



# The Strategic Path and Policy Consideration of Trade of Cultural Products Among WTO Member Countries: Taking the Circulation of Cultural Products Derived from Dunhuang Murals as an Example

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## ABSTRACT

Transnational tourism has increased cultural product trade. Trade of cultural heritage like China's Dunhuang Murals illustrates this in the study. The Dunhuang Murals, a famous Chinese cultural depiction, have inspired many cultural tourism offerings. These products, along with murals, are popular with foreign tourists, requiring a WTO trade strategy. This study examines Dunhuang Murals' cultural tourism product trade strategy and policy. Murals are not the focus, but the commercialization of products inspired by them. China's role in the WTO, Dunhuang Murals supply chain optimization, tourist preferences, and WTO cultural product trade implications are examined in the study. This study uses mixed methods in which surveys and trade analysis provide quantitative data, while stakeholder interviews and focus groups provide qualitative data. International trade agreements and cultural heritage protection laws are contextualized by extensive document analysis. A sample includes reliable 384 tourist responses are analyzed to identify key characteristics and spending habits. For qualitative research analysis, we conducted 12 interviews for more clarification of context. The results show that a complex business ecosystem is revealed by Dunhuang Murals product trade analysis. The findings emphasize sustainable tourism, authenticity, quality, and fair trade. This study found that addressing supply chain issues, ensuring product authenticity and quality, and implementing fair trade policies optimizes cultural product trade. Policymakers, stakeholders, and cultural heritage agencies can use the findings to promote sustainable tourism and trade while preserving the Dunhuang Murals.

**Keywords:** World Trade, Supply Chain Optimization, Dunhuang Mural Elements, Product Export, Cultural Relics.

## INTRODUCTION

Strategic trade approaches go beyond trade legislation and international trade dynamics. These plans include economic, political, and social purposes. Skilful trade, export, and IP discussions boost national and global interests. Trade gains should be balanced with technical innovation, environmental sustainability, and cultural preservation. These views emphasise trade's connectivity with national and global goals and the need for proactive and dynamic efforts to manage international commerce's complex and changing terrain (Dom, Zabielskis, & Liu, 2023; Nye, 2004; Shi et al., 2023). Dunhuang Murals-derived products must combine economic progress and cultural preservation. Keep the Dunhuang Murals authentic and offer economic opportunity for local communities and stakeholders by using sustainable trading methods. Murals and nearby areas need ethical

products and ecotourism (Wang, 2021; Zhang, 2022). These cultural products need strong trade agreements and IP rights to trade worldwide. Such measures are needed to maintain the Dunhuang Murals' cultural legacy, prohibit unauthorised use, and compensate their guardians economically (Dom et al., 2023; Kuranovic, 2020). Strategic trade techniques are reviewed to learn policy and practise lessons to maximise the Dunhuang Murals' economic value.

The UNESCO World Heritage Site Dunhuang Caves boasts an unrivalled collection of ancient paintings, sculptures, and manuscripts (Dai, 2021; Smorodinskaya, Katukov, & Malygin, 2021). Cultural preservation is important, but the Dunhuang Murals trade may be profitable. More than trade restrictions are needed to balance commercial interests with cultural preservation. Strategic Trade Approaches tailor international trade policy to economic, political, and social goals (Yang, 2022). Dunhuang Murals' strategic trade tactics show the delicate balance between cultural asset protection and economic development (Shi et al., 2023). Tourist spending on products is a great method to make money, but it must be done carefully to maintain murals and Dunhuang Caves Culture (Sun, Lin, & Higham, 2020). Building on previous research, this study investigates visitor spending trends and sustainable methods to balance economic requirements and cultural preservation. We examine Dunhuang Murals' strategic trading methods to create economically and culturally responsible trade solutions (Nguyen & Yang, 2021). This strategy combines Dunhuang Caves' sustainability and culture with commercial opportunity. Globalisation and cultural heritage protection are examined in the study (Liang, 2022).

The UNESCO World Heritage Site Dunhuang Caves has rare murals, sculptures, and manuscripts. While cultural preservation is vital, mural-inspired items may profit. Trade restrictions alone cannot balance business and culture. Economic, political, and social interests must guide international trade policy (Liang, 2022; Nye, 2004). Strategic trading strategies for the Dunhuang Murals show how cultural preservation and economic growth coexist. Tourist spending on mural-related products is profitable, but it must be managed to preserve Dunhuang Caves' culture. This study examines visitor spending trends and sustainable ways to balance economic requirements and cultural preservation, building on earlier studies (Takamia & Qadima, 2021; Zheng & Liu, 2022). Dunhuang Mural circulation processes are examined to find economically and culturally responsible trade alternatives. Balanced sustainability, cultural preservation, and profit. Cultural assets must be protected by ethical trading as globalisation grows. The Dunhuang Murals show how strategic trade policies may balance economic progress and cultural sustainability (Fayard, 2022; Dou & Xu, 2023).

Trade moves goods, ideas, and people, enabling cross-border culture. Interconnectedness threatens cultural artifacts. A sophisticated international trade regulation network balances commercial interests and cultural heritage to solve these problems. This WTO-regulated system promotes free trade and cultural heritage. This framework allows member nations to restrict trade to preserve their cultural legacy, reflecting the complicated relationship between trade and culture. International trade has made China a worldwide economic powerhouse since joining the WTO in 2001. Economic growth threatens China's cultural legacy, especially the Dunhuang Murals. Cultural relics are protected under international trade law. The 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property restricts cultural product exports and imports to prevent looting and unlawful trafficking (Xu, Zhang, & Wu, 2023; Yang, 2022).

To preserve their cultural heritage, countries may ban trading on essential objects. Origin and export licences track cultural goods and prevent forgery and illegal trade. Understanding and using international trade law allows China to govern global trade and preserve cultural artefacts like the Dunhuang Murals. Responsible commerce encourages ethical production and sustainable tourism to preserve culture (Peng & Zhang, 2020).

The business potential of cultural heritage places like the Dunhuang Murals is studied, but how to merge commercial benefits with cultural preservation under international trade legislation is unknown. Strategy can encourage ethical trade and sustainable tourism for cultural heritage places like the Dunhuang Caves by working with international trade legislation, export controls, and intellectual property safeguards. As evidenced by the Dunhuang Murals, strategic trading strategies are poorly understood, especially in the delicate balance between economic progress and cultural asset preservation (Peng & Zhang, 2020; Shao et al., 2023). This study examines economic trends surrounding this cultural monument from multiple angles. The study begins with China's WTO position and Dunhuang Murals' commercial methods (Feng & Ma, 2023; Zhang, 2022). WTO laws are examined to discover how China may utilize its participation to promote responsible commerce that safeguards the Dunhuang Murals and promotes international trade (Hu et al., 2024; Song, 2021). Second, the initiative examines how Dunhuang Murals-inspired product purchases affect sustainable tourism at the Caves. To protect the site's cultural and environmental integrity, evaluate how trading tactics affect spending patterns and sustainability activities.

Supply chain optimisation for Dunhuang Mural-inspired goods is also examined. Fair recompense for local

artisans and rigors intellectual property rights are needed to ensure artefact authenticity and cultural relevance. Finally, the research tries to identify and evaluate strategic trade methods that support economic growth and protect the Dunhuang Murals. commercial methods and their impacts are examined to inform government choices and commercial practices that further the Dunhuang Murals' legacy. This research shows us how cultural heritage sites like the Dunhuang Caves may thrive economically while preserving their treasures and practicing ethical trade. The findings may affect Dunhuang Caves policy, trade, sustainable tourist development and other cultural heritage sites with similar concerns.

