

India

Ajanta–Ellora Conservation and Tourism Development Project

Evaluator: Kenichiro Hidaka and others¹
(World Heritage Studies, University of Tsukuba)
Norio Ishijima (Kokusai Kogyo Co., Ltd.)
Field Survey: January, February, and May 2007

1. Project Profile and Japan's ODA Loan



Map of Project Area



Example of Project Component

1.1 Background

India is a country where diverse cultures developed in its many regions over the course of its 4000 year-plus history, and it is known for having sites endowed with “outstanding universal value” in the cultural and natural domains. India is home to a total of 27 World Heritage Sites, including 22 cultural sites and 5 natural sites, and of these, the Ajanta and Ellora rock-cut cave temples are important, massive-scale cultural heritage sites which are also the first places in India to be registered as World Heritage sites, together with the renowned Taj Mahal and Agra Fort, in 1983. In recent years, conservation of these sites, use of them as tourism resources, and balance between such conservation and use have become important issues transcending state and national borders.

The state of Maharashtra, where the cave temples are located, has a population of 96.879 million (2001), and with a gross state product is 3,284.59 billion rupees (the highest in India), the state has driven the Indian economy based on its economic hub, Mumbai, the state capital. The state has been putting effort into promotion of tourism as a vital force for further economic development. This project is considered as one part of

¹ Hidetoshi Saito, Satoshi Yamato, Andras Morgos, Haruo Yagi, Nobu Kuroda, Fuyuka Hanyu, Yasufumi Uekita, and Toshiya Matsui

that endeavour.²

1.2 Objective

The objective of the project is to promote the tourism industry through conservation, improvement of the surrounding natural environment, and infrastructure development in and around the Ajanta and Ellora rock-cut cave temples, a World Heritage Site in the state of Maharashtra, and thereby contribute to vitalisation of the local economy,. Moreover, the promotion of increased awareness of the historic site among travellers, both domestic and foreign, is to be expected through a comprehensive publicity campaign.

1.3 Special Characteristics

The special characteristic of this project is that it seeks to balance conservation of the World Heritage Site with usage of it for tourism promotion and local economic vitalisation. While conservation of World Heritage sites, which is prescribed by the World Heritage Convention, is the duty of the country where the sites are located, it is also a responsibility and issue of the world³ overall. Therefore, in implementing ODA loans, principles and technologies of global standards that may transcend the individual circumstances of borrower countries must be applied. Given this characteristic, in this ex-post evaluation, in addition to this evaluation based on the DAC 5 evaluation criteria, a group of experts involved in various aspects of the World Heritage Site conservation, including international experts, have undertaken a multi-faceted evaluation that is based on global standards⁴. (For details, see Thematic Evaluation Report: “The Ajanta–Ellora Conservation and Tourism Development Project: Special Evaluation from the viewpoint of the preservation and use as a World Cultural Heritage”)⁵

1.4 Borrower/Executing Agency

President of India / Ministry of Tourism and Culture (Ministry of Tourism at time of loan agreement)

² Phase II is currently underway as a continuation of this project.

³ As of June 2007, 182 countries are signatories to the convention.

⁴ The global standards derive from internationally recognized documents related to conservation, restoration, and use of cultural heritages, such as “Operational Guidelines for the Implementation of the World Heritage Convention”(UNESCO: 2005 revised) and “International Charter for Conservation and Restoration of Sites and Monuments” (The Venice Charter) (ICOMOS:1964)

⁵ For the thematic evaluation, field surveys and workshops were held, and experts from ICCROM (International Centre for the Study of Preservation and Restoration of Cultural Property) and ICOMOS (International Council on Monuments and Sites) were invited to those activities, in an effort to incorporate more international points of view.

1.5 Outline of Loan Agreement

Loan Amount / Loan Disbursed Amount	3,745 million yen / 3,362 million yen
Exchange of Notes / Loan Agreement	December 1991 / January 1992
Terms and Conditions	
-Interest Rate	2.6%/year
-Repayment Period (Grace Period)	30 years (10 years)
-Procurement	General untied
Final Disbursement Date	March 2002
Main Contractors	-
Consulting Services	Pacific Consultants International (Japan), Tata Consulting Engineers (now Tata Consulting Services) (India)

2. Evaluation Result (Rating: B)

2.1 Relevance (Rating: a)

2.1.1 Consistency with national policy

In India's 7th Five-Year Plan (April 1985–March 1990) which was in effect when this project was planned, tourism was recognised as a segment of industry, and the importance of the promotion of tourism development by the private sector was clearly stated. Also, the plan indicated a basic policy calling for public investment to be allotted to basic infrastructure development to support private investment. Moreover, in the 8th Five-Year Plan (1992–1997) which defined the principle of tourism development led by the private sector, as policy support for the private sector, it was prescribed that particularly promising tourism sites were to be selected as Special Tourism Areas and tourism investment, including establishment of a tourism development funds, was to be promoted. The project site of this project was also included among the Special Tourism Areas. In the most recent 11th Five-Year Plan (2007 – 2012), while development of tourism infrastructure and facilities through public-private partnership is stated, conservation of historic sites as tourism resources continues to be a priority issue.

2.1.2 Consistency with the policy and the project plan

In the investment plan proposal for tourism sector in the state of Maharashtra, 8th Five-Year Plan when this project was initially planned, this project was included and its priority was high. In the Next Five-Year Action Plan in the Maharashtra State Tourism Policy, a further increase in the importance of this project was observable. This is evident from the fact that the following are specifically indicated in the policy: external funds for

conservation of World Heritage Site and tourism promotion (clause 7), development and promotion of cultural tourism (clause 8), building of tourism information centres (clause 14), and people’s awareness building/raising toward tourism (clause 15). This action plan reflects the consistent policies of the national and state governments which emphasize tourism promotion, and this project also conforms to these series of policy trends.

