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ORIGINAL RESEARCH PAPER

The Social Responsibility of National Bank in Financing Green Startups: A Comparative Study of Domestic and International Bank

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P A P E R I N F O

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A B S T R A C T

This study was conducted to investigate the relationship between green financing and bank investment in clean energy projects within the context of green startups. The statistical population included both domestic and international banks active in this field, with the sample consisting of the Bank of Iran as a representative of domestic banks and several international banks. The research period spans from 2017 to 2024. Datas were collected from reliable library sources, including annual bank reports, international organization reports, scientific articles, and reputable information websites. Using descriptive-analytical methods and a simple linear regression model, a positive and significant relationship was observed between green financing and bank investment in clean energy projects. The results showed that the Bank of Iran has made efforts in recent years to support green startups. A comparison with international banks revealed that these banks are more extensively and systematically engaged in the field of social responsibility and green investment. Finally, recommendations were provided to enhance the social responsibility of the Bank of Iran in supporting green startups, including increasing collaboration with these startups, issuing green bonds, and making responsible investments in renewable energy. This study can serve as a scientific basis for the development of green financial policies in Iranian banks.



1. Introduction

In today's world, with the increasing public awareness of climate change, environmental crises, and the depletion of natural resources, sustainable development has become one of the key issues in the global economy. In this context, green startups or innovative businesses that focus on improving the environment and reducing the negative impacts of human activities on nature play a vital role. These emerging companies, by offering innovative solutions in areas such as renewable energy, clean technologies, resource management, and recycling, aim to create positive changes in production and consumption patterns [1]. Banks, as influential financial institutions in the economy, play a significant role in shaping and supporting the growth of these startups. The social responsibility of banks in supporting green startups is not only recognized as an ethical and social action, but it can also create new economic and financial opportunities for the banks themselves. By providing financial resources, making responsible investments, and strengthening innovation through such investments in environmentally compatible projects, banks can support the growth of these businesses while positioning themselves as pioneers in the field of sustainable development [2].

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In addition, banks can facilitate environmental policies and act as intermediaries between green startups and investors by cooperating with governmental and international organizations. Moreover, by facilitating access to new markets and ensuring transparency and reporting in the field of sustainability, they can enhance public trust. In this regard, by creating a sustainable financial and legal framework, banks can contribute to strengthening the ecosystem of green businesses and, through participation in sustainable economic development, gain public confidence [3].With this in mind, the current study aims to investigate the role of banks' social responsibility in the field of startups and explores how banks' approaches to supporting environmental innovations are structured. The study first examines the area of banks' social responsibility and their social responsibility in the context of green startups. It then proceeds to analyze the experiences of other countries in this area and, through a comparative analysis, offers strategic recommendations and suggestions.

The social responsibility of banks refers to their commitment to pursuing strategies that not only lead to the improvement of financial performance and profitability, but also contribute to the enhancement of social welfare, support for sustainable development, and protection of the environment [4]. This concept includes the implementation of ethics-based policies, transparency in financial reporting, investment in sustainable economic projects, adherence to employees' rights and labor standards, and strengthening the role of banks in social development. By embracing these responsibilities, banks act as key agents in achieving economic and social goals, ensuring the interests of all stakeholders, and promoting social stability and development; therefore, the main pillars of the social responsibility of banks are as follows [5]:

Table 1. Main pillars of the social responsibility of banks in the field of green startups.

Pillars
Financing Green Startups
Responsible Investment
Collaboration with Governments and International Organizations
Facilitating Access to New Markets
Transparency and Reporting in the Field of Sustainability

Source: See Ref. [11].

The green finance market focuses on financing projects that have positive environmental impacts. These projects include investments in renewable energy, sustainable agriculture, and initiatives that lead to the reduction of carbon emissions. Green finance consists of various financial products such as green bonds, loans, and equities, all of which are used with the aim of financing environmentally friendly projects. Therefore, Figure (1) shows the continuous growth of green finance by global banks in the area of startups, increasing from 500 billion U.S. dollars in 2017 to 3,192 billion U.S. dollars in 2023; accordingly, it is projected to reach 3,885 billion U.S. dollars in 2024. With the increase in global awareness of climate change, the demand for green finance is growing. Governments, companies, and investors all play a role in guiding this market. Regulatory frameworks and incentives also support its growth. Figure (2) shows the increase in bank investments in clean energy startup projects, rising from 649 million U.S. dollars in 2017 to 1,759 million U.S. dollars in 2023. This trend indicates a growing focus on sustainable resources and the reduction of environmental impacts.