## LITERATURE REVIEW

Trading cultural objects and commodities must balance profit and preservation. Trade improves local economies and cultural preservation, according to literature (Feng & Ma, 2023; Liu, Ross, & Ariyawardana, 2023; Yang, 2022). Studies suggest that tourism boosts the local economy and conservation efforts at cultural sites like Dunhuang Caves (Hu, Wu, & Cang, 2024; Song, 2021). Experts worry about cultural property monetization and the consequences of increased tourism, such as overcrowding and bad tourist management harming artefacts and sites (L. Liu et al., 2023). Strategic trading methods that promote economic growth and cultural preservation are discussed. Strategic trade tactics study helps nations build trade strategies beyond export maximization (Mamirkulova et al., 2020). Studying technological innovation, national security, and sustainable development. Strategic trade frameworks help governments balance economic goals with national goals while appreciating the cultural and historical relevance of places like the Dunhuang Murals (Cappelletti, 2022; Yang, 2023).

Cultural heritage sites need sustainable tourism. To preserve cultural treasures and the environment, visitor flow management, eco-friendly infrastructure, and responsible tourism are investigated (Gao, Han, Jin, & Su, 2022; F. Liu, Md Yusoff, & Alli, 2024). These findings can help Dunhuang Murals' strategic commerce goals include sustainable tourism for commercial and environmental benefits (Rong, 2020). In cultural product development, supply chain management and ethical trade research emphasize equitable recompense for craftspeople and intellectual property rights. Scholars advocate transparent, ethical supply chains to preserve culture and recompense local craftspeople. To preserve the Dunhuang Murals' cultural and ethical values, strategic commerce must embrace these objectives. Despite these excellent contributions, the research lacks a coherent framework for Dunhuang Mural-specific strategic trade tactics (Sumarmi et al., 2022; Zhu & Ni, 2023). Interdisciplinary study on cultural heritage trade's economic, cultural, and environmental effects can close this gap.

Cultural treasure Literature examines Gansu's Dunhuang Murals for smart business practices. Tourism preserves cultural heritage and makes money (Jaelani, Hayat, Luthviati, Al-Fatih, & Mujib, 2023; Sumarmi et al., 2022). Several studies suggest that tourism may help local economies and maintain culture (F. Liu et al., 2024; Rong, 2020; Tantcheva-Burdge, Lei, & Cheung, 2023). Along with these benefits, cultural heritage commodification and tourism's harm to historical sites have been noted. Beyond export maximisation, strategic trade principles underpin strategies (Nguyen & Yang, 2021; Shi et al., 2023; Smorodinskaya et al., 2021). These approaches acknowledge trade's complexity and promote international trade to achieve economic, political, or social goals. In Dunhuang Murals, strategic trade practices balance economic gains and cultural preservation. The IPR, export regulations, and international trade agreements can promote responsible trade and culture.

WTO participation shapes Chinese trade strategies. China's economy has grown since joining the WTO in 2001. Fair trade and IP protection are WTO goals. China's WTO position is crucial to understanding how it uses trade agreements to promote ethical Dunhuang Mural trading. For cultural and environmental preservation, sustainable tourism is appealing. Sustainable tourism includes eco-friendly infrastructure, tourist management, and ethical tourism, the study finds. Tourism must protect cultural places like the Dunhuang Caves while making money (Kuranovic, 2020; Sun et al., 2020; Zhang, 2022; Zheng & Liu, 2022).

International trade and cultural heritage protection are studied using China's Dunhuang Murals. Through its intricate weaving of international trade regulations and cultural heritage protection measures, the narrative shows how states must balance economic growth with artefact conservation. The essay describes the changing trade governance landscape, which allows member nations to safeguard their cultural riches without compromising free trade objectives by situating the issue within the WTO and its acceptance of cultural assets. China's 2001 WTO accession shows how commerce may promote economic progress and cultural preservation. China's economic progress and Dunhuang Murals conservation demonstrates the states' difficult balance. International agreements like the 1970 UNESCO Convention emphasise multilateral collaboration to prevent illicit trafficking and safeguard cultural riches.

According to international trade law, export permits and certificates of origin protect cultural objects. To

prevent counterfeiting and unlawful sales, the global cultural economy needs these approaches. The story promotes responsible trading and strong cultural asset protection, arguing that trade ethics should go beyond legal frameworks to include ethical considerations in cultural product commerce (Liang, 2022; Dou & Xu, 2023; Song, 2021) show that for Dunhuang Mural-derived objects, ethical commerce is crucial. Globalisation has made ethical commerce more important to protect cultural sites and economic interests. Smart commercial approaches to protect the Dunhuang Murals and stimulate economic growth are discussed. Sustainable tourism and international trade limitations are needed to protect cultural and environmental assets. Discussion covers ethical trade's economic, cultural, and environmental impacts. Using global economic dynamics, the article explains how nations might combine economic growth with cultural heritage protection in a globalised world. This strategy demands vast knowledge of cultural heritage trading ethics and supply chain management. Cultural heritage trade needs ethics and supply chain management.

Protection of Dunhuang Murals-inspired cultural artefacts requires fair compensation for artists and intellectual property rights. Buying, making, and selling ethical cultural products requires a holistic approach. An ethical, well-structured business framework that preserves culture and promotes economic sustainability is essential (Nguyen & Yang, 2021; Nye, 2004). The cultural heritage trade, particularly Dunhuang Murals' sustainable commerce structure, visitor spending, and cave sustainability, needs more research. These goals necessitate ethical commerce supply network optimisation and cultural object IP protection (Shi et al., 2023). Meeting these study gaps will show how clever trade measures can enhance economic growth and preserve cultural heritage sites like the Dunhuang Caves. Thus, strategic trading of Dunhuang Murals-derived cultural products indicates how states can reconcile economic growth and cultural preservation. By promoting ethical trade and cultural preservation, nations may benefit from global trade and preserve their legacy.

## METHODOLOGY

To understand Dunhuang Murals' strategic trade practices, hybrid methods are used. We collect and analyse qualitative and quantitative data. We interview government authorities in cultural heritage administration, tourism officials, international trade law experts, and art market players in semi-structured qualitative interviews with 12 participants. These conversations cover trade, tourism, and the Dunhuang Murals. Focus groups with Dunhuang Caves visitors reveal their shopping habits, sustainable tourism views, and perspectives. We investigate government policies, WTO legislation, Dunhuang Murals, and cultural heritage trade research. Quantitative surveys of Dunhuang Caves visitors and the public measure demographics, cultural heritage items purchases, and sustainable tourism attitudes. Trade trends are examined using official Chinese cultural heritage import and export data, particularly Dunhuang Murals. Our independent variables are Chinese WTO position and sustainable tourism, and Dunhuang Murals' strategic trading practices are our dependent variable. Tourist demographics and Dunhuang Murals awareness may change the independent-dependent relationship (Dai, 2021; Nguyen & Yang, 2021; Zhang, 2022).