Therefore, the relevance of the project is recognized as being extremely high, from the planning stage to the present and into the future.

2.2 Efficiency (Rating: b)

This project, Phase I, is composed of seven components, namely (1) Historic site (monument) conservation, (2) Improvement of surrounding natural environment, (3) Improvement and development of Aurangabad Airport facilities, (4) Road improvement and development, (5) Water supply and sewerage system improvement and development, (6) Power equipment development, and (7) Development of tourism management system as well as consulting and engineering services.

2.2.1 Output

(1) Historic site conservation

Table 1: Historic Site Conservation
Comparison of Plan at Time of Appraisal and Actual Results

Plan	Actual ⁶
(1) Installation of a protective fence Ajanta: repair of parapet wall, stairs (including pipe scaffolding and ladders) Ellora: Stairs (including pipe scaffolding and ladders)	(1) As planned (2) Almost as planned The following is additional output. (3) Improvement of pathways at Ajanta historic site
(2) Procurement of vehicles and measuring instruments Ajanta: Including transceivers and walkie-talkie, water coolers, office equipment, electric jeeps and vehicles, and portable generators. Ellora: Including transceivers and walkie-talkie, water coolers, electric jeeps and vehicles, and portable generators.	(4) Restoration and improvement of driveways around the Ellora historic site (5) Procurement of additional devices and instruments (6) Geological survey for preservation measures and planning for both historic sites (7) Restoration of caves at both historic sites Conservation and restoration in both historic sites (including measures against the surface water and conservation by chemical treatment) (8) Installing bat-proof mesh on caves of both historic sites (9) improving parking lots and expanding roads at both historic sites (10) Construction of pedestrian overpass and paved

⁶ (1) Installation of the protective fence was done by the Forest Department of Maharashtra (FDM), and as to the rest of output, the Archeological Survey of India (ASI) was in charge.

	roads around the Ajanta historic site (11) Installing a lighting system within the caves at the Ajanta historic site (12) Installing optic fiber lighting system within the caves at the Ajanta historic site (13) Setting up a fence around Daulatabad Fort (14) Geological survey of the Pitalkora historic site
--	--

At both the Ajanta and Ellora historic sites, protective fences and stairs were set up for the convenience and safety of visitors, and it was confirmed that this was implemented as initially planned. Moreover, vehicles and measuring instruments to conduct site conservation activities more smoothly and efficiently were procured basically as planned. However, aside from the water coolers and office equipment, it is difficult to say that they were being used effectively at the time of this evaluation. For example, as cell phones rapidly spread, the use of provided transceivers and walkie-talkie became unnecessary. Moreover, regarding the electric jeeps and vehicles, the two vehicles that were purchased were over 10 years old. One underwent repairs in Delhi and was in use at the time of evaluation; the other was being used in Aurangabad. The portable generators were formerly used when the electric power supply was unstable, but they were in storage for emergency use at the time of evaluation because the electric power supply were stable continuously after the construction of the power supply facilities.

Meanwhile, because project expenses were lower than initially planned in several project components due to favourable exchange rate fluctuations, additional project output was added to boost the effectiveness of the development. This additional output consists of historic site conservation output (3) – (14) under the “Actual” column on Table 1. Of these, (3), (4), (9), (10), (11), and (12) were determined to be necessary measures for opening the sites to the public and ensuring the safety and comfort of visitors. However, as stated in the Thematic Evaluation Report, there is vagueness in the selection criteria for some of the plans and designs for widening



Measure for flowing surface water (Ellora)

paths and building pedestrian bridges, and so slight doubts remain as to their acceptability when considered in light of the global standards for historic site conservation. It should be pointed out that, in implementing additional measures, accepted international practices and levels for conservation of registered World Heritage Sites should have been researched, and more thorough discussion and prior study of methods and technologies for project implementation should have been conducted.

(5), (6), (7), (8), (13), and (14) were determined to be measures or studies immediately

necessary for historic site conservation, and their implementation as additional output is recognized as relevant. In particular, (12), where a large expense amounting to 63% of the ODA loan estimate under ASI's charge was invested, can be highly evaluated as an idea that enables visitors to view the rock-cut cave's mural paintings more easily while minimizing the damage to the paintings. Moreover, (6), (7), and (8) are additional outputs that were implemented based on discussion and recommendations by POE⁷ and Geological Survey of India (GSI), and all of them are judged to have been necessary measures.

For details of evaluation concerning preservation and maintenance of the two historic sites by this project, see the Thematic Evaluation Report.

(2) Improvement of the surrounding natural environment

With the objective of improving the surrounding natural environment, it was initially planned to conduct 500 ha of afforestation and installation of 37.55 km of perimeter fence in the Ajanta region, and 237 ha of afforestation and 11.29 km of perimeter fence in the Ellora region. In addition to the implementation of the above as planned at both sites, additional output was undertaken of 200 ha of afforestation and 12.3 km of perimeter fence in the environs of Fardapur which is adjacent to the Ajanta historic site. Moreover, access path improvement from Ajanta overlook view point to the Ajanta cave was also implemented. These additional outputs were effective for improving the area around the site, and in particular, since this access path would contribute to improvement of the flow of visitors henceforth, it can be said that effective use of ODA loan funds was achieved.



Access path to Ajanta caves

(3) Improvement and development of Aurangabad Airport facilities

The following 10 outputs were selected as objectives for improvement and development of the nearest airport facilities in anticipation of an increase in tourists. All were implemented as planned. Furthermore, (3), (7), and (9) were implemented with the Airports Authority of India's (AAI) independent budget.

