

Bicycle Industry As a Post-pandemic Green Recovery Driver in an Emerging Economy: A SWOT Analysis

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Abstract

The COVID-19 pandemic has exposed socioeconomic vulnerabilities around the world. After fighting the coronavirus for more than one and a half years now, the countries are recovering from the epidemic with the help of cutting-edge medical research. The policymakers are implementing stimulus packages for post-pandemic economic recovery. However, sustainable 'green recovery' plans are yet to get adequate attention. Sustainable investment in green industries can create green jobs, promote a low-carbon economy, and foster long-lasting economic growth in the post-pandemic world. The COVID-19 affected countries with emerging economies call for even more focus on such investments. In Bangladesh, the bicycle industry - a growing low-carbon industry – has been showing promising potential for growth since the beginning of the pandemic. Both the local and global markets of Bangladeshi bicycles have seen substantial growth during the epidemic. In this paper, we analyze the potential of the Bangladeshi bicycle industry as an effective green recovery driver. We conduct semi-structured interviews with relevant experts and professionals, analyze their opinions, and perform a 'strengths, weaknesses, opportunities, and threats (SWOT)' analysis. The analysis reveals valuable insights regarding post-pandemic sustainable economic and environmental recovery which will be beneficial to the policymakers of Bangladesh and similar developing countries.

1. Introduction

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has shaken the world economy with its unprecedented and dreadful impacts. Around the world, there is barely any sector that has not suffered from the detrimental consequences of the epidemic. Due to prolonged and repetitive lockdowns worldwide and the majority of the economic activities shut down, the world economy is struggling to thrive. Fortunately, the development in medical science has gifted us with multiple vaccines such as Moderna, Pfizer-BioNTech, Oxford-AstraZeneca, Sinopharm, and Johnson & Johnson vaccines (WHO, 2021). With the production and supplies of vaccines on the rise, we can expect that the world is slowly going to win against this invisible enemy. Many countries are already recovering gradually through the proper implementation of economic, technological, and public health strategies (World Economic Forum, 2021).

The economic impacts of the COVID-19 pandemic are colossal. The consequences are even worse in the developing and least developed countries (WTO, 2020). The world leaders and policymakers acknowledge that the economy needs significant investment as the first pillar of the post-pandemic recovery strategy. However, the question to be asked before the financial decision-making is – “How sustainable is the investment?” For the investment to be sustainable, the policymakers need to ensure that expected economic growth comes with desired environmental benefits. Green investment can achieve both economic and environmental sustainability (Zahan & Chuanmin, 2021; Zhou et al., 2020). We believe that green investment could facilitate 'green recovery' in the post-pandemic world. Green recovery policies should take into account climate change due to human interference with the environment. According to

Asian Development Bank (ADB), “A green recovery is the key to ensuring a sustainable and resilient return to growth and development after COVID-19” (ADB, 2020).

The coronavirus pandemic, although a curse to the global economy, has been a blessing for the global environment (Khan, 2021; Wang & Su, 2020; Muhammad et al., 2020; Verma & Prakash, 2020). Since the crisis has forced the frequent shutdowns of industrial, transportation, and day-to-day activities, there have been significant changes in terms of – improved air quality, improved water quality, and reduced carbon emission. However, the optimistic recovery from the pandemic has already reopened the industries, traffic, and other sources of environmental pollution. Therefore, we can no longer expect that the temporary improvements will sustain unless we take proactive measures. When we think of protecting our environment, reducing carbon emission is the first thing that comes to our concern.

The two major sources of global greenhouse gas (GHG) emission are – electricity (31%) and transportation (15%) (World Resources Institute, 2017). The primary contributor to GHG is carbon dioxide. To reduce carbon emissions, one significant area of improvement could be the reduction of transportation-related emissions. One of the most consequential actions related to post-pandemic green recovery suggested by the United Nations (UN) aims to call an end to fossil fuel subsidies (UN, 2020). The adoption of electric vehicles has a great potential for reducing fossil fuel consumption and thus reducing carbon emissions (Kumar & Alok, 2020). However, are the countries with emerging economies yet ready to adopt electric vehicles over traditional fossil-fuel-based vehicles? To find that out, Ahmed & Karmaker (2019) conducted a study in Bangladesh, a South Asian country with an emerging economy. They identified some key challenges in the adoption of electric vehicles. Some of which include – shortage of power supply, lack of charging stations, high charging cost, high battery price, high life-cycle costs, etc. Under the circumstances, what should Bangladesh or the countries with similar developing economies consider as the potential alternative of a low-carbon transportation mode? In this study, we explore the strength and opportunities of the bicycle industry as a green recovery option in Bangladesh. Based on the current market scenario, evidence from previous research works, opinions from focus group discussion, and expert interviews, we perform a strengths, weaknesses, opportunities, and threats (SWOT) analysis. Through in-depth analysis of the external and internal factors, we analyze the potential of the Bangladeshi bicycle industry for green recovery through sustainable economic and environmental growth.