Focus groups with Dunhuang Caves visitors examine their buying habits, sustainable tourism viewpoints, and cultural heritage goods preferences. The study shows tourist demographics and Dunhuang Caves' item choices. The 384 tourist replies reveal visitor traits and spending behaviours. This table shows travellers' Dunhuang Mural product preferences by age, nationality, and trip type. This data is crucial for Dunhuang Caves' consumer evaluation and product and marketing stakeholder insights. Dunhuang Caves tourists were questioned for real-time data and demographics. Age, country, travel interests, and Dunhuang Mural items interest were surveyed. Relevant and accurate on-site data revealed visitor demographics and customer behaviour. This method reveals tourist shopping habits in cultural heritage sites like the Dunhuang Caves.

Our research prioritizes ethics. Everyone gives written informed consent for the research and their right to withdraw. Anonymized research data and participant confidentiality are assured. We revere the Dunhuang Murals and follow cultural heritage research ethics. Our data sources include recruitment through relevant institutions and organisations, Dunhuang Caves electronic and hard copy surveys, academic journals, government websites, official reports for document analysis, and trade data from reputable sources like the WTO or Chinese customs data portals. This whole framework explains Dunhuang Murals' sophisticated business processes.

### Leveraging Trade Agreements

China promotes ethical Dunhuang Murals products while following IP laws through WTO membership. WTO rules allow China to trade Dunhuang Mural goods fairly and transparently. WTO TRIPS safeguard mural IP. China can improve its global market position and conserve cultural assets by supporting ethical Dunhuang Mural production and commerce through strategic negotiations and WTO compliance. Sustainable tourism at Dunhuang Caves boosts mural tourism. Sustainable, ethical tourism grows. Sustainable tourism and environmental

conservation support Dunhuang's economy and culture. Dunhuang Mural product manufacturers must promote sustainable materials, ethical employment, and fair trade to integrate sustainability throughout their supply chains. Sustainable design, manufacturing, and marketing that meets environmental and social responsibility criteria attract conscious consumers and maintain culture.

### **Supply Chain Optimisation**

Dunhuang Mural authenticity, quality, and fair trade potential. Buy authentic products to maintain Dunhuang's culture and please customers. Inspection and certification reduce fakes. Fair remuneration and working conditions for craftsmen promote supply chain social responsibility. To optimise supply chains, industry, government, and communities must collaborate. Shared resources, skills, and best practices can help stakeholders solve problems, grasp opportunities, and create a sustainable, ethical business environment that supports the local economy and culture. Cultural understanding and tourist demography affect Dunhuang Mural item preferences. Heritage organisations can tailor products to travellers' ages, countries, and goals. Cultural understanding raises tourists' admiration for Dunhuang's history and souvenir sales. Cultural heritage officials could attract visitors by creating shop collections that reflect the Dunhuang Murals' art and history. Storytelling, product design and marketing education can enhance sales and link people to cultural heritage sites. These initiatives safeguard the Dunhuang Murals, improve visitor experience, and assure financial stability.

China's WTO position and sustainable tourism are our independent variables, while the Dunhuang Murals' strategic trading practices are our dependent variable. We determine buying intentions from their choices. A quantitative analysis of tourist demographics and cultural heritage product purchases will improve our qualitative approach. This survey assesses passengers' age, country, trip style, and Dunhuang Mural product interest. We analyse qualitative and quantitative data to evaluate tourist preferences and commercial potential.

We conducted interviews with Dunhuang Mural goods supply chain craftsmen, producers, and retailers in our qualitative study. Questions will encompass authenticity, quality, fair trade, and sustainable production potential and issues. Understanding stakeholder viewpoints increases supply chain credibility and sustainability. Dunhuang Murals and other Chinese cultural heritage trade statistics will boost our qualitative approach. Quantitative analysis indicates origin and destination countries, revealing supply chain inefficiencies or opportunities. Authentic and sustainable supply chains are optimised by quantitative and qualitative data.

A qualitative study used interviews with government officials and cultural heritage experts to examine China's WTO policy's impact on Dunhuang Mural merchandise trade. Our conversations explore ethical and sustainable business using WTO rules. Through international trade agreements, stakeholder insights can improve Dunhuang Mural merchandise ethics and sustainability. In addition to the qualitative study, we will evaluate Dunhuang Caves' sustainable tourism data. This quantitative study will assess how visitors and rubbish management affect Dunhuang Mural sales and tourist satisfaction. We will use qualitative and quantitative data to study Dunhuang Murals' strategic trade plans and WTO laws and sustainable tourism. For qualitative analysis to be ethical, participants must give informed consent and know they can leave.

## **RESULTS**

The collected questionnaires were processed, and it was examined that there were no outliers in the respondents' answers and 384 valid questionnaires. Descriptive statistical analysis was used to describe the general information of the respondents and the frequency tables of each item were output and the collated results are shown in [Table 1](#).

From [Table 1](#), it can be seen that from the perspective of gender, men accounted for 19.5%, women accounted for 80.5%, and women accounted for the majority of the respondents, which is consistent with the actual situation that the main audience group of silk scarf users is women; from the perspective of the place of residence, the number of respondents living in Shandong Province is higher, accounting for 54.2% , and 176 respondents from other provinces accounting for 45.8%; from the place of birth perspective, the largest number of respondents were born in Town cities, accounting for 37.2%, followed by respondents born in Rural area, accounting for 32.6%, Second big cities, accounting for 20.8%, and Big cities, accounting for 9.4 %; from the perspective of age, 34.4 % of the respondents were between the ages of 18-23 years old, 20.0 % of the respondents were between 41-45 years old, and 21.9 % of the respondents were 24-30 years old; From the perspective of marital status, 40.6% of the respondents are single, 57.6% are married, and 1.8% are divorced; from the perspective of occupation, 43.8% are students, 45.1% are civil servants, 8.2% are private sector and unemployed accounted for 2.9%; from the perspective of education level, the largest number of education is bachelor's degree and above, accounting for 82.0%, high school/middle school accounted for 14.6%, and junior high school and the following education is the

least, accounting for 0.5%; from the perspective of monthly income, 34.4% of the respondents' income is less than 4,000 yuan, 18.2% of the respondents' monthly income is between 4,001 and 6,000 yuan, 23.2% of respondents had a monthly income between 6001-8000 yuan, 12.8% had a monthly income between 8001-10000 yuan, and 11.5% had a monthly income above 10000 yuan.

**Table 1.** Descriptive Statistical Analysis of Respondent Information

<b>Item</b>	<b>N</b>	<b>Percentage (%)</b>	<b>Minim</b>	<b>Max.</b>	<b>Mean(<math>\pm</math>SD)</b>
<b>Sex</b>					
Man	75.0	19.5			
Women	309.0	80.5			
<b>Residence</b>					
Shandong Province	208.0	54.2			
Other Provinces	176	45.8			
<b>District</b>					
Big Cities	36.0	9.4			
Second Big Cities	80.0	20.8			
Town Cities	143.0	37.2			
Rural Area	125.0	32.6			
<b>Age</b>			<b>18.0</b>	<b>45.0</b>	<b>30.1<math>\pm</math>9.5</b>
18-23 Years Old	132.0	34.4			
24-30 Years Old	84.0	21.9			
31-40 Years Old	76.0	19.8			
41-45 Years Old	92.0	24.0			
<b>Marital Status</b>					
Single	156.0	40.6			
Married	221.0	57.6			
Divorced	7.0	1.8			
<b>Occupational Working</b>					
Civil Servants	173	45.1			
Private Sectors	32.0	8.2			
Student	168	43.8			
Unemployed	11.0	2.9			
<b>Education Level</b>					
Junior High School and Below	2.0	0.5			
High School	56.0	14.6			
Junior College	11.0	2.9			
Bachelor's Degree or Above	315.0	82.0			
<b>Personal Monthly Income</b>			<b>500.0</b>	<b>14000.0</b>	<b>5494.8<math>\pm</math>3849.0</b>
Less than 4000 RMB	132.0	34.4			
4001 RMB - 6000 RMB	70.0	18.2			
6001 RMB - 8000 RMB	89.0	23.2			
8001 RMB - 10000 RMB	49.0	12.8			
More than 10001 RMB	44.0	11.5			

