Financing Sustainable Development Goals (SDGs): The Role of FinTech in Closing Financing Gap

(Review Paper)
تمويل أهداف التنمية المستدامة ودور التكنولوجيا المالية في علاج فجوة التمويل

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المستخلص:

يعد إيجاد مصادر مستحدثة لتمويل أهداف التنمية المستدامة (SDGs) قضية هامة في تحقيق أجندة عام ٢٠٣٠. تهدف هذه الورقة إلى رصد وتوضيح القنوات المختلفة التي يمكن من خلالها للتكنولوجيا المالية تعبئة الموارد التمويلية لتحقيق التنمية المستدامة من خلال منهجية مراجعة الأدبيات لتحديد مدى توفر وتنوع الأدبيات الموجودة حول مصادر التمويل لأهداف التنمية المستدامة. تحدد هذه الورقة مدى اتساع نطاق الأدبيات الموجودة حول مصادر تمويل أهداف التنمية المستدامة من خلال رصد وتصنيف تلك الأدبيات. يأخذ التحليل على وجه التحديد في الاعتبار، المقالات وفصول الكتب المنشورة بين عامي 2012 و 2023 في المجلات المفهرسة من Scopus و google scholar . ومن خلال منهجية مراجعة وبحث الأدبيات

تتعرف الورقة البحثية على الثغرات البحثية في سياق أهداف الاستدامة ومصادر التمويل والأدوات المالية الإسلامية واستخدام التكنولوجيا المالية في تمويل أهداف التنمية المستدامة .وتخلص الورقة البحثية إلى الحاجة إلى مواصلة البحث في الأهداف المستدامة التي لم تحظى باهتمام كاف، وأدوات تمويل مناسبة لكل هدف، وفهم استراتيجيات التمويل المتوافقة مع الظروف الاجتماعية والسياسية والاقتصادية الخاصة بكل دولة .كما تسلط الورقة الضوء على الثغرات البحثية في الأبحاث المتعلقة بالدول النامية ودور التمويل الإسلامي في تحقيق أهداف التنمية المستدامة .بالإضافة إلى ذلك، يسلط البحث الضوء على السياسات اللازمة لمواجهة تحديات التكنولوجيا المالية، بما في ذلك إنشاء أطر تنظيمية واضحة، والاستثمار في البنية التحتية الرقمية، وتعزيز التعاون بين شركات التكنولوجيا المالية والمؤسسات المالية التقليدية والهيئات التنظيمية .ويمكن أن يؤدي تنفيذ تدابير قوية للأمن السيبراني، والبيئة الرقابية التجريبية، وسياسات حماية المستهلك إلى سد الفجوة الرقمية، ودفع الشمول المالي، وتعزيز التنمية المستدامة.

<u>الكلـمات المفتـاحية</u>: التكنولوجيا المالية – العملات الرقمية – منصات الدفع الرقمية – أهداف التنمية المستدامة – فجوة التمويل – تمويل إسلامي رقمي – الشمول المالي – مراجعة الأدبيات – فجوة البحث – الاقتصاد الرقمي.

Abstract:

Financing sustainable development goals (SDGs) is a crucial issue in the fulfillment of the 2030 Agenda. This paper aims at enumerating and stating different channels through which Fintech can mobilize funding resources for achieving sustainable development through determining the scope of the existing literature about sources of finance for SDGs. The methodology used is literature review to determine the extent of existing literature on financing sources for SDGs. The analysis specifically considers articles and book chapters published between 2012 and 2023 in Scopus-indexed journals and google scholar. This review paper identifies research gaps in the context of sustainability goals, financing sources, Islamic financial tools, and the use of Fintech in financing SDGs. It emphasizes the need for further exploration of specific goals with less attention, suitable financing tools for each goal and country, and understanding financing strategies aligned with specific social, political, and economic circumstances. The paper also highlights research gaps in publications about developing countries and the role of Islamic finance in achieving the SDGs. Additionally, it highlights necessary policy actions to tackle fintech challenges, including establishing clear regulatory frameworks, investing in digital infrastructure, and promoting collaboration between fintech companies, traditional financial institutions, and regulatory bodies. Implementing robust cybersecurity measures, regulatory sandboxes, and consumer protection policies can bridge the digital divide, drive financial inclusion, and promote sustainable development.

Keywords: Fintech – Cryptocurrencies – Digital Payment Platforms – SDGs – Financing Gap – Islamic Crowding Platforms – Financial Inclusion – Literature Review- Research Gap – Digital Economy.

1. Introduction

The traditional definition of development is based on improvement of economic indicators. While sustainable development considers economic development alongside with environmental quality, human and social aspects in addition to compromising the future generations' needs.

The sustainable financing needs are growing, but development financing is not keeping pace. The COVID-19 pandemic, Russian-Ukraine war, sharp increase in food and energy prices, and rapidly tightening financial conditions cast a shadow over SDGs and reversed its progress. Lack of financing resources becomes the most rebellious stone in paving the way toward sustainable growth, and most of sustainability agendas go under its targeted time plans.

Numerous scholarly works attempt to draw attention to the funding sources for all or just some of the Sustainable Development Goals (SDGs), depending on empirical research. While another stream of literature examines the role of financial inclusion to achieve SDGs. In addition, some studies focused on the role of Fintech and Islamic financial services in reinforcing sustainable growth.

Accordingly, as the world is now at a crossroads, the aim of this paper is elaborate the financing aspects of SDGs rather than to explore the goals themselves. In light of that goal, this paper reviews the existing literatures to explore the current level of SDGs financing to identify the financing gap and discuss the potential solutions by focusing on the role of Fintech in closing this gap.

Therefore, the main question of the study is ‘To what extent could Fintech mobilize funding resources for achieving sustainable development?’ To answer this question, the paper reviews key literatures across Scopus and Google Scholar using a defined set of keyword searches. This review has several targets, both on theoretical and practical levels. Theoretically, the paper critically

reviews previous contributions in this area. This will help to discover the research gap in financing SDGs. Then, practically the findings will pave the way for future researchers to fill this gap.

While the literature available on the different financing sources for SDGs is quite abundant; comprehensive reviews of available literature on the other hand, are scarce. Subsequently, the study contributes to this research area by reviewing and categorizing all sources of financing SDGs addressed in the literature available. Once this categorization is completed, focus will be drawn towards Fintech as an innovative means of financing SDGs. These novel efforts aim to compile and evaluate the effectiveness of Fintech on filling the funding gap in financing sustainable development to provide critical evaluation of previous studies. That could help to identify potential research areas, with more focus on the role of innovative financing tools.

In this context, the study's findings shall address a crucial information gap, providing valuable insights that can assist policy makers and development institutions in designing effective financing strategies for sustainability agendas. Moreover, these findings draw the attention of future researchers towards the significance of innovative financing tools in meeting the necessary funding requirements for sustainable development.

The remaining of the paper is structured as follows: Section 2 describes the review methodology. Section 3 elaborates the critical review of literature, while section 4 presents the research gaps found. Building on the findings of the former section, the study discusses the research agendas needed to fill those gaps in section 5. Finally, conclusion and references are provided in sections 6 and 7 respectively.

2. Methodology

The methodology of this paper is based on reviewing around 150 selected resources. In selecting the review resources, researchers

try to focus on empirical studies to identify the main challenges of the financing strategies of the 17 SDGs.

