

# An Assessment of Determinants of Green Entrepreneurship Development in Sistan and Baluchestan Province with an Emphasis on Environmental Sustainability

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## ABSTRACT

Green Entrepreneurship is a growing phenomenon that boosts sustainable investment and economic development along with the conservation of the environment and the observance of the standards. The present research used the survey methodology to assess the factors influencing the development of green entrepreneurship with an emphasis on environmental sustainability. Data were collected with a questionnaire from 57 staff of Agriculture Jihad Organization of Sistan and Baluchestan province and the experts of organic products and environment. After a review of the relevant literature, three dimensions were identified – economic, infrastructure, and educational. Data were analyzed in SPSS software package and by structural equations model in SMART PLS. The results of factor analysis revealed that all the identified dimensions had a positive and significant effect on green entrepreneurship and among them, the infrastructure was the most influential dimension on the development of green entrepreneurship. So, it is recommended to consider environmental sustainability from different aspects to accomplish green entrepreneurship development.

## 1. Introduction

Until the 1970s, economic researchers simply believed that entrepreneurs were the ones who took the risk to innovate, thereby replacing new solutions for inefficient, old methods. In this era, the emphasis was merely on the overuse of chemical fertilizers and the excessive application of chemical pesticides to increase profits and production (Mollahosseini, 2011). But, this production approach had had adverse consequences for the agricultural and environmental sectors. So, policymakers and development planners started to argue in the 1970s that that trend of economic growth would ultimately lead to environmental degradation, social inequality, resource depletion, and so on, and the economies would have to incur heavy losses in the long run to fix them (Khalji et al., 2011). In these conditions, planners and developers sought to find ways out of this environmental crisis, one of the most important ones being the use of green entrepreneurship requirements.

Green entrepreneurship is a type of entrepreneurship coupled with innovation that takes advantage of innovation opportunities of economic benefits and equity in society to help to improve the quality of life of communities while taking care of the principles of sustainable development and environmental conservation (Hall et al, 2010). Green

entrepreneurship is one of the plausible ways to manage environmental degradation (Sepahpanah & Movahedi, 2015). Thus, green entrepreneurship has drawn serious attention as a branch of entrepreneurship aimed at producing environmentally friendly products by conservative production processes (Abdollahzadeh & Sharifzadeh, 2015). This type of entrepreneurship has led to the creation of sustainable jobs, or the so-called *green jobs*, and is rapidly empowering the sustainable economic development of societies (Barzgari & Zamani, 2011).

In the last twenty years, rapid population growth and people's rising living standard and purchasing power have been responsible for attempts to increase crop yields by expanded use of agricultural machinery and increased application of chemical fertilizers and pesticides (Mollahosseini, 2011) so that the application of chemicals has increased tenfold, but crop loss by pest damages has doubled in the last 40 years. Along with such crises as the emergence of new pests and diseases, over 600 pest species' becoming resistant to pesticides, severe degradation and chemical erosion of soils, the emergence of skin diseases, cancers, deadly poisonings, and chronic diseases, and the degradation of the environment and natural agroecologies, we are faced with the crisis of production quantity too (Ibrahimi Varkiani & Sharifi Moghaddam, 2011). These observations imply that, in contrast to plans to ensure food production security by introducing materials and technologies into agriculture, adequate food production has been jeopardized by the risks of the overuse of chemicals and this has motivated to attend crop safety and green

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entrepreneurship process as international agreements in recent decades (Mollahosseini, 2011).

The agricultural sector is one of the main sources of employment and income in many countries, especially in developing countries. As such, this sector is responsible for providing food security and safety and environmental protection as a national goal. In recent years, we witnessed a sharp increase in demand for food due to the rising incomes and the increasing world population. To meet this demand, the agricultural sector had to enhance its productivity (Dobermann & Nelson, 2013) by extensive use of off-farm inputs and less attention to resource depletion, crop quality, and sustainable agriculture (Foresi et al, 2016). Various in vitro and epidemiological studies over several decades have unmasked the relationship between pesticide use and the incidence of diseases such as allergies and various cancers (Hayati et al., 2012) in humans. On this basis, it is imperative to adopt a dynamic and sustainable movement towards using the existing resources optimally and enhancing crop quality and quantity with an emphasis on the conservation and restoration of the environment (Hadizadeh Bazaz et al, 2015). Accordingly, green entrepreneurship can be the best option to settle environmental crises.