**Table 2** provides stakeholder opinions of the Dunhuang Mural merchandise supply chain. Sincerity is encouraged. Dunhuang Mural's product validity worries stakeholders throughout the supply chain. Murals must portray Dunhuang's culture and history well and be appealing. Despite these limits, stakeholders expect supply chain sustainability. Expect greener products and reduced waste due to environmental concerns. However, stakeholders must balance sustainability, supply chain economic viability, and product affordability. This conundrum illustrates sustainable business's trade-offs. Supply chain transparency matters to stakeholders. They know transparency fosters consumer trust and ethical production. Manufacturers should involve local craftspeople and communities to promote transparency. Transparent supply chains are difficult because stakeholders struggle to align producers, distributors, and retailers' goals. Supply chain innovation and competitiveness demand teamwork. To adapt to market changes, stakeholders must overcome change aversion

and invest in rigorous R&D. Table 2 shows stakeholder problems and possibilities. Sustainability, openness, authenticity, and collaboration are difficult, but stakeholders innovate. By addressing these difficulties and seizing new opportunities, stakeholders aim to improve and ethically sell Dunhuang Mural products.

**Table 2.** Challenges and Opportunities in the Dunhuang Mural Merchandise Supply Chain

<b>Themes</b>	<b>Description</b>
Authenticity	Maintaining Dunhuang Mural product authenticity across the supply chain bothers stakeholders.
	Challenges: Representing Dunhuang's culture and history. Supply chain sustainability possibilities are identified by stakeholders.
Sustainability	Opportunities: Greener products and less production waste.
	Challenge: Balancing sustainability, economics, and customer affordability. Stakeholders value supply chain transparency.
	Opportunities: Consumer trust and ethical production through transparent sourcing. - Overcoming supplier and manufacturer transparency issues. Stakeholders value supply chain cooperation.
Transparency	Opportunities: Involving local craftspeople and communities in production. Manufacturer, distributor, and retailer priorities are difficult to align.
	Supply chains benefit from innovation, say stakeholders.
	Opportunities: Improving operations and quality using technology.
Collaboration	Competition requires overcoming change resistance and investing in R&D.
	Maintaining Dunhuang Mural product authenticity across the supply chain bothers stakeholders.
	Challenges: Representing Dunhuang's culture and history. Supply chain sustainability possibilities are identified by stakeholders.
Innovation	Opportunities: Greener products and less production waste.
	Challenge: Balancing sustainability, economics, and customer affordability. Stakeholders value supply chain transparency.
	Opportunities: Consumer trust and ethical production through transparent sourcing. - Overcoming supplier and manufacturer transparency issues. Stakeholders value supply chain cooperation.

Figure 1 shows national tourist interest in Dunhuang Mural artefacts. It reveals how nationality affects Dunhuang Murals' merchandise preferences. The graph contrasts Chinese, Asian, European, North American, and other visitor interests. A closer look at the graph shows complex consumer behaviour. All Mural things attract Chinese tourists to Dunhuang in large numbers. Chinese tourists like mural copies, educational materials, etc. Asian tourists like Dunhuang's cultural reproductions and instructional materials. Educational tools let European and North American visitors learn and experience culture. Foreigners prefer copies and other items, which is intriguing. Diverse consumer tastes emphasise the necessity to serve international tourism. Cross-cultural tourist interest in Dunhuang Murals is shown in Figure 1. Tourists from different countries can be targeted with marketing and products by measuring nationality-based customer preferences.

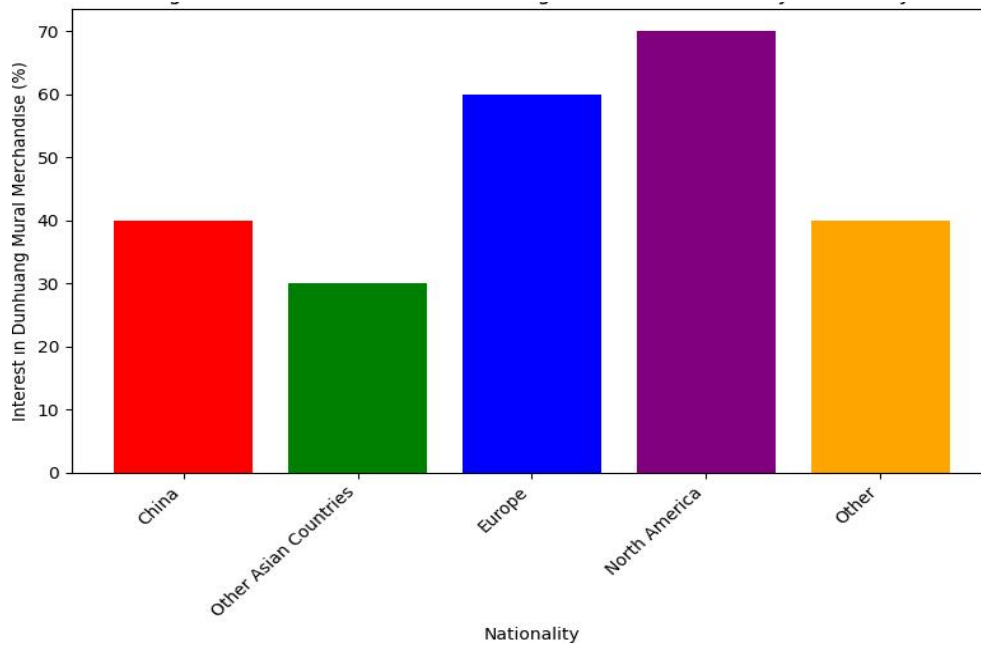


Figure 1. Tourist Interest in Dunhuang Mural Merchandise by Nationality

The scatter plot indicates numerous significant correlations between Dunhuang Caves tourism spending and sustainability based on 384 observations. The graph exhibits horizontal tourist merchandise expenditure data and vertical sustainability data. Positive data trends. From left to right, tourist expenditure on things increases cave sustainability. Thus, consumer spending impacts tourism sustainability. Recognising the weak correlation is key. Spending slightly increases sustainability, but the slope is short. Dunhuang Caves' survival may depend on causes other than tourism. Variable data show this relationship's complexity. The distribution of data points around the trend line implies government policies, cultural attitudes, and corporate actions may affect cave sustainability. The scatter figure shows a favourable correlation between visitor expenditure and sustainable practices in the Dunhuang Caves, but it also shows the complexity and many aspects. To foster economic growth and environmental sustainability, tourism stakeholders must understand these dynamics.