(1) 1500ft. Runway extension

⁷ Formally called the International Panel of Experts, this is a committee composed of experts of many nationalities that meets at least once a year. Given the importance of this project which involves World Heritage Sites, there was an obligation to have this committee decide on important matters related to the site conservation components from the initial planning stage.

- (2) Lighting for extended runway installation
- (3) Instrument landing system (ILS) installation
- (4) Fence installation and water channel bypass
- (5) Installation of air conditioning in departure lobby and luggage conveyor at departure
- (6) Runway and apron lights installation
- (7) Approach lights and power facility installation
- (8) Doppler Very High Frequency Omni-Range (DVOR) installation
- (9) Distance Measuring Equipment (DME) installation
- (10) Emergency runway and shoulder maintenance



DVOR and DME at Aurangabad Airport

In addition to the above, detailed planning of the airport terminal facility was conducted as an additional output. Since an increase in passengers is anticipated accompanying the improvement of the airport, this additional output aims to effectively improve the flow of people and the convenience of using the airport, and it can also be highly rated as promoting the progress of Phase II.

(4) Road improvement and development

Table 2: Improvement and Maintenance of Roads
Comparison of Plan at Time of Appraisal and Actual Results

Plan	Actual
(1) Aurangabad–Phulambari (25 km)	(1) As planned
(2) Phulambari–Sillod (24 km)	(2) As planned
(3) Sillod–Golegaon (26 km)	(3) As planned
(4) Aurangabad–Daulatabad–Ellora (26 km)	(4) As planned (26.68 km)
(5) Khultabad–Phulambari (27 km)	(5) As planned (26.4 km)
(6) Ajanta cave & Ajanta–Dist. border (18 km)	(6) As planned
(7) Golegaon–Ajanta village & view point (20km)	(7) As planned
(8) Ellora area road bypass	(8) Changed to Mitmita–Varzadi–Ellora (21.2 km)
	The following is additional output
	(9) Detailed plan design for Phase II

Road improvement and development was implemented according to the original plan for seven segments. Of these, a discrepancy of several hundred meters occurred in two segments, but it may be said that the work was implemented basically according to plan. Meanwhile, to alleviate the impact of exhaust gas and vibration



Aurangabad -(Ajanta)- Phulambari segment

from vehicles travelling on roads near the Ellora historic site, the Ellora region road bypass which was initially planned was altered to road improvement of the Mitmita–Varzadi–Ellora segment. This plan alteration was for the purpose of minimizing the damage on the historic site, and the effectiveness of this output was not diminished by the change. Moreover, (9) which consists of detailed road plan design for promotion of Phase II which is to continue after this project, was implemented as additional output. Road improvement and development accounted for approximately 55% of the total project cost of Phase I, and the fact that it was implemented with no large alteration from the initial plan is highly evaluated.

(5) Water supply and sewerage system improvement and development

For the purpose of improving and developing the water supply and sewerage systems in the historic sites and the surrounding areas, it was planned to improve the water supply to both historic site areas (Ajanta: 1.94 million ℓ/day, Ellora: 1.46 million ℓ/day) and to improve the sewerage system at the tourist complexes of both historic sites. Of these, the former was implemented as planned, but the latter sewerage system improvement was delayed until Phase II because the construction of the tourist complexes themselves was delayed until Phase II. A delay in the construction of the water treatment facilities in the Ajanta region occurred because changes in the initial plan became necessary due to the challenges presented by the topography to facility operation and maintenance and due to the unexpected time required to obtain permission to install water pipes in forest land.



Ajanta Water Treatment Facilities

(6) Power equipment development

There was a partial change in the power transmission lines that were to be installed to cope with the development of tourism infrastructure facilities in the area around the historic sites, but installation was carried out basically according to plan. Whereas 33 kv × 25 km transmission lines were planned in the Ajanta region, to avoid power loss due to long-distance transmission, it was decided to build a transformer substation near the



Ellora Power Distribution Facility

sites, the transmission lines were changed to 33 kv × 16 km and 11 kv × 4 km, and the distance of the transmission line extension was shortened. Moreover, the number of transformers was reduced from the initially planned two, to one. In the Ellora region, due to the same reason as those given above, whereas 33 kv × 30 km transmission lines were planned, they were changed to 33 kv × 14 km transmission lines. One transformer, as initially planned, was installed.

(7) Development of a tourism management system

With the aims of historic site conservation as well as improving services for increasing tourists, it was planned to purchase eco-friendly buses (electric buses) for both historic sites. In the initial plan, there were 30 buses for the Ajanta historic site and 3 buses for the Ellora historic site, but in the ex-post evaluation, it became clear that this had been partially changed. At the Ajanta historic site, low-pollution diesel buses had been purchased in place of the 10 electric buses and were in operation. At the Ellora historic site, because construction of the tourist complex was delayed until Phase II, bus purchase and operation was also delayed until Phase II.

Concerning the above-mentioned changes in the type of buses, according to the Maharashtra Tourism Development Corporation (MTDC), the policy was changed so as to introduce low-pollution diesel buses because the number of passengers per electric bus is low (10 to 15 passenger capacity), in addition to their high maintenance cost. Due to the change to low-pollution diesel buses, the number of passengers per bus approximately tripled, and so the number of buses purchased was reduced from 30 to 10 (of which 5 have air conditioning and the remainder have no air conditioning). Although the buses are called “low pollution,” the diesel buses create a higher environmental burden than do battery-operated electric vehicles, and so it is not easy to evaluate the appropriateness of this change in terms of the difference it makes in the environmental burden.