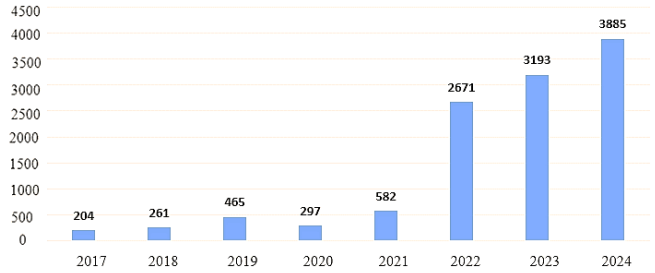


Figure 1. Green finance by global banks in the field of green startups (2017–2024).
Source: marketresearch.biz, 4irelabs.com, www.climatebonds.net, www.tbsnews.net.

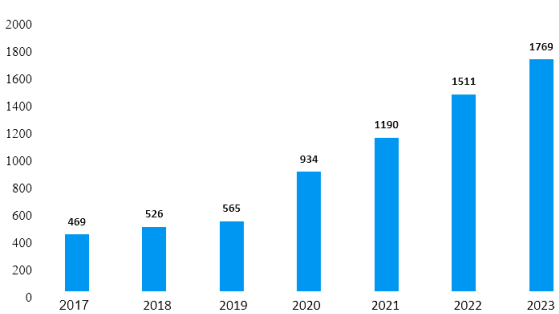


Figure 2. Bank investments in clean energy projects in the field of green startups (2017-2023).
Source: about.bnef.com.

Gidage and colleagues conducted a study titled "Exploring the impact of green finance, CSR and green banking on environmental sustainability performance in Indian banks", in which they investigated the impact of green finance, corporate social responsibility (CSR), and green banking practices on environmental sustainability performance in Indian banks. The study utilized a simple random sampling method and applied multiple regression analysis. Data were collected from 14 major banks in India. The results showed that green finance and corporate social responsibility are positively and significantly associated with the environmental sustainability performance of banks. In other words, banks that pay more attention to green policies and their social responsibilities demonstrate better performance in the environmental domain[6].Gazi and his colleagues in a research titled "Impact of green banking practices on green CSR and sustainability in private commercial banks: The mediating role of green financing activities" examine the complex interaction between bank employees' green banking behaviors and their green financing activities, and analyze their impact on green corporate social responsibility (CSR) and sustainability in private commercial banks. The findings indicate that green financing activities play a key role in translating green initiatives into sustainable outcomes. Furthermore, they emphasize the importance of employee training and awareness in this area, as this factor can help improve the implementation of green behaviors in banks[7].X Cai conducted a study titled "Towards sustainable environment: unleashing the mechanism between green finance and corporate social responsibility", in which the role and performance of green finance in achieving economic, social, and environmental sustainability goals were examined. The results indicate that green finance functions as a key instrument for sustainable development and can also contribute to enhancing the social and economic standing of organizations. Furthermore, the study emphasizes the importance of collaboration among governments, banks, and private organizations in developing and implementing green financial policies[8].Tian and colleagues conducted a study titled "Corporate Social Responsibility, Green Finance and Environmental Performance: Does Green Innovation Matter?" in which they examined the relationship between corporate social responsibility, green finance, and environmental performance using a descriptive-analytical method and multiple regression analysis. The findings of this study indicated that corporate social responsibility and green finance are positively associated with the environmental performance of companies. Moreover, green innovations play a significant mediating role in this relationship. In other words, this study highlights the importance of promoting green innovations in enhancing the positive impact of CSR and green finance on improving environmental performance [9].