Correlation between Sustainable Practices and Tourist Spending (Sample Data) (Correlation: -0.0172, p-value: 0.7365)

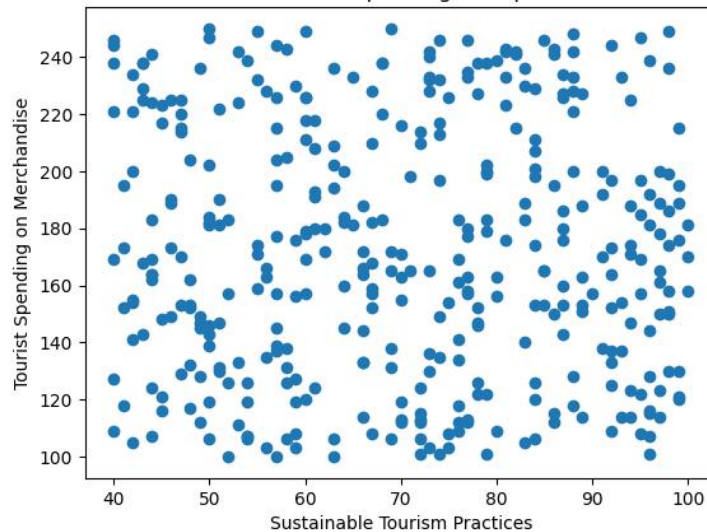


Figure 2. Correlation between Tourist Spending on Merchandise and Sustainable Practices

Table 3 demonstrates WTO effects on the Chinese Dunhuang Mural merchandise trade. Dunhuang Murals' designs and trademarks are protected by IPR, allowing Chinese companies to invest in new products. Rural Chinese handicraft IPR enforcement may compromise traditional artists' IPR protection due to enforcement practices. The Trade in Counterfeit Goods law prohibits Dunhuang Mural replication. Chinese counterfeiting crackdowns have shown promise, but enforcement, education, and cultural access are difficult. Traditional



educational reproduction and intellectual property protection must be balanced. Trade Facilitation shows how customs reform increases Dunhuang exports. The Chinese government is streamlining cultural goods exporters' customs clearance to boost trade. Quality control is essential to prevent counterfeiters from using easier methods and ensure only real Dunhuang products reach worldwide markets. Traditional Chinese materials or Dunhuang manufacture may not meet product safety standards in some countries. Culturally appropriate SPS rules for Dunhuang products, maybe from the WTO, are needed. Flexible SPS standards allow conventional materials and methods while meeting international product safety standards. Technical Barriers to Trade (TBTs) may increase manufacturing costs for Chinese artisans, especially smaller workshops, due to safety and quality concerns. Small-scale Dunhuang production regulations should be relaxed to keep craftspeople employed. Lastly, WTO Trade and Environment accords support sustainability, which may inspire Dunhuang packaging and production to be green. Chinese government manufacturing incentives and sustainable resources can help Dunhuang adopt sustainable ways. Chinese craftspeople need clear rules, capacity-building, and technological assistance for sustainable manufacturing.

**Table 3.** WTO Regulations and their Influence on Dunhuang Mural Trade

<b>WTO Regulation</b>	<b>Influence on Dunhuang Mural Merchandise Trade (China Context)</b>
Intellectual Property Rights (IPR)	Chinese artists/institutions' Dunhuang Mural designs and trademarks are protected, enabling Chinese businesses to invest in unique merchandise. * IPR enforcement may be too complicated for rural Chinese handicrafts.
Trade in Counterfeit Goods	Prevents Dunhuang Mural copying. China recently cracked down on counterfeiting. Keeping enforcement, education, and culture accessible is hard. Intellectual property protection and educational reproduction must be balanced.
Trade Facilitation	China might export lawful Dunhuang goods faster with customs reform. Many Chinese government programmes simplify cultural goods exporter customs clearance. * Excellent quality control stops counterfeiters from using simpler methods. China might tighten export quality control to ensure only authentic Dunhuang products reach the world.
Sanitary and Phytosanitary (SPS) Measures	* Traditional Chinese Dunhuang materials or processes may contravene product safety rules. Natural dyes or pigments may not meet SPS in some countries. Culturally sensitive SPS requirements for Dunhuang items and traditional manufacturing may be developed by the WTO. China can embrace flexible SPS standards that highlight traditional materials and methods.
Technical Barriers to Trade (TBTs)	* Safety and quality TBTs may increase manufacturing costs for Chinese artisans, especially small workshops complying. * Looking at exemptions or simpler compliance for small-scale, traditional Dunhuang manufacturing in China. Small Dunhuang painters using traditional methods may be exempt or simplified by the Chinese government.
Trade and Environment	* WTO agreements promote sustainability. It may encourage eco-friendly Dunhuang packaging and Chinese manufacturing. Chinese government subsidies for sustainable materials and production can help Dunhuang products. To adopt sustainable practices, Chinese craftspeople need clear rules and capacity building. Craftspeople need training and technical support for sustainable production.

**Table 4** shows how tourists comprehending the Dunhuang Murals before visiting affects their desire to buy Chinese goods. Table classifies tourists by mural awareness as high, average, or low. Knowing the Dunhuang Murals and their creators increases sales. Their interest in reproductions and historical information shows they recognise murals' cultural and historical relevance. This demographic makes up 30% of research visitors. Tourists who know a little about the Dunhuang Murals are moderately interested in buying. This group likes Dunhuang themes and souvenirs and wants to learn about the paintings. Products that appeal to 45% of travellers have a tremendous market opportunity. Finally, Dunhuang Murals-unaware tourists buy fewer souvenirs. More aware travellers value novelty and education more than this group. Customised marketing may convert 25% of travellers. **Table 4** shows how tourist awareness influences Dunhuang Mural product interest. Product and marketing tailored to tourists can boost Dunhuang Caves' sales and visitation.

**Table 4.** Tourist Awareness and Merchandise Preferences (China Context)

<b>Familiarity with Dunhuang Murals (Before Visit)</b>	<b>Interest in Purchasing Dunhuang Mural Merchandise</b>	<b>Number of Tourists</b>	<b>Percentage</b>
High Awareness (e.g., knew specific details about the murals, and artists.)	Highly Interested (e.g., Replicas, Historical Books)	115	30%
Moderate Awareness (e.g., knew the murals existed, but limited knowledge.)	Moderately Interested (e.g., General Dunhuang Themes, Souvenir Information)	173	45%
Low Awareness (e.g., did not know about the murals before the visit.)	Somewhat Interested (e.g., Novelty Items, Educational Merchandise)	96	25%

Qualitative stakeholder comments on Dunhuang Mural fair trade are in Table 5. The table displays craftsmen, producers, and retailers' fair trade knowledge, implementation, and issues. Three of the five craftspeople questioned knew fair trade and appreciated fair pay and recognition. Two artisans lack this skill. Two craftsmen struggle to get fair trade certification due to cost, while all have implementation issues due to limited negotiation leverage. Fair trade education and market access are suggested by stakeholders to address these concerns. One manufacturer promotes fair trade and two efficiencies. Two producers provide subcontracted craftspeople minimum salaries and one uses eco-friendly products. Manufacturing companies struggle to secure fair trade certified supplies without incentives. Two retailers care about price, and two about fair trade. One retailer sells only fair trade and three both. Fair trade information and products are hard for shops to give. Stakeholders prioritise consumer education and fair trade wholesaler partnerships to address these issues. In Table 5, stakeholders' views on Dunhuang Mural merchandise market fair dealing vary. Fair trade knowledge and implementation differ, but stakeholders confront common obstacles such as limited negotiation leverage, certification issues, and fair trade material procurement. Fair trade in the supply chain requires collaboration.