In addition to the purchase of electric buses, the following outputs (1) through (6) were to be implemented with either private funds or public funds, but because an excess of ODA loan funds occurred as stated above, these outputs were implemented with ODA loan funds rather than with private funds.

- (1) Designing and printing of posters and pamphlets as PR and historic site guides
- (2) PR and advertising in general magazines
- (3) Preparation and installation of map



Low-pollution diesel bus (air conditioned)

signboards

- (4) Landscaping and beautification
- (5) Construction of infrastructural facilities at Ajanta T-junction
- (6) Installation of water supply equipment at the Ajanta cave

Of these, (4) includes landscaping of the area between the Ajanta (overlook) viewpoint and the forest garden as well as improvement of the garden area in front of cave 16 in Ellora. However, regarding the garden area in Ellora, it cannot be denied that the basis for implementing this output is somewhat vague given its impact on the scenery of the historic site (For details, see the Thematic Evaluation Report).

2.2.2 Project period

The project period established at the time of appraisal was January 1992 to December 1996, or 60 months. The actual project period as confirmed by the ex-post evaluation was January 1992 to March 2002, or 123 months (205% of the planned period). Furthermore, project components are being put into use as they are completed, and the road improvements, which account for approximately 55% of the total project cost in Phase I, have been in use since the completion of road construction in 1998. The extension of the project period was due to implementation of additional outputs, in addition to inadequate coordination ability on the part of the executing agency, as stated below.

The additional outputs were all to boost the effectiveness of this project. Although it can be concluded that the outputs themselves utilized funds effectively, the extension of the project period cannot be called desirable.

In this project, the loan disbursement deadline was extended twice, and the reasons were indicated as being inadequate capability to flexibly manage the project and properly coordinate work, and particularly a lack of schedule management capability, on the part of MTDC, which was expected to be the central management agency of the project due to the fact that the project involved a diverse variety of fields. For this reason, there occurred delays in acquiring approvals,⁸ frequent plan alterations,⁹ and lack of coordination among related agencies, and as a result, there was a significant overrun in the planned project period.¹⁰ Meanwhile, the detailed design for Phase II was implemented ahead of schedule, and so the fact that efficiency in the overall schedule was promoted deserves to be highly evaluated.

⁸ In particular, a longer time than expected was required to obtain permission from the FDM to implement the planting component. Time was also required to receive permission to lay pipes in the vicinity of the rock-cut caves from the ASI.

⁹ In particular, ASI made frequent requests for changes in the scenery plan for the Ellora area.

¹⁰ Other reasons for delay include the delay in acquiring land for road construction (Mitmita-Varzadi segment) and delay in processing the consultant contracts.

2.2.3 Project cost

Whereas the initially planned project cost was 4,406 million yen (ODA loan portion: 3,745 million yen), the actual project cost was 4,081 million yen (ODA loan portion: 3,362 million yen). Accompanying exchange rate fluctuations, the value of the local currency dropped significantly from 1 rupee/5.30 yen at the time of ex-ante evaluation, to 1 rupee/2.76 yen. Due to this, together with converting the foreign currency component to local currency, implementation of additional outputs in some components became possible.

2.2.4 Summary

The efficient fund use was carried out overall although it was partially due to the local currency depreciation. Meanwhile, regarding the project period, implementation of additional outputs with the goal of effective fund use led to extension of the project period to more than double to its planned duration. Therefore, the efficiency of this project is evaluated as moderate.

2.3 Effectiveness (Rating: a)

2.3.1 Historic site conservation

Regarding historic site conservation, it was stated at the time of appraisal that “failure in the treatment of the site will not be tolerated, therefore the engineering service will study the method of treatment,” and so careful measures were taken. However, the project was actually implemented without a clear overall management plan, and it can be pointed out that there occurred problems from the standpoint of global standards such as partially excessive (or unnecessary) restoration, problem in inability to distinguish the restored parts from the original parts, adverse impact on the location, environment, and scenery, and reduction in the authenticity of the historic site. One cause of these problems is that, in the end, the project relied on conventional conservation techniques and the project was not used as an opportunity to train the human resources necessary for introducing conservation techniques that meets international standards.

Although the above problems exist, overall every measure taken for the purpose of historic site conservation and management and for opening the sites to the public and utilizing them was of high quality, and it is clear that the measures taken in this project are serving a purpose in protecting the precious World Heritage sites (For details, see the Thematic Evaluation Report).

2.3.2 Road improvement and development

As an effect of improvement through road widening, etc., it was confirmed that the

total traffic volume has been steadily increasing on all project roads since the completion of the work in 1998 (excluding additional outputs). Excluding the road between Aurangabad and Ellora which had heavy traffic volume before and the road between Golegaon and Ajanata V.P. where the traffic volume is basically fixed since it is used as a bypass, the traffic volume on each segment had nearly doubled as of 2006 compared to 1990. Looking at the total traffic volume on the project roads, the rate of increase during the eight years from 1990 to 1998 (the year the work was completed) was 8%, and the rate of increase during the eight years from 1998 to 2006 was 18%, clearly showing that recent traffic volume is in an uptrend.