2. Current Status Of Bicycle Industry In Bangladesh

Bicycles are the largest contributors to the engineering products export sector (DATABD.CO, 2020). Since 1999, Bangladesh has been exporting bicycles to European countries. In 2020, Bangladesh became the 3rd largest non-European exporter of bicycles only behind Taiwan and Cambodia (The Financial Express, 2020). Also, Bangladesh is the 8th largest exporter of the global market. The revenue generated from exporting bicycles over different fiscal years is shown in Figure 1. In 200-21 FY, Bangladesh earned an estimated \$130 million surpassing all previous records (The Daily Star, 2021). The big three companies that contribute to the exports are – Meghna Group, Alita Bangladesh, and Pran-RFL Group (DATABD.CO,

2020). The local market size for bicycles is approximately 1.5 million per year with an annual growth rate of 30% (Dhaka Tribune, 2021). The local manufacturers are fighting to satisfy this huge local demand that is ever-increasing. By 2031, the estimated worth of the global bicycle market will be \$111 billion (Persistence Market Research, 2020). With this on the horizon, the Bangladeshi bicycle industry has great potential to be a key contributor to this market.

In Bangladesh, people use bicycles predominantly for personal commute. The country's majority of bicycle users are in the capital city of Dhaka. Dhaka ranks first as the most densely populated city in the world (Statista, 2021). Due to the day-to-day city life congested traffic, people are always looking for a faster mode of transport to reduce the time wasted in the traffic jam. The bicycles can easily escape traffic jams by finding alternative routes since they can travel through compact space on the road. The growing popularity of bicycles results in an increasing demand for bicycles every year. Bicycles are not only the most affordable mode of transportation but also their maintenance cost is very low. Moreover, people are becoming health conscious more than ever. This sensible concern is driving mostly young people to choose bicycling as an exercise option.

Another significant aspect that is contributing to the growing market demand for bicycles is the e-commerce boom in Bangladesh. These online based businesses for food delivery (Foodpanda, HungryNaki, Uber Eats, Pathao Foods, etc), grocery items (Chaldal, Shwapno, Meenacllick, etc.), courier service (RedX, Delivery Tiger, eCourier, etc.), along with various other e-commerce such as Daraz, Rokomari, and Pickaboo, are adopting bicycles extensively for last-mile delivery. This trend is creating jobs for many young people. Through an affordable investment of buying a bicycle, they are now making money easily by joining the last-mile delivery job. Moreover, recently many families in Bangladesh who have been economically affected by COVID-19 are joining these delivery jobs. Bicycles indeed are helping them recover financially. Thus, the bicycles are becoming popular in Bangladesh as an economical and a sustainable mode of transportation for business and personal use.

Some recent studies (Buehler & Pucher, 2021; Doubleday et al., 2021; Kraus & Koch, 2021) show that bicycle use has increased rapidly during the pandemic in Europe, the US, and Australia. The trend is also similar for the countries with developing economy. Bangladesh has experienced remarkable increase in bicycle sales during the pandemic (Al Jazeera, 2020). The risk perception of COVID-19 driven social distancing among common people has been the major player for this demand surge. Not only the local market demand has escalated, but also the bicycle export has hit a new high during this time (The Daily Star, 2021). Therefore, there was never a better time to invest in the bicycle industry in Bangladesh. We believe the industry has a great potential for resilient economic recovery after the pandemic by earning through export, by creating jobs, and by flourishing business in the country. We also believe this low-carbon mode of transport will ensure sustainable green recovery for the global climate. In this study, we analytically explore the prospects of the bicycle industry.

