

*Feasibility Study on Water Resources Development in
Rural Area in the
Kingdom of Morocco
Final Report
Volume VII Data Book*

Data Book NE Natural Environment

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NE1 Check-list for Natural Environmental Study

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 1: Neckor Dam Site (for protection of landslide)

Environmental Element \ Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	B	B	B	A	×	×	×	×	Dam volume is large (1,577,500 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	A	×	×	×	×	No irrigation is planned.
		Eutrophication	×	×	×	×	A	×	×	×	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual water inflow is 11.7 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	B	×	×	×	There is no vegetative cover upstream.
		Soil salinization	×	×	×	×	B	×	×	×	Volume of stored water is small (15.6 million m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals upstream is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large (dam height of 36.4 m).
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is medium size (196 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	C	×	×	×	Sediment volume is large (3.8 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
	Changes in shoreline configuration	×	×	×	×	×	×	×	×	There is another dam downstream of this site.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	There is Al Hoceima National Park downstream.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 2: Tizimellal Dam Site (for irrigation and protection from landslide)

Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Environmental Element	Environmental Impact Factor	Impact									
Atmosphere	Air pollution	Emission and dust from construction	C	C	D	×	×	×	×	Quarry site has not been identified.	
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	No actions to cause significant impact on odor.	
	Noise	Noise of construction equipment	C	C	C	×	×	×	×	Dam volume is small (150,000 m ³).	
Aquasphere	Water quality	Water contamination	A	A	D	A	D	×	D	A	Level of contamination upstream is unknown.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	B	×	C	Annual water inflow is 38.4 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	B	×	×	D	No vegetation upstream and irrigation size is unclear.
		Soil salinization	×	×	×	×	A	×	×	×	Stored water is relatively small (21.3 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is small size (91.1 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	B	×	×	×	Sediment volume is moderate (0.5 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 3: Ait Baddou Dam Site (for protection of landslide)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	A	×	×	×	×	Construction site is in a remote area.
Aquasphere	Water quality	Water contamination	A	A	A	A	D	×	A	×	Level of contamination upstream is unknown.
		Eutrophication	×	×	×	×	A	×	A	×	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual water inflow of 27.9 million m ³ will be altered.
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	There is fair vegetative cover upstream.
		Soil salinization	×	×	×	×	A	×	×	×	Stored water is medium size (12.4 million m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals upstream is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	There is fair vegetative cover upstream.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is relatively small (0.3 Mm ³ /yr)
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	D	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	D	B	×	×	There is protected area, Imi N'ifri (P3) , downstream.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 4: Ain Kwachiya Dam Site (for irrigation)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is only 78,000 m ³ .
Aquasphere	Water quality	Water contamination	A	A	A	A	D	×	A	A	Proposed irrigation area is 500 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual water inflow is only 6.6 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	There is some vegetative cover upstream.
		Soil salinization	×	×	×	×	A	×	×	A	Stored water is small (11 million m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is midem size (180 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.02 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	A	×	×	Current supply of sediment is low.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	There is Ilot de Skhirat (P2) at the coast.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 5: N'fifikh Dam Site (for irrigation)

Environmental Impact Factors Environmental Element			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is only 99,100 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	A	D	×	D	A	Proposed irrigation area is relatively small (800 ha).
		Eutrophication	×	×	×	×	A	×	A	A	Annual average water inflow is 13.32 million m ³ .
	Hydrology	Surface water flow	×	×	×	×	D	A	×	×	Annual average water inflow is 13.32 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Irrigation area is small.
		Soil salinization	×	×	×	×	A	×	×	A	Stored water is medium size (19.2 million m ³).
		Soil contamination	×	×	×	×	×	×	D	D	Use of agro-chemicals is unclear.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	C	×	×	×	Reservoir surface area is large (680 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.03 m ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	Current water flow is limited.
Changes in shoreline configuration	×	×	×	×	×	A	×	×	Current supply of sediment is low.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	×	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	There is Ilot de Skhirat (P2) at the coast.

- A: Minor impact is predicted.
 B: Medium impact is predicted.
 C: Significant impact is predicted.
 D: Unknown at this stage.
 ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 6: Tazarane Dam Site (for irrigation and protection from landslide)

Environmental Impact Factors Environmental Element			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	A	×	×	×	×	Construction site is in a remote area.
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	×	×	Proposed size of irrigation area is only 900 ha.
		Eutrophication	×	×	×	×	A	×	A	×	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 11.9 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	Size of irrigation area is relatively small (900 ha).
		Soil salinization	×	×	×	×	×	×	×	×	Volume of stored water is small (9.2 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is small (51 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	B	×	×	×	Sediment volume is medium (0.1 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	Current water inflow is limited (11.9 million m ³).
Changes in shoreline configuration	×	×	×	×	×	×	×	×	×	Dam site is located inland.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	Souk El Had (P3) and Jbel Amergon (P3) sites.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 7: Amezviz Dam Site (for irrigation)

Environmental Impact Factors Environmental Element			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	B	B	D	×	×	×	×	×	Dam volume is 241,800 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	B	Proposed size of irrigation area is 1,500 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 15.5 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Irrigation area is a medium size (1,500 ha).
		Soil salinization	×	×	×	×	A	×	×	A	Volume of stored water is small (11 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is small (55.2 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.03 m ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	Current water flow is (15.5 million m ³).
Changes in shoreline configuration	×	×	×	×	×	×	×	×	×	Dam site is located inland.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 8: Soulaouane Dam Site (for irrigation)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	B	B	C	×	×	×	×	×	Dam volume is 799,000 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	A	Proposed size of irrigation area is 900 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	B	×	×	Annual average water inflow is 46.7 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Irrigation area is relatively small (900 ha).
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is 10 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is only 2.4 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.16 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 9: Taskourt Dam Site (for irrigation)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	B	B	×	×	×	×	×	Dam volume is 457,000 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	B	Proposed size of irrigation area is 4,600 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	B	×	×	Annual average water inflow is 44.65 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	B	Size of irrigation area is large (4,600 ha).
		Soil salinization	×	×	×	×	B	×	×	A	Volume of stored water is 71.7 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	There is some vegetative cover upstream.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.12 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 10: Timkit Dam Site (for irrigation and conservation of underground water)