Table 3: Traffic Volume on Major Roads (human and car/day)

	1990	1998	2000	2002	2004	2006
Aurangabad–Phulambari	2,581	3,755	4,352	4,760	4,798	4,922
Phulambari–Sillod	2,715	3,445	3,937	4,539	5,186	5,441
Sillod–Golegaon	5,302	6,589	7,061	8,037	8,195	8,427
Aurangabad–Ellora	54,847	54,040	57,553	59,214	60,150	59,926
Khultabad–Phulambari	4,018	4,501	5,001	5,261	5,502	5,612
Ajanta area	1,377	1,683	1,957	2,289	2,444	2,494
Golegaon–Ajanta V. P.	4,355	5,182	5,370	5,641	5,986	5,879
Mitmita–Varzadi–Ellora	5,959	8,160	9,494	10,883	10,216	10,008

Source: PWD (Public Works Department of Maharashtra State)

According to responses from the executing agency to our questionnaire, the travel time on major roads was significantly shortened compared to the time before the project. Moreover, when the travel time was checked during the field work, it was found to be shorter overall compared to prior to the project.

Table 4: Travel Time on Major Roads (minutes)

	1990	1998	2000	2002	2004	2006
Aurangabad–Phulambari	65	65	55	27	25	25
Phulambari–Sillod	60	60	60	45	40	30
Sillod–Golegaon	65	65	65	40	35	30
Aurangabad–Ellora	65	65	65	40	30	30
Khultabad–Phulambari	70	70	70	40	30	30
Ajanta area	40	40	40	30	25	20
Golegaon–Ajanta V. P.	40	40	40	30	25	20
Mitmita–Varzadi–Ellora	65	65	65	50	40	40

Source: PWD (Public Works Department of Maharashtra State)

2.3.3 Improvement and development of airport facilities

As shown on Tables 5 through 7 below, due to the extension of the runway and improvement of the take-off and landing system at Aurangabad Airport, a large increase is recognized since the completion of construction in 1998 in the number of airport users, the number of flights arriving and departing including irregular flights, and the cargo load. In particular, the cargo load displayed an increase of 5 times compared to at the time when construction was completed.

Table 5: Number of Aurangabad Airport Users

	1990	1998–99	2000–01	2002–03	2004–05	2005–06
Total domestic travelers (arriving + departing) (persons)	65,681	92,693	104,872	104,912	133,199	137,388

Source: AAI (Airports Authority of India)

Table 6: Number of Flights Arriving and Departing Aurangabad Airport

	1990	1998	2000	2002	2004	2006
Total departing/arriving (including irregular flights)	-	3,624	2,924	4,834	4,552	4,726
Total departing/arriving regular flights	-	1,402	1,460	2,365	2,234	2,796
Regular flights/day	4	-	4	6	6	8

Source: AAI (Airports Authority of India)

Table 7: Cargo Load at Aurangabad Airport (tons)

	1990	1998-99	2000-01	2002-03	2004-05	2005-06
Departures	-	42	268	353	539	579
Arrivals	-	138	319	515	578	537
Totals	-	180	587	868	1,117	1,116

Source: AAI (Airports Authority of India)

2.3.4 Water supply and sewerage system improvement and development

The actual figures for the amount of water supplied and the population served in both historic site areas, as shown on Table 8, are significantly below the planned figures. However, this improvement and maintenance of the water supply facilities was planned for the purpose of supplying the tourist complexes of both sites, and given that the complexes are still uncompleted, the results are as expected at this stage.

Table 8: Amount of Water Supplied (Plan/Actual)

Area	Item	Plan	Actual	Note
Ajanta	Population served (persons)	24,100	1,627	Planned figures for 2020; actual figures for 2005
	Amount of water supply (kl/day)	1,932	191	Same as above
Ellora	Population served (persons)	22,700	9,325	Planned figures for 2020; actual figures for 2001
	Amount of water supply (kl/day)	1,458	603	Planned figures for 2020; actual figures projected based on actual population

Source: MJP (Maharashtra Jeevan Pradhikaran Works)

2.3.5 Power equipment development

The number of beneficiaries (commercial set-ups) at both historic sites of the electric power supply provided through the installation of transmission lines mainly for the tourist complexes in both site areas are as shown on Table 9. Currently electric power is distributed to ordinary households because there are chronic power shortages involving planned outages in both areas. After the completion of the tourist complexes which are scheduled for Phase II, these complexes are scheduled to be the largest users of electric power. As to the Ajanta rock-cut cave temple, it is exempted from the planned outages, and power has been supplied to it at all times.

Table 9: Number of Beneficiaries (commercial set-ups)

Area	1998 (project completed)	2006
Ajanta	73	170
Ellora	67	79

Source: MSED (Maharashtra State Electricity Distribution Co. Ltd.)

2.3.6 Improvement of the surrounding natural environment

The plant survival rate is as shown on Table 10. Following implementation of the project, the survival rate declined in some years due to harsh weather conditions including drought, but the overall average survival rate has improved to around 70%. Considering that the project site does not receive abundant rainfall, it is concluded that the survival rate figures are basically as planned.

Table 10: Plant Survival Rate

	1997	1998	2000	2002	2004	2006
Ajanta area (500ha)	55%	53%	52%	60%	67%	72%
Ajanta additional area (200ha)	-	-	100%	58%	47%	50%
Ellora area (237ha)	83%	77%	65%	73%	80%	85%

Source: FD (Forest Department of Maharashtra)

2.3.7 Condition of tourism

The number of tourists who visit Ajanta and Ellora caves is as shown on Table 11. Following the end of Phase I, the number of tourists is stable around 700,000 persons annually with no large increase or decrease. However, the number of overseas tourists is in an uptrend, and although there are fluctuations depending on the year, the annual growth rate is approximately 20%.