3. Methodology Of Research

In this research work, we attempt to identify the potential strengths and opportunities of the growing bicycle industry of Bangladesh. We choose SWOT analysis as the methodological tool for this purpose. The SWOT is the acronym for strengths, weaknesses, opportunities, and threats. According to Helms & Nixon (2010) "SWOT analysis provides the foundation for realization of the desired alignment of organizational variables or issues". It is used to identify and analyze the internal factors (strengths and weaknesses) and external factors (opportunities and threats) that determine the success or failure potential of a business organization. Researchers and practitioners have been using the SWOT analysis tool to make strategic suggestions since the advent of the methodology. By analyzing the favorable and unfavorable factors, the professionals can understand how the opportunities can be leveraged by the strengths and how the weaknesses can potentially amplify the threats unless proper actions taken.

To perform the SWOT analysis we gather data from the published research works and the opinions from an expert body consisting five industry experts, two government experts, and three university professors. We obtain the Bangladeshi bicycle industry data from various local and international e-papers and the research articles published in referred journals. We conduct semi-structured interviews with every individual expert following a SWOT-based format during July and August of 2021. Later, we arrange a focus group discussion where all ten experts participated and contributed to the active discussion. We systematically organize all the collected qualitative data obtained from the interviews and the discussion session. We observe and conduct in-depth analysis and finally obtain the SWOT table. We discuss the findings in the next section of this paper.

4. Swot Analysis

After repetitive analysis of the gather data using SWOT approach, we construct the following SWOT table (Table 1). From the opinions of all the experienced professionals, we choose the internal and external factors which were mentioned repeatedly by the experts and which were prioritized over other relatively low importance factors.

Table 1
SWOT analysis of the bicycle industry of Bangladesh

Internal Factors	
Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong relationship with European buyers • Cheaper labor cost compared to the competitors • Strong product diversification capability • Most affordable personal vehicle in the country 	<ul style="list-style-type: none"> • Infrastructure barriers of local market growth • Technological barriers of production • Lack of foreign investment
External Factors	
Opportunities	Threats
<ul style="list-style-type: none"> • Increasing awareness of climate change • Booming e-commerce related last-mile delivery • Increasing health concerns among youths • Potential of bicycle sharing services in the country • Growing demand due to COVID-19 awareness 	<ul style="list-style-type: none"> • Foreign competitors' dominance in local market • High import duties on imported raw materials, and high VAT on production and trading

4.1 Strengths Analysis

Strong relationship with European buyers

The experts mentioned that the Bangladeshi bicycle manufacturer companies maintain tight relationship with the European buyers. This close relationship provides the manufacturers flexibility concerning lead time and some duty exemptions. However, the industry experts stated that the buyers generally do not compromise with product quality. This always drives the Bangladeshi manufacturers to focus on improving quality with time.

Cheaper labor cost compared to the competitors

In Bangladesh, the labor price is relatively cheaper than most of its Asian competitors in the global market – India, Sri Lanka, China, Thailand, and the Philippines. Besides, the experts believe that Bangladesh can offer skilled labor and work force in manufacturing bicycles. They also agree

undisputedly to the point that the country's education system is producing better engineers and technicians now. This is helping the country to stay competitive in the global market providing superior cost-quality trade-off.

Strong product diversification capability

Most of the experts believe that the bicycle industry is capable of product diversification both in the local market and global. To gain majority market share of the local market, the companies have already started producing low-price bicycles. These are easily affordable to the country's low income people. Duranta Bikes, a venture by Pran-RFL group has gained popularity among local customers as a cost-efficient choice over foreign products. In terms of global market, Bangladesh is eyeing on the opportunity to win foreign markets besides Europe such as USA and Australia. Some of the experts urged that this would be challenging and ambitious. However, if the companies can achieve manufacturing flexibility, the goal is not unachievable.

Most affordable personal vehicle in the country

According to the experts, the market demographic shows that the majority of the customers are young people aged between 16 to 28 years. This is because bicycle is the most affordable personal vehicle for them. The customers are mostly school, college, and university going students as well as the young people trying to earn their bread by joining home delivery based online business. Motorbike is the second most affordable personal vehicle and that too is more than ten times costly than a bicycle. This indicates that there is no close competitor of other vehicles in the market. They experts claimed that even the low income parents can now afford a bicycle for their children.