Environmental Impact Factors Environmental Element			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is relatively small (136,500 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	D	×	×	A	A	Proposed size of irrigation area is 1,300 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	×	A	×	×	Annual average water inflow is only 11.71 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Irrigation area is a medium size (1,300 ha).
		Soil salinization	×	×	×	×	A	×	×	A	Volume of stored water is 7.5 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is 164 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.2 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 11: Tadighoust Dam Site (for irrigation)

Environmental Element \ Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	B	B	×	×	×	×	×	Dam volume is medium (593,800 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	D	×	×	A	A	Proposed size of irrigation area is 1,500 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	D	A	×	×	Annual average water inflow is 36.8 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is relatively small (1,500 ha).
		Soil salinization	×	×	×	×	A	×	×	A	Stored water is medium size (54 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is only 4.5 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.75 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
	Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 12: Tiouzaguine Dam Site (for irrigation and portable water supply)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	A	×	×	×	×	Dam volume is small (128,000 m ³).
Aquasphere	Water quality	Water contamination	A	A	A	A	A	×	A	A	Proposed size of irrigation area is 220 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 4.1 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is relatively small (220 ha).
		Soil salinization	×	×	×	×	×	×	×	×	Volume of stored water is small (10.2 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	×	×	×	×	Reservoir surface area is small (75 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.14 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 13: Keng Grou Dam Site (for irrigation and conservation of underground water)

Environmental Impact Factors Environmental Element			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is relatively small (310,000 m ³).
Aquasphere	Water quality	Water contamination	A	A	A	A	A	×	A	A	Proposed size of irrigation area is only 1,210 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	B	×	×	Annual average water inflow is 65.5 million m ³ .
		Groundwater table	×	×	×	×	C	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	Size of irrigation area is small.
		Soil salinization	×	×	×	×	B	×	×	×	Volume of stored water is relatively large (90 mil. m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	C	×	×	×	Reservoir surface area is large (840 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	B	×	×	×	Sediment volume is small (1.5 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
 B: Medium impact is predicted.
 C: Significant impact is predicted.
 D: Unknown at this stage.
 ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 14: Adarouch Dam Site (for irrigation, portable water supply and water supply for livestock)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	A	×	×	×	×	Dam volume is small (130,000 m ³)
Aquasphere	Water quality	Water contamination	A	A	D	D	D	×	A	B	Proposed size of irrigation area is 2,200 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	D	B	×	×	Annual average water inflow is 64.4 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is medium.
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is medium (48 million m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	B	×	×	×	Reservoir surface area is 328 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is small (0.2 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	B	×	×	Protected area, Kharrouba (P1) exists downstream.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 15: Sidi Omar Dam Site (for irrigation)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	A	×	×	×	×	Dam volume is small (222,000 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	A	Proposed size of irrigation area is 1,500 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 27.8 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is medium.
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is medium (35 million m ³).
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is relatively small (165 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is relatively large (0.23 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
		Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	There is El Harcha (P1) downstream of the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 16: Tiwine Dam Site (for irrigation and hydro-power generation)

Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Environmental Element	Environmental Impact Factors										
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	B	×	×	×	×	×	Dam volume is 405,530 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	D	×	A	B	Proposed size of irrigation area is 2,000 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	D	B	×	×	Annual average water inflow is 96.8 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is medium.
		Soil salinization	×	×	×	×	B	×	×	×	Volume of stored water is 102.9 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	C	×	×	×	Reservoir surface area is large (705 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is relatively large (0.13 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	B	×	×	There is Barr. Al Monsour (P2) downstream.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 17: Azghar Dam Site (for irrigation)

Environmental Impact Factors			Construction Stage				Operation Stage			Remarks on Screening	
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals		Irrigation
Environmental Element	Environmental Impact Factors										
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	Quarry site has not been identified.	
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	No actions to cause significant impact on odor.	
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	Dam volume is 299,280 m ³ .	
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	B	Proposed size of irrigation area is 1,600 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 53.21 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is medium.
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is 29.5 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is 264 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.13 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 18: Boukarkour Dam Site (for irrigation and water supply for livestock)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is 172,140 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	D	×	A	A	Size of irrigation area is limited (1,000 ha).
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	D	D	×	×	No data available on annual average water inflow.
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	D	×	×	A	Size of irrigation area is limited.
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is 30.1 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	×	Use of agro-chemicals is unknown.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	B	×	×	×	Reservoir surface area is 217.5 ha.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is relatively small (0.11 Mm ³ /yr).
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	A	×	×	Dam site is located 60 km from shoreline.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is no protected areas around the dam site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 19: Aoulai Dam Site (for irrigation and protection from landslide)

Environmental Element		Construction Stage				Operation Stage				Remarks on Screening	
		Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation		
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is relatively small (310,500 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	D	D	×	A	B	Proposed size of irrigation area is 5,000 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	C	C	×	×	Annual average water inflow is 177.7 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	B	×	×	B	Size of irrigation area is large (5,000 ha).
		Soil salinization	×	×	×	×	B	×	×	×	Volume of stored water is large (145 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals upstream is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	C	×	×	×	Reservoir surface area is relatively large (710 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.43 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	×	Dam site is located inland.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	C	×	×	Jbel Tizirane (P2), upstream and Lalla Outka (P1), downstream.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 20: Sidi Abbou Dam Site (for irrigation)

Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Environmental Element	Environmental Impact Factors										
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is 32,000 m ³ .
Aquasphere	Water quality	Water contamination	A	A	D	D	D	×	A	B	Size of irrigation area is 2,000 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 34.8 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	B	Size of irrigation area is relatively large (2,000 ha).
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is 58 million m ³ .
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	B	×	×	×	Reservoir surface area is relatively large (432 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	B	×	×	×	Sediment volume is relatively large 1.0 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	×	Dam site is located inland.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	B	×	×	There is Barr. Idriss Lev (P1) downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 21: Sidi El Mokhfi Dam Site (for irrigation and water supply for livestock)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	B	A	A	×	×	×	×	There are some villages around the site.
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	A	A	Proposed size of irrigation area is 3,600 ha.
		Eutrophication	×	×	×	×	A	×	A	A	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	C	C	×	×	Annual average water inflow is 181.4 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	B	×	×	B	Size of irrigation area is relatively large (3,600 ha).
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is medium (36.7 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals upstream is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	There is some vegetative cover upstream.
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.38 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	C	×	×	Koudiat Tidighine (P2) and Ain Bou Adel (P2) around the site.

- A: Minor impact is predicted.
B: Medium impact is predicted.
C: Significant impact is predicted.
D: Unknown at this stage.
×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 22: N'ouantz Dam Site (for irrigation and water supply for livestock)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage			Remarks on Screening	
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals		Irrigation
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	Quarry site has not been identified.	
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	No actions to cause significant impact on odor.	
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	Dam volume is small (75,200 m ³).	
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	×	×	Size of irrigation area is 200 ha.
		Eutrophication	×	×	×	×	A	×	D	D	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	A	A	×	×	Annual average water inflow is 17.8 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	Size of irrigation area is 200 ha.
		Soil salinization	×	×	×	×	×	×	×	×	Volume of stored water is small (2.9 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is small (29 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.8 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	×	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	A	×	×	There is Bou Tlerda (P3) downstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 23: Iguin' Ouqa Dam Site (for irrigation, flood control and conservation of underground water)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	Dam volume is small (186,200 m ³).
Aquasphere	Water quality	Water contamination	A	A	D	D	A	×	×	×	Size of irrigation area is 600 ha.
		Eutrophication	×	×	×	×	A	×	×	×	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	A	×	×	×	Annual average water inflow is 8.3 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	×	Size of irrigation area is 600 ha.
		Soil salinization	×	×	×	×	×	×	×	×	Volume of stored water is small (10.5 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals upstream is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is small (66.7 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.75 Mm ³ /yr.
		Changes in downstream river configuration	×	×	×	×	×	A	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	Dam site is located inland.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	There is Aghbar protected area (P1) upstream of the site.

- A: Minor impact is predicted.
B: Medium impact is predicted.
C: Significant impact is predicted.
D: Unknown at this stage.
×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction

No. 24: Amount Abdelmoumen Dam Site

Environmental Impact Factors			Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Environmental Element	Environmental Impact Factors										
Atmosphere	Air pollution	Emission and dust from construction	A	A	D	A	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	A	A	A	×	×	×	×	×	A small number of houses exist around the site.
Aquasphere	Water quality	Water contamination	A	A	×	×	×	×	×	×	No irrigation is planned.
		Eutrophication	×	×	×	×	A	×	×	×	Use of agro-chemicals is limited.
	Hydrology	Surface water flow	×	×	×	×	D	B	×	×	Annual average water inflow is 72.1 million m ³ .
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
		Condition of trans-river-basin	×	×	×	×	×	×	×	×	There is no trans-basin activities.
	River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.
Lowering river bed		×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	×	×	×	×	No irrigation is planned.
		Soil salinization	×	×	×	×	D	×	×	×	Size of dam reservoir is not known.
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	There is some vegetative cover upstream.
		Hinterland dilapidation and sedimentation	×	×	×	×	D	×	×	×	No data available on sediment flow.
		Changes in downstream river configuration	×	×	×	×	×	A	×	×	There is no sign of activities in river configuration.
Changes in shoreline configuration	×	×	×	×	×	×	×	×	×	There is another dam downstream of this site.	
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	×	×	×	Ain Asmama protected area (P1), upstream of the site.

- A: Minor impact is predicted.
- B: Medium impact is predicted.
- C: Significant impact is predicted.
- D: Unknown at this stage.
- ×: No impact is predicted.

Check-list for Potential negative impacts on natural environment as a result of proposed dam construction
No. 25: Sidi Abdellah Dam Site (for irrigation and conservation of underground water)

Environmental Element		Environmental Impact Factors	Construction Stage				Operation Stage				Remarks on Screening
			Construction of access roads	Site preparation	Collection of construction material	Disposal of surplus material	Submerged area	Control of water flow	Use of agro-chemicals	Irrigation	
Atmosphere	Air pollution	Emission and dust from construction	A	A	A	×	×	×	×	×	Quarry site has not been identified.
	Odor	Emission and effluent from construction	×	×	×	×	×	×	×	×	No actions to cause significant impact on odor.
	Noise	Noise of construction equipment	B	C	C	A	×	×	×	×	Dam volume is large (2,055,300 m ³).
Aquatic	Water quality	Water contamination	A	A	D	D	A	×	×	A	Size of irrigation area is 600 ha.
		Eutrophication	×	×	×	×	A	×	×	×	Use of agro-chemicals upstream is limited.
	Hydrology	Surface water flow	×	×	×	×	D	D	×	×	Annual average water inflow is not known.
		Groundwater table	×	×	×	×	A	×	×	×	Stocked water can recharge groundwater.
	Condition of trans-river-basin	×	×	×	×	×	×	×	×	×	There is no trans-basin activities.
River bed	Quality of sediment	×	×	×	×	×	×	×	×	There is no activities affecting the quality of sediment.	
	Lowering river bed	×	×	×	×	×	×	×	×	There is no activities to lower the river bed.	
Geosphere	Soil	Soil erosion	×	×	×	×	A	×	×	A	Size of irrigation area is small.
		Soil salinization	×	×	×	×	A	×	×	×	Volume of stored water is medium (10.37 million m ³).
		Soil contamination	×	×	×	×	×	×	A	A	Use of agro-chemicals is limited.
	Topography	Induced earthquake	×	×	×	×	×	×	×	×	Size of the dam is not large.
		Landslide (slope failure)	×	×	×	×	A	×	×	×	Reservoir surface area is small (49.36 ha).
		Hinterland dilapidation and sedimentation	×	×	×	×	A	×	×	×	Sediment volume is 0.1 Mm ³ /yr.
Changes in downstream river configuration	×	×	×	×	×	A	×	×	There is no sign of activities in river configuration.		
Changes in shoreline configuration	×	×	×	×	×	A	×	×	Sediment supply to the shoreline may be reduced.		
Biosphere	Biological diversity	Terrestrial flora (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Terrestrial fauna (rare or endangered sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
		Aquatic wildlife (rare and endemic sp.)	×	×	×	×	D	×	×	×	Rare or endangered species on site is not known.
	Ecosystem	Condition of sensitive ecosystems	×	×	×	×	×	B	×	×	There are Ademine (P1) and Souss-Massa N. P. downstream of the site.

