

## HOW IS THE LAB-GROWN DIAMOND INDUSTRY AFFECTING GLOBAL DIAMOND MARKETS IN TERMS OF INVESTMENT TRENDS, MARKET CAPITALIZATION, AND ITS IMPACT ON ECONOMIES RELIANT ON TRADITIONAL DIAMOND MINING?

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### **1. Abstract**

*The explosive growth of lab-grown diamonds (LGDs) is causing a significant shift in the diamond market. Natural diamonds controlled the market for a long time, but LGDs are becoming fierce rivals. They are a popular option since they are less expensive, more environmentally friendly, and free from the moral dilemmas associated with mining. By comparing their market share with natural diamonds, analysing the advantages and disadvantages of each, and learning what consumers think of them, this study examines how LGDs are revolutionising the diamond industry.*

*The market for LGDs is being driven by younger, eco-conscious consumers, particularly millennials and Gen Z, in Western nations like the US and the UK. In contrast, because of cultural preferences for natural diamonds, acceptance is delayed in countries like China and India. The paper also discusses how economies that depend on mining diamonds face risks as LGDs grow in popularity but could find opportunities in producing these lab-made gems. It explains how LGDs are attracting investors and changing the face of the global jewelry market.*

*Keywords: Diamond Market, LGDs, Traditional Diamond, Diamond Mining*

## 2. Introduction

De Beers' famous slogan "A diamond is forever" has historically defined diamonds as symbols of eternity, luxury, and love. This trend has however been put to question given the current advancements of lab-grown diamonds in the market. These man-made diamonds mimic the formation process and have the same physical, chemical and optical characteristics as the natural diamond. Lab-grown diamonds are not only cheaper but are also aligned with the modern-day principles of responsible mining and conservation of the environment.

This innovation has destabilized what used to be an industry that was stable, affected investment, changed markets, and brought about economic instability in areas that relied on conventional diamond mining. One of the motivating factors being cost, lab-grown diamonds are cheaper than naturally mined diamonds by a margin of about 80 percent. Apart from cost, they target consumers who are conscious of the environmental and ethical issues associated with mining. This change is indicative of other social changes as well. Lab grown diamonds are proving advantageous to younger generations who are more likely to spend on experiences rather than goods, and there is appeal with their characteristics of being ethical and sustainable. The diamond supply chain had to adjust because old mining practices simply cannot fulfill the new consumer needs.

Three major areas are impacted by the rise of lab grown diamonds which are investment trends, market capitalization, and economies based on diamond mining. The diamond industry is investing in the manufacturing facilities for lab grown diamonds, instead of mining operations. More and more consumers see natural diamonds as less desirable, as there is an endless supply and lower cost of lab grown alternatives. As a result, natural diamonds are under threat of being perceived as less scarce and less valuable. As established players in the diamond industry, De Beers and others are seeing market capitalization decline as they struggle to compete with innovative lab grown diamond companies like Grown Brilliance. These market entrants are gaining market share quickly and transforming the competition.

There are also significant economic ramifications, especially when regions are dependent on diamond mining. These operations have been historically a bank of work, development of infrastructure and a source of revenue for the nations. With less demand for mined diamonds, communities that depend on this industry are uncertain, so governments and businesses begin hunting for alternatives.

### Lab Grown Diamond & Earth Mined Diamond Comparison

Factors	Lab Grown Diamond	Earth Mined Diamond
<b>Diamond type</b>	Real diamond - NOT a stimulant like Cubic Zirconia (CZ) or Moissanite	Real diamond
<b>Price</b>	Affordable (60-70% lesser than Earth Mined Diamonds)	Expensive
<b>Environmental impact</b>	Eco-friendly	Destructive mining
<b>Formation</b>	Under high pressure & temperature by crystallization of carbon in a laboratory	Under high pressure & temperature by crystallization of carbon under earth
<b>Origin</b>	Manufactured in a Lab in a few weeks	Formed under the earth over billions of years
<b>Work Environment</b>	Higher safety	Extreme work conditions
<b>Supply</b>	Increasing – can be mass produced	Stagnant & declining
<b>Industry stage</b>	High growth	Mature
<b>Certification</b>	By GIA, IGI, and other renowned labs	By GIA, IGI, and other renowned labs