The documents reviewed in this paper are selected based on several criteria, first; regarding the database, the paper is based on a review of selected papers from Google Scholar and Scopus, during the period (2012 – 2023), which are related to financing SDGs in both developed and developing countries. Although year 2015 is considered the launching year of the SDGs, the study starts the review from 2012, as there are early initiatives[1] by few scholars related to financing activities that target adverse climate changes mitigation, biodiversity and clean energy.

As regards the second criterion, the paper uses a wide range of journals to reduce selection bias and to reflect a balanced view since the nature of goals under SDGs are diverse and fall under various disciplines. Finally, regarding the third criterion, the researchers use the inclusion criterion by selecting multiple keywords reflecting topic applicable idioms[2] to consider all relevant financing tools for SDGs then filtering those off topic completely. In addition, researchers attempted to include different types of literature covering articles, book chapters, review papers, and conference papers.

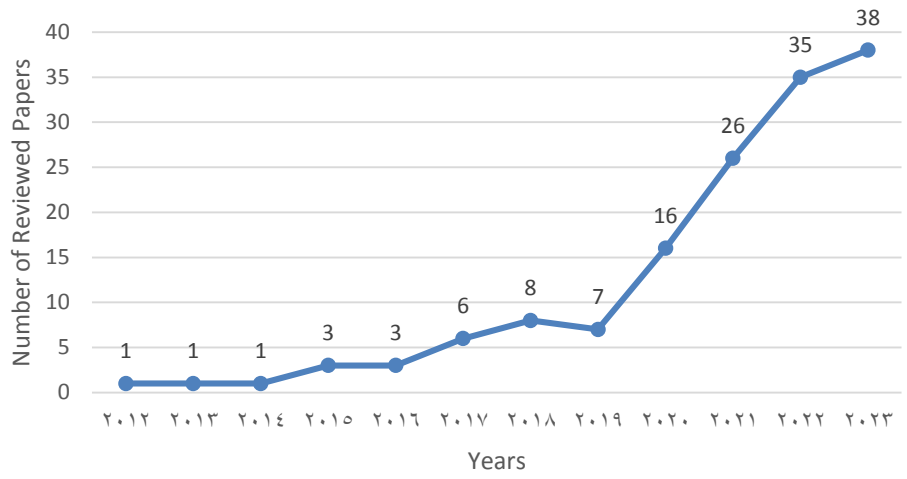
Table (1) in appendix, summarizes the total selected review publications (145 publications) in the area of financing sustainable development, sorted chronologically by publication year. Table (2) in appendix classifies the publications according

[1] In the context of achieving Millennium Development Goals (MDGs) that declared in year 2000 to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women.

[2] Such as; sustainable development, finance, SDGs, green finance, environmental economics, climate change, green bonds, financial inclusion, developing countries, comparative study, access to finance, Fintech, Islamic finance, digital platforms, green digital finance, Islamic finance, Islamic Fintech and financial technology

to the number of published documents per year, as shown in figure (1).

Figure (1): Number of Publications across Years



Source: Created by authors based on Table (2) in the appendix.

The increasing number of publications, as shown in figure (1), reflects the accelerated progress in academic output in this area of research. This trend is compatible with the UN declaration of the 17 goals in 2015. A notable surge in the number of publications occurs in 2019, which may be attributed to the misfortunate event of COVID-19 acting as an alarming sign for the importance of finding answers for the aftermath economic and social turmoil. Challenges related to financing SDGs as a result, became an even more important topic in research agendas than prior to 2019. This shows the importance of assessing these previous academic contributions in order to draw a clear map for future research to tackle the most serious and difficult obstacle for attaining sustainable development.

3. Critical Review of Literatures

Analyzing the reviewed documents in table (1) in the appendix enabled the researchers to classify them critically into **three main classes**:

3.1: ***The first class*** of documents focuses on the targeted goals to identify the research gap in terms of the sustainability goals (gap 1) and country or region (gap 2).

The researchers divide this first class into three main sub-categories; the first sub-category include resources tackling financing all SDGs in general irrespective of the nature of each goal. The second sub-category encompasses only resources focusing on a specific single SDG in relation to the most suitable source of financing for this goal. Lastly, the third sub-category includes resources on financing sources for more than one interrelated SDGs.

The first sub-category, about all SDGs, mainly elaborates the most convenient tools, policies, strategies, institutional framework, and players to achieve sustainable development goals in general. A batch of them focus on developing countries and others shed light on the main challenges and suggested policies to overcome these challenges.

The second sub-category is based on results of empirical studies, which keep track of the success experiences in financing a specific SDG. Accordingly, reviewing this group of studies reveals the most effective financing tools to achieve certain goals. It should be noted that results of those empirical studies are constrained by the specificity of the country or region to which it is applied and hence, policy makers should cautiously generalize its results –if applicable- when designing their own policies.

The third sub-category of literature are those of interrelated SDGs with the appropriate source of financing them. The studies under this sub-category assume that SDGs are interdependent and there is a causal relation between most of them, such as, achieving decent work and economic growth (SDG8) will lead to reducing

both poverty (SDG1) and hunger (SDG2). On other hand, good educational opportunities (SDG4) create jobs and promote economic growth (SDG8). Moreover, there are interdependency between mitigating adverse climate change (SDG13) and using clean energy (SDG7), whereas, partnership for development (SDG17) promotes all other SDGs.

3.2: ***The second class*** categorizes literature according to various financing sources (Table (1) in the appendix) that provide funds for SDGs. These tools of finance include green finance, debt swaps, domestic funds such as private sector, external resources such as aids and FDI, fintech, Islamic finance, taxes, public-private partnership (PPP), insurance sector and blended finance. Despite the variability in the method of funding, the relative importance of each source changes over years, as countries gradually diversify its financing structure for SDGs by introducing innovative tools like green bonds, financial platforms, Islamic finance and blue bonds.

Prior to 2018, financing SDGs depended on both domestic and external sources according to the literature reviewed. Domestic sources included domestic savings (Ray, 2015), private sector (Oji et al., 2016) and taxes (Steckel et al., 2017), while external sources included foreign aids (Miller, 2014) , external borrowing from Multilateral Development Banks (Delina, 2017) and remittances (Kedir et al., 2017), in addition to, banking sector and stock market (Meka & Meka, 2015) and (Nwosu & Orji, 2017). A small portion of literature focus on microfinance (Chirambo, 2017), public-private partnership (PPP) (Kościelniak & Górka, 2016) and green finance (Schwerhoff & Sy, 2017).

In the year 2018, countries still depended on domestic sources like taxes in Ghana, Kenya, and Uganda (Ron Balsera et al., 2018) or income support programs in Pakistan (Tahir et al., 2018)(Tahir et al., 2018). But there are scholarly contributions that shed light on using other non-traditional financing tools such as sovereign wealth funds (Mawdsley, 2018)(Mawdsley, 2018), green bonds

and green loans (Clark et al., 2018) and peer-to-peer platforms (Adams et al., 2018).