- A: Minor impact is predicted.
 B: Medium impact is predicted.
 C: Significant impact is predicted.
 D: Unknown at this stage.
 ×: No impact is predicted.

*Feasibility Study on Water Resources Development in
Rural Area in the
Kingdom of Morocco
Final Report
Volume VII Data Book
Data Book NE
Natural Environment*

NE2 Fauna and Flora

Phase 2

V Water Quality

Moroccan Standardized Analysis for Water Quality

Parameters	Reference of Method	Procedure of Analysis
1. Temperature	NF T 90-100	-
2. pH	NF T 90-008	PRO/180/29
3. Electric Conductivity at 20° C	NF EN 27888 (ISO 7888)	PRO/180/32
4. Odor	NM 03-7-016	-
5. Color	NM 03-7-018	-
6. Ca (Calcium)	NF T 90-016	PRO/180/28
7. Mg (Magnesium)	NF T 90-005	PRO/180/53
8. NO ₃ -N (Nitrate Nitrogen)	NF T 90-045	PRO/180/14
9. DO (dissolved oxygen)	NF EN 25-813 T 90-141 NF EN 25-814 T 90-106	-
10. BOD (biochemical oxygen demand)	NF T 90-103	PRO/180/11
11. COD (chemical oxygen demand)	NF T 90-101	PRO/180/9
12. SS (suspended solid)	NF T 90-105	PRO/180/16
13. T-P (Total Phosphorus)	NF T 90-023	PRO/180/42
14. PO ₄ -P (Orthophosphate Phosphorous)	NF T 90-023	PRO/180/42
15. T-N (Total Nitrogen)	NF T 90-110	-
16. NH ₄ -N (Ammonia Nitrogen)	NF T 90-015	PRO/180/33
17. Cl (Chloride)	NF T 90-014	PRO/180/30
18. NO ₂ -N (Nitrite Nitrogen)	NF EN 26 777	PRO/180/10
19. Sulfate (SO ₄)	NF T 90-040	PRO/180/13
20. Alkalinity	NF T 90-036	PRO/180/27
21. Fe (Iron), Mn (Manganese), Zinc (Zn)	NF T 90-112	PRO/180/6
22. F (Fluorine)	NF T 90-004	-
23. Dried residue at 105° C	NF T 90-029	PRO/180/15
24. Total coliforms	NF T 90-414	-

Moroccan Standardized Analysis for Water Quality

Parameter	Unit	Excellent	Good	Average	Low
1. Color	mg Pt/l	< 20	20 - 50	50 - 100	100 – 200
2. Odor at 25° C	-	< 3	3 -10	10 - 20	> 20
3. Temperature	° C	< 20	20 - 25	25 - 30	30 – 35
4. pH	-	6.5 - 8.5	6.5 - 8.5	6.5 - 9.2	< 6.5, > 9.2
5. Conductivity (20° C)	μ S/cm	< 750	750 - 1300	1300 - 2700	2700 - 3000
6. Cl	mg/l	< 200	200 - 300	300 - 750	750 – 1000
7. SO ₄	mg/l	< 100	100 - 200	200 - 250	250 – 400
8. Suspended Solid	mg/l	< 50	50 - 200	200 - 1000	1000 - 2000
9. DO	mg O ₂ /l	> 7	7 - 5	5 - 3	3 – 1
10. BOD ₅	mg O ₂ /l	< 3	3 - 5	5 - 10	10 – 25
11. COD	mg O ₂ /l	< 30	30 - 35	35 -40	40 – 80
12. Ammonium (NH ₄)	mg/l	▪ 0.1	0.1 – 0.5	0.5 - 2	2 – 8
13. TN	mg N/l	▪ 1	1 - 2	2 - 3	> 3
14. NO ³	mg/l	▪ 10	10 - 25	25 - 50	> 50
15. PO ₄ -P	mg/l	▪ 0.2	0.2 – 0.5	0.5 - 1	1 - 5
16. TP	mg P/l	▪ 0.1	0.1 – 0.3	0.3 – 0.5	0.5 – 3
17. Zn	mg/l	▪ 0.5	0.5 - 1	1 - 5	> 5
18. Mn	mg/l	▪ 0.1	0.1 – 0.5	0.5 - 1	> 1
19. Fe	mg/l	> 0.5	0.5 - 1	1 - 2	2 – 5
20. F	mg/l	▪ 0.7	0.7 - 1	1 – 1.7	> 1.7
21. Hydrocarbon	mg/l	< 0.05	0.05 - 0.2	0.2 - 1	> 1
22. Phenol	mg/l	< 0.001	0.001 - 0.005	0.005 - 0.01	> 0.01
23. As	μ g/l	▪ 10	▪ 10	10 - 50	> 50
24. Lead (Pb)	μ g/l	▪ 10	▪ 10	10 - 50	> 50
25. Mercury	μ g/l	▪ 1	▪ 1	▪ 1	> 1

