

Source: the Study Team, and DGRE

図 8.5.1 新たに提案するテレメータ観測所

図8.5.2 メジエルダ川流域の到達時間

Mejerda River Upstream of Sidi Salem Dam

	Ghardimaou		
Jendouba	72	Jendouba	
	10		
	13		
Bou Salem	112	40	Bou Salem
	17	6	
	22	9	
Sidi Salem Dam	167	95	55
	30	20	14
	38	25	16

Tributaries Upstream of Sidi Salem Dam

	Mellegue Dam		
K13	45	Sidi Medien	Bou Heurtma Dam
	4		
	5		
Bou Salem	71	32	31
	10	7	7
	12	9	9
Sidi Salem Dam	98	87	85
	23	20	21
	28	25	25

Mejerda River Downstream of Sidi Salem Dam

	Sidi Salem Dam			
Slouguia	22	Slouguia		
	4			
	6			
Mejez El Bab Pont GP5	38	19	Mejez El Bab Pont GP5	
	8	4		
Mejez El Bab Pont Andalous	11	6	0:30	Mejez El Bab Pont Andalous
	39	20	1	
El Herri	62	43	24	El Herri
	14	9	5	
Borj Toumi	18	12	7	Borj Toumi
	74	55	36	
Laroussia Dam	17	12	8	Laroussia Dam
	22	16	11	
El Battane	83	66	47	El Battane
	18	14	10	
Jedeida	25	20	14	Jedeida
	97	78	59	
Pt de Bizerte GP8	23	17	13	Pt de Bizerte GP8
	29	23	17	
Tobias Dam	106	89	70	Tobias Dam
	26	20	15	
Pt de Bizerte GP8	33	26	20	Pt de Bizerte GP8
	132	116	97	
Tobias Dam	44	34	28	Tobias Dam
	135	119	100	
	42	35	29	

Tributaries Downstream of Sidi Salem Dam

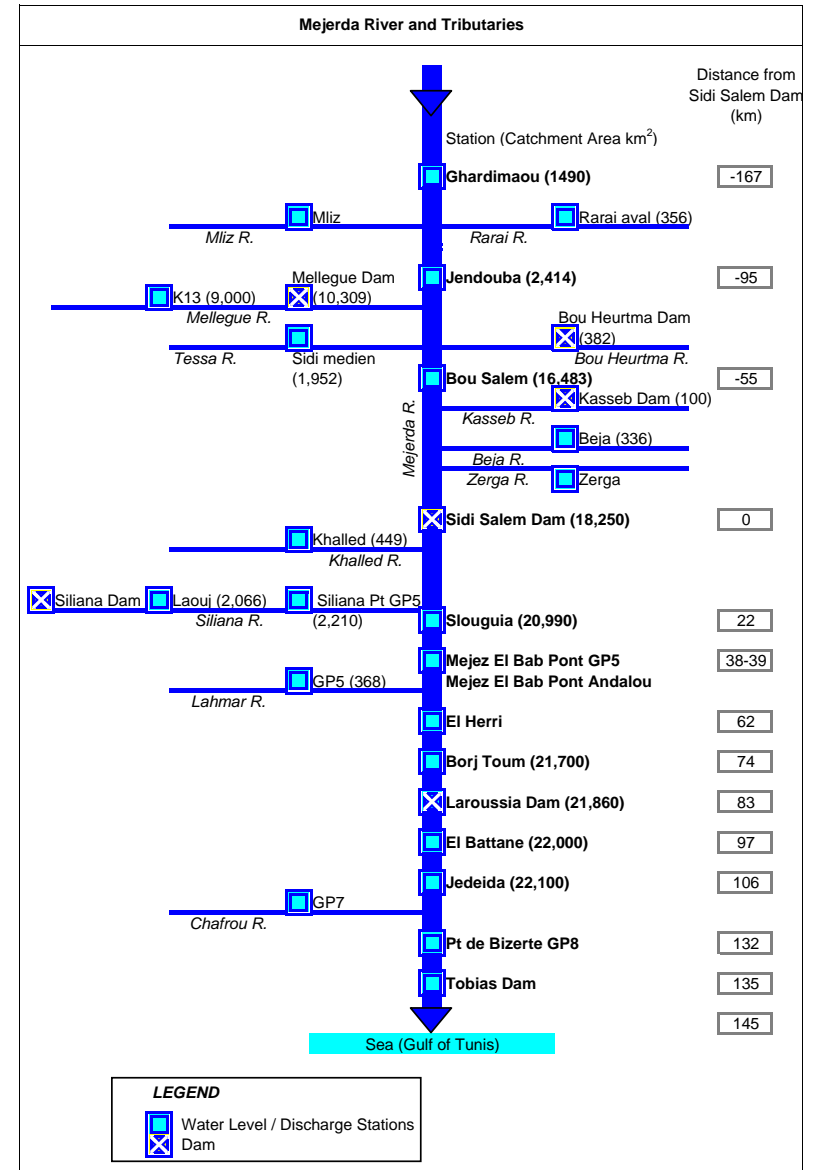
	Khalled	Siliana Dam	Siliana Laouj	Siliana Pt GP5
Slouguia	12	80	28	9
	3	18	7	2
	4	22	8	3