2. Method

This research has been conducted with the aim of examining the relationship between green finance and bank investments in clean energy projects within the field of green startups. Given the increasing global emphasis on sustainable development and environmental protection, the role of financial institutions particularly banks in supporting green initiatives has become a topic of significant interest. To achieve the research objectives, a combination of analytical and descriptive methods has been employed. The study is primarily quantitative in nature, with a focus on analyzing the impact of green finance on the investment behavior of banks in clean energy and green startup projects. Initially, the pearson correlation test between the study variables namely, green finance and bank investments was examined to determine the nature and strength of their relationship. Following this, a linear regression model was applied to assess the extent to which green finance influences the level of bank investments in clean energy and green startup projects. This model allows for the estimation of the direction and magnitude of the relationship between the independent and dependent variables, providing a clear insight into the role of green financial instruments in shaping investment decisions. In addition to the quantitative analysis, a descriptive-analytical approach was used to evaluate the experience and practices of social responsibility among both domestic and international banks in the context of green finance and clean energy investments. This part of the study involved a thorough review of the literature, as well as the analysis of bank reports and strategic documents to identify trends, challenges, and best practices in the implementation of green financial policies.The statistical population of this research includes domestic and international banks that are actively involved in the field of investment in clean energy projects and green startups. The sample comprises the National Bank of Iran, selected as a representative of domestic banks, and several international banks that have shown active engagement in green finance and clean energy investments. The research period spans from 2017 to 2024, allowing for an analysis of trends and developments over a seven-year timeframe. Numerical data were collected from library sources, including annual bank reports, reports from international organizations, scientific articles, and reputable information websites. These sources were selected based on their reliability, relevance, and accessibility. Notably, the National Bank of Iran has made significant efforts in recent years to expand its investments in clean energy projects. In its annual reports, the bank has highlighted its collaboration with green startups and its involvement in greenhouse gas reduction projects, demonstrating a growing commitment to environmental sustainability and green finance. These initiatives reflect the bank's alignment with global trends in sustainable development and its recognition of the economic and environmental.

2.1. Research Analysis

First, the trend chart of green financing variables and banks' investments in clean energy projects from the year 2017 to 2023 was drawn. The results showed that banks' green financing in these clean energy projects has followed

an upward trend. This trend indicates that this growth has occurred continuously, but in recent years, this increase has continued at a faster pace. Moreover, it shows a significant rise in banks' interest in investing in sustainable and green projects, which could be due to policy changes, increased public awareness of the environment, and also international pressures on banks to fulfill their social responsibilities (Figure 3, Table 2, 3).

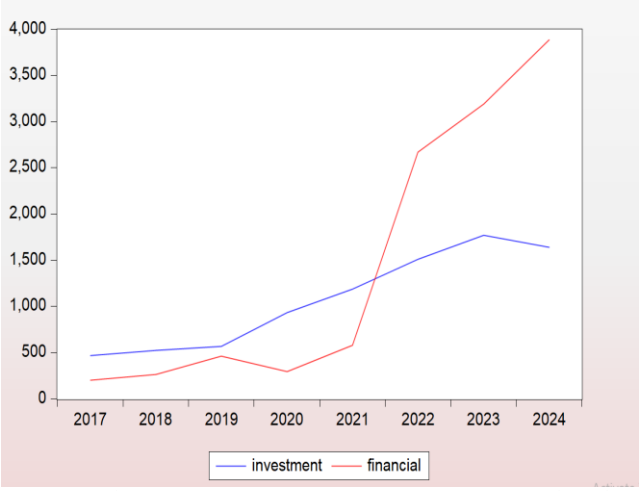


Figure 3. Green finance & bank investments in clean energy projects in the field of green startups (2017–2023).
Source: Researcher results.

Table 2. Correlation test for relationship between variables.

Financial	Investment	Variable
Investment	1.000000	0.897450
Financial	0.897450	1.000000

Source: Researcher results.

The correlation table, using the Pearson method, shows a strong and positive correlation between the variables of green financing and banks' investments in clean energy projects. The correlation value of 0.897450 indicates that an increase in the green financing variable is associated with an increase in the variable of bank investments in clean energy projects. Therefore, these variables can be used for regression modeling.

Table 3. Estimation of the effect of green financing on the level of bank investments in clean energy projects in the field of green startups by regression model (2017-2024).

Prob.	T-statistic	Std.error	Coefficient	Variable
Financial	0.0025	4.983477	0.061996	0.308956
Constant	0.0025	4.983273	126.2494	629.1352

Source: Researcher results.