Classification of Groundwater and Surface Water Quality at Each Sampling Site

Sampling Site*	Temp	pH	Cond	DO	Odor	Color	BOD	COD	PT	PO ₄	TN	NH ₄	NO ₃	SO ₄	Cl	Ca	Mg	F	Fe	Mn	Zn	TC	
N' fikh	S 1	16.0	7.5	1447	8.57	0	5	1.51	13.44	0.113	0.027	0.18	0.03	1.88	266	255	148	81.4	0.55	0.308	0.058	<0.01	340
	S 2	16.5	7.55	2315	10.7	0	10	1.29	15.36	0.143	0.033	0.38	0.082	38.5	216	557	140	163.5	0.5	<0.1	<0.02	<0.01	770
	G 1	23.0	7.20	1695	-	0	<5	-	-	-	-	-	-	2.136	-	-	196	86.1	-	-	-	-	-
	G 2	22.0	7.35	2625	-	0	<5	-	-	-	-	-	-	1.550	-	-	138	156.8	-	-	-	-	-
	G 3	24.0	7.05	1465	-	0	<5	-	-	-	-	-	-	0.393	-	-	200	40.8	-	-	-	-	-
Taskourt	S 1	16.5	7.15	668	8.56	0	0	0.90	<7.5	0.105	0.036	0.21	0.04	6.25	147	20	104	34.3	0.8	<0.1	<0.02	<0.01	10
	S 2	22.5	8.15	734	13.15	0	0	1.2	11.52	0.105	0.018	0.3	0.069	3.37	197	29	96	40.7	0.42	<0.1	<0.02	<0.01	18
	G 1	21.0	7.45	710	-	0	<5	-	-	-	-	-	-	3.842	-	-	116	42.1	-	-	-	-	-
	G 2	19.5	7.45	1262	-	0	<5	-	-	-	-	-	-	5.75	-	-	140	83.8	-	-	-	-	-
	G 3	22.5	10.95	3111	-	1	10	-	-	-	-	-	-	55.8	-	-	325	7.4	-	-	-	-	-
Timkit	S 1	17.0	7.40	2158	9.95	0	0	0.9	7.68	0.095	0.034	0.25	0.057	20.77	409	425	172	89.2	0.55	<0.1	<0.02	<0.01	110
	G 1	21.5	7.20	1619	-	0	<5	-	-	-	-	-	-	21.72	-	-	165	74.2	-	-	-	-	-
	G 2	23.5	7.05	2026	-	0	<5	-	-	-	-	-	-	11.54	-	-	190	105.8	-	-	-	-	-
	G 3	22	7.15	2687	-	0	<5	-	-	-	-	-	-	0.067	-	-	232	143.2	-	-	-	-	-
Azghar	S 1	10.0	7.50	450	9.65	0	0	0.61	<7.5	0.122	0.024	0.34	0.07	22.8	24	24	80	18.4	0.45	<0.1	<0.02	<0.01	110
	S 2	11.5	7.65	450	9.25	0	0	0.81	<7.5	0.110	0.024	0.25	0.053	7.0	22	34	60	20.4	0.3	<0.1	<0.02	0.019	190
	S 3	13.0	7.45	443	9.33	0	0	0.89	<7.5	0.105	0.038	0.21	0.048	7.75	28	26	76	19.9	0.35	<0.1	<0.02	0.02	0
	S 4	14.5	7.7	440	9.10	0	0	0.89	<7.5	0.10	0.042	0.29	0.068	7.0	30	26	68	20.7	0.35	<0.1	<0.02	<0.01	40
	G 1	18.5	8.6	461	-	0	<5	-	-	-	-	-	-	6.113	-	-	44	48.4	-	-	-	-	-
	G 2	18.5	7.65	669	-	0	<5	-	-	-	-	-	-	0.986	-	-	116	40.1	-	-	-	-	-
	G 3	18.5	7.6	692	-	1	10	-	-	-	-	-	-	5.466	-	-	104	39.3	-	-	-	-	-

NE2-3

*) Location of sampling site is shown in Supporting Report XVI (XVI 1.5.3).

V Fauna

V Terrestrial Fauna

Major Reptiles Around the Dam Sites

Species	N'fifikh	Taskourt	Timkit	Azghar
<i>Testudo graeca</i> *	+	+	+	+
<i>Emys orbicularis</i> *	+			+
<i>Uromastyx acanthinurus</i> *			+	
<i>Chamaeleo chamaeleon</i> *	+	+	+	+
<i>Scincopus fasciatus</i> *			+	
<i>Chalcices mionecton</i>	+			
<i>Chalcides montanus</i>				+
<i>Chalcides polylepis</i>	+	+		+
<i>Chalcides minitus</i>	+	+		+
<i>Psammodromus microdactylus</i> *	+	+		+
<i>Mesalina pasteuri</i> *			+	
<i>Spalerosophis dolichospilus</i> *			+	
<i>Ophisaurus koellikeri</i>	+	+		+
<i>Hemidactylus turcicus</i>	+			
<i>Saurodactylus fasciatus</i>	+	+		+
<i>Telescopus dhara</i>			+	
<i>Cerastes vipera</i>			+	
<i>Vipera mauritanicus</i>	+	+	+	+
<i>Blanus mettetali</i>	+	+		+
<i>Trogonophus welegans</i>	+	+		+
<i>Saurodactylus brosetti</i>	+	+		
Total (8)	14 (4)	11 (3)	9 (6)	12 (4)