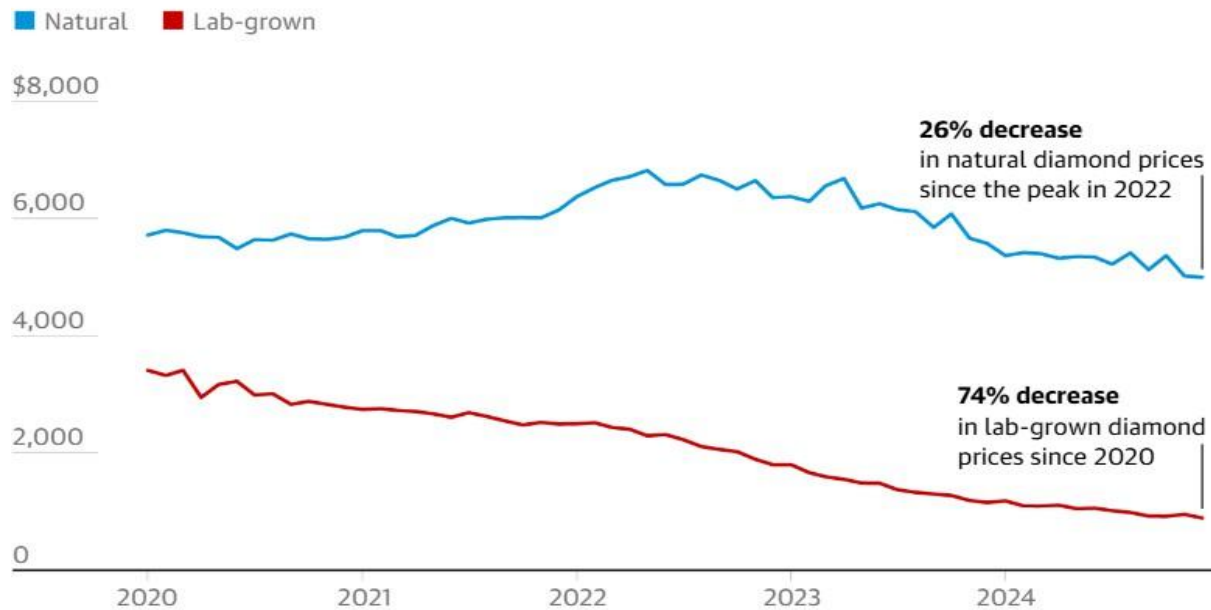
Source: mywisdomlane.com

Lab grown diamonds have virtually become a paradigm shift in the diamond industry, involving the issues of affordability, sustainability, and ethics. The rise of their industry is a crossroads for the natural diamond industry, and a question of its future and the legacy of diamonds as symbols of permanence. Bringing unique insights into how the lab-grown diamond market is challenging and changing an iconic industry, this paper explores how lab grown diamonds are reshaping investment trends, market dynamics and market economics associated with mining.

### 3. Market Share Comparison: Lab-Grown vs. Natural Diamonds

#### 3.1 Current Market Dynamics

Price per one-carat-stone



Guardian graphic. Source: Tenorix. Note: Based on retail sales data of more than 2,000 US jewellery stores

In recent years, lab grown diamonds (LGDs) have experienced a rapid rise in the world diamond market. As of 2024, the market is estimated to be worth \$147.8 billion with LGDs making up \$27.2 billion or 18.4% of the market. This number is very significant and shows the rapid uptake and increasing consumer acceptability of LGDs.

This trend is due to a number of factors. The technological breakthroughs enable the production of high quality LGDs which are nearly identical to their natural counterparts. These lab grown stones are cheaper than mined diamonds and customers can buy them for a fraction of the price. Additionally, shoppers who value the environment are attracted to LGDs because they are believed to be more ethically and sustainably sourced.

