*International Journal of Trade and Commerce-IIARTC*
*January-June 2024, Volume 13, No. 1, pp. 35-68*
*ISSN-2277-5811 (Print), 2278-9065 (Online)*

***COSMOS (Germany) JIF: 5.135; ISRA JIF: 7.249; ISI JIF: 3.721***

# Present Status of the Blue, Green and Digital Economy of Bangladesh: Challenges & Prospects

**Samira- Binte- Saif**
*Islami Bank Bangladesh Limited*
*E-mail: samiraoct1984@yahoo.com*

## Abstract
*This research paper based on present status of blue, green and digital economy of Bangladesh and then engage with their (Blue, Green and Digital Economy) empirical implementation, defiance and expectation of Bangladesh. Today green economy, blue economy and digital economy is the relevant questions of Bangladesh. To generate consciousness, remove challenges, discuss prospect/success and provide correct and appropriate information about green economics, blue economy and digital economy of Bangladesh are the main theme of this research paper. Now Bangladesh is one of the most successful least developed countries in the world. Its blue, green and digital economy plays an important role to achieve this success. This research paper has been based on the author's practical knowledge gather from blue, green and digital economy sector of Bangladesh.*

***Key Words:*** *Blue Economy, Green Economy, Digital Economy, Regression Analysis, Trend Analysis, Chi-Square Test, Hypothesis Testing.*

**PAPER/ARTICLE INFO**
**RECEIVED ON: 17/04/2024**
**ACCEPTED ON: 23/05/2024**

**Reference to this paper should be made as follows:**

**Saif, Samira-Binte (2024)**, "Present Status of the Blue, Green and Digital Economy of Bangladesh: Challenges & Prospects", *Int. J. of Trade and Commerce-IIARTC*, Vol. 13, No. 1, pp: 35-68.

**Corresponding Author*
***DOI: 10.46333/ijtc/13/1/3***

## 1. INTRODUCTION

Blue, Green and Digital Economy are the crucial part of an Economy. The 'Blue Economy' is a materializing concept which uplift better management of ocean or 'blue' resources of a country. Similar to the 'Green Economy', the blue economy model holy grails for boost of human welfare and social egalitarianism of any country, while noticeably diminishing environmental threats and ecological scantiness of a nation. The green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities all over the world. Green economy is an economy or economic development model based on livable expansion and philosophy of bionics of a country. (Deloitte2018) Digital manifesto have become an exemplary of the modern economy of any developing countries of the world. Green Economy of a country has revolutionized many sectors such as housing, retail and transportation. Now in Bangladesh new types of services including ride-sharing and home-sharing, home delivery service, mobile banking, Internet banking in addition to new modes of working such as freelancing, free agent, Income Tax Law have become possible due to advanced digital technology and very common to all class of people of Bangladesh. They have metamorphosed many sectors, together with housing, retail, education, recreation, transaction and transit/ conveyance in Bangladesh.

## 2. LITERATURE REVIEW

The concept of Blue Economy was first established by the Belgian economist Professor Gunter Pauli in 1994.According to the World Bank, the blue economy is the "sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem." European Commission defines Blue Economy as "All economic activities related to oceans, seas and coasts."

World Bank clearly announced that the blue economy consists of inaugurate ocean megacorp such as falconry, traversing and ocean in conveyance in addition to latest and emanate movement namely offshore renewable energy, aquaculture, seabed extractive activities and marine biotechnology and bio prospecting. Enlarging a viable blue economy needed a scheme to create jobs/occupation in coastal communities while securing our oceans endure blooming. Today we depend on the ocean for meals, for jobs, for movement/ vehicle, and for amusement. Everyone just requires upholding by the ocean to perceive its enormousness, its cogency and it's latent.

All through history, the sea has always been attending in the economic ventures of all heritages as a food resource, employment source, a means of conveyance and commercial exchange of any country. Now the phrase Blue Economy (BE) has become an approach rigorously connected to maritime assets and expands economies in the oceans and seas. The advance amplify of blue economy and the nascent demands of a circular economy (CE) forerunner challenges in both latest and settled regimen and substance of Bangladesh .

The prime objects of blue economy to boost economic expansion, upgrade life and community-based incorporation without conciliate the oceans' environmental sustainability; study and application of blue economy may reduce the human actions which are harmful of the sea's resources.

In the previous space and currently ocean resources bring about copious advantages to the world economy and provide crucial advantages for conveyance, food production, employment , energy, mineral extraction, biotechnology, human settlement in coastal areas, tourism and recreation, and scientific research .

According to Phelan et al.: "It has become synonymous with generating wealth from activities related to the oceans while protecting and supporting marine ecosystems."

According to Schutter and Hicks: "It seeks to curb biodiversity loss while stimulating economic development, thereby integrating environmental and economic interests."

There is a broad solidarity that Blue Economy/Blue Growth can satisfy the fundamental necessity of a country for such as way. Economic sectors of a country using oceans and inland waters comprise fisheries, aquaculture, tourism, shipping, biotechnologies, maritime security, mining, oil and gas, renewable energy.

The blue economy is not just about market fortuity; it also dispense for the defense and expansion of more impalpable 'blue' resources including customary methods of life, carbon sequestration, and coastal resilience to assist vulnerable states alleviate the often devastating outcome of climate change of the world. Marine-based renewable energy such as wind, wave and tidal range and currents offers a significant potential to contribute to low-carbon energy supplies for regions with appropriate coastal features. Off-shore wind covers all activities related to the development and construction of wind parks in marine waters, and the exploitation of wind energy by generating electricity offshore. However, most suitable onshore locations for wind turbines need to be identified and the best (windiest) offshore sites have to be connected to the main transmission grid. A wind generator with a capacity of 2 MW has already been installed in the coastal area of Kutubdia, Bangladesh, but remains inactive.

### 2.1 Challenges of Blue Economy

There are some challenges to the potential of Blue Economy in Bangladesh like frequent floods, marine pollution including Ocean acidification and blue carbon, lack of trained personnel, harmful human action, harmonizing sectorial strategies, plans and laws, poor ocean governance and lack of political support and rules and regulation in the blue economy sector.

### 2.2 Prospect of Blue Economy

The idea of Blue Economy has come into reality when the countries focus on their marine resources. It has opened a latest opportunity for economic celebration of the coastal areas of Bangladesh through supreme utilizing sea and marine resources at national and international levels.

### 2.3 Green Economy

Similar to the 'Blue Economy', the green economy model aims for improvement of human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities all over the world.

A green economy is defined as low carbon, resource efficient and socially inclusive. UN Environment encourage a elaboration trail that recognize natural capital as a censorious economic capital and a source of public benefits, especially for poor people whose livelihoods relate to on natural resources. (Dutta Satrajit 2016).

Green Economy focus on economic sectors including forestry, farming, mining or fishing among others; concentrate on environmental components such as protecting water sources and biodiversity, or reducing greenhouse gas emissions; support social protections and workers' rights; and home in on specific parts of production processes of a country.
The 'Green Development' topic has recognized six strategic pillars: climate change, resource saving and management, circular economy, environmental protection, ecosystem protection and recovery, water conservation and natural disaster prevention.
The green economy is suited to assist feasible consumption and production. Anall-embracing green economy is low-carbon, resource-conserving, diverse and circular. It squeeze latest replica of economic evolution that address the challenge of creating affluence within planetary boundaries. A Green Economy is a clean, environmentally friendly economy that boosts health, wealth, and well-being. A Green Economy is based on viable evolution – which means expanding our economies in ways that benefit, not sacrifice, social justice and equity in addition the environment. (Dutta Satrajit 2016).
A passage to a green economy requires amplifying green production and markets; diminishing diminution of natural resources and declination of ecosystems caused by economic activity; and amplifying credence, on low-carbon energy supply to alleviate climate change all over the world.
While numerous commune dynamics are at work, three are specially paramount to building wholesome and thriving communities over the long term such as, economy, ecology, and equity—the three E's. Economy is the management and use of resources to meet household and community needs of a country. According to Karl Burkart, "The green economy is based on six sectors: Renewable Energy, Green Buildings, Sustainable Transport, Water Management and Waste Management.

### 2.4 Eco-Friendly Aspects of Green Industries

***Optimum Energy Consumption:*** The present energy consumption scenario of RMG industry in Bangladesh is dominated by the use of three major energy sources: grid power, diesel power and natural gas. Factories are mostly running 24 hours and like to rely on smooth energy supply. Natural gas is the leading source among energy resources. Factories are basically dependent on captive power for continuous power supply. In the green projects, the exhaust gas of generator is further used to run other machines such as exhaust gas boilers and absorption chillers. It saves a huge amount of energy every year. (Dutta, Satrajit 2016).

***Green Garments of BD:*** Of the 200 factories, 73 are platinum-rated, 113 are gold-rated, 10 are silver-rated, and four are certified factories. Bangladesh is home to some of the best factories in the world: 13 out of 15 top LEED green factories are located in the country. In 2022, 30 garment factories received LEED certification.

**Table 01: LEED Green Garment Factories of BD**

| Type | Number |
|---|---|
| Platinum | 58 |
| Gold | 108 |
| Silver | 10 |

| | |
|---|---|
| Certified | 4 |
| Total | 180 |

Table 01 show that number of LEED green factories is very negligible in BD. The first LEED-certified green factory of 2023 which has received a gold rating is Amanat Shah Fabrics Limited. Bangladesh is the global leader having the highest number of green garment buildings, where 60 are platinum rated, 110 gold rated, 10 silver, and four have no rating.

***Green Banking of BD:*** So far, 55 banks out of 56 and 27 financial institutions (NBFIs) out of 30 have undertaken green banking programs by establishing green banking unit. Green banking activities include financing green projects, using climate fund, turning bank branches online, enhancing CSR activities, promoting mobile banking etc.
212 branches of 26 banks are now powered by solar energy. To mention a few, 32 branches of Al Arafah Islami Bank, 22 branches of Islami Bank Bangladesh and 15 branches of Sonali Bank are powered by solar energy. 150 SME/ATM units of 9 banks are powered by solar energy.

**2.5 Characteristics of Green Economy**

[i] Green economy expedite viable expansion of a country.
[ii] Green Economy is asset and energy-efficient.
[iii] This economy generate ample work and green jobs of a society.
[iv] It acclaim planetary boundaries or ecological barriers or paucity all over the world.
[v] Green Economy presume integrated decision making of a country.

The Green Economy plays a censorious part in constructing community wealth/ampleness for several key reasons: As a growing sector of our economy, the green economy contributes additional market space for ingenious ownership formation that build community-based wealth and boost meaningful employee involvement to take hold of Bangladesh..