After 2018, financing SDGs depended on three main tools: Islamic finance, green finance, and Fintech. Studies focusing on Islamic financing channels highlight the importance of using Islamic Sukuk, Waqf and Zakat (Alshaleel, 2019), Islamic crowding platforms (Piliyanti, 2019), blended Islamic Finance (T. Khan & Badjie, 2022) and Islamic banks (Jan et al., 2023) and (Golzare Nabi et al., 2023).

In terms of green finance, green bonds and green banks continue to be a significant component in financing SDGs from 2018 through 2023. Specifically, green bonds appeared to be the most important tool in many empirical studies, such as (PRAKASH & SETHI, 2021), (Nurgaliyeva et al., 2022), (Feng et al., 2023) and (Siddiqui & Navaneeth, 2023).

Another significant emerging source of finance involves harnessing technological innovation like Blockchain to mobilize funds for financing SDGs through bitcoins, cryptocurrencies, peer-to-peer platforms, and supply chains (Adams et al., 2018)(Adams et al., 2018). Although the scholars' interest in such sources of finance continued from 2018 until 2022, surprisingly, in 2023, number of studies in this area sharply declined (nearly 8% only of publications) which raises a big question about this gap. The reason behind the notable fall in literature as regards the use of fintech solutions for financing SDGs may be related to two events. The first is the COVID-19 pandemic, which may have shifted the focus of digital technologies from fintech as a tool for financing SDGs to addressing immediate challenges in areas like health and education. On the other hand, the second event may be related to several challenges associated with the use of emerging digital technologies as was highlighted by the reviewed papers and perhaps became empirically evident.

There are several challenges attached to the use of these technologies like the increased vulnerability to cyber-attacks, which can escalate to cyberwarfare. This poses security risks and

threatens citizens' privacy. Additionally, the reliance on power supply and interdependencies between operators can create vulnerabilities. Secondly, there is a tension in human-machine interaction during decision-making. Users often distrust these technologies, questioning whether they have their best interests at heart. This distrust stems from difficulties in explaining and interpreting digital data in a way that is actionable and understandable to humans. Moreover, increasing infrastructure digitalization raises challenges in terms of equity and inclusivity. It is crucial to ensure that these technologies comply with equitable principles and "leave no one behind." However, the adoption of such technologies in developing economies may be slower, creating a digital divide (Argyroudis et al., 2022a). In a broader sense, the challenging need for prudential regulation of the use of technology- especially with the development of AI has cast a shadow on the aspired benefits technology can bring to SDGs and slowed down the enthusiasm for rapid application.(Truby, 2020a; Yigitcanlar et al., 2021a)

This aggregation will help to assess the research gap in terms of Islamic Financing Tools (gap 3) in order to clarify whether all Sharia-Compliant contracts of Islamic finance is used effectively to finance SDGs or not. Finally, research gap in terms of Fintech (gap 4) that try to assess the role of financial technology in fill the financing gap to SDGs.

3.3: The third class emphasizes on the effect of financial inclusion on financing SDGs. This stream of literature does not introduce financing tool, instead, it suggests policies, regulations, and institutional framework to support and facilitate attaining SDGs. In return, some of SDGs will decrease the financial exclusion by many classes of society. For this important and mutual relation between SDGs and financial inclusion, the researchers track this relation by analyzing the previous scholarly contributions in order to set comprehensive policy recommendations for accelerating the sustainability agendas.

This class of literature such as (Sen et al., 2023) , (Wong et al., 2023) , (Kara et al., 2021), (Essel-Gaisey & Chiang, 2022) , (Cavoli et al., 2023) and (Li & Wu, 2023) try to show the importance of inclusiveness of all women, poor people, illiterate individuals and students in formal financial sector to push most of sustainable development goals. This fact strongly appears in case of social targets such as reduce poverty and hunger, better educational opportunities, gender equality and subsequently decent work.

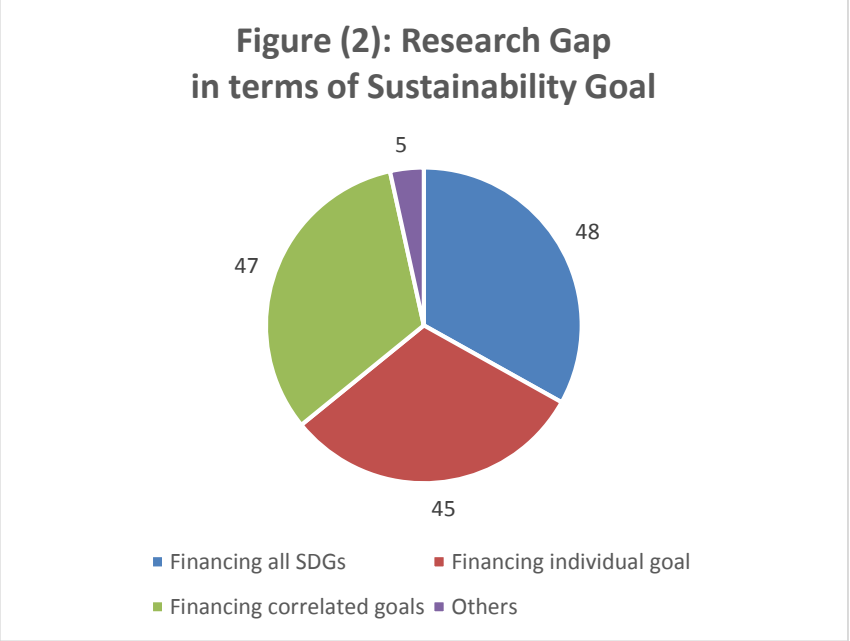
In addition to other studies that expand the role of financial inclusion in promoting SDGs, through using fintech to facilitate the inclusiveness of different categories to financial services such as (Esmaeilpour Moghadam & Karami, 2023) , (Buckley et al., 2021), and (Demir et al., 2022).

4. The Research Gap

The novel efforts of this review paper are in discovering and describing the research gaps in terms of the sustainability goals, in terms of country or area of countries, in terms of financing source, and in terms of Islamic Financial tools.

4.1. Research Gap in terms of the SDGs

Reviewed papers could be reclassified according to the number of studies that elaborate the financing sources for each goal of SDGs (Table (3) in appendix). This highlights the contribution of this review paper, by discovering the research gap in terms of goals that need more investigation by researchers to fill this gap.



Source: Created by authors based on Table (3) in the appendix.