*) Threatened species; () Number of threatened species

Major Bird Species Around the Dam Sites

Species	N'fikh	Taskourt	Timkit	Azghar
<i>Ardea cinerea</i>	+	+	+	+
<i>Ixobrychus minutus*</i>			+	+
<i>Bubulcus ibis</i>	+	+	+	+
<i>Egretta vulgaris</i>		+		+
<i>Egretta garzetta*</i>	+	+	+	+
<i>Ciconia</i>	+	+	+	+
<i>Neophron perceropterus*</i>		+		+
<i>Gyps fulvus*</i>				+
<i>Circus pygargus*</i>	+			
<i>Accipiter gentilis*</i>		+		+
<i>Aquila rapax*</i>		+	+	
<i>Aquila chrysaetos*</i>				
<i>Falco naumanni*</i>	+			+
<i>Falco pelegrinoides*</i>		+	+	+
<i>Rallus aquaticus*</i>			+	
<i>Chlamydotis undulata*</i>			+	
<i>Sterna albifrons*</i>				+
<i>Pterocles coronatus*</i>			+	
<i>Columbia livia</i>	+	+		+
<i>Streptopelia roseagrisa</i>	+	+		+
<i>Streptopelia decaocto</i>	+	+	+	+
<i>Streptopelia turtur</i>	+	+	+	+
<i>Streptopelia senegalensis*</i>			+	+
<i>Tyto alba*</i>	+	+	+	+
<i>Asio capensis*</i>	+			
<i>Caprimulgus aegyptus*</i>			+	
<i>Apus caffer*</i>		+		
<i>Merops superciliosus*</i>			+	
<i>Upupa epops*</i>	+	+	+	+
<i>Dendrocopos major*</i>		+		+
<i>Rhamphocorys clotbey*</i>			+	
<i>Calandrella brachydactyla</i>	+	+	+	+
<i>Galerida theklae</i>		+		+
<i>Calandrella rufescens</i>	+		+	+
<i>Chersophilus duponti*</i>			+	
<i>Riparia paludicola*</i>		+		+
<i>Hirundo rustica</i>	+	+	+	+
<i>Hirundo urbica</i>		+		+
<i>Scotocerca inquieta*</i>			+	
<i>Sylvia nana*</i>			+	

(Continues)

(Continued)

Species	N'fifikh	Taskourt	Timkit	Azghar
<i>Sylvia hortensis</i> *				+
<i>Sturnus vulgaris</i>	+	+		+
<i>Turdoides fulvus</i> *		+		
<i>Corvus monedula</i>		+	+	
<i>Corvus corne</i>			+	+
<i>Corvus corax</i>		+	+	+
<i>Corvus ruficollis</i> *			+	
<i>Pyrrhocorax graculus</i>		+		+
<i>Pyrrhocorax pyrrhocorax</i>		+		+
<i>Pica pica</i>	+	+	+	+
<i>Passer domesticus</i>	+	+	+	+
<i>Passer hispaniolensis</i>	+	+	+	+
<i>Passer unicolor</i>	+	+		+
<i>Passer simplex</i>			+	
<i>Passer montanus</i> *		+		
<i>Rhodopechys sanguinea</i> *		+		
<i>Emberiza schoeniclus</i> *		+		
<i>Emberiza striolata</i>		+	+	+
Total (33)	21 (6)	36 (11)	33 (17)	37 (14)

*) Threatened species; () Number of threatened species

Some Biological Characteristics of Threatened Species of Bird

Species	Biological Characteristics
<i>Ixobrychus minutus</i>	Laying: in May 5 to 6 eggs Food: mainly fishes, amphibians and insects Habitat: Vegetation of the water plans banks Status: Nester in the way to extinction, migrant and wintering
<i>Egretta garzetta</i>	Laying: in May 2 to 5 eggs Food: Especially fishes, amphibians, insects ... Habitat: in border of water plans Status: nester sedentary, rare migratory and wintering
<i>Neophron percnopterus</i>	Laying: in March 1 to 2 eggs Food: Necrophagous Habitat: Territory with vast zones without vegetation Status: Nester and migrant
<i>Gyps fulvus</i>	Laying: in January, 1 only egg Food: Vulture Habitat: miscellaneous Status: Nester in way of disappearance, migrant and wintering

<i>Circus pygargus</i>	Laying: in April, 3 to 6 eggs Food: Insects, rodents, birds.. Habitat: fallow lands and fields of cereal Status: Nester and migratory
<i>Aquila rapax</i>	Laying: in January 1 to 2 eggs Food: Carrion, alive birds of water Habitat: Forests of weak height Status: Nester
<i>Aquila chrysaetos</i>	Laying: from January till March, 2 eggs Food: Rodents, Birds and Lizards Habitat: low and average height Status: sedentary Nester
<i>Falco naumanni</i>	Laying: in April 1 in 6 eggs Food: Insects and Lizards Habitat: rocky faults Status: Nester tourist
<i>Falco pelegrinoides</i>	Laying: in February Food: Migratory birds, Insects and Lizards Habitat: Rocky faults Status: Nester
<i>Rallus aquaticus</i>	Laying: in March - April 5 in 6 eggs Food: Omnivore Habitat: Border of water Status: rare, migratory Nester and wintering
<i>Chlamydotis undulata</i>	Laying: in March 2 to 3 eggs Food: Omnivore Habitat: Open space, steppe, half - desert zones Status: Nester in process of extinction
<i>Sterna albifrons</i>	Laying: in April-May 3 eggs Food: Small fishes, insects, shellfish Habitat: Water plans of streams Status: Summer Nester, rare and migratory
<i>Pterocles coronatus</i>	Laying: no data Food: Vegetables and insects Habitat: Warm and dry Zones Status: Nester
<i>Tyto alba</i>	Laying: in April 4 to 7 eggs Food: Small birds Habitat: Rocks and big agglomerations Status: Sedentary Nester
<i>Asio capensis</i>	in March 2 in 4 eggs Food: Beetles and micromammals Habitat: Swampy Zones Status: Sedentary Nester in process of extinction