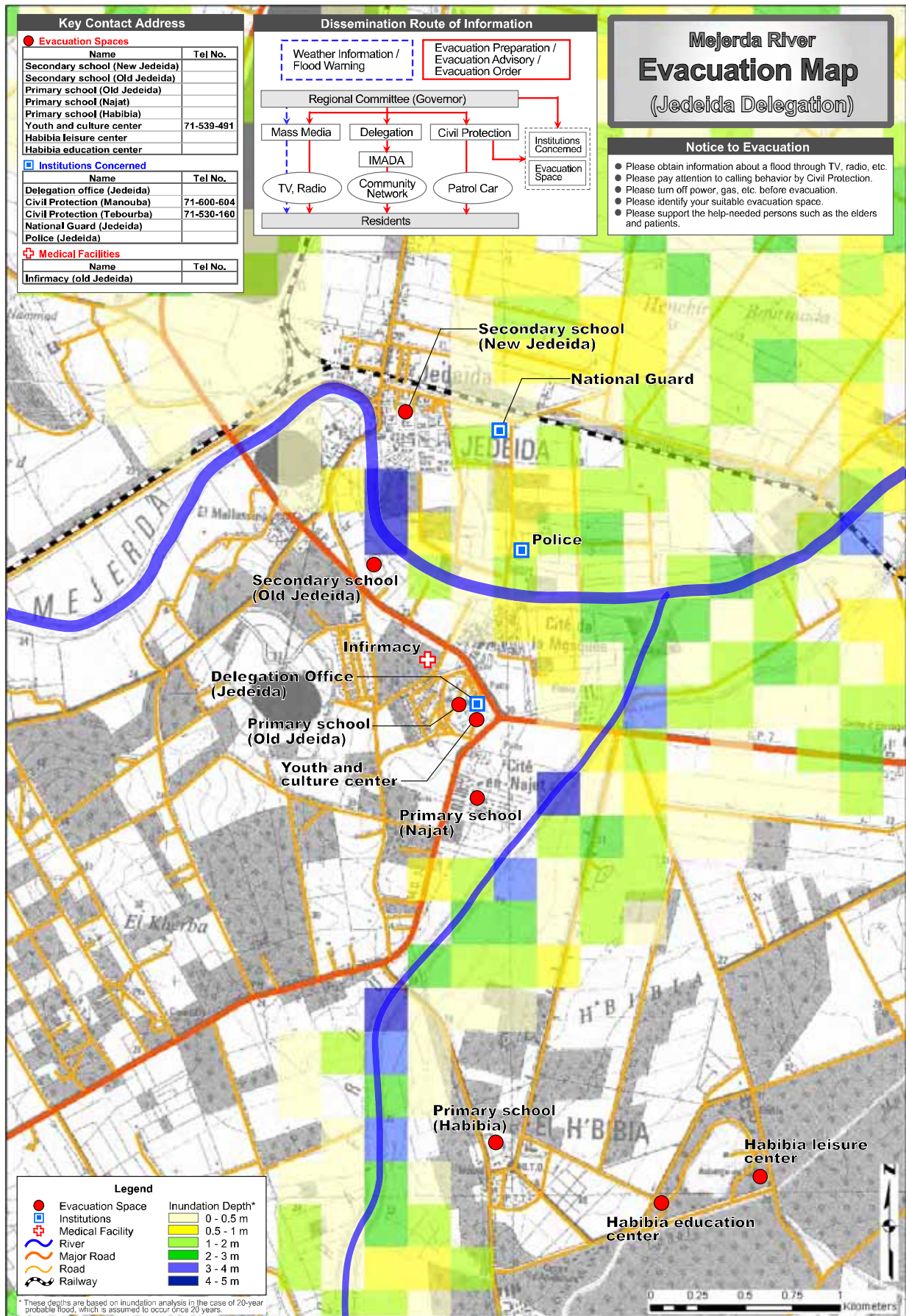
Tributaries Downstream of Sidi Salem Dam

	Lahmar GP5
El Herri	30
	6
	8

LEGEND

	Sidi Salem Dam	
Slouguia	18 km	Distance between Slouguia and Sidi Salem Dam (km)
	4 h	Minimum propagation time (hr)
	6 h	Maximum propagation time (hr)