**2.6 Challenges of Green Economy**

Even when there is a powerful economic, environmental and social case for contributing in greening trade of a country, a number of chief barriers remain. These associate adverbs mainly to limitations in financial and human resources, weak regulatory frameworks, lack of enforcement mechanisms, and poor economic infrastructure of the society.
These categories consist of air quality, sanitation and drinking water, heavy metals, waste management, biodiversity and habitat, ecosystem services, fisheries, climate change, pollution emissions, water resources, and agriculture. Climate change is at the core of these environmental challenges faced by Bangladesh.

**2.7 Prospect of Green Economy**

The likelihood and inherent of green jobs in Bangladesh are enormous. The Green Economy administers a macro-economic approach to sustainable economic growth with a central focus on investments, employment and skills in a country. Multi-stakeholder partnerships for the promotion of a Green Economy are assisting to facilitate and consolidate sustainable changes in both consumption and production patterns in Bangladesh.

### 2.8 Digital Economy

Digital economy attribute to an economy that is establish on digital computing technologies, but is often apprehend as conducting business through markets based on the internet and the World Wide Web in all business and economic sector.

The best example of this is the rise of digital platforms such as Amazon, Uber and Airbnb.

A digital economy facilitate, the firms to cut out an aspect of the retail chain and send personalized goods direct from factory or warehouse to people's goods, rather than through shops. This permit lower costs and lower prices. The digital economy incorporate of numerous components, key among which include government; policy and regulation; internet, the world wide web (WWW) and electricity infrastructure; telecommunication industry; digital service providers; e-business and e-commerce industry; information and knowledge management systems. (BoostDot. (2020). Current trends of digital marketing in Bangladesh)

To fortuitously adapt, one must first be conscious of the five prime attributes of the digital economy**:**

[i] It is Digitized and Hunted. In a digital economy, analog gadget produce digital signals that can be dignified, tracked and analyzed for superior decision making.
[ii] It is tied up.
[iii] Digital Economy is shared.
[iv] It is personalized.
[v] It is direct.

The digital economy assign to a extensive span of economic movement that manipulate digitized information and knowledge as key components of production. The digitization of the economy generates benefits and efficiencies as digital technologies drive contrivance and fuel job opportunities and economic expansion.

### 2.9 Challenges for the Global Digital Economy of Bangladesh

- Lack of new technologies.
- Lack of new competitors.
- Lack of new regulations.
- Lack of sufficient new customers.
- Lack of new business models.
- Lack of new global threats.

### 2.10 Prospect of Digital Economy in Bangladesh

The digital economy has the capability to magnify ingenuity, income and social well-being. It is generating job opportunities in new markets and boosting employment in some existing occupations.

## 3. OBJECTIVE OF THE RESEARCH

This paper tried to establish a relationship among blue, green and digital economy of BD.

[i] This paper tries to found that blue, green and digital economies are three concepts that have the unique objectives to make the world more earth friendly.

[ii] This paper try to establish that, blue, green and digital economy are three pillars of Bangladesh economy which are work together to ensure an affluent, sustainable and equal environment for all the people of Bangladesh.

[iii] This research show that how effective human action and activities preserve the digital, blue and green economics resource and used them in a proper way.

## 4. THE PROBLEM STATEMENT OF THE PROGRESS OF BLUE, GREEN AND DIGITAL ECONOMY OF BANGLADESH

[i] Geo- Politics of the present world is hindering the progress the Blue, Green and Digital Economy of Bangladesh.

[ii] Bureaucratic Problem of Bangladesh is also a major issue that lessens the growth of Blue, Green and Digital Economy in this country.

[iii] Corruption spread out in all sectors of Bangladesh, it also hinders the growth of Blue, Green and Digital economy of our country.

[iv] Political instability is a crucial issue of the inauguration of Blue, Green and Digital economy of Bangladesh.

[v] Natural calamities are one of the major factors of the expansion of Blue and Green economy of our country.

[vi] Population and Inequality are another factor that inhibits the progress of Blue, Green and Digital economy of Bangladesh.

## 5. LIMITATIONS OF THE RESEARCH

[i] Limited data.

[ii] Not possible to analysis all sectors of the research.

[iii] The sample is selected randomly for the research.

[iv] The entire population of the research is too large so it was very much time consuming to analysis the whole of them in a short time.

[v] Latest data are not found in the reliable source.

## 6. RESEARCH METHODOLOGY

Methodology means that deals with the manner in which data is collected, analyzed and interpreted for a specific research purposes.

In this research the author used secondary sources of data. Here the author uses both quantitative and qualitative data because it is an empirical study.

The author collected data from year 2010, 2011, 2012, 2013, 2014 & 2015 for blue economy purposes. For Green Economy purpose the author collect data from year 2012-2022. For Digital Economy data analysis purpose the author collect data from year 2016, 2017, 2018, 2019, 2020 respectively.

The author used regression analysis, trend analysis, F –statistic, Correlation test, Chi-Square Test, CAGR, Pearson R test for data analysis purposes. These methods helped in explain the status of blue, green and digital economy of BD.

Here the author collected data from two organizations; one is Bangladesh Bureau of Statistics and another is Bangladesh Bank.

**6.1 Bangladesh Bureau of Statistics:** The Bangladesh Bureau of Statistics (BBS) is the centralized official bureau in Bangladesh for collecting statistics on demographics, the economy, and other facts about the country and disseminating the information.

Although independent statistical programs had existed in the country before, they were often incomplete or produced inaccurate results, which led the Government of Bangladesh to establishing an official bureau in August 1974, by merging four of the previous larger statistical agencies, the Bureau of Statistics, the Bureau of Agriculture Statistics, the Agriculture Census Commission and the Population Census Commission.

The Bangladesh Bureau of Statistics is headquartered in Dhaka. As of 2019, it has 8 Divisional statistical offices, 64 District statistical offices and 489 Upazila/Thana offices.

**6.2 Bangladesh Bank:** Bangladesh Bank is the central bank of Bangladesh and is a member of the Asian Clearing Union. It is fully owned by the Government of Bangladesh. The bank is active in developing green banking and financial inclusion policy and is an important member of the Alliance for Financial Inclusion.

The Bangladesh Bank compiles and publishes a range of Economic data in monetary and financial sector. These include Major economic indicators [monthly], selected indicators [weekly], Economic position of the country [Monthly], Export, Import and Bangladesh balance of payments.

## 7. Data Analysis

### 7.1 Blue Economy Data Analysis of Bangladesh

**Table 02: Financial Evaluation of Major Blue Economics Sectors in Bangladesh from 2010 to 2015 (Million US$)**:

| Economic Sector | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Marine Fisheries | 843.75 | 949.48 | 1107.42 | 1231.06 | 1384.77 | 1475.66 |
| Oil | 21.90 | 23.84 | 26.82 | 28.77 | 29.35 | 34.05 |
| Gas | 948.35 | 956.30 | 1041.35 | 1127.73 | 1158.13 | 1305.42 |
| Sea Salt | 119.25 | 123.48 | 160.90 | 206.00 | 212.35 | 214.84 |
| Sand, Minerals & Coals | 735.18 | 944.39 | 1183.79 | 1452.46 | 1644.08 | 1893.14 |
| Water Transport | 1215.14 | 1330.36 | 1450.21 | 1606.10 | 1682.31 | 1816.67 |
| Trade & Shipping | 31390.15 | 36178.04 | 41728.94 | 47156.44 | 52078.80 | 58466.90 |

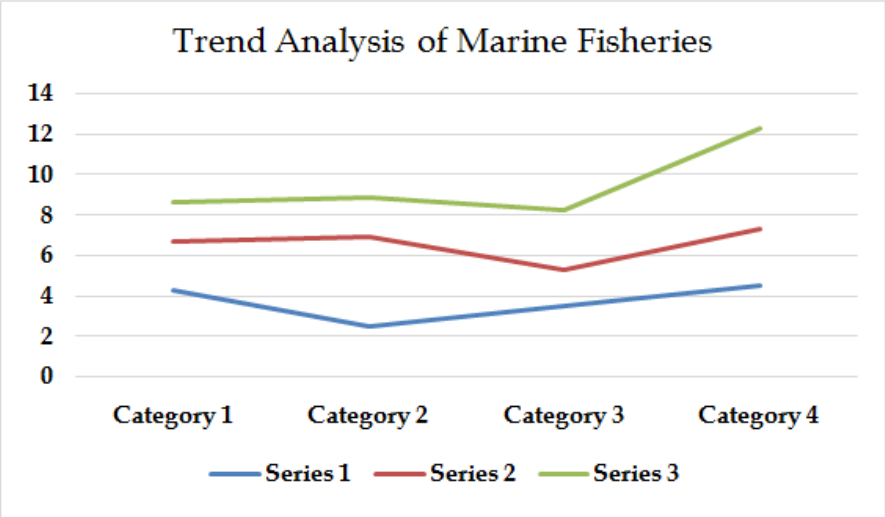
Sources: Data adopted from Bangladesh Bureau of Statistics (BBS, 2017, Hussain et al., 2017)

Now the author applies trend analysis formula for data analysis purpose.

**Table 03: Trend Analysis of Marine Fisheries Financial Evaluation**

| Year(x) | Income(Y) | Deviation(X) 2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 843.75 | -1 | 1 | -843.75 | 740.11 |
| 2011 | 949.48 | 0 | 0 | 0 | 1165.36 |
| 2012 | 1107.42 | 1 | 1 | 1107.42 | 1590.61 |

| | | | | | |
|---|---|---|---|---|---|
| 2013 | 1231.06 | 2 | 4 | 2462.12 | 2015.86 |
| 2014 | 1384.77 | 3 | 9 | 4154.31 | 2441.11 |
| 2015 | 1475.66 | 4 | 16 | 6302.64 | 2866.36 |
| Total | 6992.14 | | 31 | 13182.74 | |




Graph 01: Trend Analysis of Marine Fisheries

So the trend analysis of income of Marine fisheries of Bangladesh is increased day by day.