On the other hand, because of its historical significance and well-established standing as a luxury good, the natural diamond category still accounts for a bigger share of the market. In the conventional buyer's mind, natural diamonds have always been associated with durability and scarcity. However, this portion has problems. Natural diamond prices reportedly have fallen 26% since 2020. The reasons for this loss have been attributed to a global economic slump, a fall in demand in key areas such as China and the growing popularity of LGDs.

The changing preferences of consumers, especially those of the younger people are one of the major factors in this market evolution. Natural diamonds are not as popular among them as they are more concerned with price, sustainability and ethical issues, which is why they prefer LGDs.

#### 3.2 Projected Growth Trends

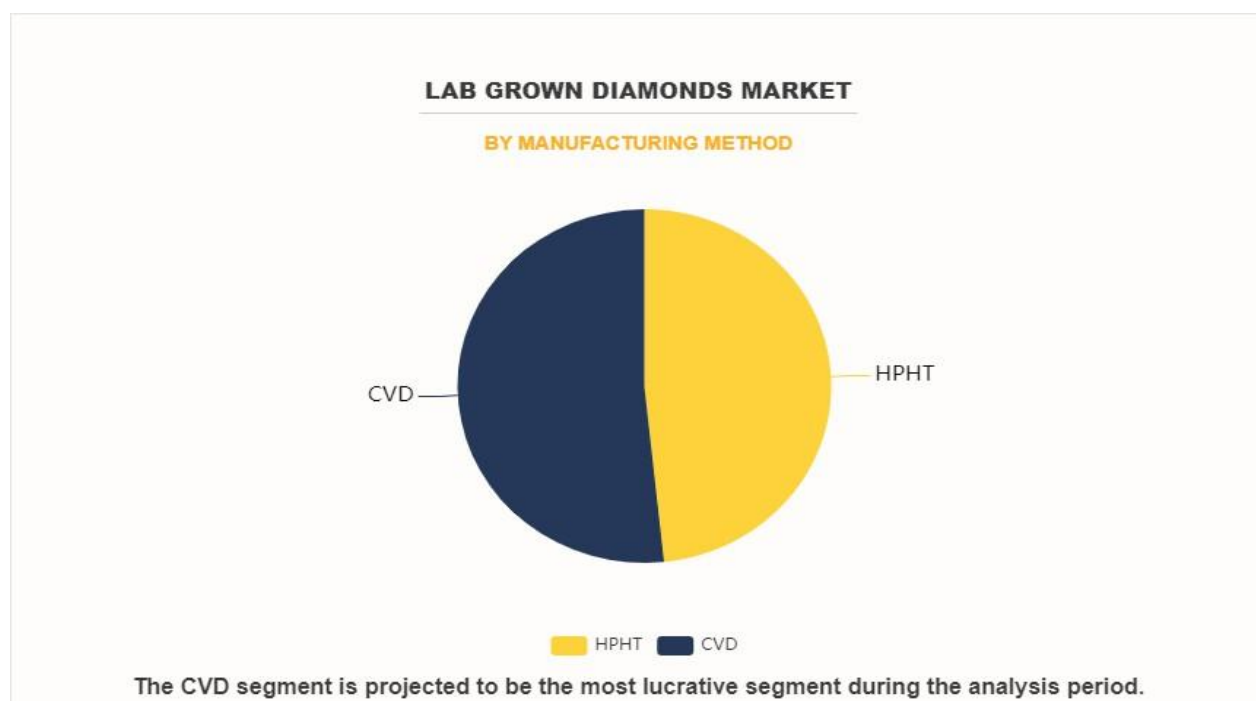
The lab grown diamond (LGD) market is expected to account for more than 25 % of the whole diamond market by 2030. This is being supported by an environmental consciousness, changes in consumer preference, and better industrial methods.



Source: Allied Market Research

As of 2022, the value of this market was at \$24 billion and is expected to grow 9.6% annually to reach \$59.2 billion by 2032. During the course of the decade, the bar graph clearly shows consistent growth and as a result this is an indication that there is a growing demand and adoption of lab grown diamonds related to, affordability, sustainability, as consumers tastes shift.