4.2 Weaknesses Analysis

Infrastructure barriers of local market growth

The experts point out two infrastructure related barriers that impede the local market growth. Those are – lack of dedicated lanes for bicycles on the roads and lack of parking facilities. If these weaknesses could be eliminated, more people would consider using bicycles during their daily life. It is no secret that the country's capital city of Dhaka and some other big cities such as Rajshahi and Chattogram, are suffering from their poorly planned traffic. The megacity of Dhaka is where the country's majority of the bicycle users and potential customers live. However, there are no dedicated lanes for bicycle riding on the roads. The experts expressed their concerns noting that riding bicycles on the same lanes with motorized vehicles such as bike, car, leguna, bus, and truck, has substantial risk of accidents. The experts doubt that implementing dedicated bicycle lanes in Dhaka could be highly unfavorable. However, this should not be challenging to implement in other major cities of country (Zafri et al., 2021). The parking facilities for bicycle in the major cities are inadequate. Often the users would not take their bicycles to places where they need to park the vehicle of hours. While the motorized vehicles can avail parking facilities, the

bicycles do not. According to the experts, bicycle parking facilities can be easily developed since hundreds of bicycles can be parked in a compact space.

Technological barriers of production

Over the world, the developed countries are leveraging automation and artificial intelligence in production. This results in reduced human labor, higher production volume, low unit product cost, and most importantly higher product quality. However, in developing countries like Bangladesh, the production facilities do not have proper access to smart manufacturing. The experts believe that if Bangladeshi bicycle manufacturers use state-of-the-art technology in their production facilities, their products will be more competitive in the foreign market. They experts are, however, optimistic about this progress soon.

Lack of foreign investment

Capital investment from foreign investors is a vital prerequisite in developing new production facilities in a developing country like Bangladesh. In 2018, Cube Bikes, one of the biggest manufacturers of bicycles in Europe, invested approximately \$12 million to Meghna Group to make high-quality bicycles (The Daily Star, 2018). Investment as such is what Bangladesh needs to look for. Bangladesh needs to attract the investors from countries with green investors. The government body needs to facilitate the investment process by removing bureaucratic complexities and by reducing tax on the investors. The same should be done for the local investors as well. The local investment can create new start-up companies capable of meeting local market demand.

4.3 Opportunities Analysis

Increasing awareness of climate change

Bicycles are the greenest mode of transportation which does not carbon emission when in use. Adopting bicycles over motorized transports can significantly reduce total carbon emission. A study conducted in Bangladesh by Roy et al. (2019) reveals that “53% of carbon dioxide emission can be reduced if only 40% of people use bicycles instead of using private transport for short distance”. The authors also found that bicycle production in Bangladesh is more environment friendly in Bangladesh than in Europe. The increase in climate awareness demands for clean production and sustainable use of energy and resources. With this prospect, bicycle industries are getting attention over the last decade. Climate activists and the government are inspiring people to replace personal motorized vehicles with bicycles. The number of bicycle users in Bangladesh and also almost everywhere in the world is increasing. This implies a bright future scope for expansion of the bicycle industry in Bangladesh. The climate awareness is even more profound among the target customers, i.e., young people. The experts believe that this is the biggest opportunity for the bicycle industry to thrive.

Booming e-commerce related last-mile delivery

The widespread adoption of internet has facilitated the rapid development and growth of internet based businesses, colloquially called e-commerce. These businesses are focused on good customer experience and thus provide home delivery for their products. The best way for making such last-mile delivery is using bicycles in the big cities like Dhaka and Chattogram. Also, bicycles being cheapest mode of transport significantly increase the profit of the business. The experts reckon that the booming e-commerce will expand even more in the upcoming years and this will accelerate the need for bicycle production in high volume.

Increasing health concerns among youths

In Bangladesh, people are becoming health conscious now. The youth are adopting healthy lifestyle that includes doing regular physical exercise. Bicycling being an affordable exercise option is thus getting popularity among youths. According to Harvard Health Publishing (2016), cycling is good for health and muscles, and it improves how a person walks, balance, and climb stairs. Besides health benefits, it comes with economic benefits in terms reduced healthcare costs and fewer sick days of the employees (Handy et al., 2014). The experts believe that the growing health awareness among the youth is a big opportunity for the growth of bicycle industries in Bangladesh.