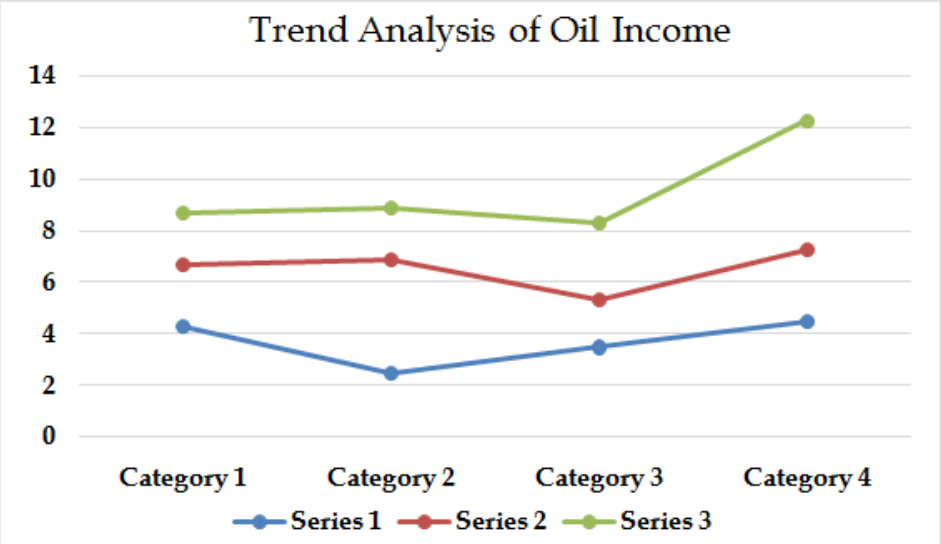
**Table 04: Trend Analysis of Oil**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 21.90 | -1 | 1 | -21.90 | 18.206 |
| 2011 | 23.84 | 0 | 0 | 0 | 27.455 |
| 2012 | 26.82 | 1 | 1 | 26.82 | 36.704 |
| 2013 | 28.77 | 2 | 4 | 57.54 | 45.953 |
| 2014 | 29.35 | 3 | 9 | 88.05 | 55.202 |
| 2015 | 34.05 | 4 | 16 | 136.2 | 64.451 |
| Total | 164.73 | | 31 | 286.71 | |

Now predict the future value of oil of year 2020 and 2022

Year 2020 = 27.455 + ( 9.249 * 9 ) = 110.696

Year 2022 = 27.455 + ( 9.249 * 11 ) = 129.194




Graph 02: Trend Analysis of Oil Income

So the trend analysis of income of Oil of Bangladesh is increased day by day.

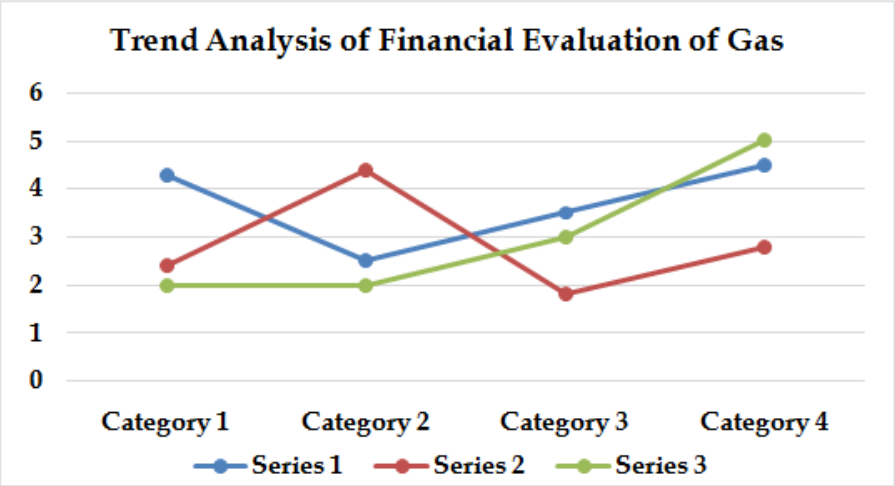
**Table 05: Trend Analysis of Gas of Bangladesh**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 948.35 | -1 | 1 | -948.35 | 733.27 |
| 2011 | 956.30 | 0 | 0 | 0 | 1089.55 |
| 2012 | 1041.35 | 1 | 1 | 1041.35 | 1445.83 |
| 2013 | 1127.73 | 2 | 4 | 2255.46 | 1802.11 |
| 2014 | 1158.13 | 3 | 9 | 3474.39 | 2158.39 |
| 2015 | 1305.42 | 4 | 16 | 5221.68 | 2514.67 |
| Total | ∑Y=6537.28 | | ∑X^2=31 | ∑X*Y=11044.53 | |

Now predict the future value of Gas of year 2022 and 2025

Year 2022 = 1089.55 + ( 356.28 * 11 ) = 5008.63

Year 2025 = 1089.55 + ( 356.28 * 14 ) = 6077.47




Graph 03: Trend Analysis of Financial Evaluation of Gas

So the trend analysis of financial evaluation Gas of Bangladesh is increased day by day.

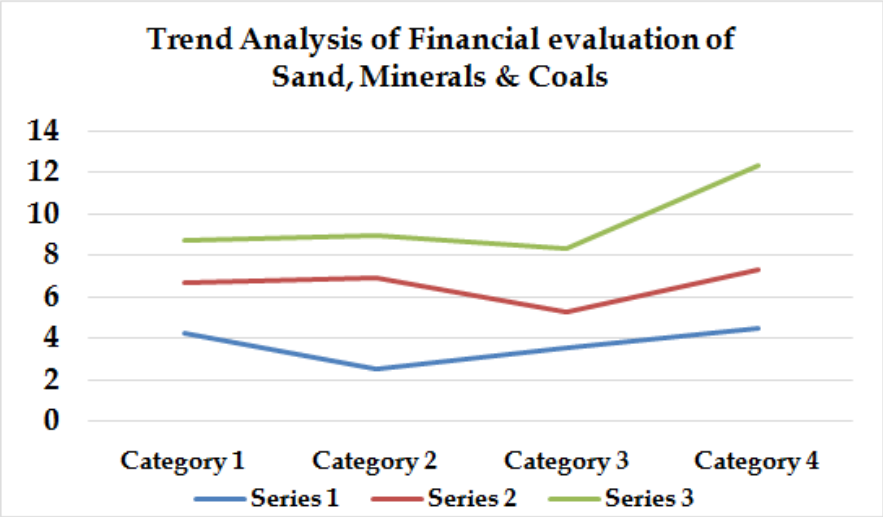
**Table 06: Trend Analysis of Financial evaluation of Sea salt of Bangladesh**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 119.25 | -1 | 1 | -119.25 | 109.89 |
| 2011 | 123.48 | 0 | 0 | 0 | 172.80 |
| 2012 | 160.90 | 1 | 1 | 160.90 | 235.71 |
| 2013 | 206.00 | 2 | 4 | 412 | 298.6 |
| 2014 | 212.35 | 3 | 9 | 637.05 | 361.53 |
| 2015 | 214.84 | 4 | 16 | 859.36 | 424.44 |
| Total | ∑Y=1036.82 | | ∑X^2=31 | ∑X*Y=1950.06 | |

So the trend analysis of financial evaluation of Sea salt of Bangladesh is increased day by day.

**Table 07: Trend Analysis of Financial evaluation of Sand, Minerals & Coals of Bangladesh**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 735.18 | -1 | 1 | -735.18 | 797.28 |
| 2011 | 944.39 | 0 | 0 | 0 | 1308.84 |
| 2012 | 1183.79 | 1 | 1 | 1183.79 | 1820.4 |
| 2013 | 1452.46 | 2 | 4 | 2904.92 | 2331.96 |
| 2014 | 1644.08 | 3 | 9 | 4932.24 | 2843.52 |
| 2015 | 1893.14 | 4 | 16 | 7572.56 | 3355.08 |
| Total | ∑Y=7853.04 | | ∑X^2=31 | ∑X*Y=15858.33 | |




Graph 04: Trend Analysis of Financial evaluation of Sand, Minerals & Coals

So the trend analysis of financial evaluation of Sand, Minerals & Coals of Bangladesh is increased day by day.

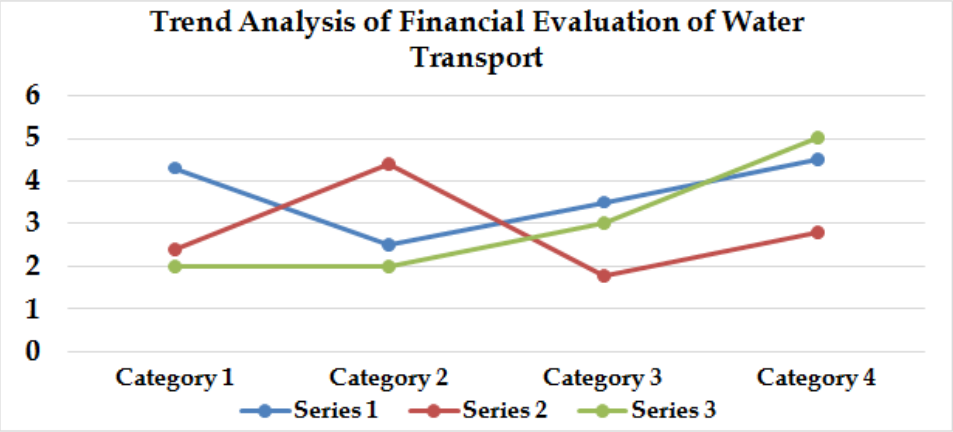
**Table 08: Trend Analysis of Financial evaluation of Water Transport of Bangladesh**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 1215.14 | -1 | 1 | -1215.14 | 1008.38 |
| 2011 | 1330.36 | 0 | 0 | 0 | 1516.80 |
| 2012 | 1450.21 | 1 | 1 | 1450.21 | 2025.22 |
| 2013 | 1606.10 | 2 | 4 | 3212.2 | 2533.64 |
| 2014 | 1682.31 | 3 | 9 | 5046.93 | 3042.06 |
| 2015 | 1816.67 | 4 | 16 | 7266.68 | 3550.48 |
| Total | ∑Y= 9100.79 | | ∑X^2=31 | ∑X*Y=15760.88 | |

Financial evaluation of water transport of Bangladesh in year of 2020 and 2025 are,

Year 2020 = 1516.80 + ( 508.42 * 9 ) = 6092.58

Year 2025 = 1516.80 + ( 508.42 * 14 ) = 8634.68




Graph 05: Trend Analysis of Financial Evaluation of Water Transport

So the trend analysis of Financial evaluation of Water Transport of Bangladesh is increased day by day and in future it might be more profitable.

