

D. OTHER SUPPLEMENTAL SURVEY REPORTS FOR DESIGN

ENVIRONMENTAL CONSIDERATION

Environmental Consideration

1. Methodology

'Environmental Consideration' has been done in the project is composed of the following examinations:

- analysing environmental impacts of development activities on the project site and its surrounding areas during the stages of both construction and operation,
- proposing necessary mitigation measures to avoid and/or alleviate significant adverse impacts on natural and human environment.

However, because of the project nature which environmental impacts of the development activities are minor, the environmental consideration did not include environmental impact assessment based upon simulation works to forecast and evaluate environmental impacts using simulation models. As shown in below it mainly examined the impacts with qualitative expressions for evaluation.

(1) pre-assessment

- Reviews of the previous environmental studies

(2) analysis of existing constraints and potential impacts

- Collection of further data and maps
- On-site survey by JICA Study Team
- Discussion with experts of JICA Study Team and the authorities concerned

(3) mitigation measures

- On-site survey
- Literatural survey
- Discussion with experts of JICA Study Team and the authorities concerned

As the Jordanian Government does not have its own guidelines on environmental assessment, basically taking into consideration of the Environmental Consideration Guidelines of JICA and OECF, the important environmental items were carefully assessed through the above process.

The environmental examination was undertaken in each work component of the project from the viewpoints of both natural and social environment, mainly focussing on unclear or significant environmental issues pointed out in the previous environmental studies. Based upon such comprehensive environmental examination, the major negative and positive impacts at both construction and operational phases caused by the project implementation were identified. The possible impacts were classified according to the natures of the development activities such as site location and project scale. In addition, to reduce or avoid the negative impacts, some mitigation measures were proposed.

2. Previous assessment

2.1. Initial Environmental Examination (IEE) by JICA:

The current environmental conditions were affected by the adverse consequences of traffic

problems, water supply difficulties, flooding and insufficient waste management.

The proposed project was considered to help improve urban conditions, but some changes may be occurred due to increased number of visitors.

The study concluded that there was no significant adverse environmental effect requiring an EIA considering the project scale and components.

2.2. Environmental consideration by SAPROF:

The study classified the project as Category B as it should basically give rise to an improvement in the environmental qualities of the built environment.

However, environmental surveys, mitigation measures and monitoring described in the examination of each component should be carried out carefully to achieve the objectives of the project in full.

3. Existing constraints

Salt is located in the north of Jordan with hilly terrain. Most of houses are terraced the hillside. It was ex-capital and intensive land use and condensed population can be seen. Because of such physical conditions, urban problems such as wastes and traffic problems are getting serious. The major environmental issues of the proposed project can be summarised as follows:

- traffic nuisance caused by car including tourist cars and coaches: traffic congestion, pedestrian severance because of intensive land use and poor traffic circulation.
- air and noise pollution: cumulatively caused by severe traffic congestion, which are getting serious by increase of vehicles including tourist cars and coaches. Particularly, air pollution may cause damage to health condition and buildings.
- water-related problems: irregularity and shortage of water supply, flooding of streets
- waste-related problems in the town: caused by accumulation of litters and insufficient waste collection system occur regularly, because there is no single responsible environmental section in the organisational structure of the Salt Municipality and institutional deficiency.
- lack of amenities to draw attention of tourists: Salt city is very old and historical place but buildings are in a disorderly fashion

4. Examination on potential environmental impacts and proposed mitigation measures

4.1. Potential environmental impacts

The project components are consisted of 1) renovation of Abu-Jaber Building, 2) improvement of tourist trails and 3) construction of view terraces. The project sites are located in the centre of Salt City concentrated by houses, commercial and governmental facilities, where the natural environment cannot be seen.

According to the environmental consideration based upon on-site survey, negative impacts on the natural environment are not expected by the project implementation. The major impacts are restricted to the human environment such as human health and socio-economic activities.

The followings are major impacts at the both stages of construction and operation.