### Technological Advancements Driving Growth



Source: Allied Market Research

Modern Chemical Vapour Deposition (CVD) or High Pressure High Temperature (HPHT) synthesis has greatly altered the manufacture of LGD. They cut prices drastically while allowing producers to produce diamonds that are identical to natural ones. LGD production has been faster and more efficient in order to meet the growing demand.

### Environmental Considerations

Lab grown diamonds are said to be more environmentally friendly than diamonds that are mined. According to reports, the carbon footprint of LGD production is up to 85% less than that of conventional mining. Furthermore, LGDs steer clear of the social exploitation, water pollution, and deforestation that are frequently connected to natural diamond mining. This is in line with the ideals of Gen Z and millennial consumers who care about the environment and are pushing the market for sustainable luxury goods (Bain & Company, 2024).

### Challenges: Price Declines and Oversupply

The market is oversupplied as a result of LGDs' explosive expansion. Although the substantial 74% decline in LGD pricing since 2020 has increased accessibility, it has also sparked worries about the long-term stability of the market (The Guardian, 2025).

## Natural Diamond Market Outlook

Jewellery sales of natural diamonds are expected to rise modestly from \$43 billion in 2022 to \$54 billion in 2030. The younger generation's emphasis on ethics and affordability, however, poses a problem. The major market for natural diamonds continues to be luxury buyers who appreciate heritage and rarity (Financial Times, 2023).

## Industry Adaptation

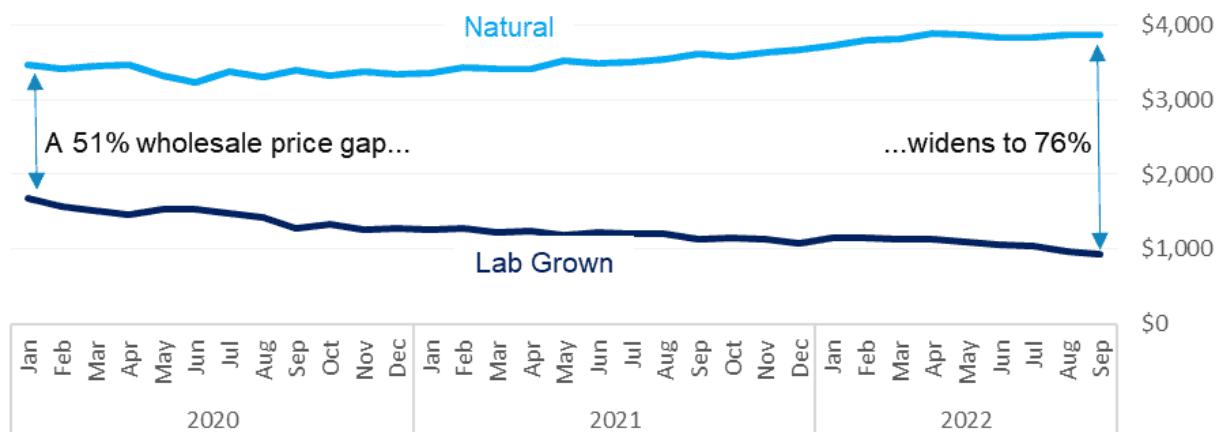
In response, businesses such as De Beers are diversifying their holdings and making investments in the production of LGD. Additionally, they have cut the production of natural diamonds by 20% and concentrated on advertising efforts that emphasise the emotional significance and scarcity of mined diamonds (The Guardian, 2025).