Source: JICA Study Team, and interview with Civil Protection Manouba

図 8.6.1 ジュテイダ市の避難図

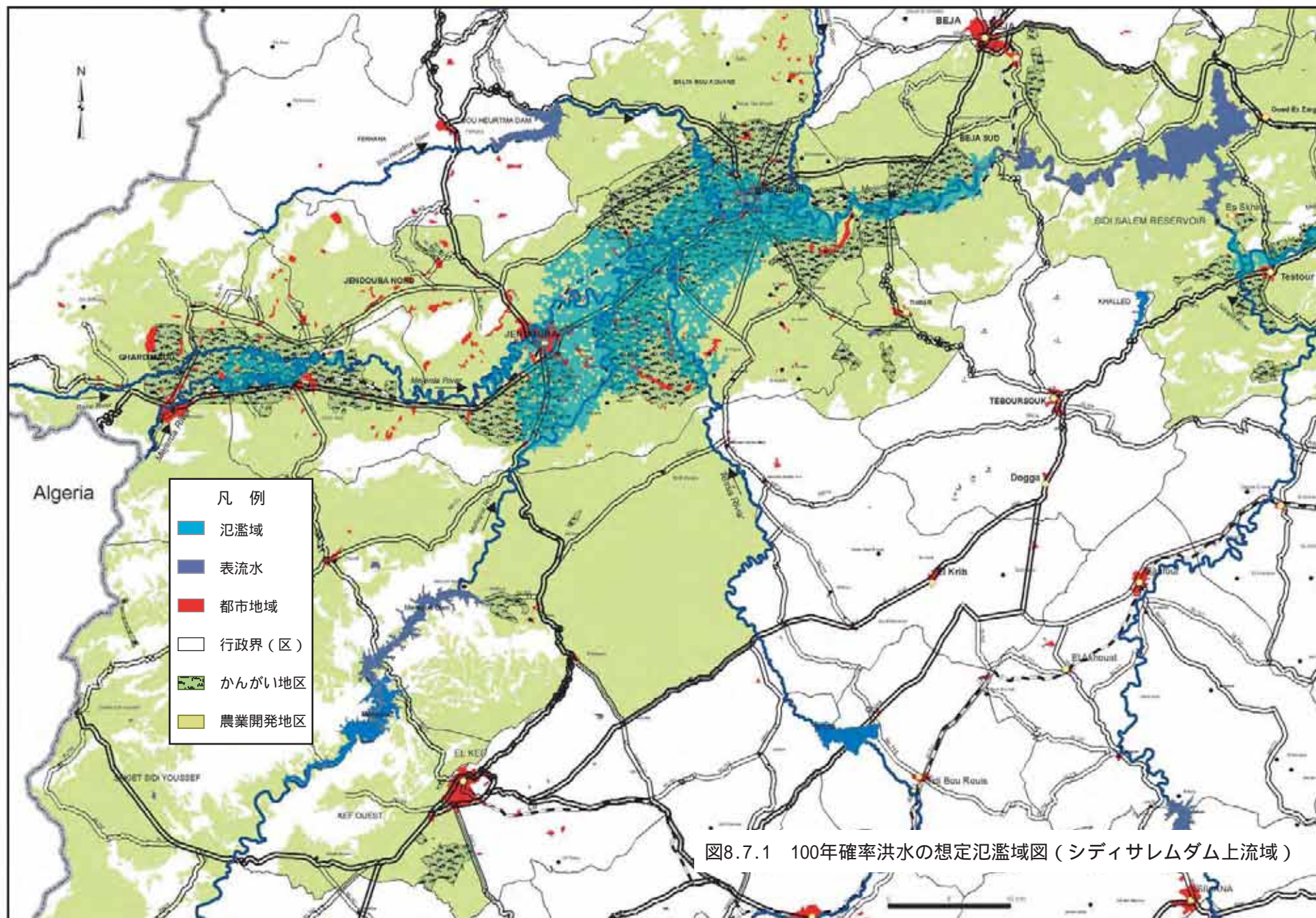


図8.7.1 100年確率洪水の想定氾濫域図(シディサレムダム上流域)