Generally, green entrepreneurship can be divided into two main categories based on their approaches: (i) existing businesses that accept environmental management operations or clean production processes; and (ii) new businesses created based on the conservation of natural and ecological resources (such as solar energy and ecotourism companies). The first group can be explained by product separation theories. According to these theories, companies choose environmental management operations for the purpose of innovation and competitive advantage (Nill and Kemp, 2009).

The second group includes organizations and businesses involved in pollution prevention (e.g. air and water pollution control sites, wastewater treatment plants, and mine rehabilitation sites) and those involved in the use of natural resources to develop new products (soil, mountains, lakes, forests, and rangelands) (Dean and McMullen, 2007). In addition, some regional and international institutions, such as Entrepreneur Support for Sustainable Development and the International Institution for Sustainable Development, have also been established to inform entrepreneurs on green entrepreneurship issues. Green entrepreneurship can be defined as an effort to create a new product, service or organization to protect the environment in order to take advantage of market opportunities (Lober, 1998). So any industry, service, or commodity that has added value and is along the protection of the environment can be defined as a green entrepreneurial activity.

**1.1. Research objectives**

- Investigating and analyzing the role of the economic dimension in green entrepreneurship development in Sistan and Baluchestan province with an emphasis on environmental sustainability

- Investigating and analyzing the role of the infrastructure dimension in green entrepreneurship development in Sistan and Baluchestan province with an emphasis on environmental sustainability
- Investigating and analyzing the role of the educational dimension in green entrepreneurship development in Sistan and Baluchestan province with an emphasis on environmental sustainability

**1.2. Review of literature**

D’Souza et al. (2006) enumerates factors including positive corporate perception, organizational success, environmental responsibility, remaining competitive, increased market share, increased consumer loyalty, environmental protection as a management task, and the willingness of environmentally conscious consumers for the development of green entrepreneurship.

In an attempt to reassess green marketing, Polonsky (2011) lists the factors underpinning green business development to include, but not limited to, environmental protection, greater resource efficiency, financial savings, waste and pollution reduction, internal and external pressures, cost management, competitive advantage, and positive corporate perception.

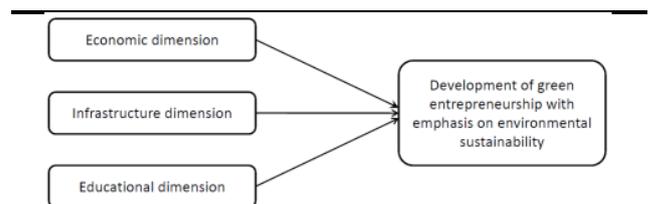
It is reported in a study that the three factors of structural transformations, the institutionalization of green entrepreneurship, and the government’s support services have a positive and significant impact on reducing the barriers to green entrepreneurship development. The study shows that according to the participants, the institutionalization of green entrepreneurship has the most positive effect on enhancing green entrepreneurship development. Therefore, the manipulation of the culture to change purchase and consumption behaviors and the promotion of the production and consumption of green products can lay the ground for displaying entrepreneurial behaviors by farmers (Najafpour, 2016).

Yi (2014) reports that the growth and survival of green businesses in the US are dictated by the adoption of renewable energy policies, the permission to use renewable energies, import credits, and the presence of green energy businesses.

According to Uslu et al. (2015), tax exemptions for green businesses is an effective driver of the development of such businesses.

The results of the literature review are summarized in Table 1.