## 4. Cost-Benefit Analysis of Lab-Grown Diamonds

### 4.1 Cost Efficiency

#### A Price Gap That Only Widens

Wholesale price trend of 1-carat round natural & LG diamonds



Source: Tenoris.bi

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When compared to real diamonds, lab-grown diamonds (LGDs) are roughly 70-80% less expensive to make. This notable pricing disparity is due to the manufacturing procedures used for LGDs. Natural diamonds are extracted from the soil through time consuming and labour intensive processes, whereas LGDs are grown in labs using cutting edge technologies. The two main processes that control the manufacture of LGD are High Pressure, High Temperature (HPHT) synthesis and Chemical Vapour Deposition (CVD). CVD produces diamonds by allowing carbon gases to progressively crystallise into diamonds by subjecting them to extreme heat and pressure inside a chamber. HPHT recreates the natural processes that create diamonds deep under the earth by using high pressure and temperature to turn carbon into diamond. These technologies have allowed diamonds to be created at a faster rate and for a fraction of what traditional mining diamonds costs, LGDs are now inexpensive enough to compete in the global market. The International Grown Diamond Association (2024) study states that LGDs are becoming more affordable to consumers as production costs are decreasing annually (IGDA, 2024).

### 4.2 Environmental Impact

Lab grown diamonds are considered to be more environmentally friendly than natural diamonds. Traditional diamond mining accounts for several environmental problems such as deforestation, soil erosion, water pollution, and elevated carbon emissions. It takes an estimated 250 tonnes of earth to be moved and more than 125 kilogrammes of carbon dioxide to produce one carat of mined diamond (World Economic Forum, 2022).

However, the environmental impact of producing a lab grown diamond is much less. Bain & Company (2023) shows, for instance, that LGDs can use up to 50% less energy or produce 85% fewer carbon emissions than mined ones. Additionally, the manufacture of LGD does not disturb the land and protects habitats and ecosystems that are often destroyed during mining operations. LGDs are especially attractive to consumers concerned about the environment because of their less detrimental effects on the environment. As people become more aware of the climate change and sustainability (Bain &

Company, 2023), younger generations are choosing to buy lab grown diamonds as an ethical and environmentally responsible choice.

#### 4.3 Perceived Value

LGDs provide sustainability and cost benefits but natural diamonds continue to have a premium position in the premium market because of perceptions of authenticity and rarity. Natural diamonds are in high demand for significant occasions like engagements and anniversaries since they are frequently regarded as a symbol of timeless love, individuality, and tradition.

Marketing initiatives from large diamond mining firms, like De Beers, that highlight the "forever" quality of natural diamonds serve to further bolster this emotional worth. Lab-grown diamonds cannot completely replace the status and family legacy that come with the rarity of natural diamonds in many cultures, particularly in Asia (DeBeers Group, 2023). Younger generations, especially Gen Z and millennials, are more practical when it comes to buying diamonds, nevertheless. Many people believe that LGDs have the same physical characteristics as real diamonds but are more affordable and environmentally friendly, making them more accessible. According to an MVI Marketing poll from 2024, 70% of millennials think about LGDs while buying diamond jewellery due of its ethical appeal and cost (MVI Marketing, 2024).

#### Summary

For contemporary consumers, lab-grown diamonds make a strong argument since they are innovative, affordable, and sustainable. Notwithstanding these benefits, natural diamonds maintain their status in the luxury market due to their emotional and symbolic worth. The decision between lab-grown and natural diamonds will probably come down to personal priorities as both markets develop, whether those priorities are influenced by tradition, cost, or the environment.

### 5. Regional Adoption Trends

#### Lab Grown Diamond Jewellery Market Size in India, 2023-2030



Note: Non-jewellery applications of Lab Grown Diamonds are not included

Source: Secondary Research, Mywisdomlane Estimates

#### 5.1 The UK and US Markets

As a result of their innovative cultures and progressive customer bases, the United States and the United Kingdom have become leaders in the adoption of lab-grown diamonds (LGDs). This change is being driven by younger populations in these nations, especially millennials and Gen Z, who place a high value on cost, sustainability, and ethical sourcing.