A linear regression model was then run to examine the effect of green financing on bank investments in clean energy projects within the field of green startups (2017-2024). The results show that a one-unit increase in the green financing variable leads to an increase of 0.308956 units in bank investments in clean energy projects. This value indicates a positive and significant relationship between the two variables, highlighting the importance of green financing in encouraging banks to invest in sustainable and clean energy projects.

2.2. Experience of Domestic and International Countries in the Social Responsibility of Banks in the Field of Green Startups

2.2.1. Experience of Domestic Banks

The social responsibility of domestic banks in the field of startups can contribute to strengthening the national economy and creating new job opportunities. The National Bank of Iran, as one of the largest, most pioneering, and oldest financial institutions in the country, plays an important role in the area of social responsibility and supporting startups. By creating a supportive ecosystem and providing appropriate financial services, this bank can significantly contribute to strengthening startups and the country's economic growth. These actions are not only beneficial for startups, but also for the overall economy of the country. The table below refers to some of the actions and programs of domestic banks (Table 4).

Table 4. Experience of Iranian banks.

Bank	Actions and Programs
Melli Bank	Bank Melli Innovation Center Hosting events Supporting accelerators Providing low-interest loans to startups Creating online platforms to connect investors and startups
Shahr bank	Supporting innovative ideas Organizing events and workshops
Saderat bank	Organizing events and networking with knowledge-based companies Supporting technological startup projects

2.2.2. Experience of Indian Banks

The social responsibility of domestic banks in the field of startups can contribute to strengthening the national economy and creating new job opportunities. The Bank Mellat, as one of the largest, most pioneering, and oldest financial institutions in the country, plays an important role in the area of social responsibility and supporting startups. By creating a supportive ecosystem and providing appropriate financial services, this bank can significantly contribute to strengthening startups and the country's economic growth. These actions are not only beneficial for startups, but also for the overall economy of the country. The following table refers to some of the actions and programs of domestic banks (Table 5).

Table 5. Experience of social responsibility of indian banks in the field of green startups.

Pillars	Bank	Volume of Financing for Social Responsibility Innovations of Startups
✓ Financing green ✓ Green loans ✓ Organizing events	HDFC Bank	945 million rupees
✓ Supporting fintech startups ✓ Supporting social and sustainable projects ✓ Investing in clean technologies	Axis Bank	202 million rupees
✓ Educational programs ✓ Establishing specialized investment funds for startups ✓ Encouraging environmental innovations	ICICI Bank	4630 billion rupees

Sources: Kumar, 2022; www.thehindu.com; indiacsr.in; www.icicibank.com.

Figure (4) shows the experience of banks' social responsibility in the field of green startups, where ICICI Bank leads with 4,630 million dollars, HDFC Bank ranks second with 945 million dollars, and Axis Bank is at the lowest level with 202 million dollars.

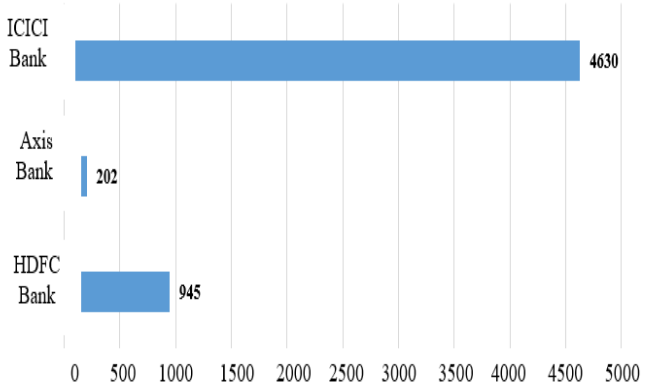


Figure 4. The Experience of Indian banks' social responsibility in the field of green startups.
Source: www.icicibank.com, indiacsr.in, www.thehindu.com.

2.2.3. The Experience of Banks in Bangladesh

The activities of Bangladeshi banks in supporting green startups and promoting social responsibility in the environmental sector are expanding. Given environmental challenges such as pollution and climate change, banks play a key role in strengthening sustainable development. Many banks, by leveraging the government's sustainable development policies and collaborating with international organizations, have provided financing to startups related to green technologies and natural resource management, which contribute to improving the quality of life and protecting natural resources (Table 6).

Table 6. The Experience of social responsibility of banks in bangladesh in the field of green startups.