**1.3. Theoretical framework**



**Fig. 1.** The theoretical framework of the research derived from the literature review

**Table 1.** A summary of the review of the relevant literature

Reference	Identified codes
Kubota (2014)	Cooperation of ministries, formulation of operational plans, allocation of appropriate funds to green businesses, educational planning, establishment of cooperatives and public-based support funds.
Mehdipour (2015)	Government investments, facilitating infrastructure development for the development of the green economy, focusing on the accumulated knowledge and skills needed to develop green businesses, using social potential, lowering tariffs on green products, adopting a coherent strategy as to green development, focusing on the market to control demand in lieu of supply, categorizing green activities, giving identity to green job employers
Raymond et al. (2013)	Inability of the business environment to develop entrepreneurship, the lack of awareness programs, the lack of policies and regulations to meet the goals of the plan and the increase in the administrative bureaucracy
Goharshahi (2015)	Carbon sequestration project, organic agriculture
Hosseinzadeh et al (2015)	Skill and entrepreneurship training consistent with green businesses, green economy culture
Navidinia and Khoshhal (2015)	Laying the ground and establishing green jobs, financial and regulatory instruments, technology development, awareness enhancement, training
Rezaei et al. (2017)	Economic, infrastructural, promotion-educational, technical, managerial, and support factors
Navidinia and Khoshhal (2015)	Promoting organic and healthy products through purposeful mass media and training at all levels, forming an organization to certify organic and healthy products with the power to enforce their approvals, educating farmers on green entrepreneurship
Khosravi et al. (2017)	Infrastructures to establish green entrepreneurship, the culture of green entrepreneurship, supportive frameworks for green entrepreneurship, the culture of green production

Based on the literature review and the opinions of the experts, 24 indices were identified to influence the development of green entrepreneurship with an emphasis on environmental sustainability. These indices were then classified into economic, infrastructure and educational dimensions. The indices of the economic dimension include ‘allocating an appropriate budget to green businesses’, ‘establishing cooperatives and non-governmental support funds’, ‘government investments’, ‘access to bank credits for green entrepreneurship’, and ‘green product purchase by people’.

The indices of the infrastructure dimension include ‘facilitating infrastructure development for green economy development’, ‘guaranteed purchase of products by the government at the provincial level’, ‘establishing organizations to monitor and certify green products’, ‘focusing on the carbon sequestration project’, ‘tax exemption for green businesses’, ‘existing export areas for green products’, ‘creating green jobs’, ‘fostering an identity for green workers’, ‘effective advertisement of green production and consumption’, ‘the culture of green product consumption’, ‘appropriate packaging of green products’, ‘presenting green entrepreneurship and its advantages in media and journals’, ‘adopting technologies compatible with the production of environmentally-friendly commodities and services’, ‘asking for lower tariffs for green products’, ‘promoting organic farming’, and ‘permission to use renewable energies’. Finally, the educational dimension was composed of the indices of ‘focus on accumulated knowledge and skills required for the development of green jobs’, ‘consciousness of people and

consumers of green products’, and ‘the training of farmers and agriculture students about green entrepreneurship’.

## 2. Methodology

The research is an applied study in terms of type and a survey in terms of data collection and analysis. A questionnaire was distributed among 57 agricultural Jihad staff and organic products specialists in Sistan and Baluchestan province. The items of the questionnaire were extracted in three sections from the review of the literature. After confirming the content validity by a panel of entrepreneurship professors, 25 staff of Agricultural Jihad Organization of Sistan and Baluchestan Province completed the questionnaire to assess its reliability. Cronbach's alpha was calculated to be 0.832. After the questionnaires were collected, the data were analyzed using the SPSS 20 and SMART PLS Ver. 2 software packages.

## 3.Result and Discussion

Confirmatory factor analysis was used to examine the relationship between observed variables (indices or questionnaire items) with the latent variable (independent and dependent variables). The results for the reliability of the study show that the observed factor load had a value greater than 0.4 in all cases, indicating a good correlation between the observed variables and the related latent variables. Also, confirmatory factor analysis was used to confirm the construct validity and Cronbach's alpha method

was used to assess the reliability of the questionnaire. Cronbach's alpha was found to be 0.834 for the economic dimension, 0.971 for the infrastructure dimension, and 0.807 for the educational dimension. The composite reliability of all variables was above 0.7 and the average variance extracted (AVE) was greater than 0.5 in all cases, confirming the convergent validity. The root of AVE of all variables was greater than the correlation value between them, implying a good divergent validity and good fit of the measurement models. Given the research type, the

structural equations method (SEM) was applied in the SMART PLS software package to determine the concurrent effect of the independent variables on the dependent variable, to analyze the data, and to test the hypotheses.