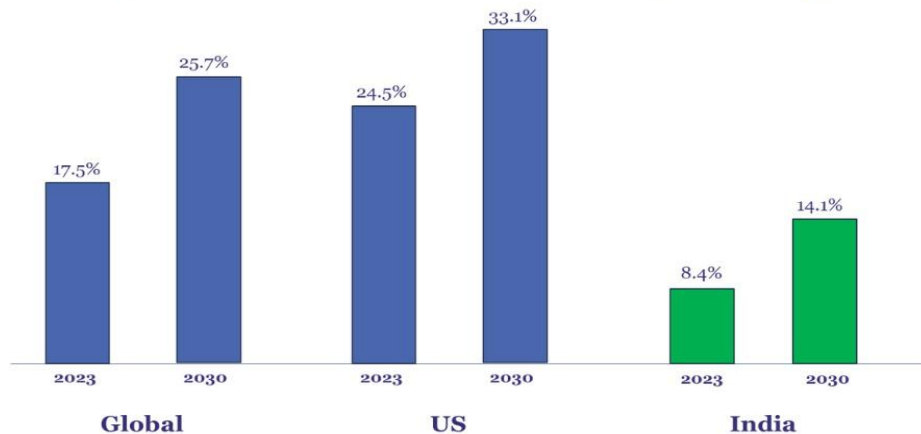
While sales of natural diamond jewellery fell by 0.7% during the same period, LGD sales in the US increased by 12.5% through November 2024 (Bain & Company, 2023). This striking disparity demonstrates how American consumers' tastes are changing. Lab-grown diamonds are often seen as a sustainable and economical substitute for mined diamonds by millennials and Gen Z, who currently make up the bulk of diamond sales in the United States. Their purchasing decisions are often influenced by the desire to minimize environmental harm and avoid the ethical concerns associated with traditional diamond mining, such as unsafe labor practices and conflict diamonds (MVI Marketing, 2024).

The demand for LGDs has increased in the UK as well. According to UK retailers like Taylor & Hart, LGDs account for an increasing percentage of their sales, especially for personalised jewellery and engagement rings. The traceability and transparency provided by LGDs, along with their capacity to provide premium goods without the environmental and social consequences linked to diamond mining, are highly valued by many British consumers (Retail Jeweller, 2023).



## 5.2 Asian Markets: India

### LGD Jewellery as a % of Natural Diamond Jewellery, 2023-2030



Note: The % share indicate LGD jewellery market size (in value terms) as a % of natural diamond jewellery market size

Source: Secondary Research, Mywisdomlane Estimates

India, one of the biggest diamond consumers in the world, has demonstrated a slower demand-side adoption of LGDs than Western markets. This hesitancy is a result of ingrained cultural beliefs that link natural diamonds to wealth, status, and good fortune. Natural diamonds have symbolic value that lab-grown substitutes have not yet been able to match in nations like India, where diamonds are frequently given as wedding presents and during important life events (GIA Research, 2023).

Although there is still little consumer demand for LGDs, China and India are quickly rising to the top of the worldwide LGD manufacturing market. These nations are perfect for establishing LGD production facilities since they have cheap labour and production costs. The world's centre for diamond polishing, Surat, India, for example, has emerged as a major producer of LGD, with many companies using state-of-the-art CVD and HPHT technology (Economic Times, 2024). In a similar vein, China has made significant investments in the creation of LGDs, using its experience in industrial diamond manufacturing to increase the output of lab-grown diamonds of gem quality (Frost & Sullivan, 2023).

Although there is currently little consumer acceptance in these areas, there are indications that things are starting to change gradually. The market for LGDs is anticipated to increase as younger urban customers in places like Beijing, Shanghai, and Mumbai grow more cost-conscious and ecologically concerned. According to a recent McKinsey & Company survey from 2023, 40% of young people in China and India would buy LGDs if they were promoted as environmentally beneficial. (McKinsey & Company, 2023).

#### In Summary

Since younger consumers are more concerned with affordability and sustainability, the US and the UK are leading the way in the acceptance of lab-grown diamonds. China and India, on the other hand, control the manufacture of LGD and are therefore important participants in the industry's supply chain, despite their sluggish consumer acceptance. These geographical trends will probably converge as cultural perspectives change and worldwide demand keeps increasing, which will further accelerate the LGD market's growth.