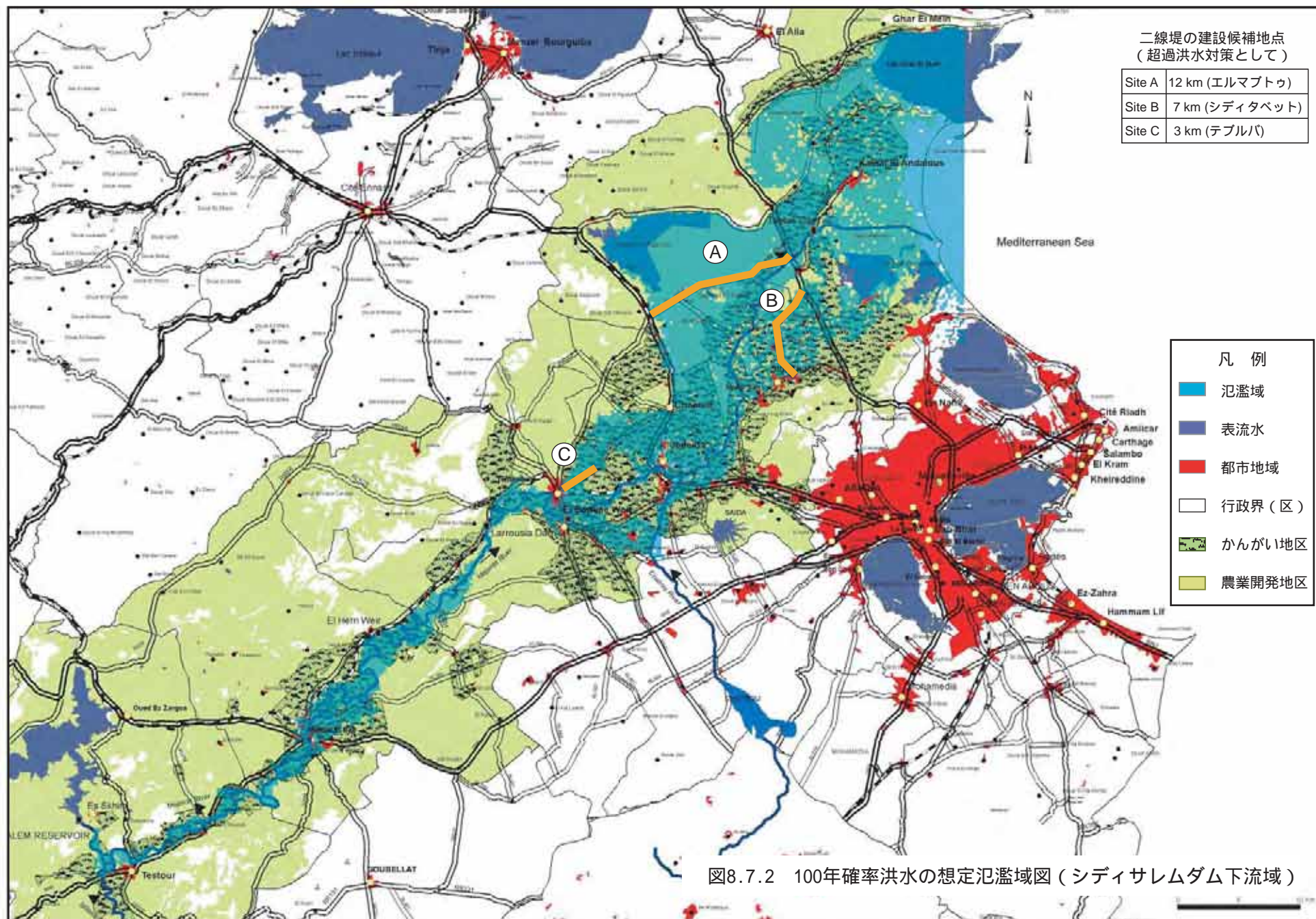


図8.8.1 統合洪水管理の組織体制図 (1/2)

Management Measures	River Administration			Organizations Concerned *				
	Integrated Administration: River Area, River Course, Water (DGRE)	Integrated Planning and Implementation	Integrated Operation and Maintenance	MARH (Rural)	MEHAT (Urban)	Minsiry of Interior	Others	
<b>Structural Measures</b>	<b>Storing and Regulating Flood Runoff</b>				DGBGTH: dams, large inter-regional projects			INM: information
	a) construction of dams & retarding basins	○	○	○	DGBGTH			
	b) improvement of reservoir operation	○	○	○	DGBGTH			INM
<b>River Channel Improvement</b>					DGBGTH: large, inter-regional project, CRDA: small projects in a region			
	a) Dike	○	○	○	DGBGTH, CRDA			
	b) Channel excavation & widening	○	○	○				
	c) Bypass channel, flood ways	○	○	○				
<b>Non-Structural Measures</b>	<b>Basin Preservation</b>				DGF: forst area, DGACTA: outside forest area, planning for CRDAs		ANPE: environment, IRESA: research only	
	a) Forest management	○	○	○	DGF, CRDA, DGACTA			ANPE, IRESA
	b) Land use management	○	○	○				
	c) Soil erosion management	○	○	○				
<b>Flood Plain Management</b>					Coordination among DGRE, DGBGTH, DGF, CRDAs			INM: rainfall, IREA: data base
	a) Land use control (zoning)	○	○	○	DGF, CRDA	○	Change of land Use	
	b) Flood forecasting system		○	○	DGRE		○	INM, IRESA, Algeria
	c) Flood warning, evacuation & fighting activities	○	○	○	CRDAs		Civll Protection	
	d) Flood insurance, crop insurance, tax adjustment	○	○	○	DGFIOP: Protection against damages			MF (upon request)
	e) Education and dissemination of people	○	○	○	CRDAs	○		
	f) Water proofing	○	○	○	○	○		