Potential of bicycle sharing services in the country

Public bicycle sharing scheme is getting popularity since the introduction of this in Bangladesh in 2018. JoBike, the country's first bicycle rental service was launched in June 18, 2018 (The Daily Star, 2018). Since then the system is serving the cities of Dhaka, Chattogram, and Cox's Bazar. Inside Dhaka they are available in Gulshan, Banani, and Mirpur DOHS area. The use and popularity are growing in various university campuses as well. The investors of JoBike are optimistic about the venture's future despite the pandemic hit (The Business Standard, 2020). A study conducted by Rahman (2020) revealed that the bicycle sharing scheme has a good potential to increase bicycle use in Dhaka and other big cities of Bangladesh. Also, the users' environmental concern are positively affecting their intentions to adopt bicycle-sharing (Zhu et al., 2020). The experts believe that in the next five years, there will be number of bicycle sharing services will be launched by the entrepreneurs. Moreover, the experts claim that foreign bicycle sharing companies such as Mobike and Ofo will shortly be interested in starting their business in Bangladesh.

Growing demand due to COVID-19 awareness

The COVID-19 pandemic has led people to adopt bicycles for transportation for some definite reasons. First, to fight the disease boosting one's immunity is a vital prevention approach. Since cycling everyday boosts immunity, people are considering riding bicycles for personal commute. Second, during the COVID-19 epidemic there has been a significant shift in travel mode choice (from public transport to personal vehicle) due to the risk perception among people (Bhaduri et al., 2020; De Vos, 2020). Due to social distancing and other coronavirus related safety protocols, public transports have seen decline in number of passengers to travel. The cars and the motorcycles are among the widespread personal vehicle

options. However, people in developing countries are struggling to get either of them. Therefore, they are considering bicycle as an affordable personal transport mode. This trend is prevalent in Bangladesh and similar developing countries. According to experts, this growing practice will most likely result in increased bicycle demand for the years to come.

4.4 Threats Analysis

Foreign competitors' dominance in the local market

The major threat for the growth of bicycle industry in Bangladesh is the fierce market competition with the foreign companies in the local market. Two biggest competitors are India and China, who supply vast majority (nearly 70%) of the local market demand (Dhaka Tribune, 2021). One big reason for their dominance in the local market is the lower unit price than that of locally produced bicycles. Since the customers' bargaining power is growing, they tend to choose relatively cheaper foreign bicycles of comparable quality. Reducing the unit product cost that will be more affordable to the local customers remains a big challenge to overcome. Since most of the raw materials are imported at high price, reducing the unit cost to the competitors' level is difficult for the local manufacturers. The experts suggest that if the government can impose anti-dumping duty or other protective tariffs on the foreign companies, the local industry will see rapid growth in this business.

High import duties on imported raw materials and high VAT on production and trading

The local companies import most of the raw materials and spare parts for bicycle from various countries. Recently, the import duty has been increased from 10–25% on raw materials (DATABD.CO, 2020). Moreover, an average duty of 55% on the bicycle spare parts is a big barrier to overcome. Not only the high import duties are affecting the growth of the industry, poorly structured administrative issues at the ports often cause high lead time of the imported items. This eventually hampers the productivity and makes the local companies vulnerable to their competitors at both home and abroad. The experts believe that for the bicycle industry, the government should rethink the 'VAT act 2012' that imposes 15% VAT on production and 5% VAT on trading. A sizeable reduction in VAT can make the Bangladeshi bicycle companies highly competitive in both local and international market.

5. Conclusion

Sustainable investment ensures clean production and green usage of resources and thus could be an effective strategy for green recovery after the COVID-19 pandemic. Since bicycles are the greenest mode of transport, investing in the bicycle industry can bring about economic and environmental sustainability. In this paper, we perform a SWOT analysis to find out the potential of the bicycle industry as a post-pandemic green recovery driver in an emerging economy context of Bangladesh. We investigate the strengths, weaknesses, opportunities, and threats for the growth of the industry. We observe that the huge opportunities can easily be leveraged by the strengths of the industry. The weaknesses can be recovered through proper strategic planning by the government. The potential threats can be eliminated by

designing and implementing a better tax policy. Altogether investment in bicycle industry in Bangladesh as well as other developing countries has a tremendous potential to positively change the economic and environmental status quo of the country. We believe that the bicycle industry can surely be a significant driver for green recovery in the post-pandemic world.

Declarations

6.1 Ethics approval and consent to participate

Not applicable.

6.2 Consent for publication

Not applicable.

6.3 Availability of data and materials

The data used and/or analyzed during the current study are available from the corresponding author on reasonable request.