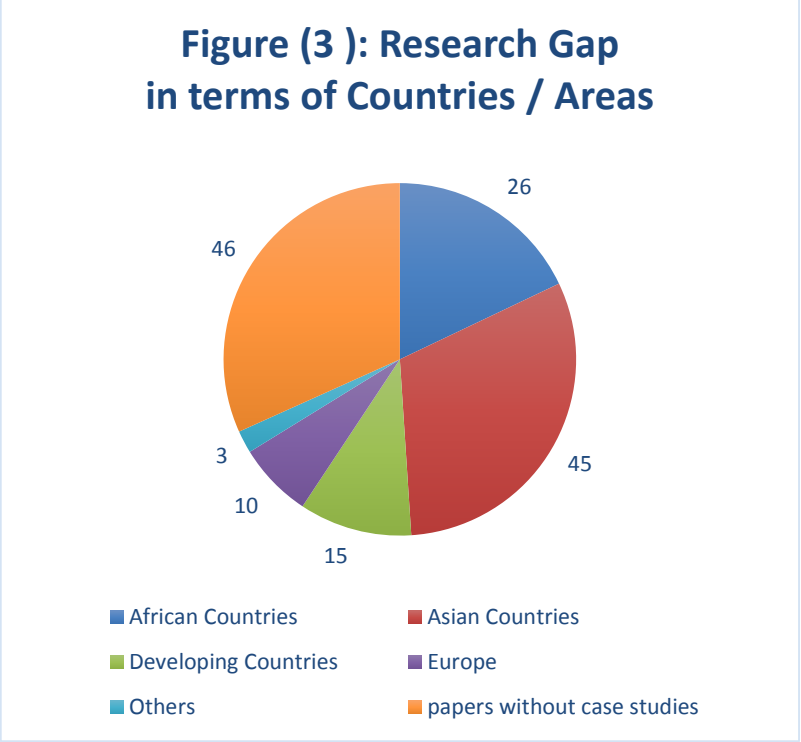
As clear in Figure (2), the three mainstreams in literature have nearly the same shares. But, after eight years of the UN declaration for the 17 SDGs, the deep sight for these equally shares may not reflect an acceptable research agenda in the future. As there is no need to focus again by future researchers on using general approach in financing all SDGs. On contrary, there is a critical need for exploring the most harmonic financing tool for each goal, country or group of countries.

Understanding the research gap regarding each individual goal is extremely difficult. As some of them are either interrelated or with causal relation. For example, large number of studies focus on financing SDG9. On contrary, few studies elaborate SDG6, SDG11 and SDG12. But it is not reasonable to judge that there is

a research gap regarding these three goals, as more focus to achieve SDG9 means attaining SDG6, SDG11 and SDG12. While, contributions about financing SDG14 and SDG15 are very limited, and there is a need to fill this gap in the future.

4.2. Research Gap in terms of Countries or Area

The researchers try to shed light on countries or area of countries need more research efforts to stimulate sustainable growth using the most compatible financing tools with its social, political and economic circumstances. As choosing the financing strategy by policy makers require a comprehensive vision about the case study, regarding its budget structure, economic and social indicators and its international relations.



Source: Created by authors based on Table (4) in the appendix.

As regards in Figure (3) and table (4) in appendix, 46 papers (out of 145 publications) or nearly third of the reviewed papers do not mention any case studies and only elaborate the policies needed to attain or finance SDGs. While 70% of papers focus on case studies, especially year 2023 as 35 (out of 38 publications) focus on empirical studies, comparing with only 10 (out of 35) in previous year, 2022. This gives a good trend in scholars' research interest. On the other hand, papers about the Asian experience (45 papers out of 145), especially about success stories in China, state very important policy recommendations for researchers in the

future, in addition to other benchmarks in Europe cases. But, the great shortage in publications about developing countries, reflects the research gap according to countries. So, more efforts are needed by the scholars to fill this gap.

4.3. Research Gap in terms of Islamic Financing Tools

There are few numbers of studies[3] focus on the role of Islamic finance in achieving SDGs. Then, it is clear that there is a research gap in terms of number of publications. As regards the case studies, there are a large concentricity on Asian countries, such as Malaysia and Indonesia (Jan et al., 2023) , Bangladesh (Golzare Nabi et al., 2023) and Pakistan (Siddique et al., 2022). In concern with the Sharia-Compliant tools; Islamic banks, Waqf, Zakat and blended Islamic finance are commonly suggested by scholars or actually used in some countries. Besides, a part of studies suggested innovative channels such as Islamic crowding platforms (Atif et al., 2021), (Alshater et al., 2022), (Chong, 2021), (Hudaefi, 2020) and (Rabbani et al., 2021). In addition to, green Suluk (Keshminder et al., 2022) .

4.4. Research Gap in terms using Fintech in Financing SDGs

Most empirical studies about using Fintech in financing SDGs focus heavily on Asian countries such as; China (Deng et al., 2019), (Y. Liu et al., 2021) and (Paradise, 2022)(Paradise, 2022). And Indonesia (Hudaefi, 2020), (Setiawan et al., 2021) and (Nugraha et al., 2022), in addition to Bangladesh (Bin Amin et al., 2022) and Iran (Rasoulinezhad & Taghizadeh-Hesary, 2022) .

Almost 30% of literature collected on using Fintech has primarily focused on the connection between financial technology (fintech) and financial inclusion. This emphasis reflects the significant importance placed on financial inclusion as both a goal and a means for achieving sustainable development. Financial inclusion, which refers to providing access to affordable and

[3] Nearly less than 10% of the reviewed publications -145

appropriate financial services to all individuals and businesses, is crucial for reducing poverty, promoting economic growth, and fostering social development. Fintech has emerged as a powerful tool in expanding financial access, especially in underserved and unbanked populations. By leveraging digital technologies, fintech enables innovative solutions such as mobile banking, digital payments, and microfinance, which can overcome traditional barriers to financial inclusion. As a result, the intersection between fintech and financial inclusion has become a key area of research and policymaking, highlighting the integral role that financial inclusion plays in achieving sustainable development goals. (Babajide et al., 2020) (Arner et al., 2020) (Hoang et al., 2021) (Buckley et al., 2021) (Setiawan et al., 2021) (Nugraha et al., 2022) (Du et al., 2022) (Adeola, 2022) (Esmaeilpour Moghadam & Karami, 2023).

5. Role of Fintech in closing Financing Gap: Challenges and Potential Solutions

Fintech is the using technology in providing financial services, this may help to close the financing gap that hinders the attaining of SDGs. The researchers review previous studies about some success stories in mobilizing funds by innovative financial services such as; Mobil Payments Systems, Crowdfunding Platforms, Peer-to-Peer Lending, Crypto currencies, Artificial Intelligence and Blockchain. Few of studies consider the Islamic Crowding Platforms and Islamic Cryptocurrency.

The role of financial technology (fintech) in closing the financing gap is significant, but it also comes with its own set of challenges. Fintech has the potential to revolutionize the financial landscape by providing innovative solutions that can bridge the financing gap, particularly in areas such as sustainable development. One

major challenge is the digital divide, where access to fintech services is limited, especially in developing economies and rural areas. (Argyroudis et al., 2022a)This lack of access prevents individuals and businesses from benefiting from fintech solutions. To overcome this challenge, efforts are needed to enhance digital infrastructure and promote digital literacy, ensuring that everyone has equal access to fintech services.

Another challenge is the issue of cybersecurity and data privacy(Truby, 2020a). As fintech relies heavily on digital platforms, it is prone to cyber-attacks and unauthorized access to sensitive information. Strong cybersecurity measures and robust data protection regulations are crucial to build trust and ensure the safe and secure use of fintech. Additionally, regulatory frameworks and policies need to keep pace with the rapid advancements in fintech. Striking a balance between promoting innovation and protecting consumers is essential. Regulatory sandboxes, which provide a controlled environment for fintech experimentation, can be implemented to facilitate innovation while managing risks. Collaboration and partnerships among various stakeholders are also vital in addressing the challenges and harnessing the potential of fintech. Governments, financial institutions, technology companies, and development organizations should work together to create an enabling environment, share knowledge, and foster innovation in fintech.