Notes: ○ subject to integrated management, \* See the next page for explanation.

MARH: Ministry of Agriculture and Hydraulic Resources, DGRE: General Direction of Water Resources, DGBGTH: General Direction of Dams and Large Hydraulic Works, DGACTA: General Direction of Development and Preservation of Agricultural Lands, DGF: General Direction of Forests, DGFIOP: General Direction of Financing, Investments and Professional Organisms, CDRA: Regional Commissary for Agricultural Development, MEHAT: Ministry of Equipment, Housing and Country Planning, ANPE: National Agency for the Protection of the Environment, IRESA: Institute of Agricultural Research and Education, INM: National Institute of Meteorology, MF: Ministry of Finance,

図 8. 8. 1 統合洪水管理の組織体制図 (2/2)

< Structural Measures >

<b>Storing and Regulating Flood Runoff</b>
- All large dams and hill dams in the country are under the management of the DGBGTH at all stages from planning and design stages to construction, operation and maintenance stages. Establishment of a new control center for integrated reservoir operation and preparation of documented guidelines, design standards and reservoir operation rules can be managed under the jurisdiction of the DGBGTH. The INM provides only the meteorological information to the DGBGTH.
<b>River Channel Improvement</b>
- River channel improvement works, such as retarding basins, dikes, river channel excavation and widening, flood ways, and bypass channels can be implemented within the jurisdiction of the MARH. The DGBGTH takes charge of planning, design and construction of large and inter-regional river projects while the CRDAs take charge of the small river projects inside respective governorates. The operation and maintenance of the river works are devoted to the CRDAs.

< Non-structural Measures >

<b>Basin Preservation</b>
- The MARH takes charge of the basin preservation, such as forest management, land use management and soil erosion management by the joint coordination of the CRDAs, the DGF and the DGACTA. The DGF manages the forest areas while the DGACTA manages the areas outside the forest areas. The DGACTA also supports the CRDAs for planning. The ANPE manages the environmental preservation of the watershed. The IRESA takes charge of researches in the field of basin preservation.
<b>Flood Plain Management</b>
- Flood plain management is executed by the coordination among the DGRE, the DGBGTH, the DGF, the INM and the IRESA. The INM provides the necessary rainfall data and the IRESA provides the data base services.
a) Land use control
- The CRDAs take charge of the land use control and restriction inside the Public Hydraulic Domain and the zoning for flood control under the direction of the DGF. The Ministry of Interior manages registration of land use. In case of a large flood event, a special committee is occasionally established by the chairman, the Governor concerned, and an inundation map for the event is made supported by relevant regional organizations.
b) Flood forecasting system
- The DGRE takes charge of the flood forecasting and flood announcement with strong collaboration of the INA and the IRESA. The flood forecast and announcement is transmitted to the civil protection of the Ministry of Interior.
c) Flood warning, evacuation and fighting activities
- The civil protections in Governorates take charge of the flood warning, evacuation and fighting activities with collaboration of the CRDAs.
d) Flood insurance
- All insurances are under the legislation of the MF. The DGFIOP is responsible of protection of farmers from damages. The existing agricultural insurance covers damages by fire, drought, hail, floods, etc.
e) Education and dissemination of people against floods
- The CDRAAs are responsible of education and dissemination of people against floods in the rural and urban areas under the guidance of the MEHAT and/ or the MARH.
f) Water proofing
- Technical guidance to the CRDAs is effective from the MARH and /or the MEHAT.