Pillars	Bank	Volume of Financing for Social Responsibility Innovations of Startups
✓ Financing Green Projects ✓ Prioritizing Loans for Green Startups ✓ Green Banking	Brac bank	122 million Taka
✓ Educational Programs ✓ Supporting Fintech Startups ✓ Issuance of Green Bonds for Green Startups	Stron Bank	280 million Taka
✓ Encouraging Environmental Innovations ✓ Organizing Events ✓ Responsible Investment in Renewable Energy ✓ Encouraging environmental innovations	Dutch-Bangla Bank	940 million Taka

Source: www.bracbank.com, www.ebl.com.bd, thefinancialexpress.com.bd.

Figure (5) shows the experience of banks' social responsibility in the field of startups, where Dutch-Bangla Bank leads with 940million,astrabank follows

in second place with 940million,astrabank follows in second place with 280 million, and Pratik Bank is at the lowest level with $112 million.

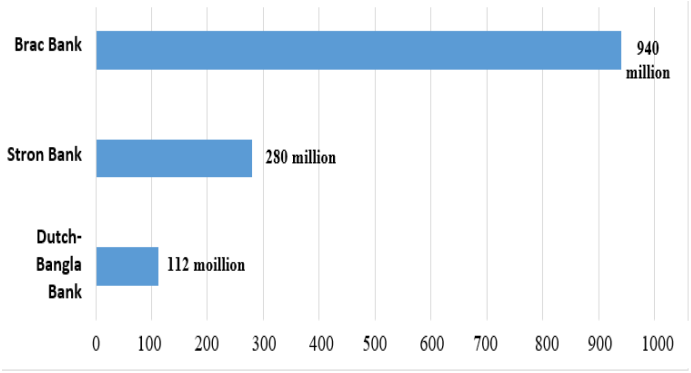


Figure 5. The Experience of social responsibility of banks in Bangladesh in the field of green startups.
Source: www.bracbank.com, www.ebl.com.bd, thefinancialexpress.com.bd.

2.2.4. Experience of Pakistani Banks

In recent years, Pakistani banks have taken significant steps to support green startups and promote their social responsibility in this area, due to increased awareness of environmental issues and international pressure for sustainable development. Given the challenges of climate change, water scarcity, and air pollution in Pakistan, banks are striving to assist green technology startups by providing financial facilities and specialized services. Their activities in this field include financing environmental projects, implementing green banking policies, and investing in renewable energy.

Table 7. The Experience of Pakistani banks in social responsibility in the field of green startups.

Pillars	Bank	Volume of Financing for Social Responsibility Innovations of Startups
✓ Financing Green Startups ✓ Prioritizing Loan Disbursement to Green Startups ✓ Educational Programs ✓ Collaboration with Government and International Organizations to Attract Financial Resources and Facilitate Access to Appropriate Funding ✓ Supporting Social and Sustainable Projects ✓ Issuance of Green Bonds for Green Startups	Al Habib Bank	771 million rupee
✓ Establishing Specialized Investment Funds for Startups ✓ Encouraging Environmental Innovations ✓ Supporting Fintech Startups	National Bank of Pakistan	88 million rupee
✓ Green Startups ✓ Organizing Events ✓ Responsible Investment in Renewable Energy	Faisal Bank	113 million rupee

Source: www.nbp.com.pk, www.faysalbank.com, www.bankalhabib.com.

Figure (6) shows the experience of banks in the field of social responsibility related to startups. Al Habib Bank leads with 771million,followed by Faisal Bank with 771*million, followed by faisalbank with* 88 million in second place, while the National Bank of Pakistan stands at the lowest level with $113 million.

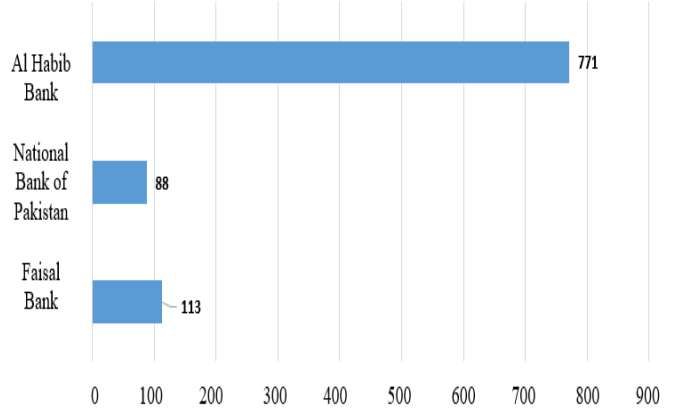


Figure 6. Experience of Pakistani banks in the field of green startups.
Source: www.nbp.com.pk, www.faysalbank.com, www.bankalhabib.com.