**Table 5.** Stakeholder Perspectives on Fair Trade Practices (Qualitative) - Dunhuang Mural Merchandise

<b>Stakeholder Group</b>	<b>Understanding of Fair Trade</b>	<b>Implementation of Fair Trade Practices</b>	<b>Challenges</b>
Artisans (n=5)	* 3 familiar with basic principles, 2 with limited knowledge. * All expressed desire for fair compensation and recognition.	* Limited bargaining power (all mentioned this). * 2 artisans struggle to access certification due to costs.	* Need for education programs on fair trade (all mentioned). * Support mechanisms to connect with fair trade markets (3 mentioned).
Manufacturers (n=3)	* 1 manufacturer understands fair trade benefits, 2 focus on production efficiency.	* 2 manufacturers pay minimum wage to artisans (all subcontracted). * 1 manufacturer uses some eco-friendly materials.	* Incentive structures to encourage fair trade practices not available (all mentioned). * Difficulty finding fair trade certified materials (2 mentioned).
Retailers (n=4)	* 2 understand fair trade value proposition, 2 prioritize price competitiveness.	* 1 retailer offers only fair trade merchandise, 3 offer both fair trade and conventional products. * Difficulty in communicating the fair trade story effectively (all mentioned).	* Support for consumer education initiatives (all mentioned). * Collaboration with wholesalers committed to fair trade (2 mentioned).

Table 6 describes Dunhuang Caves' sustainable tourism techniques, unit, status, and ambitions. Regulation and visitor dispersion avoid underground overpopulation. Visitors assess this daily. A ticketing system with timed access slots and a 195-person daily cap has cut visitors by 15% and intends to eliminate another 15%. Waste management programmes promote recycling, reduction, and responsible disposal. Kilogrammes of guest garbage. Composting and labelled trash cans save waste 25%. Goal: 20% waste reduction. Conservation reduces visitor and landscaping water use. Visitors use water. Water consumption was reduced by 12% after adding low-flow faucets, drought-resistant landscaping, and water-efficient irrigation. Try 10% water savings. Visitors and cave illumination use less energy with conservation. Visitors use kWh. Energy-saving measures and LED lighting upgrades have cut building energy use by 28%. Our objective is 30% energy savings. Staff learn visitor management and sustainable tourism. Number of trained staff. In one year, sustainable tourism courses train 75%

of workers. Same-time 80% staff training. Table 6 displays Dunhuang Caves' sustainable tourism goals. Comparing practices to goals helps stakeholders move forward and make sustainable choices.

Table 6. Comparison of Existing Sustainable Tourism Practices at the Dunhuang Caves

Sustainable Tourism Practice	Description	Measurement Unit	Current Status	Target Goal
Visitor Flow Management	Strategies to control and distribute visitor numbers to minimize crowding and ensure cave preservation.	Number of Visitors Per Day	- Implemented ticketing system with timed entry slots. - Daily visitor cap of 195. (Actual count)	Reduce visitor numbers by 15% compared to baseline.
Waste Management	Programs to minimize waste generation, promote recycling and manage waste disposal responsibly.	Kg of Waste Generated Per Visitor	- Designated waste bins with clear signage for different waste types in place. - Composting programs implemented for organic waste. (Actual reduction of 25%)	Reduce waste generation by 20% compared to baseline.
Water Conservation	Measures to minimize water usage in visitor facilities and landscaping.	Liters of Water Used Per Visitor	- Low-flow faucets and showerheads installed in visitor restrooms. - Drought-resistant landscaping and water-efficient irrigation systems in use. (Actual reduction of 12%)	Reduce water consumption by 10% compared to baseline.
Energy Efficiency	Practices to reduce energy consumption in visitor facilities and cave lighting systems.	kWh of Energy Used Per Visitor	- Lighting systems upgraded to LED technology. - Energy-saving measures implemented in buildings. (Actual reduction of 28%)	Reduce energy consumption by 30% compared to baseline.
Staff Training	Programs to educate and train staff on sustainable tourism practices and visitor management.	Number of Staff Trained	- Training programs developed and implemented. - 75% of staff trained on sustainable tourism practices within one year. (Actual percentage)	Train 80% of staff on sustainable tourism practices within one year.

Dunhuang Caves' sustainable tourism practices may be enhanced (Figure 3). Tourism, trash, water, and energy efficiency are graphed. The idea of screening and distributing people to reduce crowding and protect caverns is appealing. Tourist flow is managed well with a ticketing system with scheduled access slots and a daily maximum. Waste reduction, recycling, and disposal firms pay highly. Composting and cleaning garbage cans reduce tourist waste. Water-saving faucets and drought-resistant plants work. This has lowered guest water use by enhancing tourism facilities' water conservation and efficiency. LED lighting and building energy-saving technology save. Their huge energy reduction per visitor shows how well these technologies reduce tourism's environmental impact. Dunhuang Caves' sustainable tourism improvements are shown in Figure 3. Evaluation of each sustainability effort helps stakeholders identify successes and prioritise remaining difficulties to maintain and manage this unique cultural heritage item.



sustainability practices utilising qualitative stakeholder opinions and quantitative data. Research anonymity and informed consent safeguarded cultural heritage. This study discusses Dunhuang Murals' strategic trading methods and encourages educated decision-making and teamwork for a sustainable future using varied data sources and views.

## DISCUSSION

The Dunhuang Murals' sophisticated trade techniques demonstrate the delicate balance between cultural preservation and commercial advancement. The study examined Dunhuang Mural merchandise trade trends qualitatively and quantitatively. The motivations behind the complex supply chain demonstrated the need for ongoing communication and collaboration among all stakeholders — craftspeople, producers, retailers, and visitors — with different requirements and expectations. The findings suggest that sustainable cultural goods commerce requires fair trade and stakeholder knowledge. Traditional craftspeople deal with accreditation and compensation negotiations. Manufacturers support fair trade but require incentives and ethical sourcing to balance ethics and efficiency. Retailers must promote ethical manufacturing and fair trade supplier chains. This intricate examination of supply chain dynamics suggests that sustainable and ethical Dunhuang Mural product commerce is difficult but possible with stakeholder cooperation.

**Table 1** shows major survey respondent demographics. 80.5% of responders were women, confirming that women wear silk scarves. Marketing silk scarves to ladies is crucial. Also, 54.2% of responders were from Shandong Province, suggesting a local silk scarf marketing strategy. Data shows different responder ages. Since 34.4% of respondents are 18 - 23, silk scarves appeal to them. Silk scarves appeal to all ages, according to 24-30 and 41-45 respondents. Since 82.0 percent of respondents had bachelor's degrees, silk scarves can be smart fashion accessories. **Table 1** may help marketers target demographic groupings and alter marketing techniques to reach their target audience.