6. Conclusion and Policy Implications

In conclusion, this paper has conducted a comprehensive analysis of the existing literature on financing sustainable development goals (SDGs) and has highlighted the potential role of financial technology (fintech) in achieving these goals. The increasing number of publications in this area demonstrates the growing importance of addressing the challenges related to financing SDGs. The analysis has identified three main categories of

documents, focusing on the research gap in terms of sustainability goals and geographical areas. The first category encompasses research that explores financing all SDGs without specifying particular tools, while the second category examines the most efficient sources of finance for each individual goal. The third category analyzes financing sources for interrelated goals. These documents provide valuable insights into the tools, policies, strategies, institutional frameworks, and challenges associated with achieving sustainable development goals.

This review paper focuses on identifying research gaps related to sustainability goals, country or area, financing sources, and Islamic financial tools. In terms of the Sustainable Development Goals (SDGs), the paper highlights the need for further investigation into specific goals that have received less attention, such as SDG6, SDG11, and SDG12, while also emphasizing the need to explore the most suitable financing tools for each goal, country, or group of countries. Additionally, there is a research gap in terms of publications on financing SDG14 and SDG15, indicating a need for more studies in these areas. Regarding countries or areas, the paper suggests that more research efforts are needed to understand the financing strategies that align with the social, political, and economic circumstances of specific cases. While some papers provide policy recommendations without focusing on specific case studies, there is a growing trend of empirical studies, particularly in Asian countries like China and success stories in Europe. However, there is a significant shortage of publications about developing countries, indicating a research gap in this regard. The role of Islamic finance in achieving the SDGs is another area where research gaps exist. There are limited studies on this topic, with a focus on Asian countries such as Malaysia, Indonesia, Bangladesh, and Pakistan. Commonly suggested Islamic financing tools include Islamic banks, Waqf, Zakat, and blended Islamic finance. Some studies also propose innovative channels like Islamic crowding platforms and green Suluk. In terms of using Fintech in financing SDGs,

most empirical studies concentrate on Asian countries like China, Indonesia, Bangladesh, and Iran. Additionally, approximately 30% of the literature collected on Fintech and SDGs focuses on the connection between Fintech and financial inclusion.

The main focus of the paper - while providing an overview for literature in the field of financing SDGs- was to highlight the role of fintech particularly in financing SDGs because of the evident financing obstacles that seem to have increased in recent years after Covid-19 and Russian-Ukraine war, causing a need to mobilize more funds, especially domestic resources. The paper highlights quite a gap in the specific use of fintech tools for financing SDGs in terms of methodological tools, geographical framework and scope of SDGs. Nevertheless, existing literature contemplates the risks associated with the use of technology in general and AI specifically drawing attention to possible adverse impact on SDGs. In summary, while fintech holds great promise in closing the financing gap, challenges such as the digital divide, cybersecurity, regulatory frameworks, and collaboration need to be addressed. By overcoming these obstacles, fintech can contribute significantly to achieving sustainable development goals and ensuring inclusive and accessible financing for all.

To overcome the challenges of using fintech tools, policymakers should consider implementing a range of policies. This includes establishing clear regulatory frameworks that address consumer protection, data privacy, and cybersecurity. Additionally, investment in digital infrastructure is crucial to ensure widespread access to fintech services. Financial inclusion initiatives, such as financial literacy programs and increased access to basic banking services, can bridge the digital divide. Promoting collaboration and partnerships between fintech companies, traditional financial institutions, and regulatory bodies can foster innovation and address challenges collectively. Robust cybersecurity measures, regulatory sandboxes for testing new technologies, and strong consumer protection policies are also important. Lastly, international cooperation and information sharing among

regulatory bodies can help address cross-border challenges and promote harmonized regulatory frameworks for fintech. By implementing these policies, governments can create a supportive environment for fintech innovation, driving financial inclusion and sustainable development.

Moving forward, future research should continue to explore innovative sources of finance, such as cryptocurrencies, debt swaps, SWF, FDI, blue bonds, microfinance, Islamic mutual funds, insurance sector and social impact bonds in order to overcome the most significant obstacles in attaining sustainable development. The future research agendas need more efforts to focus on the role of the financing tools in attaining SDGs; By leveraging these technologies and implementing appropriate policies, we can ensure progress towards the 2030 Agenda and create a more sustainable future for all.

7. References

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Table (1): Total Selected Publications for Review: Ranked According to Publication in Years (2012 - 2023)

No.	Author (s)	Publication Year	Targeted SDGs	Source of Finance	Case Study
1	(Giagnocavo et al., 2012)(Giagnocavo et al., 2012)	2012	Environmental degradation (the 5th goal of Millennium Development Goals, MDGs)	Cooperative banks	Italy and Spain
2	(Mitric, 2013)(Mitric, 2013)	2013		Foreign aid and private sector	
3	(Miller, 2014)(Miller, 2014)	2014		Foreign aid	
4	(Dr. S. K. Mishra, 2015)(Dr. S. K. Mishra, 2015)	2015	ALL MDGs	Domestic and external sources of finance	
5	(Meka & Meka, 2015)(Meka & Meka, 2015)	2015	ALL SDGs	Banking sector – Stock market	Albania
6	(Ray, 2015)(Ray, 2015)	2015	SDG9	Domestic savings	South Asia and Southeast Asia
7	(Oji et al., 2016)(Oji et al., 2016)	2016	SDG7	Private sector	Africa
8	(Jakob et al., 2016)(Jakob et al., 2016)	2016	SDG9	yield of carbon tax	Saharan African countries
9	(Kościelniak & Górka, 2016)(Kościelniak & Górka, 2016)	2016	SDG11	PPP, taxes and green bonds.	
10	(Steckel et al., 2017)(Steckel et al., 2017)	2017	All SDGs	Domestic resources, especially, taxes	
11	(Delina, 2017)(Delina, 2017)	2017	SDG7 – SDG13	Multilateral development banks (MDBs)	
12	(Nwosu & Orji, 2017)(Nwosu & Orji, 2017)	2017	SDG1 – SDG5	Access to formal credit (financial inclusion)	Nigeria
13	(Kedir et al., 2017)(Kedir et al., 2017)	2017	SDG1	Domestic savings, taxes and remittances.	Africa
14	(Chirambo, 2017)(Chirambo, 2017)	2017	SDG13	microfinance	Africa
15	(Schwerhoff & Sy, 2017)(Schwerhoff & Sy, 2017)	2017	SDG7 – SDG13	aids and subsidies loans from regional development banks - green bond Public-Private partnership (PPP)	poor African countries