The fit of the research structural model was checked by several criteria. The most essential criterion was the significance coefficient of Z, or the so-called t-values. The values of higher than 1.96 are required to confirm their significance at the 0.95 confidence level.

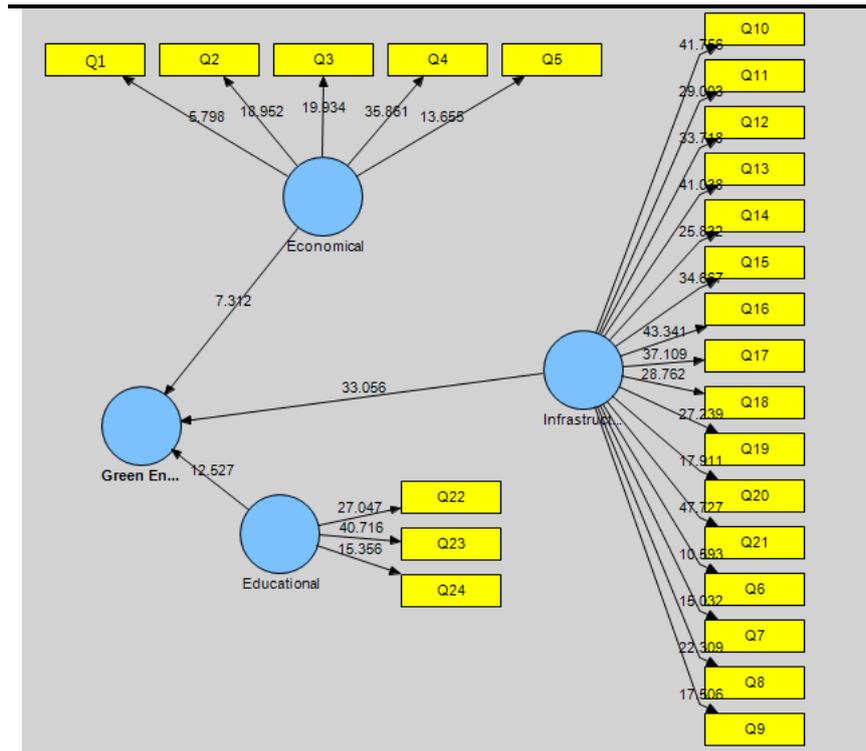


Fig. 2. The fit of the structural model

According to the results of the measurement model, the Bootstrapping value (t-statistic) was greater than the critical value of 1.96 for all cases, indicating a significant correlation between the observed variables and the related latent variables. According to Figure 2, all z-significance coefficients were greater than 2.56. This reflects the significance of all items and the relationships of the variables at the 0.99 confidence level. Therefore, it can be concluded that all primary variables were measured correctly, so the research hypotheses can be tested.

**Hypothesis 1:** The economic dimension has an impact on the development of green entrepreneurship in Sistan and Baluchestan province with an emphasis on environmental sustainability.

All factor loadings of the questions were above 0.4, so none of them was required to be excluded and this indicates the appropriacy of the criterion. Since the utility of the indices was performed at the 0.99 confidence level, values that were not in the range of 2.56 and -2.56 would be significant. As shown in Diagram 1, the indices considered

for the economic dimension of the green entrepreneurship development model could significantly account for the significance since the significant value derived from them was outside the absolute range of 2.56. So, it can be said that the economic dimension has an impact on the development of green entrepreneurship. Its impact factor was estimated at 0.135, meaning that it accounts for 0.13 of the variance in the development of green entrepreneurship in Sistan and Baluchestan province.