図8.9.1 メジエルダ川流域の洪水防御マスタープランの構成

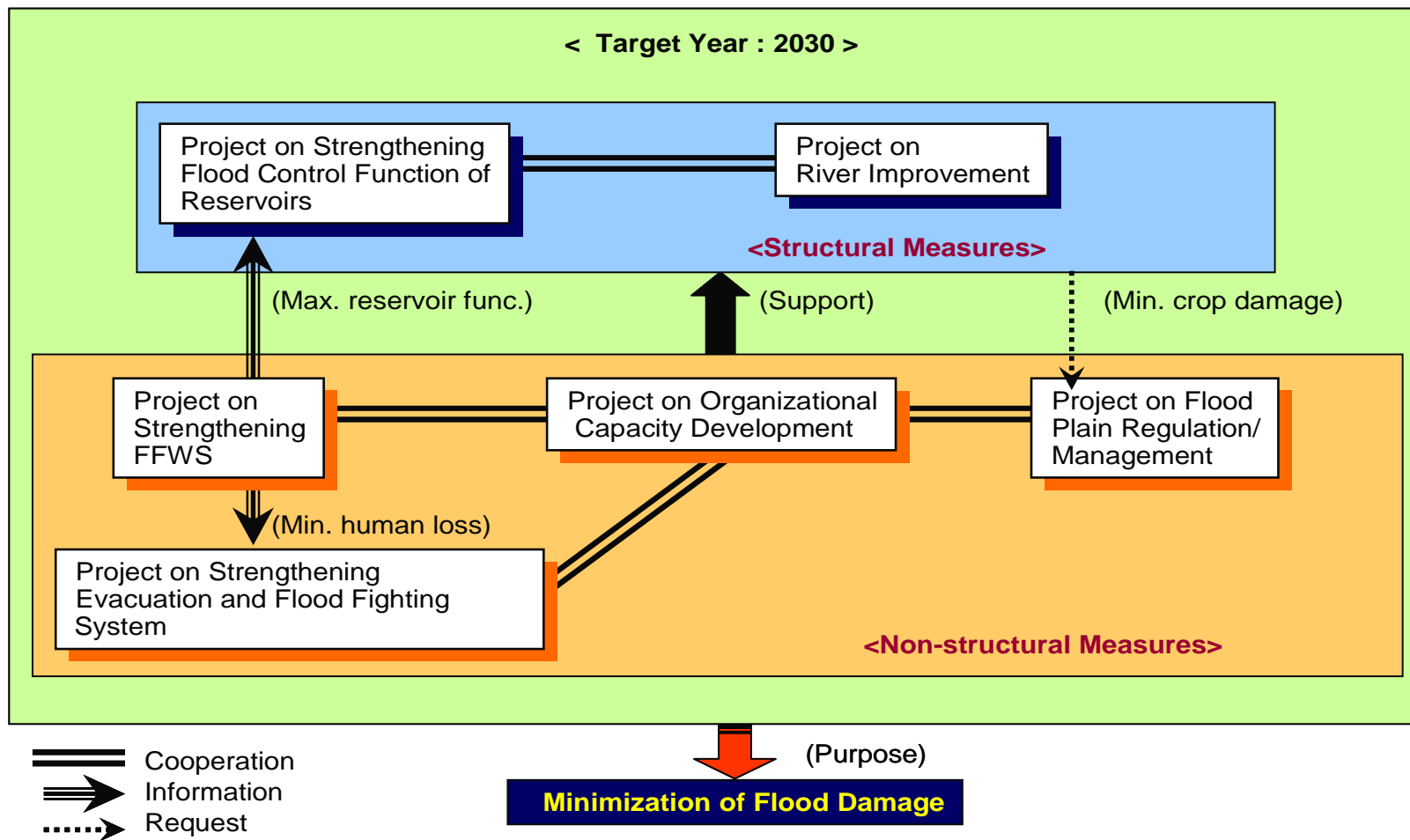




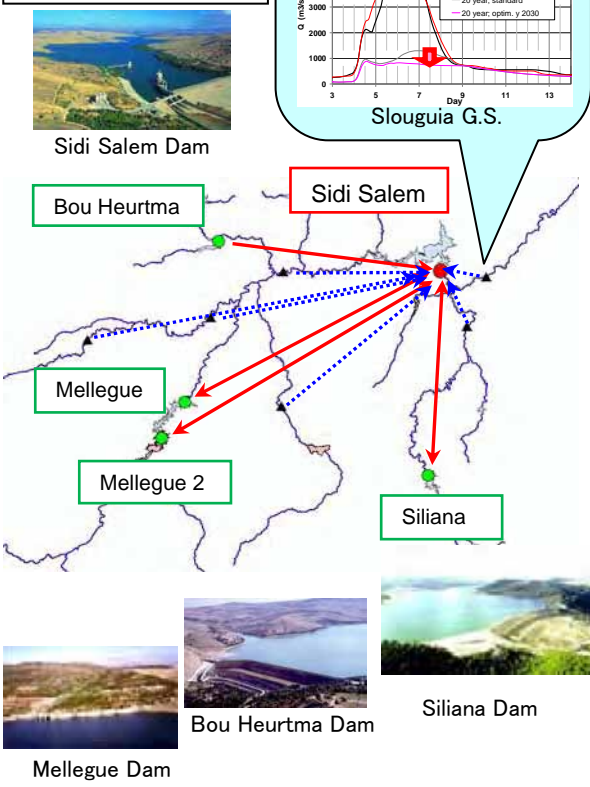
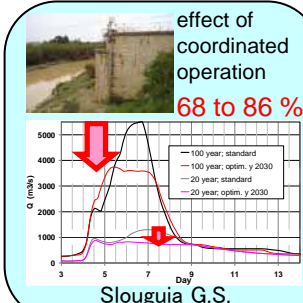
図 8.9.2 メジェルダ川流域における洪水防御マスタープランの概要