<i>Caprimulgus aegyptus</i>	Laying: In the middle of March Food: Insects Habitat: On the sandy grounds and the rocky deserts Status: Rare Nester
<i>Apus caffer</i>	Laying: in May 1 to 3 eggs Food: Flying Insects Habitat: Valleys, banks of streams Status: Summer rare Nester
<i>Upupa epops</i>	Laying: in June 4 to 6 eggs Food: Insects, slugs and worms Habitat: Opened Zones lined with trees Status: Summer rare Nester
<i>Dendrocopos major</i>	Laying: in May 4 to 7 eggs Food: Larva of beetles and lepidoptera ... Habitat: Forests Status: Nester
<i>Rhamphocorys clotbey</i>	Laying: in March 2 to 7 eggs Food: Insects and small seeds Habitat: Rocky deserts Status: Sedentary Nester
<i>Riparia paludicola</i>	Laying: from December to the end of April 3 to 4 eggs Food: Small flying insects Habitat: Border of oueds Status: Nester
<i>Ptyonogrogne fuligula</i>	Laying: from December to the end of April, 3 to 4 eggs Food: Small flying insects Habitat: Border of oueds Status: Nester
<i>Scotocerca inquieta</i>	Laying: in March - April 4 to 5 eggs Food: Insects Habitat: Steppes and eased deserts Status: Nester
<i>Sylvia nana</i>	Laying: from January till April 3 to 6 eggs Food: Insects, larva and fruits Habitat: dense plants, sandy desert zone Status: Nester
<i>Sylvia hortensis</i>	Laying: in April 4 to 5 eggs Food: Insects and fruits Habitat: Vegetation Status: Nester
<i>Turdoides fulvus</i>	Laying: from January till March 3 to 6 eggs Food: Invertebrates and bays Habitat: Sahara Status: Nester

<i>Passer montanus</i>	Laying: in March 4 to 6 eggs Food: Insects, larva, seeds, fruits .. Habitat: Fields Status: Rare Nester
<i>Rhodopechys sanguinea</i>	Laying: in June 5 eggs Food: Invertebrates and seeds Habitat: Forest of mountain Status: Rare Nester
<i>Emberiza schoeniclus</i>	Laying: from October to March Food: Seeds, worms, shoots, Insects. Habitat: Fields, swamp Status: Nester in way of disappearance and rare wintering

Major Mammalian Species Around the Dam Sites

Species	N'fifikh	Taskourt	Timkit	Azghar
<i>Meriones shawi</i>	+	+	+	+
<i>Meriones libycus</i>			+	
<i>Meriones crassus</i>			+	
<i>Gerbillus gerbillus</i>			+	
<i>Gerbillus nanus</i>			+	
<i>Gerbillus campestris</i>	+	+	+	+
<i>Pachyaromys duprasi</i>			+	
<i>Psammomys obesus</i>			+	
<i>Jaculus orientalis</i>			+	
<i>Jaculus jaculus</i>			+	
<i>Hystrix cristata</i> *	+	+		+
<i>Atlantoxerus getulus</i>		+	+	+
<i>Mus spretus</i>	+	+		+
<i>Apodemus sylvaticus</i>	+			+
<i>Lemniscomys barbarus</i>	+			+
<i>Rattus rattus</i>	+	+		+
<i>Mus musculus</i>	+	+	+	+
<i>Erinaceus algerus</i>	+	+	+	+
<i>Paraechinus aethiopicus</i>			+	
<i>Crocidura witakeri</i>	+	+		
<i>Crocidura russula</i>	+	+		
<i>Aselia tridens</i>			+	
<i>Elephantulus rozeti</i>		+	+	
<i>Myotis bithi</i>	+	+	+	+
<i>Pipistrellus kuhli</i>	+	+	+	+
<i>Plecotus austriacus</i>	+	+	+	+
<i>Lepus capensis</i>	+	+	+	+
<i>Canis aureus</i> *	+	+	+	+
<i>Vulpes vulpes</i> **	+	+	+	+
<i>Mustela nivalis</i>	+	+	+	+
<i>Poecilictis libyca</i>			+	
<i>Lutra lutra</i> *	+		+	+
<i>Genetta genetta</i>	+	+	+	+
<i>Herpestes ichneumon</i>	+	+		+
<i>Felis libyca</i> **	+		+	+
<i>Felis caracal</i> ***	+			+
<i>Sus scrofa</i>	+	+		+
<i>Ammotragus levia</i> ***		+	+	+
Total	24	22	28	24

*) Vulnerable species; **) Threatened species; ***) Endangered species

V Aquatic Fauna

Major Aquatic Animal Species Around Taskourt (No.9) Site

Taxa	Species	Upstream	Downstream
Plathelminthes	<i>Dugesia gonocephala</i>	+	+
	<i>Polycelis felina</i>		+
Nemathelminthes	<i>Nematodes</i>	+	
Mollusks	<i>Physa acuta</i>	+	+
	<i>Melanopsis</i> spp	+	
	<i>Lymnaea truncatula</i>	+	+
Annelides	<i>Hirudo medicinalis</i>	+	+
Shellfish	<i>Gammarus</i>	+	+
Insects	<i>Baetis rhodani</i>	+	
	<i>Ephemerella</i> spp	+	+
	<i>Caenis luctiosa</i>	+	+
	<i>Gomphus</i> spp	+	+
	<i>Nepa rubra</i>	+	+
	<i>Notonecta glauca</i>	+	+
	<i>Gerris</i> spp	+	+
	<i>Hydrobia tarda</i>	+	
	<i>Chironomes</i>	+	+
	<i>Tonnoiriella</i> spp	+	+
	<i>Dixa</i> spp	+	+
	Fishes	<i>Gambusia affinis</i>	+
<i>Barbus</i> spp		+	+
Amphibians	<i>Rana esculenta</i>	+	+