**Hypothesis 2.** The infrastructure dimension has an impact on the development of green entrepreneurship in Sistan and Baluchestan province with an emphasis on environmental sustainability

All items had a factor load of >0.4, so they should be excluded and the criterion was appropriate (Diagram 2). Since the utility of the indices was performed at the 0.99 confidence level, the figures would be significant if they were not in the range of 2.56 and -2.56. It is evident in Diagram 3 that the indices considered for the infrastructure dimension of the green entrepreneurship development

model could significantly account for the model since the significant values obtained for them were outside the absolute range of 2.56. Thus, we can infer that the infrastructure dimension was significantly influential on the development of green entrepreneurship. Its impact factors

was found to be 0.843 meaning that it could capture 0.84 of the variance in the development of green entrepreneurship in Sistan and Baluchestan province.

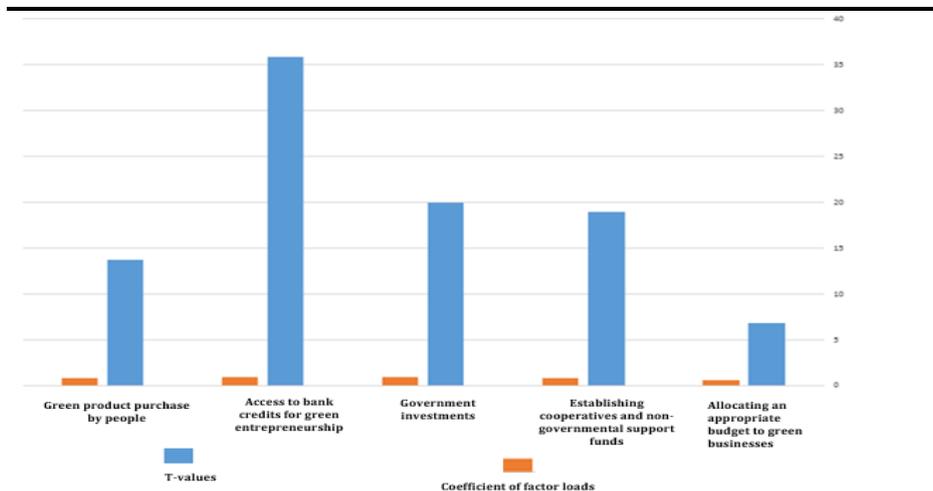
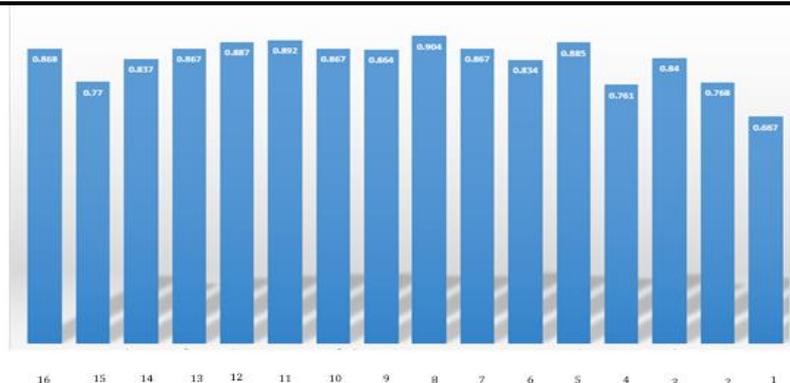
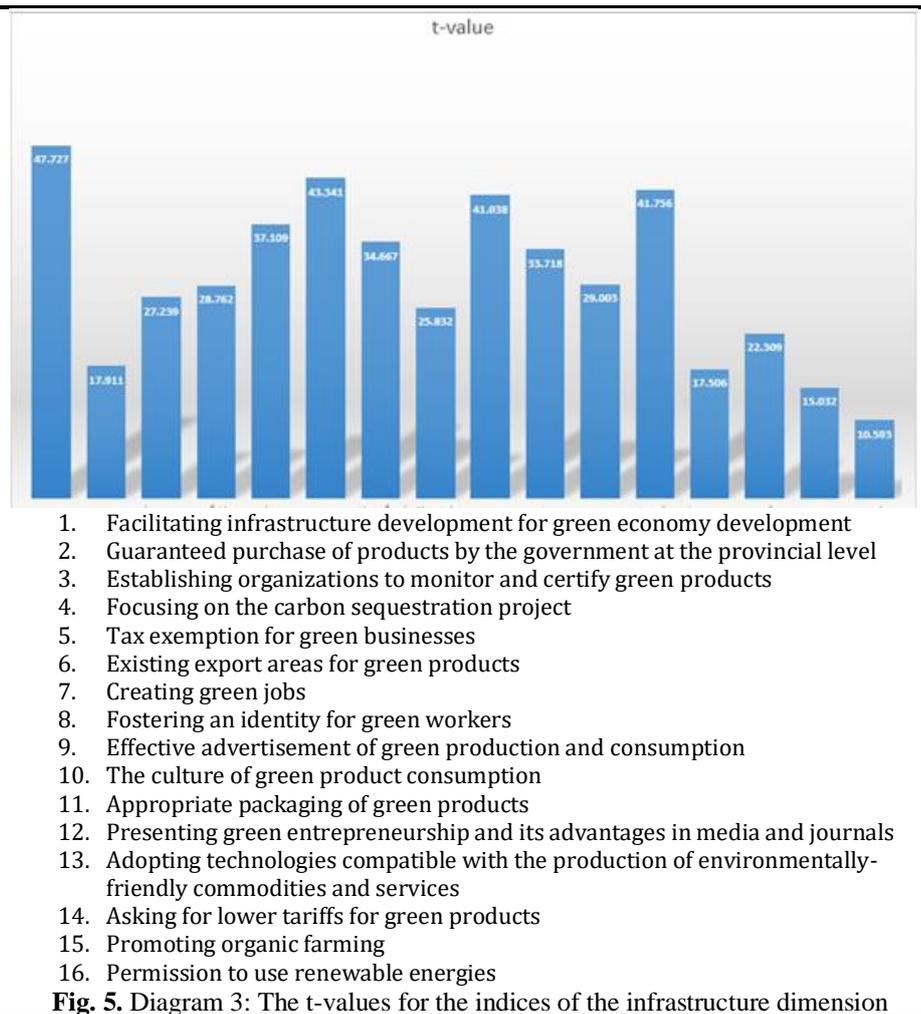