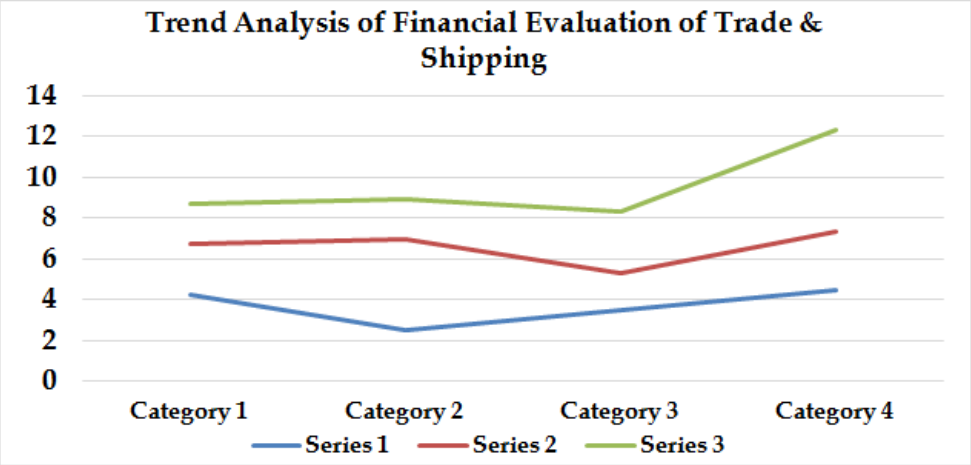
**Table 09: Trend Analysis of Financial Evaluation of Trade & Shipping of Bangladesh**

| Year(x) | Income(Y) | Deviation(X) x-2011 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2010 | 31390.15 | -1 | 1 | -31390.15 | 28540.02 |
| 2011 | 36178.04 | 0 | 0 | 0 | 44499.88 |
| 2012 | 41728.94 | 1 | 1 | 41728.94 | 60459.74 |
| 2013 | 47156.44 | 2 | 4 | 94312.88 | 76419.6 |
| 2014 | 52078.80 | 3 | 9 | 156236.4 | 92379.46 |
| 2015 | 58466.90 | 4 | 16 | 233867.6 | 108339.32 |
| Total | ∑Y=266999.27 | | ∑X^2=31 | ∑X*Y= 494755.67 | |

Financial evaluation of Trade & Shipping of Bangladesh in year of 2020 and 2025 are,

Year 2020 = 44499.88 + ( 15959.86 * 9 ) = 188138.62

Year 2025 = 44499.88 + ( 15959.86 * 14 ) = 267937.92




Graph 06: Trend Analysis of Financial Evaluation of Trade & Shipping.

So the trend analysis of Financial evaluation of Trade & Shipping of Bangladesh is increased day by day and future income of trade and shipping might be profitable and optimistic.

### 7.2 Green Economy Data Analysis

**Table 10: Sectoral Share of GDP**

| Sector | FY 2018 | FY 2019 | FY 2020 |
|---|---|---|---|
| **1. Agriculture:** | **14.23** | **13.65** | **13.35** |
| a) Agriculture and forestry: | **10.67** | **10.15** | **9.83** |
| I. Crop and horticulture | 7.51 | 7.06 | 6.76 |
| II. Animal farming | 1.53 | 1.47 | 1.43 |
| III. Forest and related services: | 1.62 | 1.62 | 1.64 |
| b) Fishing | **3.56** | **3.49** | **3.52** |

The above table shows that in the field of agriculture, crops, animal farming the GDP are decreasing from year 2018 to 2020.It is an alarming rate. And the GDP of forest and related services are increased slightly.

**Table 11: Sectoral Share of GDP**

| Sector: | FY 2018 | FY 2019 | FY 2020 |
|---|---|---|---|
| **Industry** | **33.66** | **35.00** | **35.36** |
| **a) Mining and Quarrying** | **1.78** | **1.74** | **1.72** |
| **b) Manufacturing** | **22.85** | **24.08** | **24.18** |
| i) Large & Medium Scale | 19.07 | 20.21 | 20.22 |
| ii) Small Scale | 3.78 | 3.87 | 3.96 |
| **c) Electricity, Gas and Water Supply** | **1.54** | **1.55** | **1.57** |
| **d) Construction** | **7.50** | **7.63** | **7.89** |

The above table shows that in the industry sector of BD the GDP rate are increased from year 2018 to 2020.

**Table 12: Sectoral Share of GDP**

| **Sector: Services** | **FY2018** | **FY2019** | **FY2020** |
|---|---|---|---|
| a) Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods. | **52.11** | **51.35** | **51.30** |
| b) Hotel and restaurants: | **0.75** | **0.74** | **0.75** |
| c) Transport, storage and communication: | **11.13** | **11.01** | **11.09** |
| d) Financial intermediations: | **3.45** | **3.42** | **3.39** |
| i) Monetary intermediation (banks). | 2.97 | 2.95 | 2.91 |
| ii) Insurance: | 0.30 | 0.29 | 0.29 |
| iii) Other financial intermediation: | 0.18 | 0.18 | 0.19 |
| e) Real estate, renting and business activities : | **6.31** | **6.13** | **6.09** |
| f) Public administration and defence: | **3.71** | **3.65** | **3.67** |
| g) Education: | **2.46** | **2.44** | **2.46** |
| h) Health and social work: | **1.83** | **1.89** | **1.97** |
| i) Community, social and personal Services: | **8.52** | **8.15** | **8.01** |
| Total | **100** | **100** | **100** |

The above table shows that Sectoral Share of GDP in service sectors are not very much varied from year 2018 to year 2020.In some sectors GDP rate are decreasing year by year.

**Table 13: Major Green Banking Activities at a Glance in July-September, 2016**

| **Issue** | **Bank** | **FI** |
|---|---|---|
| Number of banks/FIs having green banking unit | 56 | 32 |
| Number of environmental risk rated projects | 18981 | 658 |
| Number of environmental risk rated projects and financed | 16653 | 678 |
| Amount disbursed against rated projects(in Million BDT) | 435416.21 | 25274.60 |
| Online branches(as % of total branches) | 69.54% | N/A |
| Amount disbursed as green finance( in million BDT) | 109231.80 | 3086.20 |
| Direct green finance as % of total funded loan disbursement | 0.40% | 1.37% |
| Amount utilized from climate risk fund (in million BDT) | 255.60 | 0.50 |
| Amount utilized for green marketing, training and development (in million BDT) | 8.08 | 0.82 |

Source: Bangladesh Bank (2016)

Null Hypothesis: In terms of green banking activities bank and financial institution are interrelated to each other.

Here the author used pearson r test, r = 0.63.

So the null hypothesis, In terms of green banking activities bank and other financial institution are interrelated is true. Banks and financial institute of Bangladesh are positively correlated to each other in terms of green banking activities.

**Table 14: Sector wise Disbursement (February, 2016)**

| Sector | Cumulative amount in BDT (Million) |
|---|---|
| Solar Home System | 327507199 |
| Solar Irrigation pumping station | 68270000 |
| Solar PV module assembly plant | 569287647 |
| Solar Mini Grid | 10000000 |
| Bio-gas plant | 627954600 |
| Effluent treatment plant(ETP) | 110365200 |
| Hybrid Hoffman kiln/equivalent technology in Brick field | 467189950 |
| Vermicompost | 2645000 |
| Safety working environment | 45680000 |
| Green Industry | 400000000 |
| Paper waste Recycling | 20000000 |
| Organic Manure | 200000 |
| Total | 2649099596 |

The above table shows that every sector wise disbursement of Bangladesh Bank is not sufficient, the amount allot for Organic Manure sector, Vermicompost sector, Solar Mini Grid sector are very negligible.

**Table 15: Green finance in different products at a glance by Bangladesh Bank in FY 2017 (Million BDT)**

| Category of green finance | SCBs | DFIs | PCBs | FCBs | NBFIs | Total |
|---|---|---|---|---|---|---|
| Renewable energy | 47.9 | 4.3 | 2202.5 | 330.1 | 1859 | 4443.8 |
| Energy efficiency | 0 | 2.1 | 3118.8 | 0 | 277.4 | 3398.3 |
| Solid waste management | 0 | 0 | 7.3 | 0 | 0 | 7.3 |
| Liquid waste management | 101.3 | 0 | 8678.2 | 15.3 | 282.4 | 9077.2 |
| Alternative energy | 0 | 0 | 132.7 | 0 | 0 | 132.7 |
| Fire burnt brick | 441.1 | 11.9 | 4646.6 | 0 | 1085.7 | 6185.3 |
| Non fire block brick | 1 | 0 | 192.6 | 0 | 0 | 193.6 |
| Recycling and recyclable product | 283.2 | 0 | 5813 | 0 | 180.2 | 6276.4 |
| Green Industry | 418.8 | 0 | 4212.2 | 152.6 | 900.2 | 5746.8 |
| Safety and security of factory | 40 | 0 | 1438 | 53.3 | 46.5 | 1577.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Miscellaneous | 9.7 | 0.6 | 10.3 | 0 | 0 | 20.6 |
| Others | 1478.4 | 0 | 126.3 | 0 | 1.2 | 1605.9 |
| Total | 2884.4 | 18.9 | 30578.5 | 551.3 | 4632.6 | 38665.7 |

Source: Annual report 2017, Sustainable Finance Department, Bangladesh Bank.

Financial Year: 2016-17
Here, SCBs= Scheduled Commercial Bank
DFIs=Department of Financial Institution
PCBs=Private Commercial Bank
FCBs=Foreign Commercial Bank
NBFIs=Non Bank Financial Institution

***Null Hypothesis:*** There is no significant association exists among different department of Bangladesh bank and Category of green finance.

Here the author used Chi Square test,

The calculated Chi- square value is = 25274.50

Degrees of Freedom=44

At 0.05 level of significance and 44 degrees of freedom the table value of Chi square value is = 61.63

So chi square cal>chi square table

If our chi-square calculated value is greater than the chi-square critical value, then we reject our null hypothesis. So the null hypothesis, There is no significant association exists among department of Bangladesh bank and Category of green finance, is reject or not true. So there is a significant association exists among different department of Bangladesh bank and Category of green finance.

**Table 16: Disbursement Trend of Bangladesh Bank Refinance Scheme for Green Products (Amount in Million BDT)**

| Category | FY13 | FY14 | FY15 | FY16 | FY17 |
|---|---|---|---|---|---|
| Bio gas | 113.6 | 212.8 | 83.3 | 84.8 | 46.6 |
| Solar home system(SHS) | 40.2 | 32.2 | 87.5 | 114.7 | 35.3 |
| Solar Irrigation pump | 0.0 | 17.9 | 26.5 | 0.6 | 0.0 |
| Solar assembly plant | 122.7 | 49.6 | 148.1 | 16.3 | 0.0 |
| Solar Mini-grid | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 |
| Effluent Treatment Plant(ETP) | 57.4 | 10.0 | 0.0 | 58 | 179.6 |
| HHK technology in brick Kiln | 172.2 | 59.0 | 47.0 | 177.8 | 10.0 |
| Vermicompost | 0.0 | 0.0 | 1.1 | 1.6 | 1.3 |
| Green Industry | 0.0 | 0.0 | 0.0 | 400 | 0.0 |
| Safe working environment | 0.0 | 0.0 | 0.0 | 35.7 | 55.3 |

| | | | | | |
|---|---|---|---|---|---|
| Organic manure from slurry | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 |
| Paper waste Recycling. | 0.0 | 0.0 | 0.0 | 20 | 20 |
| Energy efficient Technology | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Total | 506.1 | 381.5 | 393.5 | 919.7 | 348.8 |

Source: Annual Report 2017, Sustainable Finance Department, Bangladesh Bank.

