative and interdisciplinary models of tafsir that would emerge in subsequent generations.

Conclusion

In the context of Indonesian commentators, Mahmud Yunus through his *Tafsir Qur'an Karim*, introduced a modern approach to Qur'anic interpretation by integrating scientific explanations into his tafsir. Several verses analyzed in this study show that his scientific exegesis falls within the descriptive-informative category and tends to be apologetic in nature. Notably, in the concluding section of his tafsir titled *Kesimpulan Isi Al-Qur'an,* Mahmud Yunus outlines major scientific themes such as verses related to science, natural sciences, and chemistry, as well as earth sciences and physics all of which have been discussed in this study. However, his classification also includes additional themes not covered in this research, such as zoology, anthropology, botany, and geology (15 verses), health sciences (7 verses), and education, particularly reading, writing, and arithmetic (5 verses).

These themes remain open for future researchers to explore, offering the potential for new perspectives on Yunus's scientific exegesis. Furthermore, it is important to conduct comparative studies with other Indonesian tafsir works that employ scientific approaches. Such comparisons will help highlight the unique characteristics of each interpretation and contribute significantly to understanding the broader development of scientific exegesis in Indonesia.

CRediT Authorship Contribution Statement

Amir Hamzah: Conceptualizing the research theme, finding primary and secondary research data, also writing the initial draft. **Siar Ni'mah:** Help organize research data and edit the initial draft, including translating. **Firdaus:** Contributed in reviewing the initial concept and initial draft, also contributed in finalizing the research.

Declaration of Competing Interest

We don't have any competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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