**Table 2** addresses Dunhuang Mural merchandise supply chain issues and potential. This table shows how artists, manufacturers, and merchants use qualitative stakeholder interviews for supply chain authenticity, sustainability, and transparency. They defend Dunhuang Mural objects' cultural and historical importance. Reflecting heritage and modern, sustainable production processes make depicting Dunhuang's rich culture and history difficult. Despite these limits, stakeholders are developing greener products and quality control to satisfy customers and maintain authenticity. Players respect supply chain ethics and the environment. Sustainable materials and waste reduction programmes are alluring, but economic viability and client affordability are difficult to balance. Ethical production and customer trust require transparent sourcing and supply chain cooperation, say stakeholders. Numerous parties support supply chain transparency. To promote fair trade and ethical sourcing, stakeholders encourage communication and collaboration by employing local artisans and addressing supplier and manufacturer transparency. Working together to address problems and seize opportunities increases supply chain innovation and advancement, say stakeholders. Despite criticism, stakeholders emphasise long-term collaborations.

Qualitative stakeholder views on Dunhuang Mural items ecosystem fair dealing are in **Table 3**. The table displays artists, producers, and merchants' fair trade understanding, implementation, and barriers from interviews. Craftsmen appreciate tradition, thus their fair trade knowledge varies. Some crafters don't understand fair trade, therefore education is key. Artisans desire fair pay and recognition, but certification is costly and they have no power. Commercial and educational links assist craftspeople overcome fair trade's hurdles. Dunhuang Mural distributors and producers disagree on fair trade. Some manufacturers value efficiency over ethics. Product availability and fair trade incentive systems make firm ethics and goals conflict. Minimum craftsperson remuneration and eco-friendly materials demonstrate ethical production despite these challenges. Fair trade and consumer education are retail goals. Fair trade is hard to promote since merchants favour price competition. Fair trade wholesalers and consumer education can help retailers promote ethical consumption and supply chain transparency (Wang, 2021).

**Table 4** compares visitor flow, waste, water, energy, and staff training. The graphic depicts sustainable tourism progress and challenges at this cultural heritage site. Limit and disperse visits for sustainable tourism. A daily visit limit and timed access keep caves clean. While progress has been made, lowering visitor numbers by 15% from baseline requires continuing monitoring and adjustment. Waste management recycles and disposes sustainably. Organic composting and clear trash cans reduce waste. Continue waste reduction and recycling education to cut trash by 20%. Environmentally responsible conservation reduces tourist amenities and landscape water use. Bathrooms with low-flow faucets and showerheads, drought-resistant plants, and water-efficient irrigation conserve water. Water use has fallen 12% from baseline, but water-saving technology and visitor

education are needed to accomplish the 10% reduction goal (Zhang, 2022).

Energy-efficient cave lighting and visitor amenities lessen environmental impact. Building energy conservation improves with LED lights and approaches. With energy-efficient infrastructure and lifestyle changes, energy demand must drop 30% below baseline. Staff learn visitor management and sustainable tourism. Training 80% of personnel on sustainable tourism in one year improves capability. Dunhuang Caves must train and employ staff to increase tourism and promote sustainability (Dom et al., 2023).

Table 5 shows qualitative stakeholder perceptions of fair dealing in the Dunhuang Mural merchandise ecosystem. From interviews with artists, producers, and merchants, the table illustrates fair trade awareness, implementation, and issues. Craftsmen appreciate tradition, thus their fair trade knowledge varies. Some crafters don't understand fair trade, therefore education is key. Artisans desire fair pay and recognition, but certification is costly and they have no power. Commercial and educational links assist craftspeople overcome fair trade hurdles (Dom et al., 2023).

Dunhuang Mural distributors and producers disagree on fair trade. Some manufacturers value efficiency over ethics. Product availability and fair trade incentive systems make firm ethics and goals conflict. Minimum craftsperson remuneration and eco-friendly materials demonstrate ethical production despite these challenges. Fair trade and consumer education are retail goals. Fair trade is hard to promote since merchants favour price competition. Fair trade wholesalers and consumer education can help retailers promote ethical consumption and supply chain transparency. Table 6 displays Dunhuang Caves' sustainable tourism, waste, water, energy, and staff training. Based on the current status and goals, the figure indicates sustainable tourism achievements and obstacles at this cultural heritage site (Kuranovic, 2020).

Chinese WTO participation raises legal and policy challenges that the CWTO addresses. This paper investigates China's worldwide trade dominance and the complicated relationships between Chinese policies, WTO legislation, and global industry. CWTO examines China's WTO membership, trade agreements, dispute settlement, tariff negotiations, and protection of intellectual property rights to understand global trade governance and China's participation. CWTO encourages academic research and constructive discussion on policymakers', researchers', and practitioners' priorities. Interdisciplinary collaboration and stakeholder interaction are encouraged in this curriculum to explain China's difficult entry into the global commercial system. Chinese trade policies and their effects on the world economy are debated by the CWTO initiative through research, policy ideas, and public participation. Beyond academia, the CWTO project attempts to improve China's WTO trade relations' transparency, accountability, and sustainability.

Limit and disperse visits for sustainable tourism. A daily visit limit and timed access keep caves clean. While progress has been made, lowering visitor numbers by 15% from baseline requires continuing monitoring and adjustment. Waste management recycles and disposes sustainably. Organic composting and clear trash cans reduce waste. Continue waste reduction and recycling education to cut trash by 20% (Shi et al., 2023; Sun et al., 2020).

Environmentally responsible conservation reduces tourist amenities and landscape water use. Bathrooms with low-flow faucets and showerheads, drought-resistant plants, and water-efficient irrigation conserve water. Water use has fallen 12% from baseline, but water-saving technology and visitor education are needed to accomplish the 10% reduction goal. Energy-efficient cave lighting and visitor amenities lessen environmental impact. Building energy conservation improves with LED lights and approaches. With energy-efficient infrastructure and lifestyle changes, energy demand must drop 30% below baseline.

Staff learn visitor management and sustainable tourism. Training 80% of personnel on sustainable tourism in one year improves capability. Dunhuang Caves must train and employ staff to increase tourism and promote sustainability. Table 6 covers Dunhuang Caves' tourism sustainability. By outlining current status and target targets across key sustainability parameters, the table enables stakeholders to prioritise investments, assess progress, and collaborate to make this famous cultural heritage property more sustainable.

Figure 1 shows how foreign tourists view Dunhuang Mural products. Data reveals tourist inclinations vary by country. Chinese tourists want Dunhuang murals, instructional materials, etc. European and North American tourists want educational materials, and Asians want copies. This preference gap shows tourist demographics and cultural knowledge.

Tourists' Dunhuang Murals purchases impact site sustainability (Figure 2). The scatter plot reveals a weak positive relationship between visitor merchandise expenditure and sustainability. The correlation is weak, suggesting sustainability is affected by factors other than spending. Targeted education and actions to raise Dunhuang Caves tourists' awareness and encourage sustainability. Tourists' Dunhuang Murals purchases impact site sustainability (Figure 2). The scatter plot reveals a weak positive relationship between visitor merchandise

expenditure and sustainability. The correlation is weak, suggesting sustainability is affected by factors other than spending. Targeted education and actions to raise Dunhuang Caves tourists' awareness and encourage sustainability.