STRUCTURAL MEASURES

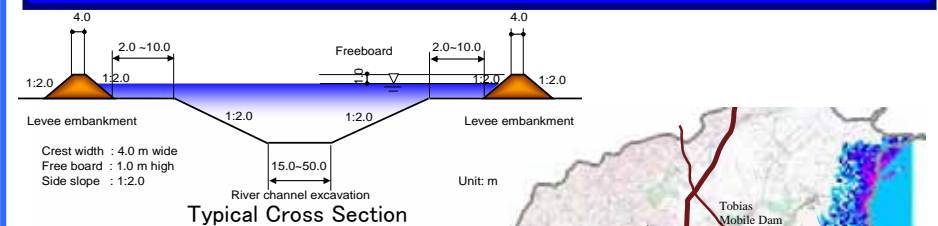
NON-STRUCTURAL MEASURES

Strengthening Flood Control Function of Reservoirs

- Legend:
- Sidi Salem Reservoir
  - reservoirs to be coordinated
  - ▲ discharge reference points



River Improvement

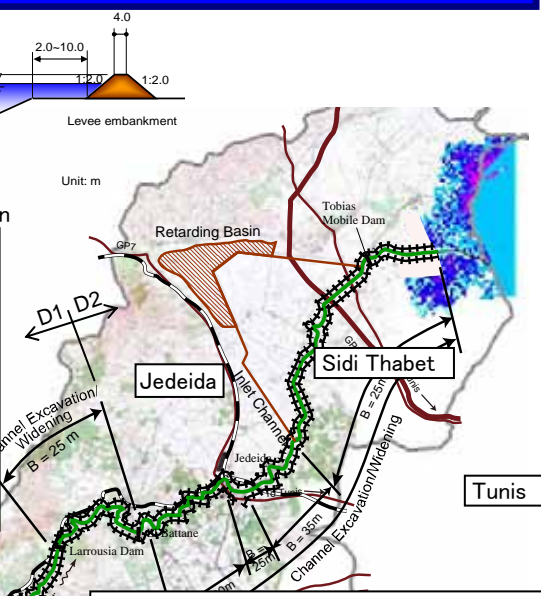


**Zone D1: Laroussia Dam to Sidi Salem Dam (Mejerda River)**

- Embankment: L=70.6km, H=0.5-2.5m
- Channel excavation/widening: 81.2km
- Sluice gate: 72 nos.
- Revetment
- Renewal of existing bridge: 1 no.

**(Majez El Bab Bypass Channel)**

- Length: 4.5km
- Channel bottom width 15m

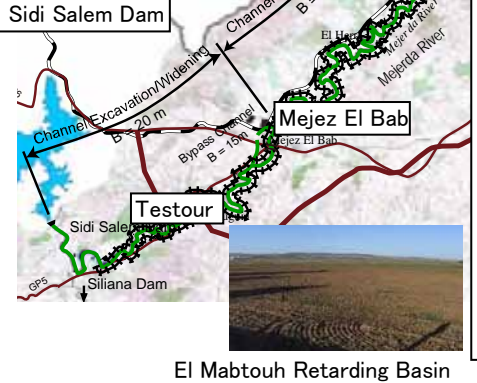


**Zone D2: Estuary of the Mejerda River to Laroussia Dam (Mejerda River)**

- Embankment: L=55.9km, H=0.5-2.5m
- Channel excavation/widening: 63.8km
- Sluice gate: 47 nos.
- Revetment
- Renewal of existing bridge: 3 nos.
- Heightening of existing railway bridge: 1 no.