Fig. 3. Diagram 1: The t-values and coefficient of factor loads for the indices of the economic dimension



1. Facilitating infrastructure development for green economy development
2. Guaranteed purchase of products by the government at the provincial level
3. Establishing organizations to monitor and certify green products
4. Focusing on the carbon sequestration project
5. Tax exemption for green businesses
6. Existing export areas for green products
7. Creating green jobs
8. Fostering an identity for green workers
9. Effective advertisement of green production and consumption
10. The culture of green product consumption
11. Appropriate packaging of green products
12. Presenting green entrepreneurship and its advantages in media and journals
13. Adopting technologies compatible with the production of environmentally-friendly commodities and services
14. Asking for lower tariffs for green products
15. Promoting organic farming
16. Permission to use renewable energies

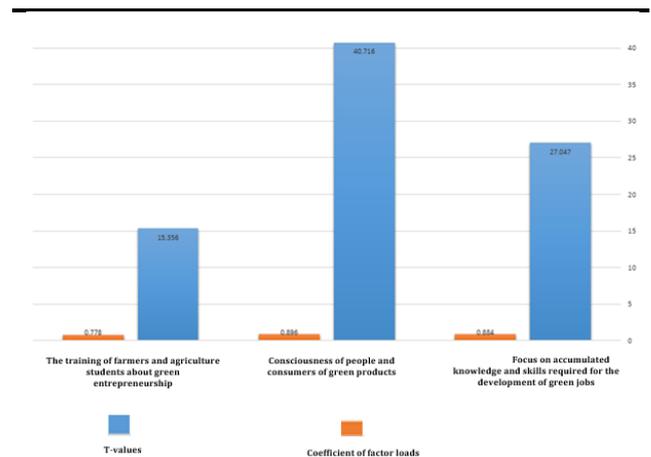
Fig. 4. Diagram 2: The coefficient of factor loads for the indices of the infrastructure dimension