Financial year 2016-2017
Here the author used trend analysis,

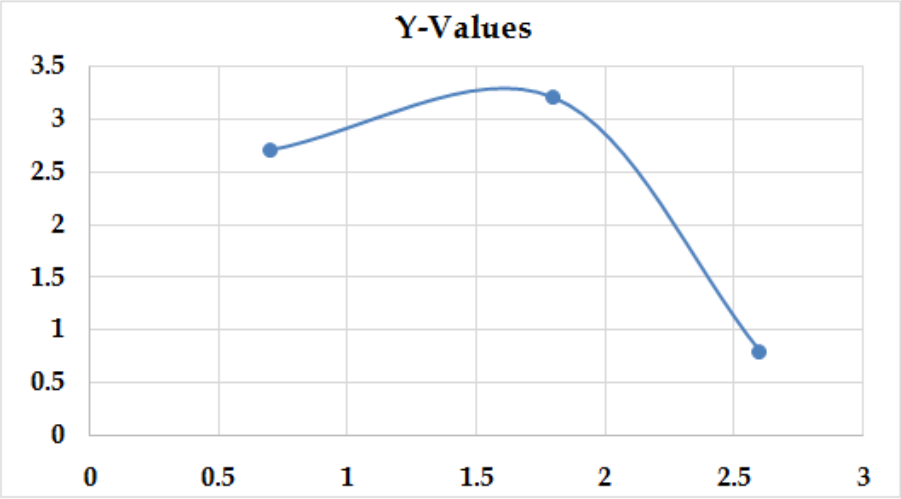
**Table 17: Trend Analysis disbursement of Bio Gas**

| Year(x) | Bio gas(Y) | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y= a+bX |
|---|---|---|---|---|---|
| 2013 | 113.6 | -2 | 4 | -227.2 | 166.44 |
| 2014 | 212.8 | -1 | 1 | -212.8 | 137.33 |
| 2015 | 83.3 | 0 | 0 | 0 | 108.22 |
| 2016 | 84.8 | 1 | 1 | 84.8 | 79.11 |
| 2017 | 46.6 | 2 | 4 | 93.2 | 50 |
| Total | ∑Y=541.1 | | ∑X^2=9 | ∑X*Y= -262 | |

Trend analysis of Bangladesh in year of 2020 and 2025 are,

Year 2020=-37.33

Year 2025=-182.88




Graph 07: Trend Analysis of disbursement of Bio gas

So the trend analysis of disbursement of Bio gas of Bangladesh is decreased day by day and future disbursement of Bio gas might be decreased.

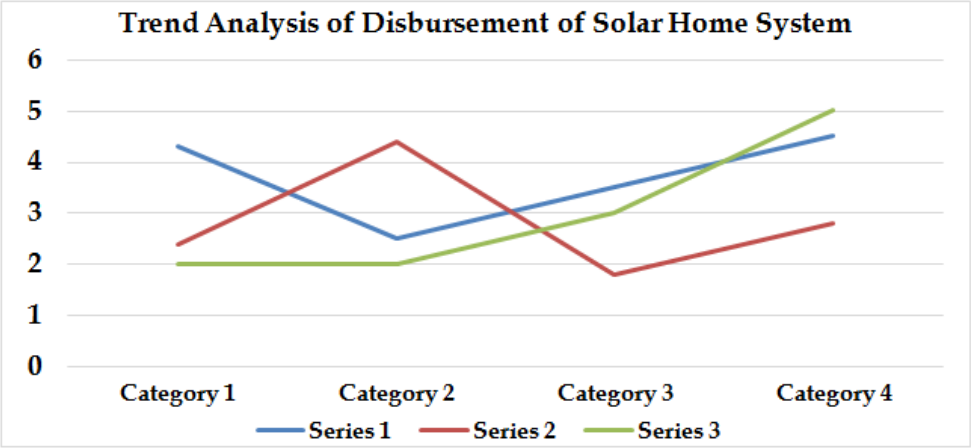
**Table 18: Trend Analysis of Solar Home System (SHS) of Bangladesh**

| Year(x) | Solar Home System(Y) | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2013 | 40.2 | -2 | 4 | -80.4 | 45.82 |
| 2014 | 32.2 | -1 | 1 | -32.2 | 53.9 |
| 2015 | 87.5 | 0 | 0 | 0 | 61.98 |
| 2016 | 114.7 | 1 | 1 | 114.7 | 70.06 |
| 2017 | 35.3 | 2 | 4 | 70.6 | 78.14 |
| Total | ∑Y=309.9 | | ∑X^2=9 | ∑X*Y= 72.7 | |

Financial evaluation of Solar Home System (SHS) of Bangladesh in year of 2020 and 2025 are,

Year 2020 = 102.08

Year 2025 = 142.78




Graph 08: Trend Analysis of Disbursement of Solar Home System

So the trend analysis of disbursement of Solar Home System of Bangladesh is increased day by day and future disbursement of Solar Home System might be increased.

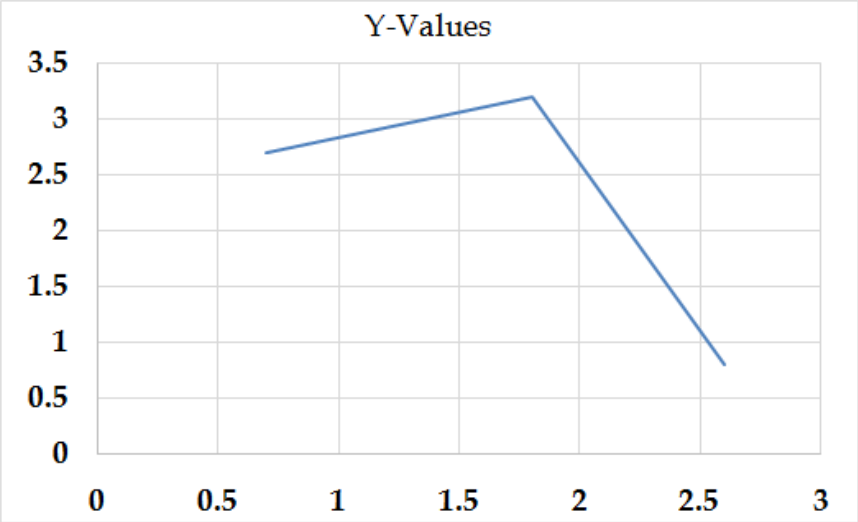
**Table 19: Trend Analysis of Solar Irrigation Pump of Bangladesh**

| Year(x) | Solar Irrigation Pump (Y) | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2013 | 0.0 | -2 | 4 | 0 | 12.84 |
| 2014 | 17.9 | -1 | 1 | -17.9 | 10.92 |
| 2015 | 26.5 | 0 | 0 | 0 | 9 |
| 2016 | 0.6 | 1 | 1 | 0.6 | 7.08 |
| 2017 | 0.0 | 2 | 4 | 0 | 5.16 |
| Total | ∑Y=45 | | ∑X^2=9 | ∑X*Y= -17.3 | |

Trend Analysis of Solar Irrigation Pump of Bangladesh in year of 2020 and 2025 are,

Year 2020 = -0.6

Year 2025 = -10.2




Graph 09: Trend Analysis of Disbursement of Solar Irrigation Pump

So the trend analysis of disbursement of Solar Irrigation pump of Bangladesh is decreased day by day and future disbursement of Solar Irrigation pump might be decreased.

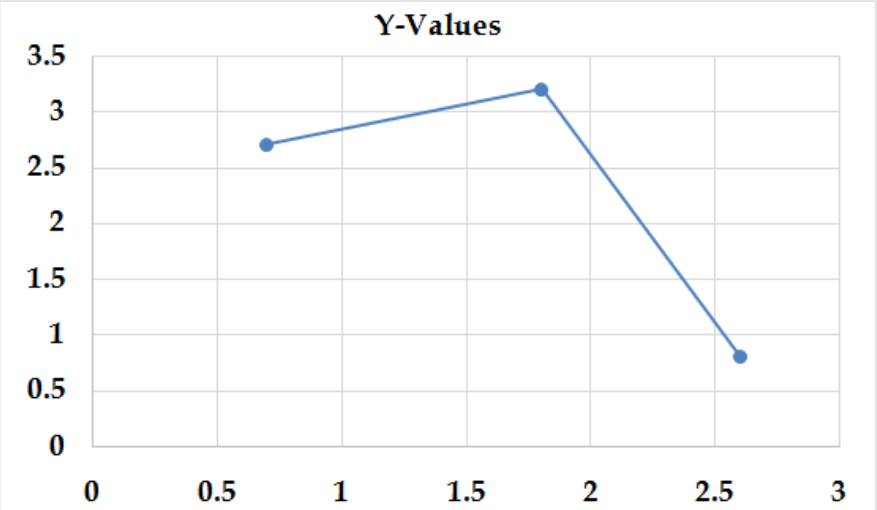
**Table 20: Trend Analysis of Solar Assembly Plant of Bangladesh**

| Year(x) | Solar Assembly Plant (Y): | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2013 | 122.7 | -2 | 4 | -245.4 | 129.88 |
| 2014 | 49.6 | -1 | 1 | -49.6 | 98.31 |
| 2015 | 148.1 | 0 | 0 | 0 | 67.34 |
| 2016 | 16.3 | 1 | 1 | 16.3 | 36.37 |
| 2017 | 0.0 | 2 | 4 | 0 | 5.4 |
| Total | ∑Y=336.7 | | ∑X^2=9 | ∑X*Y= -278.7 | |

Trend Analysis of Solar Assembly Plant of Bangladesh in year of 2020 and 2025 are,

Year 2020 = - 87.51

Year 2025 = - 242.36




Graph 10: Trend Analysis of Disbursement of Solar Assembly Plan

So the trend analysis of disbursement of Solar Assembly Plant of Bangladesh is decreased day by day and future disbursement of Solar Assembly Plant might be decreased.