16	(Popoola et al., 2018)(Popoola et al., 2018)	2018	SDG2	domestic resources like taxes	Nigeria
17	(Abdullah, 2018)(Abdullah, 2018)	2018	All SDGs	Islamic finance / Waqf	
18	(Ron Balsera et al., 2018)(Ron Balsera et al., 2018)	2018	SDG4	Taxes	Pakistan, Ghana, Kenya and Uganda
19	(Akenroye et al., 2018)(Akenroye et al., 2018)	2018	All SDGs	Budgetary resources	Developing countries
20	(Tahir et al., 2018)(Tahir et al., 2018)	2018	SDG1 - SDG5	Income support program	Pakistan
21	(Mawdsley, 2018)(Mawdsley, 2018)	2018	All SDGs	venture capital, sovereign wealth funds, and private sector	
22	(Clark et al., 2018)(Clark et al., 2018)	2018	SDG13	Green finance, in form of, green bonds and green loans	
23	(Adams et al., 2018)(Adams et al., 2018)	2018	All SDGs	Fintech / Blockchain / P2P Platforms	
24	(Alshaleel, 2019)(Alshaleel, 2019)	2019	SDG1 – SDG2- SDG3- SDG4- SDG5- SDG7- SDG9- SDG13	Islamic finance / sukuk (Islamic bonds) / zakat / waqf.	
25	(Twine et al., 2019)(Twine et al., 2019)	2019	SDG2	Increasing access to credit (financial inclusion)	Tanzania
26	(Murray & Spronk, 2019)(Murray & Spronk, 2019)	2019	SDG7	Blended finance	Canada
27	(Ferrata, 2019)(Ferrata, 2019)	2019	SDG1 – SDG2- SDG5- SDG8	Digital finance promotes financial inclusion	
28	(Piliyanti, 2019)(Piliyanti, 2019)	2019	All SDGs	Islamic crowdfunding platforms	
29	(Hinson et al., 2019)(Hinson et al., 2019)	2019	SDG12	Fintech / Green Technologies	
30	(Deng et al., 2019)(Deng et al., 2019)	2019	All SDGs	Fintech / P2P Platforms	China
31	(Onyiriuba et al., 2020)(Onyiriuba et al., 2020)	2020	SDG8	Domestic credit through banking sector	Egypt
32	(Grigoryev et al., 2020)(Grigoryev et al., 2020)	2020	SDG10 – SDG13	Progressive taxes	BRICS

33	(Gupta et al., 2020)(Gupta et al., 2020)	2020	All SDGs	Artificial intelligence (AI) and digital technologies	
34	(Truby, 2020)(Truby, 2020)	2020	All SDGs	Tackling risks of AI and its negative impacts on SDGs	Developing countries
35	(Di Vaio et al., 2020)(Di Vaio et al., 2020)	2020	SDG12	Artificial intelligence and innovation	
36	(Eissa, 2020)(Eissa, 2020)	2020	SDG1 – SDG2	domestic resources and PPP	Egypt
37	(Jung, 2020)(Jung, 2020)	2020	SDG7 SDG8	Domestic resources	Egypt
38	(Ruiz-Gauna et al., 2020)(Ruiz-Gauna et al., 2020)	2020	SDG7	Blended finance	Canada
39	(Achugamonu et al., 2020)(Achugamonu et al., 2020)	2020	SDG1 – SDG2-SDG8	Financial Inclusion	Sub-Saharan African countries
40	(Bird & Choi, 2020)(Bird & Choi, 2020)	2020	SDG8	Foreign aid, foreign direct investment and remittances.	
41	(Garcia et al., 2020)(Garcia et al., 2020)	2020	SDG1 – SDG5 – SDG8	Microcredit	Sierra Leone
42	(Lewin, 2020)(Lewin, 2020)	2020	SDG4	domestic resources	Sub-Saharan African countries
43	(Babajide et al., 2020)(Babajide et al., 2020)	2020	All SDGs	Fintech / Financial inclusion	Nigeria
44	(Fadeyi et al., 2020)(Fadeyi et al., 2020)	2020	SDG11	Fintech / Cryptocurrency	
45	(Hudaefi, 2020)(Hudaefi, 2020)	2020	All SDGs	Islamic Financial Technology	Indonesia
46	(Arner et al., 2020)(Arner et al., 2020)	2020	All SDGs	Fintech / Financial inclusion	
47	(Hoang et al., 2021)(Hoang et al., 2021)	2021	All SDGs	Fintech / Financial inclusion	
48	(Yigitcanlar et al., 2021)(Yigitcanlar et al., 2021)	2021	SDG11	green artificial intelligence	
49	(Braganza et al., 2021)(Braganza et al., 2021)	2021	SDG8	Fintech / AI	
50	(Glavina et al., 2021)(Glavina et al., 2021)	2021	All SDGs	Islamic financial industry	Islamic Cooperation (OOIC) member countries

51	(Pauliukevičienė & Stankevičienė, 2021)(Pauliukevičienė & Stankevičienė, 2021)	2021	SDG8 - SDG8 - SDG9	Fintech (Financial technologies)	
52	(Buckley et al., 2021)(Buckley et al., 2021)	2021	SDG1 – SDG8	Fintech / financial inclusion	
53	(Zhang et al., 2021)(Zhang et al., 2021)	2021	SDG1- SDG13-SDG15	Fintech / Platforms	China
54	(Setiawan et al., 2021)(Setiawan et al., 2021)	2021	All SDGs	Fintech / Financial inclusion	Indonesia
55	(Kara et al., 2021)(Kara et al., 2021)	2021	All SDGs	Financial inclusion	
56	(Situm et al., 2021)(Situm et al., 2021)	2021	SDG3	Result-based financing, impact investment and public-private partnership	Ukraine and Austria
57	(Christiansen, 2021)(Christiansen, 2021)	2021	SDG14	Blended Finance	
58	(Son-Turan, 2021)(Son-Turan, 2021)	2021	SDG4 – SDG5 – SDG8	Blended Finance	
59	(Bayliss et al., 2021)(Bayliss et al., 2021)	2021	SDG3 – SDG9	private-public partnership (PPP).	Senegal and Brazil
60	(Gambetta et al., 2021)(Gambetta et al., 2021)	2021	ALL SDGs	Private sector	Mexico
61	(McHugh, 2021)(McHugh, 2021)	2021	ALL SDGs	private sector / banking sector/ development banks.	
62	(Chiu, 2021)(Chiu, 2021)	2021	All SDGs	private sector and social specialized banks	
63	(Simplicio & Jardim, 2021)(Simplicio & Jardim, 2021)	2021	SDG1 – SDG2	Development impact bonds issued by non-governmental institutions.	India, Brazil and South Africa
64	(Türkelli, 2021)(Türkelli, 2021)	2021	SDG1 - SDG2 - SDG3 - SDG4	The multilateral development banks (MDB)	