Table 1 Potential environmental impacts

Factors	Actions	Impacts	Stage	Impact ranking	Type
Air Pollution	- renovation works of the building and tourist streets	- cause nuisance of the neighbouring residents by dust	construction	○	direct
Noise/Vibration Pollution	- construction equipment and vehicles	- cause nuisance of the neighbouring residents	construction	○	direct
Water Pollution	- renovation work of the building and tourist streets	- contaminate water quality by wastewater from construction plants	construction	△	direct
Waste Pollution	- renovation work of the building and tourist streets - increase of tourists	- generate construction wastes	construction	○	direct
		- increase of solid wastes	operational	○	cumulative
Landscape	- construction of view terraces	- deteriorate landscape	operational	△	direct
Traffic & Safety	- renovation work of the tourist streets - increase of tourist cars	- cause conflict between pedestrian and vehicles	construction	○	direct
		- increase of traffic jam and accidents	operational	○	cumulative
Existing infrastructure	- renovation of the visitor centre and the tourist streets	- effect the existing signage, sewage and electric lines etc.	construction	△	direct
Relocation	- renovation of the tourist streets	- construction work will cause relocation of the residents and shops in Abu Jaber building	construction	○	direct

○ major △ minor

Source: JICA Study Team

4.2. Proposed mitigation measures

The projects will help to bring economic enhancement in the urban area of the City due to increase of tourists, but on the other hand cumulative negative impacts such as waste related problems and traffic problems may occur due to increase of tourist vehicles and litters as below.

- waste related problems: for increase of tourist litters regular collection system of municipal solid wastes are required.
- traffic problems: shortage of parking space and traffic problems such as traffic congestion and traffic conflict between pedestrian and vehicles are getting serious due to increase of tourists and vehicles.

Table 2 Proposed mitigation measures

	Impacts	Mitigation measures
mitigation measures should be clarified in the tender document	Air Pollution	[construction stage] - use low emission equipment - provide sheets for dust control - watering for dust control
	Noise & Vibration Pollution	[construction stage] - use low noise and vibration equipment - provide noise protection sheet - restrict working hours
	Waste Pollution	[construction stage] - ensure disposal sites and transportation
	Existing Infrastructure	[construction stage] - alleviate effects on existing infrastructures such as electricity and sewage systems by clarifying the existing conditions and scope of works
	Traffic & Safety	[construction stage] - conduct traffic control - secure detours (if necessary) - restrict working hours (avoid rash hours)
others	Waste Pollution	[operational stage] - place litter box for increasing general wastes - improve the existing waste collection system by establishment of laws and regulation
	Traffic & Safety	[operational stage] - raise awareness by environmental education - improve the functions of the existing parking areas - plan/ implement drastic traffic system to reduce the car number of city centre and to secure good traffic circulation with long-term perspectives
	Relocation	[construction stage] - secure necessary measures for relocation of the residents - make the tenant fee stabled to ensure temporary relocated shops return back

Source: JICA Study Team

5. Renovation of Abu Jaber Building

5.1. Existing constraints to be solved

- poor drainage system and water supply system
- fecal dropping by birds (on terrace)

5.2. Examination against the OECF Environmental Guidelines

Abu Jaber building is located in the city centre where natural environment cannot be seen. Therefore, negative impacts on the natural environmental will not be expected by renovation. In the meanwhile, the building is located in the condensed area and the renovation works may cause serious nuisance such as air pollution and water pollution to neighbouring residents, restaurants and shops. In addition, the project requires relocation of families and shops in the building during the renovation. Therefore, public consensus on the project implementation is

very crucial in this project.

In addition, because of insufficient waste management system appropriate disposal sites of construction wastes and regular collection system of general wastes are required.

The detailed information on environmental impacts caused identified as the result of on site survey is described in the main report.

(1) Construction stage

- air pollution: dust by construction work and exhaust fume from construction machines
- water pollution : waste water from construction works
- waste pollution: construction debris
- noise and vibration pollution: caused by construction machines and vehicles
- relocation of residents in Abu-Jaber building
- traffic nuisance: increase of traffic congestion and traffic conflicts
- socio-economic impacts on residents and shops

(2) Operational stage

- waster related: increase of tourist litters
- relocation: renovation may raise rent fee for shops
- traffic nuisance: increase of traffic congestion and traffic conflicts
- socio-economic impacts because of increased tourists

5.3. Proposed environmental action plans

(1) Responsible organisation for pollution control and response

- institutional strength: establishment of environmental steering group within the Health & Environment Affairs Department of Salt Municipality because it is weak.