6.4 Competing interests

The authors declare that they have no potential conflict of interest or financial conflict to disclose.

6.5 Funding

Not applicable.

6.6 Authors' contributions

All authors conducted the interviews of the participants, gathered and analyzed responses. DX and JS wrote the manuscript. FS supervised the overall work. All authors read and approved the final manuscript.

6.7 Acknowledgement

Not applicable.

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Figures

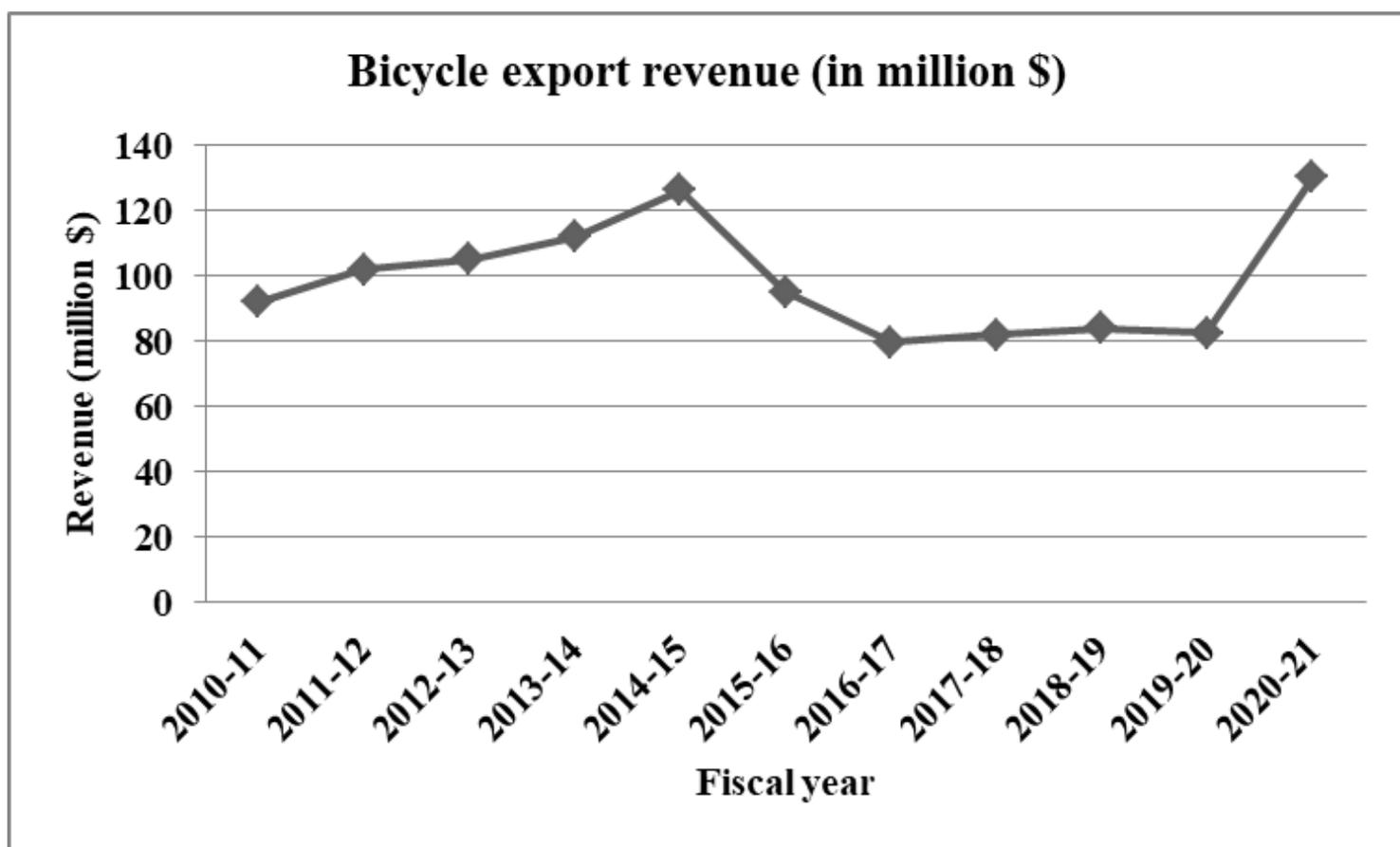


Figure 1

Bangladesh bicycle export revenue trend over time (Source: Export Promotion Bureau, Bangladesh)