+) Present

Major Aquatic Animal Species Around Timkit(No.10) Site

Taxa	Species
Plathelminthes	<i>Dugesia gonocephala</i>
Nemathelminthes	<i>Nematodes</i>
Mollusks	<i>Physa acuta</i>
	<i>Melanopsis spp</i>
Annelides	<i>Hirudo medicinalis</i>
Insects	<i>Baetis rhodani</i>
	<i>Caenis luctiosa</i>
	<i>Gomphus spp</i>
	<i>Nepa spp</i>
	<i>Notonecta glauca</i>
	<i>Gerris spp</i>
	<i>Chironomes</i>
Fishes	<i>Gambusia affinis</i>

V Flora

V N'fifikh (No. 5)

Major Terrestrial Plant Species Around the Site

Taxa	Species
Leguminosae	<i>Anthyllis tetraphylla</i>
	<i>Genista quadriflora</i>
	<i>Retama monosperma</i>
Frankeniaceae	<i>Frankenia laevis</i>
Oleaceae	<i>Fraxinus communis</i>
	<i>Phylleria angustifolia</i>
	<i>Olea europea</i>
Apocynaceae	<i>Nerium oleander</i>
Anacardiaceae	<i>Pistacia lentiscus</i>
Rhamnaceae	<i>Rhamnus lycoides</i>
	<i>Ziziphus lotus</i>
Verbenaceae	<i>Vitex agnus castus</i>
Moraceae	<i>Ficus carica</i>
Festuceae	<i>Phragmites communis</i>

V Taskourt (No. 9)

Major Terrestrial Plant Species Around the Site

Taxa	Species
Cupressaceae	<i>Juniperus oxycedrus</i>
Ephedridaeae	<i>Ephedra fragilis</i>
Oleaceae	<i>Fraxinus communis</i>
	<i>Olea europea</i>
	<i>Phylleria angustifolia</i>
Salicaceae	<i>Populus spp</i>
	<i>Populus alba</i>
	<i>Salix purpurea</i>
Rosaceae	<i>Prunus spinosa</i>
	<i>Rubus ulmifolius</i>
	<i>Rosa sempervirens</i>
Scrophulariaceae	<i>Paruntucellia viscosa</i>
Lythraceae	<i>Lythrum junceum</i>
Iridaceae	<i>Gladiolus byzantinus</i>
Chenopodiaceae	<i>Sueda fruticosa</i>
Rhamnaceae	<i>Ziziphus lotus</i>
Ulmaceae	<i>Celtis australis</i>
Onagradeae	<i>Epilobium parviflorum</i>
Euphorbiaceae	<i>Euphorbia exigia</i>
	<i>Euphorbia helioscopea</i>
Moraceae	<i>Ficus ingens</i>
Apocynaceae	<i>Nerium oleander</i>
Lauraceae	<i>Laurus nobilis</i>
Festuceae	<i>Phragmites communis</i>
Poaceae	<i>Cynodon</i>
Liliaceae	<i>Asparagus acutifolius</i>

Major Aquatic Plant Species Around the Site

<i>Spirogyra spp</i>
<i>Chara spp</i>
<i>Potamogeton pectinatus</i>

V Timkit (No. 10)

Major Terrestrial Plant Species Around the Site

Taxa	Species
Ephedridae	<i>Ephedra fragilis</i>
Salicaceae	<i>Populus euphratica</i>
Rhamnaceae	<i>Ziziphus lotus</i>
Liguliflores	<i>Picris aculeata</i> <i>Launaea arborescens</i>
Chenopodiaceae	<i>Arthrocnemum indicum</i>
Cistaceae	<i>Helianthemum hirtum</i>
Cynareae	<i>Centaurea calcitrapa</i>
Lauraceae	<i>Laurus nobilis</i>
Labiaceae	<i>Lavandula marocana</i>
Senecionaeae	<i>Senecio leucanthemifolius</i>
Crucifereae	<i>Sisymbrium crassifolium</i>
Solanaceae	<i>Solanum sodomaeum</i>
Tamaricaceae	<i>Tamarix gallica</i>
Apocynaceae	<i>Nerium oleander</i>
Saxifragaceae	<i>Saxifraga aizoides</i>
Festuceae	<i>Phragmites communis</i>
Liliaceae	<i>Asparagus acutifolius</i>
Joncaceae	<i>Juncus</i> spp
Areaceae	<i>Phoenix dactylifera</i>
Stipees	<i>Stippa tenacissima</i>

Major Aquatic Plant Species Around the Site

<i>Spirogyra</i> spp
<i>Chara</i> spp

V Azghar (No. 17)

Major Plant Species (terrestrial) Around the Site

Taxa	Species
Cupressaceae	<i>Juniperus oxycedrus</i>
	<i>Juniperus phoenicea</i>
Leguminosae	<i>Anthyllis tetraphylla</i>
	<i>Genista quadriflora</i>
	<i>Retama monosperma</i>
Oleaceae	<i>Fraxinus communis</i>
	<i>Olea europaea</i>
	<i>Phylleria angustifolia</i>
Moraceae	<i>Ficus carica</i>
Vitaceae	<i>Vitis vinifera</i>
Anacardiaceae	<i>Pistacia lentiscus</i>
Polygonaceae	<i>Polygonum hydropiper</i>
Salicaceae	<i>Populus spp.</i>
Fagaceae	<i>Quercus ilex</i>
Rosaceae	<i>Rosa canina</i>
	<i>Rubus ulmifolius</i>
Rhamnaceae	<i>Ziziphus lotus</i>
Tamaricaceae	<i>Tamarix gallica</i>
Ericaceae	<i>Arbutus unedo</i>
Apocynaceae	<i>Nerium oleander</i>
Frankeniaceae	<i>Frankenia laevis</i>
Areaceae	<i>Chamaerops humilis</i>