Table 11: Number of Visitors to Rock-cut Caves (persons) * Number of tickets sold

		1992	2001–2002	2002–2003	2003–2004	2004–2005
Ajanta	Overseas	-	15,529	17,639	23,139	28,642
	(rate of increase)			13.6%	31.2%	23.8%
	Domestic	-	283,281	269,959	289,130	271,681
	(rate of increase)			-4.7%	7.1%	-6.0%
	Total	260,330	298,810	287,598	312,269	300,323
	(rate of increase)		14.8%	-3.8%	8.6%	-3.8%
Ellora	Overseas	-	10,460	10,627	13,727	15,977
	(rate of increase)			1.6%	29.2%	16.4%
	Domestic	-	442,329	383,214	432,762	377,909

	(rate of increase)			-13.4%	12.9%	-12.7%
	Total	396,309	452,789	393,841	446,489	393,886
	(rate of increase)		14.3%	-13.0%	13.4%	-11.8%
Overseas subtotal		-	25,989	28,266	36,866	44,619
	(rate of increase)			8.8%	30.4%	21.0%
Domestic subtotal		-	725,610	653,173	721,892	649,590
	(rate of increase)			-10.0%	10.5%	-10.0%
Total		656,639	751,599	681,439	758,758	694,209
	(rate of increase)		14.5%	-9.3%	11.3%	-8.5%

Source: MTDC (Maharashtra Tourism Development Corporation)

Table 12: Number of Tourists in Aurangabad City

		1992	1998	2000	2002	2004	2006
Number of Tourists	Overseas	34,914	36,168	36,596	40,571	65,172	65,943
	Domestic	1,377,752	1,557,098	1,621,926	1,562,264	1,559,799	1,624,739
	Total	1,412,666	1,593,266	1,658,522	1,602,835	1,624,971	1,690,682

Source: Impact Evaluation of Ajanta–Ellora Project Phase I (TATA Consulting Services (2006)) consigned by JBIC.

2.3.8 Benefits

At the time of appraisal, the following benefits were assumed in consideration of the costs which consist of the project cost as the capital cost as well as operation and maintenance expenses.

- (1) Improvement in conservation condition of the historic site
- (2) Improvement in natural environment surrounding historic sites
- (3) Increase in consumption accompanying tourism
- (4) Savings on vehicle maintenance cost accompanying road improvement
- (5) Increased safety and time-saving for tourists due to improvement in airport facilities and widening/improvement of roads
- (6) Improvement of the living environment of surrounding residents through improvement and maintenance of the water supply and sewerage facilities and supply of electric power.

Because many of these benefits are difficult to express quantitatively due to lack of data, EIRR was calculated only for the road improvement, and the result was 21.5%. However, because budget data concerning operation and maintenance could not be adequately confirmed in the ex-post evaluation, the IRR has not been calculated.

2.3.9 Impact

(1) Vitalisation of local economy

As shown in Table 13, there are years when the changes in tourism revenue do not

coincide with the changes in the number of tourists, but the annual growth averages around 10% overall.

Table 13: Tourism Revenue in Aurangabad City

		1992	1998	2000	2002	2004	2006
Tourism Revenue (Cr)	Foreign	31	32	33	36	58	59
	Domestic	237	268	279	269	269	280
	Total	268	300	312	305	327	339

*Cr: 10 million rupees. Tourism revenue includes tourists' lodging expenses, meals, domestic travel expenses, and purchases of medicines and souvenirs. (However, domestic travel expenses are excluded in calculating the revenue earned from domestic tourists.)

Source: Same as Table 12.

Regarding the hotel industry, when a comparison was made of income and profit data in 1998 (prior to the project implementation) and 2005 (following project completion) obtained in a hotel industry survey¹¹ (of 17 hotels) in the Aurangabad region, it was found that income and profit rose by 11% and 10%, respectively. Moreover, when a comparison was made of the number of hotel employees (including managerial and non-managerial positions) in the same region in 2000 (prior to project completion) and 2005 (following project completion), it was found that the number of managerial positions increased by 63%, and the number of non-managerial positions increased by 67%. When a comparison was made of data for 2000 and 2005 concerning the average salaries of hotel employees, it was found that the average salary of managerial positions increased 87% and that of non-managerial positions increased 78%. Because the percentage of increase in the number of employees is less than the percentage of increase in the average salaries, average salaries are recognized as having increased overall.

Furthermore, in the satisfaction survey concerning this project of shop owners in the project area and surrounding region who are some of the main beneficiaries, an average of over 70% of responses were "slightly improved" or "greatly improved" for each component, as shown on Table 14. So, a favourable evaluation result was seen overall.

Table 14: Results of Phase I Satisfaction Survey

Sub-component	Greatly improved	Improved	Slightly improved	No change	Worse
Roads	8%	63%	12%	17%	0%
Water supply	2%	22%	48%	28%	0%
Public transportation	2%	37%	48%	11%	1%
Guide signs/road signs	7%	33%	41%	17%	2%

¹¹ Impact Evaluation of Ajanta–Ellora Project Phase I (TATA Consulting Services (2006)) consigned by JBIC.

Airport facilities	4%	34%	40%	20%	2%
Electric power condition	7%	23%	46%	22%	2%
Paths for events	6%	15%	54%	25%	0%
Media	7%	50%	25%	17%	1%

)Questionnaire survey of 123 shops located in the project area (Ajanta and Ellora) and in the surrounding area (Daulatabad Fort, Bibi Ka Maqbara, and Aurangabad).

)Source: Same as Table 12.

(2) Secondary impacts of each component

It was difficult to measure the impact of each component on vitalisation of the local economy, but the following secondary impacts are suggested by the data that is available.