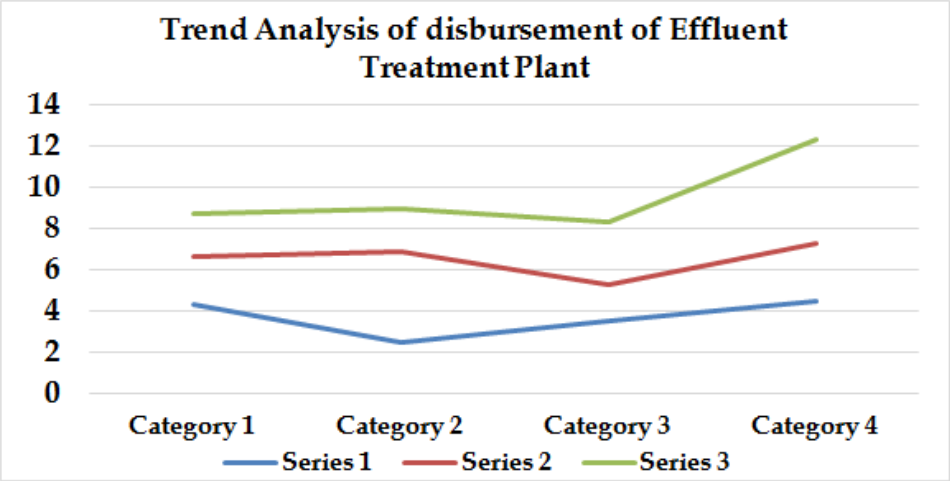
**Table 21: Trend Analysis of Effluent Treatment Plant (ETP) of Bangladesh**

| Year(x) | Effluent Treatment Plant(Y) | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2013 | 57.4 | -2 | 4 | -114.8 | -3.98 |
| 2014 | 10.0 | -1 | 1 | -10 | 28.51 |
| 2015 | 0 | 0 | 0 | 0 | 61 |
| 2016 | 58 | 1 | 1 | 58 | 93.49 |
| 2017 | 179.6 | 2 | 4 | 359.2 | 126.98 |
| Total | ∑Y=305 | | ∑X^2=9 | ∑X*Y= 292.4 | |

Trend Analysis of Effluent Treatment Plant (ETP) of Bangladesh in year of 2020 and 2025 are,

Year 2020 = 224.45

Year 2025 = 386.9




Graph 11: Trend Analysis of disbursement of Effluent Treatment Plant

So the trend analysis of disbursement of Effluent Treatment Plant of Bangladesh is increased day by day and future disbursement of Effluent Treatment Plant might be increased.

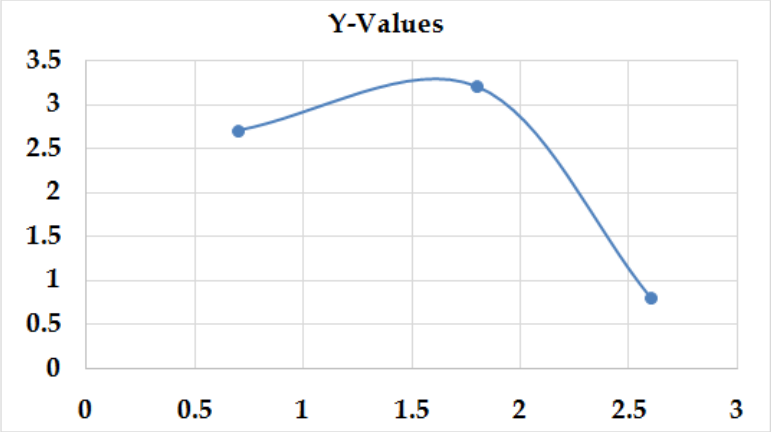
**Table 22: Trend Analysis of HHK technology in brick Kiln of Bangladesh**

| Year(x) | HHK technology in brick Kiln(Y) | Deviation(X) x-2015 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2013 | 172.2 | -2 | 4 | -344.4 | 138.88 |
| 2014 | 59 | -1 | 1 | -59 | 116.04 |
| 2015 | 47 | 0 | 0 | 0 | 93.2 |
| 2016 | 177.8 | 1 | 1 | 177.8 | 70.36 |
| 2017 | 10 | 2 | 4 | 20 | 47.52 |
| Total | ∑Y=466 | | ∑X^2=9 | ∑X*Y=-205.6 | |

Financial evaluation of Trade & Shipping of Bangladesh in year of 2020 and 2025 are,

Year 2020 = - 21.2

Year 2025 = - 135.4




Graph 12: Trend Analysis of disbursement of HHK technology in Brick Kiln.

So the trend analysis of disbursement of HHK technology in brick Kiln of Bangladesh is decreased day by day and future disbursement of HHK technology in brick Kiln might be decreased.

**Table 23: Year wise LEED Certified Green factories of BD**

| Year | Number |
|---|---|
| 2011 | 2 |
| 2012 | 3 |
| 2013 | 3 |
| 2014 | 3 |
| 2015 | 11 |
| 2016 | 15 |
| 2017 | 17 |
| 2018 | 24 |
| 2019 | 28 |
| 2020 | 24 |
| 2021 | 23 |
| 2022 | 27 |
| Total | 180 |

Here the author used CAGR & trend analysis

Here, CAGR = 24.22%

A good CAGR for an industry is 8% to 12% for large companies, while for high-risk companies; a good CAGR is between 15% to 25%.

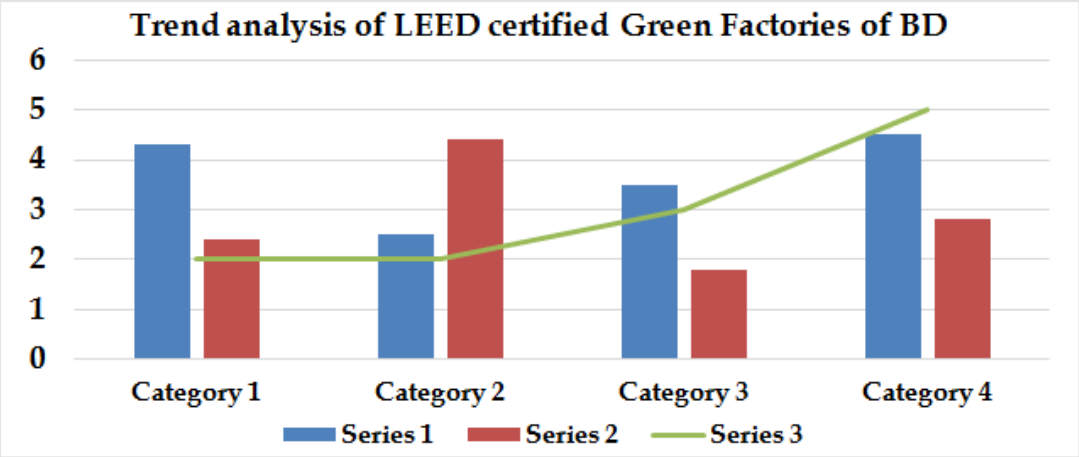
**Table 24: Trend Analysis of Year Wise LEED Certified Green Factories of BD**

| Year(x) | Green Factory(Y) | Deviation(X)= x-2016.5 | X^2 | X*Y | Trend Analysis Y=a+bX |
|---|---|---|---|---|---|
| 2011 | 2 | -5.5 | 30.25 | -11 | 0.205 |
| 2012 | 3 | -4.5 | 20.25 | -13.5 | 2.895 |
| 2013 | 3 | -3.5 | 12.25 | -10.5 | 5.585 |
| 2014 | 3 | -2.5 | 6.25 | -7.5 | 8.275 |
| 2015 | 11 | -1.5 | 2.25 | -16.5 | 10.965 |
| 2016 | 15 | -0.5 | 0.25 | -7.5 | 13.655 |
| 2017 | 17 | 0.5 | 0.25 | 8.5 | 16.345 |
| 2018 | 24 | 1.5 | 2.25 | 36 | 19.035 |
| 2019 | 28 | 2.5 | 6.25 | 70 | 21.725 |
| 2020 | 24 | 3.5 | 12.25 | 84 | 24.415 |
| 2021 | 23 | 4.5 | 20.25 | 103.5 | 27.105 |
| 2022 | 27 | 5.5 | 30.25 | 148.5 | 29.795 |
| Total | ∑Y=180 | | ∑X^2=143 | ∑X*Y=384 | |

LEED certified Green factories of Bangladesh in year of 2023 and 2025 are,

Year 2023 = 15 + ( 2.69 * 6.5 ) = 32.485 = 32

Year 2025 = 15 + ( 2.69 * 8.5 ) = 37.865 = 38




Graph 13: Trend analysis of LEED certified Green Factories of BD

So the trend analysis of LEED certified Green factories of Bangladesh is increased day by day and in future the number of LEED certified Green factories might be profitable and optimistic.

**Table 25: Sectorial Growth rate of GDP**

| Sector | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 |
|---|---|---|---|---|
| Agriculture | 2.46 | 8.16 | 9.67 | 10.1 |
| Industry | 9.64 | 4.37 | 3.3 | 2.6 |
| Service | 5.51 | 5.62 | 5.8 | 6.7 |

(Source—National Accounts Statistics, Bangladesh Bureau of Statistics)

***Null Hypothesis:*** GDP Growth rate of Agriculture, Industry and Service sector (Green Economy) of Bangladesh are not independent.

***Alternative Hypothesis:*** GDP Growth rate of Agriculture, Industry and Service sector (Green Economy) of Bangladesh are independent.

Here the author used Chi-Square test,

**Table 26: Observed Value of Sectorial Growth Rate of GDP**

| Sector | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | Total |
|---|---|---|---|---|---|
| Agriculture | 2.46 | 8.16 | 9.67 | 10.1 | 30.39 |
| Industry | 9.64 | 4.37 | 3.3 | 2.6 | 19.91 |
| Service | 5.51 | 5.62 | 5.8 | 6.7 | 23.63 |
| Total | 17.61 | 18.15 | 18.77 | 19.4 | 73.93 |

**Table 27: Expected Value of Sectorial Growth Rate of GDP**

| Sector | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | Total |
|---|---|---|---|---|---|
| Agriculture | 7.24 | 7.46 | 7.72 | 7.97 | 30.39 |
| Industry | 4.74 | 4.89 | 5.05 | 5.22 | 19.91 |
| Service | 5.63 | 5.80 | 5.99 | 6.20 | 23.63 |
| Total | 17.61 | 18.15 | 18.77 | 19.4 | 73.93 |

The equation editor, $\chi^2 = \sum (aij - eij)^2 / eij$

Here aij = observed value

And eij = Expected value

$\lambda^2 = 11.37998434$

= 11.38

Degrees of Freedom = ( 3 – 1 ) * ( 4 – 1 ) = 6

At 0.05 percent level of significance and 6 degrees of freedom the critical value or table value of $\lambda^2$ test is 12.592, So calculated value(11.38) is less than critical / table value. We fail to reject the null hypothesis. i.e. the null hypothesis is true and accepted. So, GDP Growth rate of Agriculture, Industry and Service sector (Green Economy) of Bangladesh are not independent is true, so they are dependent.