65	(Cohen et al., 2021)(Cohen et al., 2021)	2021	SDG1 – SDG10	PPP, donor-private partnership (DPP) and blended finance.	
66	(Roy et al., 2021)(Roy et al., 2021)	2021	SDG8	Aid to trade policy	low and lower middle - income countries
67	(Sinha et al., 2021)(Sinha et al., 2021)	2021	All SDGs	Green Finance	
68	(Zheng et al., 2021)(Zheng et al., 2021)	2021	All SDGs	Green Finance / Green Banking	Bangladesh.
69	(McDonald et al., 2021)(McDonald et al., 2021)	2021	SDG6	Public Banks	
70	(Ng et al., 2021)(Ng et al., 2021)	2021	SDG7	Green Finance	
71	(PRAKASH & SETHI, 2021)(PRAKASH & SETHI, 2021)	2021	SDG7 – SDG13	Green Bonds	India
72	(Fang, 2021)(Fang, 2021)	2021	All SDGs	Foreign Direct Investment (FDI)	African Countries
73	(Nugraha et al., 2022)(Nugraha et al., 2022)	2022	SDG1 – SDAG8 – SDG10	Fintech / Financial inclusion	Indonesia
74	(Du et al., 2022)(Du et al., 2022)	2022	All SDGs	Fintech / Financial inclusion	
75	(Adeola, 2022)(Adeola, 2022)	2022	SDG1 – SDG2 – SDG5- SDG8	Fintech / Financial inclusion	African countries
76	(Paradise, 2022)(Paradise, 2022)	2022	SDG7 – SDG8	Green digital finance / Digital platforms	China
77	(Devidze, 2022)(Devidze, 2022)	2022	SDG13	Fintech	Developing countries
78	(Rasoulinezhad & Taghizadeh-Hesary, 2022)(Rasoulinezhad & Taghizadeh-Hesary, 2022)	2022	All SDGs	Green digital finance	Iran
79	(Vikas et al., 2022)(Vikas et al., 2022)	2022	All SDGs	Fintech/ Financial intermediaries like banks and other financial institutions using technology platforms	
80	(Bin Amin et al., 2022)(Bin Amin et al., 2022)	2022	All SDGs	Fintech / green digital financing	Bangladesh
81	(Parmentola et al., 2022)(Parmentola et al., 2022)	2022	SDG7 – SDG13 – SDG11 – SDG12 – SDG14 – SDG15	Fintech / blockchain / cryptocurrencies	

82	(Mustafa et al., 2022)(Mustafa et al., 2022)	2022	SDG7 – SDG13	Fintech / Blockchain / Cryptocurrency	
83	(Nurgaliyeva et al., 2022)(Nurgaliyeva et al., 2022)	2022	All SDG	Green bonds / Privat sector	Kazakhstan Pakistan
84	(Siddique et al., 2022)(Siddique et al., 2022)	2022	All SDGs	Islamic Banks	Pakistan
85	(F. Khan & Haneef, 2022)(F. Khan & Haneef, 2022)	2022	SDG1 – SDG2 – SDG5 – SDG9 – SDG10 – SDG11	Islamic Finance / Zakat and Waqf	
86	(Lin, 2022)(Lin, 2022)	2022	All SDGs	Public sector through government enterprises	European Union (EU)
87	(Bolch et al., 2022)(Bolch et al., 2022)	2022	SDG1	Foreign Aids	Developing Countries
88	(Elneel & AlMulhim, 2022)(Elneel & AlMulhim, 2022)	2022	All SDGs	domestic investment	Saudi Arabia
89	(Chang et al., 2022)(Chang et al., 2022)	2022	SDG8	Green bonds	top 10 countries that support green finance
90	(Thompson, 2022)(Thompson, 2022)	2022	SDG8 – SDG14	Blue bonds	
91	(Prakash & Sethi, 2022)(Prakash & Sethi, 2022)	2022	SDG13 – SDG15	Blended Finance	Asian Economies
92	(T. Khan & Badjie, 2022)(T. Khan & Badjie, 2022)	2022	SDGs (4-7-8-9-10-11-12-13-17)	Blended Islamic finance	
93	(Taneja et al., 2022)(Taneja et al., 2022)	2022	SDG8 – SDG15-SDG17	Green finance such as bank loans and bond issuance for green projects	India
94	(Bolch et al., 2022)(Bolch et al., 2022)	2022	SDG1	Taxes – Foreign aids	Developing countries
95	(Suchodolski et al., 2022)(Suchodolski et al., 2022)	2022	All SDGs	Sustainable development banks (SDBs)	Brazil and Vietnam
96	(Riaño et al., 2022)(Riaño et al., 2022)	2022	All SDGs	Public Development Banks	
97	(Bunevich & Gorbacheva, 2022)(Bunevich & Gorbacheva, 2022)	2022	SDG7	Green bonds - Taxes – Asset-backed securities.	Russia

98	(Prakash & Sethi, 2022)(Prakash & Sethi, 2022)	2022	All SDGs	Public sector by green Bonds, sustainability bonds and social-income bonds.	Asian economics
99	(Bai et al., 2022)(Bai et al., 2022)	2022	SDG7	Banking sector – Global Financial Institutions	China
100	(Zhao et al., 2022)(Zhao et al., 2022)	2022	SDG7 – SDG13	Banks – Other financial Institutions - Government Spending	the Asian and ASEAN economies
101	(Quang & Thao, 2022)(Quang & Thao, 2022)	2022	SDG7	Green Finance	ASEAN (Association of Southeast Asian Nations) countries
102	(Akanle et al., 2022)(Akanle et al., 2022)	2022	All SDGs	Remittances	African Countries
103	(Essel-Gaisey & Chiang, 2022)(Essel-Gaisey & Chiang, 2022)	2022	All SDGs	Financial inclusion	Ghana
104	(Nsouli, 2022)(Nsouli, 2022)	2022	All SDGs	Public-Private Partnership (PPP) using Islamic Sukuk	
105	(Kochhar, 2022)(Kochhar, 2022)	2022	All SDGs	Green Finance	
106	(Keshminder et al., 2022)(Keshminder et al., 2022)	2022	SDG13	Green Sukuk	Malaysia
107	(Awawdeh et al., 2022)(Awawdeh et al., 2022)	2022	SDG7	Green finance	Egypt
108	(Carè et al., 2023)(Carè et al., 2023)	2023	All SDGs	Fintech	
109	(Esmaeilpour Moghadam & Karami, 2023)(Esmaeilpour Moghadam & Karami, 2023)	2023	SDG5	Fintech / Financial inclusion	
110	(Jiang, 2023)(Jiang, 2023)	2023	SDG6 – SDG8 – SDG9 – SDG11 – SDSG13	Fintech / Digital Payments Platforms	
111	(Das & Basu, 2023)(Das & Basu, 2023)	2023	SDG10	Financial inclusion / Banking sector	low- income countries
112	(Wang, 2023)(Wang, 2023)	2023	SDG7	private sector	China
113	(Feng et al., 2023)(Feng et al., 2023)	2023	SDG7 - SDG13	Green bonds	China
114	(Ali et al., 2023)(Ali et al., 2023)	2023	SDGs7 - SDG8- SDG11- SDG12 - SDG13	Financial inclusion / Financial development	E-7 economies