1) Historic site conservation

For details on the impact of this project's historic site conservation work, see the Thematic Evaluation Report. Among the above impacts, a particular example of balance between historic site preservation and tourism promotion is the installation of optic fiber lighting and drainage channels in the upper areas of the historic sites. The former is a lighting system that reduces radiant heat, ultraviolet light, and infrared light which are causes of deterioration of the mural paintings, and it allows the paintings to be preserved without reducing their public accessibility (see photo on page 1 of this report). The latter facilitates reduction of historic site deterioration by reducing the flow of surface water down into the sites.

2) Improvement of the surrounding natural environment

Afforestation is contributing to the maintenance and conservation of the ecosystems surrounding the historic sites and to maintenance of the topography by inhibiting soil erosion and landslides in the area around the sites. Some of the afforested areas by this project were in locations not visible from the historic sites and so had no direct effect in improving the scenery of the sites; however, other afforested areas did contribute to the improvement and maintenance of the scenery along the approach paths to the historic sites. Afforestation activities created a total of 1.6 million person-days worth of work. Because approximately 70% of the persons employed in the activities were women, the project contributed to improvement of the social status of women, together with creating employment opportunities, and thereby may be considered to have contributed to the vitalisation of the local economy.

3) Improvement and development of the Aurangabad Airport facilities

Improvement of the airport departure and arrival system contributed to the safe operation of aircraft and also led to an increase in the number of private airlines with service to and from the airport.

4) Road improvement and development

Responses received from interviews of Japanese travel agents offering tours to the Ajanta and Ellora historic sites indicate improvements not only in convenience but also in comfort, with several companies responding that “the time required was shortened due to road improvement, and stress from unpaved roads was reduced” and “tours move more smoothly because the travel time is shortened.” Moreover, the executing agency reports that the environmental burden on the sites has been lightened due to the road bypass plan at the Ellora historic site.

5) Water supply and sewerage system improvement and development

While the water coolers installed on the historic sites provide a supply of drinking water for tourists, it was pointed out that the effect is not being adequately realized because the absolute volume of water resources is limited during the dry season, which is leading to the problems in supply stability.

6) Power equipment development

At the Ajanta rock-cut caves, electricity is now stably supplied using optic fiber lighting for the wall paintings, which are the greatest tourist attraction.

7) Development of tourism management system

Prior to implementation of this project, souvenir stalls were located adjacent to the historic sites and exerted a negative effect on the scenery around the sites. It was confirmed that, since a shopping complex was newly built by this project near the bus stop which is away from the historic sites, the area around the historic sites has been aesthetically improved. However, it was confirmed that improvement of the tourist route with consideration for the flow of tourists and placement of map signboards and pamphlets is inadequate (For details, see the Thematic Evaluation).

2.3.10 Summary of effectiveness and impact

It was found that data was favourable for most of the operation and effect indicators of the components. Considering that there are components whose effects will only be confirmable after Phase II is completed, Phase I is evaluated as having high overall effectiveness overall. It is difficult to measure the impact of each component on vitalisation of the local economy, but in light of the results of the beneficiary survey and the available information concerning the hotel industry, there is a recognizable contribution by this project to the vitalisation of the local economy overall.

2.4 Sustainability (Rating: b)

2.4.1 Technical capacity

Technical capacity required for facilities and equipment provided for the purpose of historic site conservation (component supervised by ASI) was not given consideration as

part of the overall management plan for site conservation. In addition, this project was not adequately used as an opportunity for human resources training to improve the operation and maintenance, and techniques and methods of the staff in charge of historic site conservation. Thus, issues of sustainability remain in technical capacity. Meanwhile, there is no problem in the technical capacity for the operation and maintenance of facilities that are part of infrastructure development, including the airport, roads, and water supply. However, the operation and maintenance of the water supply facilities will be transferred to the local government following the completion of the facilities unless there is a particular request otherwise, and so technical support may be necessary if the staff in charge of operation lacks specialized knowledge, such as in the city of Kultabad which operates the water supply for the Ellora region.¹² The electric power facilities are operating smoothly following completion of the facilities. No cause for concern is visible in the technical capacity because technicians stationed at each transmission and transformer station are mid-level veterans with over 10 to 30 years of experience and training programs to improve skills are held throughout the year at training centres built in each area. There are no particular technical issues in the afforestation activities.

2.4.2 Operation and maintenance system

The local manager of ASI is an expert in archaeology and has the knowledge and experience to preserve and manage the historic sites but is not knowledgeable about opening the historic sites to the public and utilizing them for tourism. Meanwhile, the local manager of MTDC is an expert on tourism but does not possess knowledge concerning historic site management. Also, in the plan for development of exhibits on the historic sites at the Ajanta tourist centre which was designed as part of Phase I (and under construction in Phase II), there was no input of ASI expertise, and doubts have been raised as to whether there is adequate presentation of accurate and appropriate information for tourists. Consequently, it can be said that it is necessary to assign a project manager who is capable of, or to create a mechanism for, comprehensively promoting both conservation of the historic sites and development of tourism infrastructure.

At the airport, staff members have been assigned to the AAI, the competent agency, who are able to operate the new departure and arrival system, and no particular problems are visible. At the Public Works Department of Maharashtra State (PWD) which is in charge of the roads, new section was created for this project's road improvement, and operation and maintenance is currently being conducted smoothly. In the water supply component, the Maharashtra Jeevan Pradhikaran (MJP) is directly operating and

¹² It is based on the statement of staff in charge of the Ellora district at the MJP.

managing the water supply facilities in the Ajanta region on consignment from MTDC. In the Ellora region, operation and maintenance of water supply facilities have been transferred to the local city of Kultabad, as stated above. In the electric power component, planned personnel placement at each transmission and transformer station is being carried out. Regarding afforestation and its operation and maintenance, the various groups in charge at the FDM, which is the competent agency, have been set up, and system is in place so that each facility is being patrolled regularly and repairs are carried out as necessary.