## 6. Consumer Perception

### 6.1 Environmental Awareness

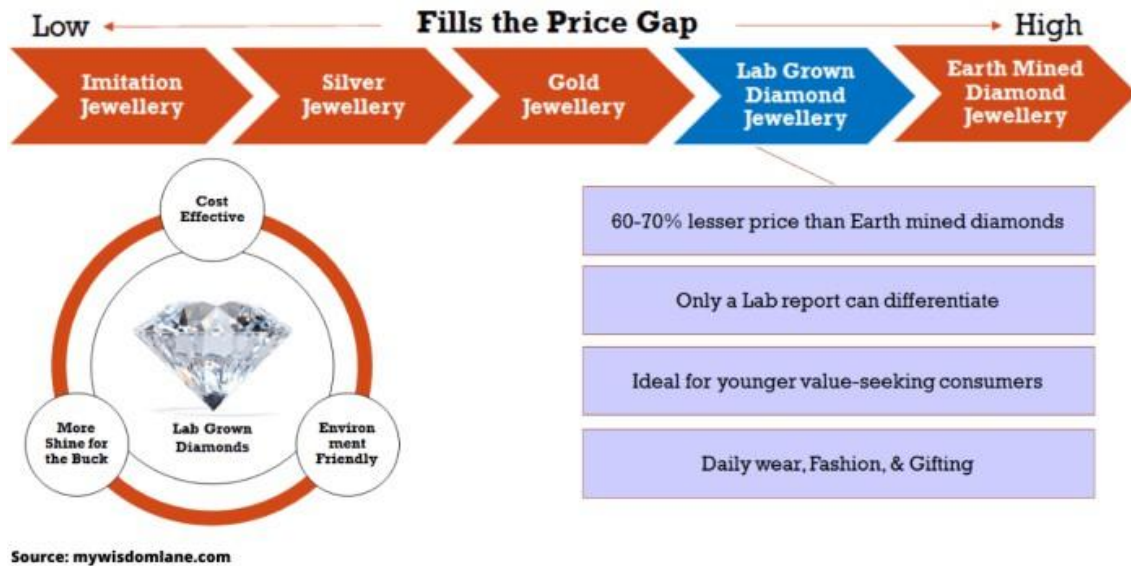
The fact that lab-grown diamonds (LGDs) are more environmentally friendly is one of the primary factors driving consumer preference. Deforestation, water pollution, and excessive carbon emissions are just a few of the negative environmental effects of traditional diamond mining. For instance, around 250 tonnes of earth must be moved and 125 kilograms of carbon dioxide are released in order to produce one carat of a mined diamond. On the other hand, lab grown diamonds are made under controlled conditions from methods that use much less carbon and consume fewer natural resources.

Frost & Sullivan poll suggests that 85% of consumers who bought lab grown diamonds were influenced by sustainability. It shows a larger trend of consumers wanting to buy high quality goods.

Moreover, procured lab grown diamonds have no ethical implications like the case with 'blood diamonds' that are mined in conflict areas and used to fund violence. Important to many buyers, lab grown diamonds are made in a way that no human rights abuses take place.

### 6.2 Generational Influence

## Lab Grown Diamond: Consumer Benefits



Younger generations are driving the market for lab-grown diamonds, particularly Millennials and Gen Z. Affordability, transparency and sustainability are values that lab grown diamonds satisfy, and these organisations put a very high value on these things. Research shows that 60-70 per cent of Gen Z and Millennials are open to buy lab grown diamonds because of the environmental and ethical advantages.

Another reason younger consumers are attracted to LGDs is that they are much cheaper—around 60-70% less expensive than natural diamonds. With financial pressures like student loans and housing costs, lab-grown diamonds provide a way for these younger buyers to afford high-quality jewelry without going over budget.

Natural diamonds are still preferred by older generations, such as Gen X, who view them as rare, valuable, and meaningful. Natural diamonds are frequently associated with significant life events and are seen by many as a sign of prestige and tradition. Even older generations, though, are beginning to accept lab-grown diamonds. According to a 2023 survey, 30% of Gen Xers stated that if lab-grown diamonds were promoted as sustainable and of a calibre equivalent to natural diamonds, they would buy them.