(2) Waste management

- construction wastes: it is needed to secure some disposal sites
- tourist litters: waste management system such as allocation of litter boxed and collection systems
- community involvement and education need to be encouraged

6. Tourist trails

6.1. Existing constraints to be solved

- uncontrolled electric lines and signage: because of deficient regulations it became one of the main reasons that mar the beauty of the scenery
- insufficient surface water treatment: frequent flooding occurs during heavy rain
- insufficient waste management: wastes cause underdrain of filter and offensive odour
- traffic nuisance: traffic congestion and noise pollution, and pedestrian disturbance

because of frequent traffic

6.2. Examination against the OECF Environmental Guidelines

As the Master Plan Study that has been conducted by JICA analysed, construction of the project is considered as having positive impacts rather than negative impacts on the environment. The main reason is that the project is considered to help to improve the urban living environment.

The project can be expected different potential impacts on the environment depending on the stages of the project such as construction stage and operational stage. Possible sources of negative impacts are only those on the social environment induced by the operation of the project. The major sources are 1) increasing visitors, 2) change in traffic density and traffic pattern, 3) change in business and 4) change in land use pattern.

According to the Master Plan Study conducted by JICA, the project is generally considered as having positive impacts rather than negative impacts on the environment. The main reason is that the project is considered to help to improve the urban living environment.

However, the residents located near and along the site, and therefore serious negative impacts which are different depending at the stage of the project are expected.

(1) Construction stage

The major negative impacts are air, noise and vibration pollution caused by construction works. Negative impacts on economic activities such as restaurants and shops will be effected by air pollution and traffic disturbance construction stage work. So, to reduce such impacts appropriate mitigation measures such as arrangement and shortening of working hour and schedule are required.

(2) Operational stage

In the meanwhile, the negative impacts induced by operation of the projects are landuse change and business change. The possible sources of negative impacts on the social environment are as follow; 1) increase of tourists, 2) change in traffic density and traffic pattern, 3) change in business and 4) change in land use pattern. In particular, increase of traffic jam and accidents are expected near the view point terraces because tourist coach stop on the road near the view points. To reduce such traffic problems, a comprehensive traffic system, a 'park and ride' system is recommended.

The below tables summarise the key environmental issues and their impacts generated by the projects and mitigation measures at every sub-project.

6.3. Proposed environmental action plans

(1) Responsible organisation for pollution control and response

- develop an environmental steering group within Health & Environment Affairs Department of Salt Municipality

(2) Waste management

- construction wastes: it is needed to secure disposal sites
- tourist litters: waste management system such as allocation of litter boxed and collection systems
- private sectors involvement

(3) Traffic control

- traffic control construction stage to minimise traffic congestion/ disturbance
- reorganise functions of parking spaces
- introduce a new traffic system such as 'park and ride' in order to drastically reduce vehicles within the city centre
- lack of amenities to draw attention of tourists

(4) Environmental education and training for changing awareness

- environmental education programme: to enhance voluntary activities for waste collection within tourist trails and clean up of city centre by the municipality and to promote public participation for improvement of the existing environmental constraints

Environmental Checklist of Panoramic lookout

Construction Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution		—			• dust from construction work may effects the neighbouring residents	• provide sheets and water for dust control	
	2. Water Pollution			*				
	3. Soil contamination			*				
	4. Noise and vibration		—			• noise and vibration from construction work may effects the neighbouring residents	• provide noise protection sheets • use low noise and vibration equipments	
	5. Subsidence			*				
	6. Waste pollution		—			• construction wastes	• secure transport and disposal site	
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure			*				
	3. Relocation			*				
	4. Traffic and safety			*				
	5. Socio-economic effects			*				
	6. Others			*				