In line with the Government's Renewable Energy Policy, govt. has plans to develop at least 500 MW power from renewable energy by 2015:

**Table 28: Renewable Energy Policy of BD Government**

| Category | Present Achievement( X) | Future Target(Y) |
|---|---|---|
| SHS | 45 MW | 400 MW |
| Other Solar PV applications including Solar Irrigation | 1 MW | 50 MW |
| Wind Energy | 2 MW | 30 MW |
| Biomass based Electricity | 1 MW | 25 MW |
| Biogas based Electricity | 1 MW | 25 MW |
| Total | 50 MW | 530 MW |
| Average(mean) | 10 MW | 106 MW |

***Null Hypothesis:*** No consistency exists between present achievement and future target of Renewable energy policy of Bangladesh Government.

***Alternative Hypothesis:*** There is a consistency exists between present achievement and future target of Renewable energy policy of Bangladesh Government.

Here the author used independent t - test.

Here t calculated value is 1.29444

T table value at 5% level of significance is 2.353

Tcal < Ttab

T calculated value is less than t table value so the null hypothesis is true. So the null hypothesis, "No consistency exists between present achievement and future target of Renewable energy policy of Bangladesh Government" is true i.e. the null hypothesis is accepted

### 7.3 Data Analysis of Digital Economy of Bangladesh

**Table 29: Number of freelancer in Bangladesh of various sector in year 2019 and 2018 are given below**

| Sector | Number of freelancer in year 2019(X) | Number of freelancer in year 2018(Y) |
|---|---|---|
| Writing & Translation | 2132 | 1197 |
| Software development & Technology | 6214 | 9763 |
| Sales & Marketing Support | 3699 | 15882 |
| Creative & Multimedia | 19552 | 11972 |
| Professional Service | 808 | 2446 |
| Clerical & Data Entry | 3608 | 2158 |
| Total | 36013 | 43418 |
| Average (Mean x) | 6002.17 | 7236.33 |

(Source: Online Labor Index (2020) of an Oxford Internet Institute)

Here the author used Pearson R test,

Correlation Coefficient R = ( - 0.02 * 0.02 ) / ( √ 236637024.8 * 188768445.3 )

= - .0019

So there is a negative correlation exists between the number of freelancer of year 2018 and 2019 in - Writing & Translation sector, Software development & Technology sector, Sales & Marketing Support sector, Creative & Multimedia sector, Professional Service sector, Clerical & Data Entry sector.

A negative correlation is an event of two variables moving in the opposite direction. As one variable increases in value, the other decreases.

Now the author analysis the trend analysis of volume of online payment in Bangladesh over time.

**Table 30: Year Wise Volume of Online Payment of BD**

| Year | Payment (in Crore BDT) |
|---|---|
| 2016 | 168 |
| 2017 | 1295 |
| 2018 | 1576 |
| 2019 | 1978 |
| 2020 | 4000 |

(Source: Author's compilation based on data collected from e- CAB as of August 2020)

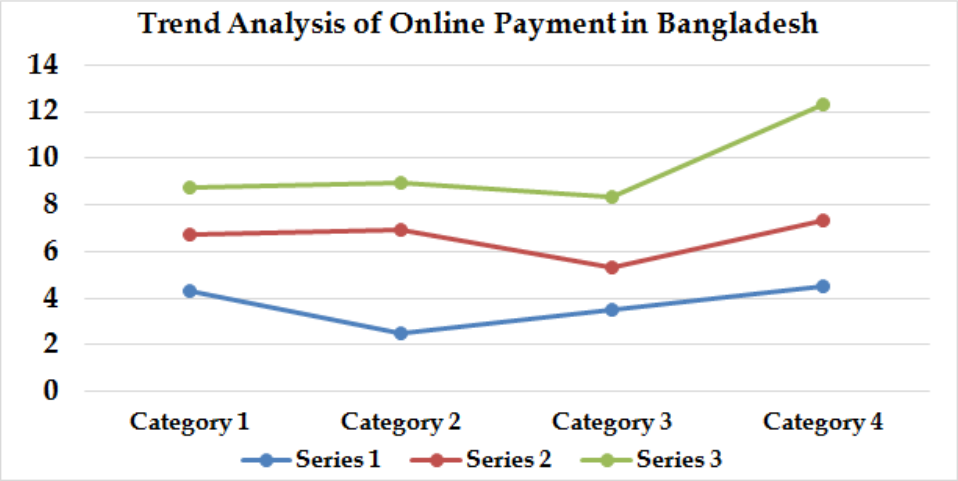
Now the author constructs the following table

**Table 31: Trend Analysis of Volume of Online Payment**

| Year(x) | Payment(Y) | Deviation(X)=x-2018 | Log Y | X*Y |
|---|---|---|---|---|
| 2016 | 168 | -2 | 2.2253 | -4.4506 |
| 2017 | 1295 | -1 | 3.1123 | -3.1123 |
| 2018 | 1576 | 0 | 3.1976 | 0 |
| 2019 | 1978 | 1 | 3.2962 | 3.2962 |
| 2020 | 4000 | 2 | 3.6021 | 14.4084 |
| Total | 9017 | | | 10.1417 |

Now the author predict the future trend value of online payment in Bangladesh in year 2022 is,

Y = 9.4159 * 10 ^ 13




Graph 14: Trend Analysis of Online Payment in Bangladesh

So the future trend value of online payment in Bangladesh in year 2022 is, 9.4159 * 10 ^ 13 Crore which is very much increased.

### 7.4 Financial Inclusion Indicators of Bangladesh

***Null Hypothesis:*** No association exists among gender, credit card user and online transaction performer of Bangladesh

***Alternative Hypothesis:*** There is an association exists among gender, credit card user and online transaction performer of Bangladesh.

Here the author used Chi- Square test,

**Table 32: Observed Value of Gender, Credit Card User and Online Transaction Performer of Bangladesh**

| Category | Male (in %) | Female (in %) | Total |
|---|---|---|---|
| With Credit card | 0.4 | 0 | 0.4 |
| Online transaction performer | 4.3 | 2.8 | 7.1 |
| Total | 4.7 | 2.8 | 7.5 |

(Source: DATAREPORTAL, 2020)

**Table 33: Expected Value of Gender, Credit Card User and Online Transaction Performer of Bangladesh**

| Category | Male | Female | Total |
|---|---|---|---|
| With Credit card | 0.25 | 0.15 | 0.4 |
| Online transaction performer | 4.45 | 2.65 | 7.1 |
| Total | 4.7 | 2.8 | 7.5 |

The equation editor,

$\lambda \wedge 2 \text{ Test} = \sum ( aij - eij ) \wedge 2 / eij$

$= 0.253546745$

$= 0.25$

Here aij = observed value

Eij = Expected value

Degrees of Freedom= (2-1)*(2-1)=1

At 5% level of significance and one degrees of freedom the critical value/ table value of $\lambda^2$ Test is 3.841, So calculated value is less than table value. So we fail to reject the null hypothesis. i.e. the null hypothesis is true and accepted. So there is an association exists among gender, credit card user and online transaction performer.

## 8. DISCUSSION & ANALYSIS

From the data analysis section we see than in blue economy sector the performance is increased day by day. In Bangladesh the amount financial evaluation of Marine Fisheries, Oil, Gas, Sea- salt, Sand, Minerals & Coals, Water transport, Trade & Shipping is increased year by year.

One billion people in developing countries of the world pivot on seafood for their principle fountain of protein. So the clamours of blue economy resources of Bangladesh are increasing all over the world.

The research show that in the field of agriculture, crops, animal farming the GDP of BD is decreasing. The study shows that; in the industry sector of BD the GDP rate are increased, which is a positive sign of development.

The author also explain that in terms of green banking activities bank and other financial institution are interrelated, if banks are performed well in green banking activities other financial institute are done well. The research also shows that the sector wise disbursement (Green banking unit) of Bangladesh Bank is not sufficient; in some cases it is very negligible.

The research also found that, there is a significant association exists among different department of Bangladesh bank and category of green finance. Which means; different department of Bangladesh bank focused on different type of green finance method.

The research also show that the disbursement trend of green product of Bangladesh bank .Here the author found that in terms of Bio-gas, solar irrigation pump, solar assembly pump, HHK technology brick kiln the disbursement trend is decreasing. But in the sector of solar home system, Effluent treatment plant the disbursement trend is increasing.

The research also found that, the CAGR of year wise LEED certified Green factories of BD, is 24.22%, which is a good CAGR. So the number of LEED certified green factories are increased year by year. It is a positive indicator of green economy's perspective.

In green economy sector GDP of three sector Agriculture, Industry and service sector are interrelated each other. If GDP of agriculture sector increased than the GDP of Industry and Service sector is also increased and vice versa. In year 2012, 2013, 2014, 2015 and 2016 we see the

GDP of agriculture, industry and service sector are increased proportionately. If agricultural sector performed well the industry sector and service sector are also improved.

Again there is no consistency exists between the present achievement and future target of Renewable energy policy of Bangladesh Government is observed in the data analysis sector. So the present achievement of SHS, Other Solar PV applications including Solar Irrigation, Wind Energy, Biomass based Electricity, Biogas based Electricity have no consistency with the future target. The present achievements in these sectors are not better, but this present achievement has a strong impact to achieve the future target of green economy in Bangladesh.

In digital economy sector Bangladesh face some difficulties but rather doing good. Number of freelancer in Bangladesh of various sector in year 2019 and 2018 are not proportionately related. The number of freelancer in Software development & Technology sector, Sales & Marketing Support sector, Professional Service sector are decreased from year 2018 to year 2019. Inadequate access to the latest technology, sophisticated telecommunications infrastructure, low computer literacy as well as numerous cultural and socio-economic factors are just some of the challenges that Bangladesh has to face to adopt latest digital economy policy.