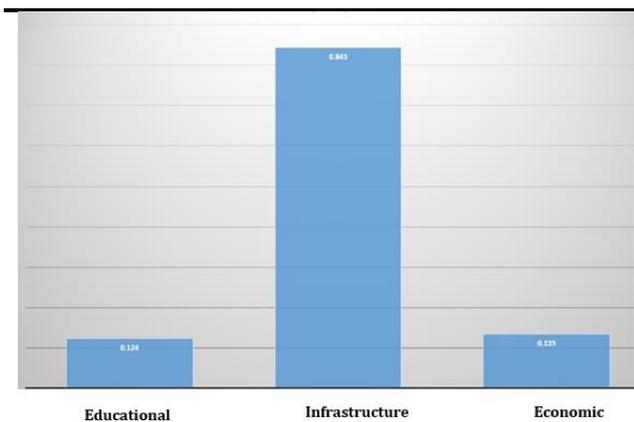
**Hypothesis 3.** The educational dimension has an impact on the development of green entrepreneurship in Sistan and Baluchestan province with an emphasis on environmental sustainability

The factor loads were greater than 0.4 for all items, showing no need for their exclusion. Thus, the criterion was appropriate. The utility of the indices was performed at the 99% confidence level, so the values outside the range of 2.56 and -2.56 would be significant. As is evident in Diagram 4, the indices considered for the components of the educational dimension had a significant explanatory impact because the significant values derived for them were outside the absolute range of 2.56. Thus, we can say that the development of green entrepreneurship is influenced by the educational dimension. Its impact factor was 0.124, meaning that it could account for 0.12 of the variance in green entrepreneurship development in Sistan and Baluchestan province.

Diagram 5 shows that the three dimensions can be arranged in the order of impact on the development of green entrepreneurship in the studied province from the most effective to the least effective as the infrastructure dimension (with an impact factor of 0.843), the economic dimension (with an impact factor of 0.135) and the educational dimension (with an impact factor of 0.124).



**Fig. 6.** Diagram 4: The t-values and coefficient of factor loads for the indices of the educational dimension



**Fig. 7.** Diagram 5: Impact factors of the dimensions of green entrepreneurship development with emphasis on environmental sustainability

#### 4. Conclusion

The southern part of Sistan and Baluchestan Province has a hot and humid climate, so it is apt for growing tropical fruits whose production is impossible in other parts of Iran. A plant that can be produced in this province is gladiolus, but no investment has yet been made on the production of its cut flowers. Other crops and fruits that can be produced in this province include papaya, pistachio that is grown in the plain of Gohar in Khash County and is different from the pistachio produced in other parts of Iran, date, and mango. In addition to these tropical fruits, citrus including bergamot oranges, sweet oranges, grapefruits and tangerines, pomegranates, and summer plants are other products of this province that taste different from those grown elsewhere in Iran. So, the production of these crops in green and organic manner can contribute to implementing the standards of green entrepreneurship. Green and organic crop production helps environmental conservation, the protection of public health, and the creation of green jobs, which will contribute to the creation of green entrepreneurship. Given the potential of the province in producing diverse green crops, it is imperative to identify the factors underpinning the development of green entrepreneurship in this province. Therefore, the literature was reviewed and 24 relevant indices were derived in three dimensions: economic, infrastructure, and educational. Then, the SMART PLS software package was used to assess the effect of these dimensions on the development of green entrepreneurship in Sistan and Baluchestan province. The results revealed that all three dimensions had an impact on the development of green entrepreneurship. However, the infrastructural dimension was identified to be the most effective dimension for the development of green entrepreneurship in Sistan and Baluchestan province. Therefore, to develop green entrepreneurship in the province, it is recommended to provide the necessary infrastructure in the first place, including:

- Effective advertisement for the production and consumption of green crops

- Developing the culture of green crop consumption
- Presentation of green entrepreneurship and its benefits in media and magazines

Guaranteed purchase of green crops by the government at the provincial level.

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