### In Summary

Consumer attitudes towards lab-grown diamonds are split along generational lines. Younger generations are drawn to LGDs for their sustainability and affordability, while older generations still favor natural diamonds for their rarity and emotional value. As the diamond market grows, businesses must cater to both groups—offering eco-friendly options for the younger crowd and maintaining the traditional appeal of natural diamonds for older buyers. To succeed, companies will need to strike a balance between luxury and sustainability, adapting to the changing values of today's consumers.

### 7. Economic Impact on Mining-Dependent Economies

#### 7.1 Declining Revenues from Natural Diamond Mining

Diamond mining is a major source of revenue and employment for nations like Botswana, Russia, and the Democratic Republic of the Congo. Lab grown diamonds (LGDs) are becoming increasingly popular as the demand for natural diamonds depreciates. This means that these countries could lose diamond export earnings, fewer jobs, lower tax receipts and less public services. For example, a drop in demand for natural diamonds would affect other businesses in Botswana, such as infrastructure and transportation, which are based on diamond mining. If diamond mining jobs are not replaced by new businesses or skills, unemployment, social issues and poverty may increase in these areas.

#### 7.2 Opportunities for Diversification

However, the rise of lab grown diamonds gives these nations an opportunity to diversify their economy. Since they already have the infrastructure, trained labour and technology from conventional diamond mining, these nations can start producing lab grown diamonds. Investing in this new sector may reduce the dependence of countries like Botswana on natural diamonds and countries like Botswana may join the expanding LGD market. They can also attract foreign investment by creating a favourable business environment for the lab grown diamond enterprises. This could also create new employment opportunities in the environmentally friendly sectors of LGD manufacture and technological development, which would help these nations recover from the revenue losses from natural diamond mining.

## 8. Investment Trends and Market Capitalization

### 8.1 Shifting Investment Patterns



A lot of money is being spent on LGDs, in research, production and technology. Investors view this as a huge possibility because LGDs are more ethical and environmentally benign than mined diamonds. Production of LGDs is done in controlled environment, so the demand can be met easily as compared to wild diamonds that have limited supplies and hurt the environment. LGDs have become a desirable investment choice as the interest in sustainable products has grown. Investors view LGD companies as a wise choice because of the increase in interest, which means more funds are going to these companies, enabling them to grow and enhance their offerings.

## 8.2 Implications for the Luxury Market

The luxury market is evolving as lab-grown diamonds gain popularity. Luxury companies continue to emphasise the uniqueness and scarcity of natural diamonds, even though LGDs are gaining popularity in the mid-tier market because to their affordability and sustainability. Natural diamonds are regarded by these brands as status and wealth markers. High-end businesses may need to adapt as LGDs proliferate by providing both lab-grown and natural diamonds to appeal to environmentally conscientious customers. This will require businesses to come to a compromise between delivering on the rising demand for ethical and sustainable alternatives against the highly luxurious appearance of natural diamonds. To target these market sectors, astute investing tactics will have to be used.

## 9. Conclusion

The lab grown diamond industry is definitely changing the global diamond market and it is becoming clear that this is not a passing trend. Lab grown diamonds are the perfect fit for what we want, sustainable, ethical and most importantly affordable, to what is otherwise seen as unattainable luxury. The fact is that consumer tastes are changing, even though genuine diamonds are still attractive as status, unique and authentic symbols. Younger generations are spearheading this change. They think more of sustainability, as well as moral behaviour. As a result, the diamond market now is at a crossroads, making mining dependent economies have to change or otherwise risk being left behind.

This is especially true in sectors such as sustainable technology and manufacturing because the rising lab grown diamonds present these economies an opportunity to diversify and explore new avenues for growth. But the clock is ticking. Failing to innovate and choosing to ignore this change could result in diamond companies that traditionally thrived seeing them fail in a market becoming less willing to choose exclusivity over eco consciousness. Ultimately, the diamond industry will have to evolve, whether it's to embrace lab grown diamonds or to work to clear up lucrative and environmental concerns of today's consumer. The path is being forged into the future of diamonds, and those that adapt to it will do well in it.

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