The number of freelancer in Writing and Translation sector, Software development & Technology sector, Sales and Marketing Support sector, Creative and Multimedia sector, Professional Service sector, Clerical and Data Entry sector, are negatively related. The number of freelancer of year 2018 are decreased in year 2019 in Software development & Technology sector, Sales and Marketing Support sector, Professional Service sector because the number of freelancer decreased in software development and technology sector it also decreased the number of freelancer in sales and marketing sector and professional service sector, these sectors are interrelated. The numbers of freelancer of year 2018 are increased in year 2019 in Writing & Translation sector and Clerical & Data Entry sector because these two sectors are also interrelated.

Latest and nascent digital advancement, such as cloud computing, mobile web services, smart grids and social media, are revolutionary advancing the business landscape all over the world — restructuring the nature of work, in addition the boundaries and accountability of enterprises of any country. These trends go beyond technological innovation.

In this study the author analysis the trend analysis of volume of online payment in Bangladesh over time. The author found that the trend values of online payments are increased year by year. The future trend value of online payment in year 2022 is also very increased. So the performance of online payment is increased year by year. It is a well indicator of digital economy.

Again in Bangladesh the entrepreneur used financial inclusion indicators for transaction purpose. Both male and female entrepreneur used digital equipment for transaction purpose such as- credit card, mobile money account etc. there is an association exists among gender, credit card user and online transaction performer. It is to be seen that the percentage of financial inclusion indicator of male entrepreneur is higher than female entrepreneur in Bangladesh. This happens because of female entrepreneur face some problem to enter in digital financial inclusion system in Bangladesh.

Recent data of blue, green and digital of BD are not found in the website of Bangladesh Bank, Bangladesh Bureau of Statistics. So it is difficult to explain the whole circumstances.

## 9. LIMITATION OF THE RESEARCH RESULT

There are some potential sources of bias or constraints that might influenced the result:

[i] Data collection of this research negatively affected by factors such as bias, use of language, ethics, cost, time and timing, privacy issues, and cultural sensitivity.

[ii] The Bangladesh Bank and Bangladesh Bureau of Statistic couldn't provide latest data of various sectors.

[iii] Factors called independent variables, explanatory variables, manipulator variables, or risk factors of this research are not found in numerical form.

## 10. RECOMMENDATIONS

One of the principle assets of the blue economy for Bangladesh is the marine fishery. Moreover, the Bay of Bengal is considered as a potential ground for the natural growth of various fishes which contribute to supply 52 percent of animal-based protein in Bangladesh. The Blue economy approach emphasized that ideas, principles, norms of Blue Economy lend notable contribution towards elimination of poverty, contributing to food and nutrition security, alleviation and adaptation of climate change and generation of sustainable and inclusive livelihoods of our country.

The Blue Economy is a great stimulator for innovative services of a country. Satellite applications bring an added-value for addressing the specific challenges of coastal areas of Bangladesh. Cooperation networks are the key for improving the take-up of satellite services among local authorities of our country. The following steps taken to develop the blue economy of our country:-

[i] All the different scales of actors must be involved in innovation development and take-up all these sectors.

[ii] Users training have to be developed to ensure an efficient adoption of the services of blue economy.

The following acts would assist to create a more level policy-making playing field:-

[i] Boost public consciousness and the case for change of green economy.

[ii] Expand greater visibility on the need for this transition can encouragement voters and consumers - not just because of the costs but also the economic assistances engender by a Green Economy of Bangladesh, like new jobs and new markets.

[iii] Upgrade new indicators that complement GDP of this country.

[iv] Spread out government decision, action and policies regarding blue, green and digital economy to the public and civil society.

[v] Recognize and take edge of political leadership when available as this will be crucial in order to limit the undue influence of "dirty" economic holdouts.

## 11. CONCLUSION

Blue, green and digital economy plays an important role in the economic development of Bangladesh. Now blue, green and digital economy has various prospects and faces some challenges in Bangladesh.

In Bangladesh the Bay of Bengal and the coastal regions provide the backbone of huge sea resources and play a very supreme part in the economic development of our country. .The topmost implementation of blue economy resources can be one of the greatest achievable infusions for Bangladesh to attain sustainable economic growth. According to the research the growth of blue resource and earning through blue resource of BD are increasing day by day.
In this research the author tried to describe the present situation of blue, green and digital economy of Bangladesh. From the analysis the author found that sea production and aquaculture is increasing that is a good sign. But our blue sector is damaged by frequent floods, pollution, various human actions. Bangladesh has no well-trained, skilled and educated human resources in different marine industries in order to develop this sector.
The government of Bangladesh should take future policy-framework for the success of the Blue Economy in this country.
Green economy has three sectors, agriculture, service and industry. In Bangladesh agriculture, industry and service sectors are interrelated and dependent on each other. So if one sector performs well other sectors are also doing well and vice-versa. Green banking and green industry aspects are become more popular in BD.
The function of digital platforms in the economy is prolonging gradually all over the world. Bangladesh is not except to this digitalization economic epoch. If the vast juvenile population of Bangladesh could be adequately schooled and competent and equipped with modern market-relevant skills and methodology, then they could reap enormous assistance through the digital platform economy of Bangladesh. The research showed that the numbers of freelancer are decreasing in BD because of training, payment system, and lack of internet facilities. The trend of online payment system is increasing in BD. The research also shows that, there is a significant association exists among gender, credit card user and online transaction performer. Males are more used to digital platform than female in BD.
So, the government of Bangladesh ought to act imperatively and priorities the digital platform economy in its policy agenda.

## 12. IMPLICATION & FUTURE STUDY

The future development potential of a blue, green and digital economy strategy for Bangladesh mostly relies on the quality and ability of the economic actors to create a sustainable business model which fits the development of all the stages of these three economies.
Although the trust and reliability of the future potential of these three economies are established, new entrepreneur can smoothly enter the new digital business, invest their time and money, upgrade and magnify the businesses.
When risks abate of these blue, green and digital economy sector, large industrialist, business magnet (e.g. from pharmaceutical, chemical and cosmetics, but also energy, utility and mining companies) are expected to become interested in the opportunities and scope.
Now access to finance is the top barriers for the maritime economic activities in Bangladesh so maritime economic function is less developed here.

The future study can be done upon the risk analysis of these three types of economics, less scope of financial access. Future research may be done also the training of the skilled manpower of blue, green and digital economy purpose.

## REFERENCES

[1]. Alexa. (2020, April 25). The top 500 sites on the web by category. Retrieved from https://www.alexa.com/topsites/category/Computers/Internet/On_the_Web/Web_Applications/ Databases.

[2]. BASIS. (2019, April 27). Digital Marketing Summit: Annual event. Retrieved from http://dms2015.bbf.digital

[3]. BBS & UNICEF. (2019). Progotir Pathey Bangladesh: Multiple Indicator Cluster Survey 2019, Survey Findings Report. Dhaka: Bangladesh Bureau of Statistics (BBS). Retrieved from https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/b343a8b4_956b_45ca_872f_4cf9b2f1a6e0/2020-02-25-10-45-cd0b88df19645ebac225dada954bf 4b3.pdf

[4]. Boost Dot. (2020). Current trends of digital marketing in bangladesh. Retrieved from https://boostdot.net/digital-marketing-in-bangladesh/

[5]. Bughin, J., & van Zeebroeck, N. (2017, August 15). New evidence for the power of digital platforms. The McKinsey Quarterly. Retrieved from https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/newevidence-for-the-power-of-digitalplatforms#

[6]. Dahlman, C., Mealy, S., & Wermelinger, M. (2016). Harnessing the Digital Economy for Developing Countries. OECD Development Centre Working Papers, No. 334. Paris: Organisation for Economic Co-operation and Development (OECD). doi: https://doi.org/10.1787/18151949.

[7]. DATAREPORTAL. (2020, February 17). Digital 2020: Bangladesh. Retrieved from https://datareportal.com/reports/digital-2020-bangaldesh#:~:text=There%20were%20163.0%20million%20mobile,99%25%20of%20the%20total%20population.

[8]. De Groen, W. P., Lenaerts, K., Bosc, R., & Paquier, F. (2017a). Impact of Digitalisation and the On-Demand Economy on Labour Markets and the Consequences for Employment and Industrial Relations. Study Report. Brussels: European Economic and Social Committee. doi:10.2864/156665.

[9]. De Groen, W.P., Kilhoffer, Z., Lenaerts, K., & Salez, N. (2017b). The impact of the platform economy on job creation. Inter economics, 52, 345–351. doi: https://doi.org/10.1007/s10272-017-0702-7.

[10]. Deloitte. (2018). The rise of the platform economy. Amsterdam: Deloitte. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/humancapital/deloitte-nlhc-reshaping-work-conference.pdf.

[11]. Becker, L. J., & Seligmon, C. (1981). Welcome to the energy crisis. Journal of Social issues, 37(2), 1-7.

[12]. Boin, A. (2016). The new world of crisis and crisis management: Implication for policy making and research.

[13]. Chauhan, R.S. & Qureshi, M.M. (2021), "An Analytical Study of Ideal Fixation of Prices of Agricultural Crops in India (With Special Reference to Uttar Pradesh)", Int. J. of Trade and Commerce-IIARTC, Vol. 10, No. 2, pp: 323-332.
[14]. Dutch Transformation Forum. (2018). Unlocking the Value of the Platform Economy: Mastering the Good, the Bad and the Ugly. The Hague: Dutch Transformation Forum. Retrieved from https://dutchitchannel.nl/612528/dutch-transformation-platformeconomy-paper-kpmg.pdf.
[15]. E-CAB. (2020, January 10). E-Commerce in Bangladesh. Retrieved from http://e-cab.net/resource-center/bangladesh-e-commerce-sector/
[16]. Dutta Satrajit (2016), 'Green Economy' In the Context of Indian Economy, International Review of Research in Emerging Markets and the Global Economy (IRREM), Vol. 2, Issue: 3 [ISSN: 2311-3200].
[17]. Murugan, R. (2013). "A Study on Consumer Perception Towards the Neem Products with Special Reference to Sivakasi Taluk" Int. J. of Trade and Commerce-IIARTC, Vol. 2, No. 1, pp 110-124.
[18]. Tanwar, Md Irshad Ali & Qureshi, Mohd Mohsin (2023), "A Study on Green Bond Framework and Indian Government Initiative for Green Bond Market", Int. J. of Trade and Commerce-IIARTC, Vol. 12, No. 2, pp: 303-313.
[19]. United Nations Environment Programme (UNEP). Available from:https://www.unenvironment.org. [Last accessed on 2020 March 10].
[20]. Sustainable Development - United Nations Environment Programme (UNEP).
[21]. Available from: https://sustainable development.un.org/index.php?menu=1446. [Last accessed on 2019 December 10].