115	(Sen et al., 2023)(Sen et al., 2023)	2023	SDG7	Financial inclusion	Bangladesh
116	(Dai & Chen, 2023)(Dai & Chen, 2023)	2023	SDG8 – SDG12 – SDG13 – SDG15	Green bonds - Green Investment Funds	China
117	(A. K. Mishra et al., 2023)(A. K. Mishra et al., 2023)	2023	SDG17	Socially Responsible Investment Funds (SRIF)	India
118	(Wong et al., 2023)(Wong et al., 2023)	2023	SDG1 – SDG10	Financial inclusion / Banking sector	Indonesia -Malaysia – Phillippines – Thailand - Vietnam
119	(Tariq & Hassan, 2023)(Tariq & Hassan, 2023)	2023	All SDG	Green Finance	In 70 countries
120	(Razak & Ali, 2023)(Razak & Ali, 2023)	2023	SDG8 – SDG9 – SDG13	Green Investment Firms	Malaysia.
121	(Li & Wu, 2023)(Li & Wu, 2023)	2023	All SDG	Financial development	BRICS countries
122	(Reddy & Gopalan, 2023)(Reddy & Gopalan, 2023)	2023	SDG5	Financial Inclusion / Banking Sector	Emerging and Developing Countries
123	(Smith & Wesselbaum, 2023)(Smith & Wesselbaum, 2023)	2023	SDG1 – SDG4 – SDG9 – SDG10 – SDG17	Financial Inclusion / Banking Sector	low- and middle-income countries
124	(Jan et al., 2023)(Jan et al., 2023)	2023	SDG8 -SDG9 - SDG12	Islamic Banks	Malaysia and Indonesia
125	(Siemionek-Ruskań & Fanea-Ivanovici, 2023)(Siemionek-Ruskań & Fanea-Ivanovici, 2023)	2023	SDG4 - SDG8	Green Banking	Poland and Romania
126	(Skare et al., 2023)(Skare et al., 2023)	2023	SDG7 - SDG13	Financial development	214 countries in East Asia and the Pacific
127	(Ze et al., 2023)(Ze et al., 2023)	2023	SDG13	Financial inclusion / Banking sector	China
128	(Wu et al., 2023)(Wu et al., 2023)	2023	SDG7 - SDG13	Green finance by government sector	China
129	(Bilal et al., 2023)(Bilal et al., 2023)	2023	SDG5 – SDG8	Entrepreneurial intention of Omani women using social networking	Sultante of Oman
130	(Umar & Safi, 2023)(Umar & Safi, 2023)	2023	SDG8 - SDG13	Green Finance	OECD countries
131	(Mirza et al., 2023)(Mirza et al., 2023)	2023	SDG8 - SDG9	Green finance	BRIC countries
132	(Akomea-Frimpong et al., 2023)(Akomea-	2023	SDG9	Public-Private partnership (PPP)	Ghana

	Frimpong et al., 2023)				
133	(Siddiqui & Navaneeth, 2023)(Siddiqui & Navaneeth, 2023)	2023	SDG13	Green bonds	Developing Countries
134	(Cavoli et al., 2023)(Cavoli et al., 2023)	2023	SDG6	Financial inclusion	low and middle-income countries
135	(Markhayeva et al., 2023)(Markhayeva et al., 2023)	2023	SDG13	Green banking	the Russian Federation and the Republic of Kazakhstan
136	(Zaman, 2023)(Zaman, 2023)	2023	All SDGs	Private investment and NGOs	Bangladesh
137	(Numan et al., 2023)(Numan et al., 2023)	2023	All SDGS	Progressive Taxes – Private Sector – Global Organizations	Exporting Countries
138	(Feridun & Talay, 2023)(Feridun & Talay, 2023)	2023	All SDGS	principles of responsible banking (PRB)	Europe
139	(Golzare Nabi et al., 2023)(Golzare Nabi et al., 2023)	2023	All SDGs	Islamic Finance	Bangladesh
140	(Z. Liu et al., 2023)(Z. Liu et al., 2023)	2023	SDG7	Private sector	Developing and developed countries
141	(Barbier & Burgess, 2023)(Barbier & Burgess, 2023)	2023	All SDGs	fossil fuel subsidy swaps, tropical carbon taxes, and improved management and distribution of resource revenues	low- and lower-middle-income economies
142	(Behera et al., 2023)(Behera et al., 2023)	2023	SDG13	Green Finance	Emerging Economies
143	(Hannah et al., 2023)(Hannah et al., 2023)	2023	All SDGs	Corporate taxes – Private sectors (Multinational corporations)	Sub-Saharan Africa
144	(Han et al., 2023)(Han et al., 2023)	2023	All SDGs	Green finance – Green insurance	China
145	(Chaudhry & Hussain, 2023)(Chaudhry & Hussain, 2023)	2023	SDG1- SDG2- SDG3 - SDG12- SDG13	Green finance	Pakistan

Table (2): Classification of Reviewed Papers According to in Years (2012 - 2023)

Publication Year	Number of Reviewed Papers
2012	1
2013	1
2014	1
2015	3
2016	3
2017	6
2018	8
2019	7
2020	16
2021	26
2022	35
2023	38

Table (3): The 3 Mainstreams of Literatures in the Context of SDGs

The mainstream	Number of Reviewed Papers
Financing all SDGs	48
Financing individual goal	45
Financing correlated goals	47
Others	5

Table (4): Classification of Reviewed Papers According to Countries/Areas

Countries / Areas	Number of Reviewed Papers
African Countries	26
Asian Countries	45
Developing Countries	15
Europe	10
Others	3
papers without case studies	46

Table (5): Fintech: Major Challenges and Potential Solutions

Reference	Financing Tool	Challenges	Potential Solutions
(Argyroudis et al., 2022)(Argyroudis et al., 2022)	**Digital Technologies (SDG13)**	The operational and functional obstacles of infrastructure of emerging digital technologies in achieving SDG13. In addition to, lack of consensus and legislation needed to support these technologies.	Adoption of holistic standards, regulations and legislation to fully utilized of these technologies.
(Yigitcanlar et al., 2021)(Yigitcanlar et al., 2021)	**AI (SDG11)**	AL may complex the urban problems in case of achieving SDG11	The study suggests the importance of consolidated AI or green AI to facilitate smart cities transformation. In addition to set a framework for adoption AI that satisfy efficiency, equity and sustainability.
(Truby, 2020)(Truby, 2020)	**AI (All SDGs)**	AI poses several risk factors that may hinder the achievement of the UN sustainable development goals (SDGs), especially in developing countries. As lack of ethical governance and transparency cause unfair outcomes and unequal access to finance. Therefore, all SDGs with high dependency on financial inclusion will backward.	Tackling these risk factors need implementation of regulatory framework based on internationally accepted principles of AI governance.

(Braganza et al., 2021)(Braganza et al., 2021)	**AL** (**SDG8**)	Psychological contracts have a positive effect on productivity and decent work (SDG8). But AI may lead to decrease the psychological contracts. Then, low engagement and less trust will hinder SDG8 as AI weakens the relationship between employer and their employees.	There is a need to apply a new type of social contracts that satisfy higher level of employee engagement and trust for achieving SDG8. Moreover, the study proposes large opportunities for future research to fill the gap related to effect of AI adoption on psychological relation between employees and employers.
(Di Vaio et al., 2020)(Di Vaio et al., 2020)	**AI** (**SDG12**)	The adoption of AI to attain SDG12 results in economic, social, legal and ethical challenges.	The study suggests to tackle these obstacles by implementing sustainable business models (SBMs) of consumption and production. This model requires involvement and cooperation of academic researchers, businesses and public policies.
(Esmaeilpour Moghadam & Karami, 2023)(Esmaeilpour Moghadam & Karami, 2023)	**Fintech** (**SDG5**)	Insignificant effect of Fintech on achieving gender equality in countries with high gender discrimination. Then, fintech is inadequate tool to attain SDG5.	financial empowering for women requires cultural and social initiatives to enhance financial access of women and change gender norms.
(Mustafa et al., 2022)(Mustafa et al., 2022)	**Cryptocurrency (SDG7)**	The use of huge energy during the crypto mining process affects negatively on SDG7 and SDG13.	There is a need to use wealth generated from cryptocurrency trading in financing projects that promote attaining SDG7 and SDG13.

Source: Authors compiled