2.4.3 Financial status

An essentially fixed amount is secured for the operation and maintenance budget for the airport facilities. However, since there is no fixed budget for the roads and the budget is determined on a needs basis, the timing of operation and maintenance tends to be slow.¹³ The plan is for MTDC to supply the operation and maintenance expenses for the water supply facilities in the Ajanta region when the tourist complex begins operation; however, since financial measures by MTDC are inadequate, improvement is desired. Regarding the power facilities, the local manager reports that there is a need for adequate operation and maintenance funds. Meanwhile in the afforestation component, while there is fluctuation depending on the year, an operation and maintenance budget averaging 4 million rupees/year is appropriated. There is fluctuation from year to year also in tourism sector budget of Maharashtra state, but a medium-term budget plan is being prepared (however, data on the operation and maintenance budget in the plan is unknown).

Table 15: Trends in Tourism Budget of Maharashtra State

	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007
Approved budget (lakhs)	6548.00	16813.00	8173.00	9778.60	16659.06
Amended budget (lakhs)	6548.00	11725.96	9111.64	9778.60	-
Actual spending (lakhs)	1007.42	1316.81	10212.51	-	-

* Lakhs: 100,000 rupees

** Planned budget for 2002–07: 35,279 lakhs

Source: Financial Performance of Maharashtra during Tenth Plan

2.4.4 Operation and maintenance status

Inspections and checks concerning regular operation and maintenance are being carried out for almost all components (i.e., airport, roads, water supply, electric power, and plantings). In the road component, in addition to a regular weekly patrol, a traffic volume

¹³ The road segment of Aurangabad–Daulatabad–Ellora was designated as a national road, and operation and maintenance of it was consigned to the PWD under the supervision of the central government; however, the operation and maintenance consignment budget of 40,000 rupees/km has not yet been provided.

study is also implemented twice yearly. In the tourism component, partial revision of the pamphlets for both historic sites was confirmed. A report was received that the eco-friendly buses receive appropriate maintenance.

2.4.5 Evaluation of sustainability

Financially, it was clear that some of the components have a fragile budget base, but the sustainability is evaluated as good overall in terms of the technical capacity, the operation and maintenance system, and the operation and maintenance status.

3. Feedback

3.1 Lessons Learned

Because tourism promotion projects cover diverse sectors, when setting the project period, it is necessary to consider the time required to coordinate the sectors.

For sustainability of historic site preservation, it is necessary to use the site preservation work itself as an important opportunity for human resource training (For details, see the Thematic Evaluation Report).

3.2 Recommendations

Lack of coordination by the executing agency (MTDC) may be pointed out as a concern of this project. However, there are limits on the coordination that may be expected of MTDC given that this project involved diverse sectors, this was MTDC's first endeavour in coordinating work in these sectors, and not only the state government of Maharashtra but multiple central governments were also involved. Having said that, it is necessary to search for some sort of measure that includes the construction of an institutional coordination mechanism that is adequately based on the lessons learned in this project, such that the above-mentioned concerns (see "2.4.2 Operation and maintenance system") do not reoccur in the similar type of projects.

Comparison of Original and Actual Scope

Item	Plan	Actual
1. Output	<p>[1] Historic site conservation</p> <p>(1) Installation of protective fence</p> <p>(2) Procurement of vehicles and measuring instruments</p> <p>[2] Improvement of surrounding natural environment</p> <p>(1) Planting: 737 ha</p> <p>(2) Perimeter fence: 48.84 km</p> <p>[3] Improvement and development of airport facilities</p> <p>(1) 1500 ft. runway extension</p> <p>(2) Improvement of facilities</p> <p>(3) Installation of equipment</p> <p>[4] Road improvement and development</p> <p>(1) Improvement of major roads</p> <p>[5] Water supply and sewerage system improvement and development</p> <p>(1) Water supply facilities</p> <p>(2) Sewerage facilities</p> <p>[6] Power equipment development</p> <p>(1) Transmission lines: 55 km</p> <p>(2) Installation of 3 transformers</p> <p>[7] Development of tourism management system</p> <p>(1) Purchase of 33 electric buses (both sites)</p>	<p>[1]</p> <p>(1) As planned</p> <p>(2) Almost as planned</p> <p>(3) Installation of lighting at Ajanta site, etc.</p> <p>[2]</p> <p>(1) Planting: 937 ha</p> <p>(2) Perimeter fence: 61.14 km</p> <p>(3) Access path improvement</p> <p>[3]</p> <p>(1)–(3) As planned</p> <p>(4) Detailed design of terminal</p> <p>[4]</p> <p>(1)As planned</p> <p>(2)Detailed design for Phase II</p> <p>[5]</p> <p>(1) As planned</p> <p>(2) Postponed until Phase II</p> <p>[6]</p> <p>(1)34 km</p> <p>(2)2 transformers</p> <p>[7] Almost as planned</p> <p>(1) 10 low-pollution diesel buses (Ajanta region)</p> <p>(2) Improvement of T-junction in Ajanta; Media publicity</p>
2. Project Period	January 1992–December 1996	January 1992–March 2002
3. Project Cost		

Foreign currency	759.00 million yen	237.14 million yen
Local currency	2031.00 million yen (677.00 million rupees)	3844.00 million yen (1,281.52 million rupees)
Total	4,406.00 million yen	4,081.94 million yen
ODA loan portion	3,745.00 million yen	3,362.00 million yen
Exchange rate	1 rupees = 5.39 yen	1 rupees = 2.99 yen (average from 1996 to 2002)