Operational Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution			*				
	2. Water Pollution			*				
	3. Soil contamination			*				
	4. Noise and vibration			*				
	5. Subsidence			*				
	6. Waste pollution		—			• increase of tourist litters	• place litter box • secure waster management system	
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure			*				
	3. Relocation			*				
	4. Traffic and safety		—			• increase of tourist car may increase traffic conflict	• secure parking space	
	5. Socio-economic effects		+			• increase of business opportunity		
	6. Others			*				

+: positive impacts —: negative impacts

Environmental Checklist of Abu Jaber Building

Construction Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution		—			• dust from construction work may effects the neighbouring residents	• provide sheets and water for dust control	
	2. Water Pollution		—			• wastewater from construction plants might cause water pollution	• secure reliable and regular inspection • provide wastewater management facility	
	3. Soil contamination			*				
	4. Noise and vibration		—			• noise and vibration from construction work may effects the neighbouring residents	• provide noise protection sheets • use low noise and vibration equipments	
	5. Subsidence			*				
	6. Waste pollution		—			• construction debris might clog drain pipe	• secure transport and disposal site • enhance recycling of construction wastes	
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure		—			• electricity and telephone line and sewage pipe of subsurface will be damaged	• alleviate effects on the existing electric and telephone line and sewage pipe by clarifying the scope of work	Existing subsurface infrastructure condition has not been understood by the Municipality
	3. Relocation		—			• construction work will relocate residents and shops in Abu Jaber building	• secure resettlement for the shops and residents • keep the fee stable after renovation	Salt Municipality got consensus with existing residents who will have to relocate
	4. Traffic and safety		—			• construction work may cause traffic conflict	• secure detours for business/tourist cars • conduct traffic control to minimize disturbance	
	5. Socio-economic effects			*				
	6. Others			*				

Operational Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution			*				
	2. Water Pollution			*				
	3. Soil contamination			*				
	4. Noise and vibration			*				
	5. Subsidence			*				
	6. Waste pollution		—			• increase of tourist litters	• improve the existing waste management system	
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure			*				
	3. Relocation			*				
	4. Traffic and safety		—			• increase of tourist car may increase traffic nuisance	• improve the functions of the existing parking areas • plan/implement drastic traffic system to minimise the vehicle number in the city center	
	5. Socio-economic effects		+			• spread of tourist benefit to shops		
	6. Others			*				

+: positive impacts —: negative impacts

Environmental Checklist of Tourist Trails

Construction Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution	—				• dust from construction works and equipment	• provide sheets and water for the control of dust	
	2. Water Pollution			*				
	3. Soil contamination			*				
	4. Noise and vibration	—				• noise and vibration from construction equipment	• select low noise and vibration equipment • provide sheets to reduce noise pollution	In particular Hamam Street
	5. Subsidence			*				
	6. Waste pollution		—			• construction wastes	• secure transport and disposal site • enhance recycling of construction wastes	
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure	—				• electric and telephone line and sewerage pipe of subsurface may be damaged	• alleviate effects on the existing electric and telephone line and sewerage pipe by clarifying the scope of work	In particular Hamam Street Façade could be renovated if necessary
	3. Relocation			*				
	4. Traffic and safety		—			• construction work and vehicles car may cause traffic conflict	• secure detours and conduct traffic control for traffic nuisance	
	5. Socio-economic effects		—			• disturbance of commercial activities	• working schedule should be shorten or managed to reduce disturbance	In particular Hamam Street
	6. Others			*				

Operational Stage

		Major	Minor	None	Not Clear	Problems	Actions & Mitigation measures proposed	Remarks
Pollution	1. Air Pollution			*				
	2. Water Pollution			*				
	3. Soil contamination			*				
	4. Noise and vibration			*				
	5. Subsidence			*				
	6. Waste pollution	—				• increase of tourist litters	• place litter box • improve waste management system	insufficient capacity of the Municipality
Natural	1. Effect on ecology			*				
	2. Effect on landscape			*				
Human Environment	1. Historical and cultural heritage			*				
	2. Effect on existing infrastructure			*				
	3. Relocation			*				
	4. Traffic and safety			*				
	5. Socio-economic effects	+				• spread of tourist benefits to shops		
	6. Others			*				

+: positive impacts —: negative impacts