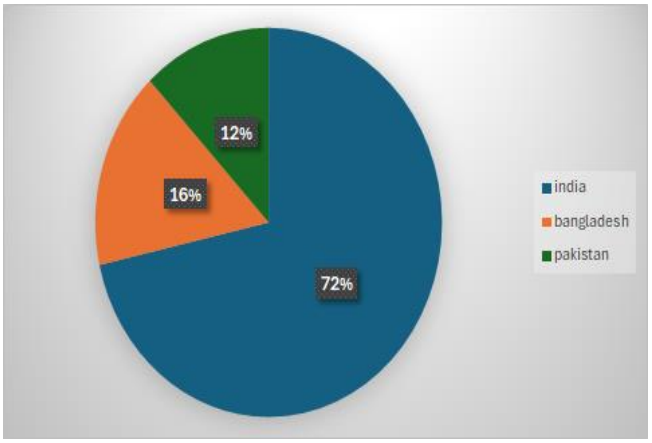


Figure 7. Experience of International banks in the field of green startups.
Source:researcher results.

3. Results and Discussion

As one of the largest state-owned banks in Iran, the National Bank of Iran plays a significant role in the country's economy and therefore bears a special responsibility for economic and social development. The status of the National Bank of Iran in supporting green startups reflects a combination of efforts and challenges. In recent years, the bank has taken steps to strengthen sustainable development and support green startups. However, studies show that the bank is in a similar situation compared to other domestic banks, such as Bank Saderat and Bank Mellat. This means that although the National Bank of Iran has taken some steps toward supporting green startups, there is still room for further expansion and improvement of its initiatives. This situation provides the National Bank with the opportunity to become a model for other banks by investing more in sustainable projects and developing effective strategies. Moreover, the findings indicate that green financing can serve as an effective factor in attracting banking investments in clean energy projects within the green startup sector. Therefore, encouraging and supporting green financing can help strengthen investment in this area. By strengthening collaborations with green startups and increasing awareness of the importance of sustainable development, the National Bank can play a more significant role in environmental protection. For this reason, a comparative analysis was conducted with international banks, including those in India, Bangladesh, and Pakistan. This comparison showed that adopting and implementing social responsibility programs—such as financing green startups, prioritizing loan allocation to these startups, cooperating with governments and international organizations to attract financial resources, and facilitating access to appropriate resources—can help strengthen the National Bank's strategies. Additionally, supporting social and sustainable projects, issuing green bonds, and making responsible investments in renewable energy can not only enhance the bank's level of social responsibility but also increase customer trust and help attract and retain customers. The comparison between the National Bank of Iran and international banks revealed that international banks are more widely active in the field of investing in green projects and regularly report on their social responsibility policies. In this regard, Table 7 presents practical recommendations for improving the National Bank's social responsibility in the area of startups.

To strengthen the role of the National Bank of Iran in supporting green startups and enhancing social responsibility, the following strategic recommendations can be considered:

Table 7. Practical recommendations for enhancing the social responsibility of the national bank in the field of green startups.

Target Status	Current Status
✓ Financing green startups ✓ Prioritizing loan provision to green startups ✓ Supporting fintech startups ✓ Educational programs ✓ Cooperating with the government and international organizations to attract financial resources and facilitate access to appropriate financial resources for these startups ✓ Supporting social and sustainable projects ✓ Establishing specialized investment funds for startups ✓ Issuing green bonds for green startups ✓ Encouraging environmental innovations ✓ Supporting fintech startups ✓ Green startups ✓ Responsible investment in renewable energy	✓ National Bank Innovation Center ✓ Organizing educational events and specialized workshops in the fields of green innovation, resource management, and sustainability to increase awareness and entrepreneurial capabilities ✓ Supporting accelerators

Source: Researcher results.

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