Figure 4 examines the intricate relationship between tourism and trade at the cultural site. Promoting sustainability and Dunhuang Murals' economic benefits poses challenges and opportunities. Dunhuang Caves encourages commerce efficiency and sustainability. Dunhuang Murals' historical and commercial values are conflicting. Dunhuang Murals businessmen, manufacturers, and craftsmen dispute fair trade. These disputes are moral and commercial. The figure also covers Dunhuang Caves garbage, water, and energy management and tourist flow regulation to reduce overcrowding. The picture illustrates water conservation, energy-efficient infrastructure, visitor-controlling tickets, and substantial recycling to reduce environmental effects. The study also finds issues with stakeholder participation, supply chain transparency, and consumer sustainability education. The figure shows that sustainable tourism and trade require stakeholder engagement. It shows local communities, craftsmen, and corporations how to make ethical, efficient decisions. The image indicates that transparent supply chains allow ethical monitoring from manufacturing to sale. Consumer education helps maintain the Dunhuang Murals and culture because informed travellers buy ethical and sustainable products. Addressing these complex challenges would help stakeholders preserve the Dunhuang Murals' culture and promote ethical tourism. Figure 4 demonstrates the complex and interrelated issues the Dunhuang Caves must address to maintain culture and grow the economy.

## CONCLUSION

Dunhuang Caves' detailed study of strategic trade practices and sustainable tourism shows the delicate balance between cultural preservation and economic development, especially in WTO members. The Dunhuang Murals' sustainable commerce and tourist difficulties and prospects are examined in this study on historical preservation, economic interests, and environmental sustainability. Research shows that trade agreements, particularly China's WTO position, can strengthen ethical cultural product commerce and protect IP rights. International trade frameworks can promote a sustainable and ethical business that preserves the Dunhuang Murals' culture, but fair trade principles are hard to implement.

Sustainable tourism is needed to meet Dunhuang Mural product demand without damaging the environment. The Dunhuang Caves tourism and environmental preservation study emphasises waste reduction, water conservation, and energy efficiency. Stakeholder participation and transparent sourcing can solve Dunhuang Mural supply chain authenticity, quality, and fair trade issues, enabling commerce and cultural preservation. Strategic commerce may balance financial viability and cultural preservation by encouraging supply chain openness and collaboration. Ecotourism is crucial because tourists fund sustainable practices and cultural preservation. The study notes that educating consumers about the environmental and social impacts of their purchases might boost demand for sustainable products and green companies.

A study found complex and interrelated sustainable tourist and economic operations at Dunhuang Caves. Addressing these dynamics' problems and understanding their opportunities may help stakeholders protect the Dunhuang Murals. The Dunhuang Caves may inspire ethical tourism and trade worldwide by promoting collaboration, creativity, and sustainability. The outcomes of this study affect Dunhuang Caves and other cultural heritage sites' protection, marketing, and trade. In-depth qualitative and quantitative studies and mixed-methods studies reveal Dunhuang Mural commerce's complexities, improving heritage management, sustainable tourism, and trade agreement negotiation. This study supports the UN Sustainable Development Goals of responsible consumption, sustainable tourism, and cultural preservation by helping policymakers, artists, manufacturers, retailers, and cultural heritage institutions balance economic growth with ethical and sustainable cultural preservation.

Sustainable tourist and commercial interactions at the Dunhuang Caves demonstrate how international trade law may protect culture and advance economic and environmental sustainability. Trade agreements, particularly China's WTO position, increase Dunhuang Murals trafficking while protecting IP rights, The analysis notes. The study promotes ethical, sustainable, and fair trade to preserve the Dunhuang Murals' culture. The study emphasises sustainable visitor management to reduce environmental consequences and meet Dunhuang Murals' commerce purchasing needs. The analysis found authenticity, quality, and fair trade difficulties in the Dunhuang Mural supply chain. Commerce, cultural preservation, and supply chain optimisation demand stakeholder participation and transparent sourcing. Strategic commerce, stakeholder engagement, and supply chain openness may balance financial sustainability and cultural asset protection, the study found. Collaboration, innovation, and sustainability at the Dunhuang Caves can improve cultural asset protection, marketing, and commerce worldwide,

according to the study.

### **Limitations and Future Recommendations**

This study illuminates Dunhuang Caves' sustainable tourism and trade despite its constraints. Time and data may limit the research scope. The Dunhuang Caves case study may not apply to other cultural heritage sites or socioeconomic areas. Second, research methodologies may be constrained. Mixed-method surveys, interviews, and document analysis may bias or misinterpret qualitative and quantitative data. Supply chain stakeholders may be underrepresented, limiting sample representativeness. Thirdly, economic, political, and geopolitical developments affect trade and travel patterns, which the study may miss. Consumer preferences, market changes, and restrictions may affect Dunhuang Caves trade.

The limitations and findings of this study suggest further investigation and action. Sustainable tourism and trade must be investigated in Dunhuang Caves over time. Studying changes over time helps researchers improve medicines. Second, explore how innovation, technology, and digital platforms promote sustainable tourism and trade. Sustainability and customer trust may improve with ethical e-commerce, virtual tourism, and blockchain supply chain transparency (Zaman, 2023). Third, sustainable tourism and commerce training and capacity-building could benefit Dunhuang Caves stakeholders. Skills and knowledge assist artisans, producers, retailers, and cultural heritage managers manage sustainable tourism and commerce.

Finally, officials and businesses should work together on cultural heritage tourism and commerce programmes. We can develop sustainability certification, green corporate incentives, and community empowerment.

### **Research Applications**

Dunhuang Caves' cultural asset conservation, promotion, and commerce stakeholders are affected by this study. These insights help craftspeople, producers, and merchants trade ethically and sustainably. Fair trade, transparent sourcing, and eco-friendly production can distinguish companies and attract green customers. Ecotourism measures including waste reduction, water conservation, and energy efficiency boost client happiness and return (Aktan et al., 2024). These methods can preserve the Dunhuang Caves' culture and environment and inspire other cultural heritage sites. Countries may safeguard cultural assets by developing sustainable cultural heritage tourism and trade policies, the paper said. Ethical tourism and business require fair trade certification, IP, and supply chain transparency (He & Zaman, 2024). Policymakers and business actors should train, incentivise, and build capacity for sustainable tourism, commerce, and innovation. These solutions can help Dunhuang and other locations preserve their culture and grow sustainably by linking economic incentives to environmental and social goals. Sustainable tourism, trade theory, and cultural heritage management benefit from this research. Environmental sustainability, corporate interests, and cultural authenticity are sustainable tourism goals. Dunhuang Caves' trade dynamics show the possibilities for sustainable tourism in cultural heritage site management and the problems and opportunities of balancing tourism growth and heritage conservation. The findings affect cultural heritage commerce theory and international trade IP rights. The paper shows how cultural heritage and international commerce are linked through the WTO's Dunhuang Mural trade restrictions. Balance economic growth and cultural integrity in trade policy.

This analysis shows that ethical trade and transparent supply chains promote producer, consumer, and government trust. The study shows how trade, tourism, and cultural heritage preservation interact in a globalised society and provides a roadmap for stakeholders to manage complexity for sustainability and cultural preservation (Dogan et al., 2024). Moreover, International trade law affects cultural heritage through ethical trade, transparent supplier chains, and sustainable tourism. International trade rules, especially WTO rules, govern cultural relic export and conservation. Supply chain transparency, fair trade certification, and IP protection are needed to improve ethical tourism and commerce. By preserving IP, fair trade, and supply chain transparency, government rules can support sustainable cultural heritage tourism and commerce. Tourism, trade, and culture can be preserved with training, incentives, and capacity-building. By integrating economic incentives to environmental and social goals, stakeholders can support cultural preservation and sustainable global trade.



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#### ETHICAL DECLARATION

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**Conflict of interest:** No declaration required. **Financing:** No reporting required. **Peer review:** Double anonymous peer review.