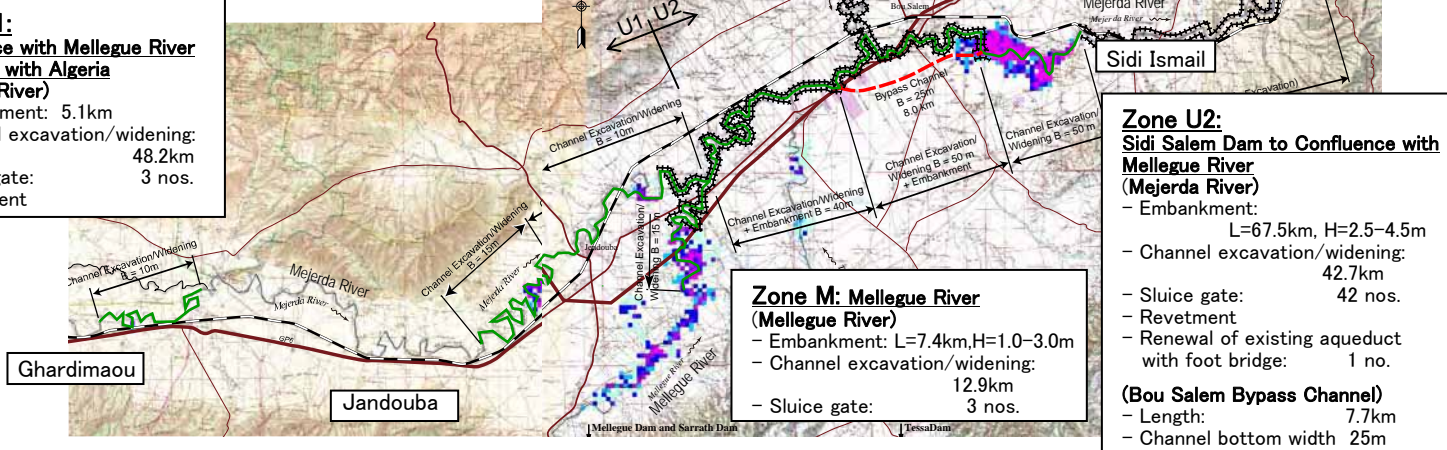
**(El Mabtouh Retarding Basin)**

- Inlet channel: 11.9km
- Outlet channel: 7.8km
- Surrounding dike: L=10.1km, H=2.0-4.0m



**Zone U1: Confluence with Mellegue River to Border with Algeria (Mejerda River)**

- Embankment: 5.1km
- Channel excavation/widening: 48.2km
- Sluice gate: 3 nos.
- Revetment



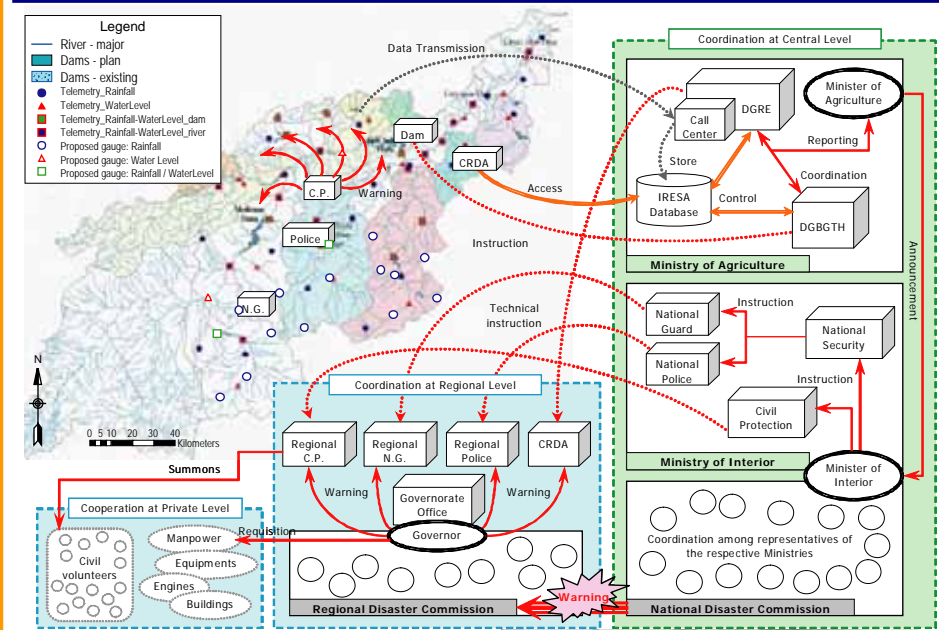
**Zone M: Mellegue River (Mellegue River)**

- Embankment: L=7.4km, H=1.0-3.0m
- Channel excavation/widening: 12.9km
- Sluice gate: 3 nos.

**(Bou Salem Bypass Channel)**

- Length: 7.7km
- Channel bottom width 25m

Strengthening of Existing FFWS and Evacuation & Flood Fighting System



Organizational Capacity Development

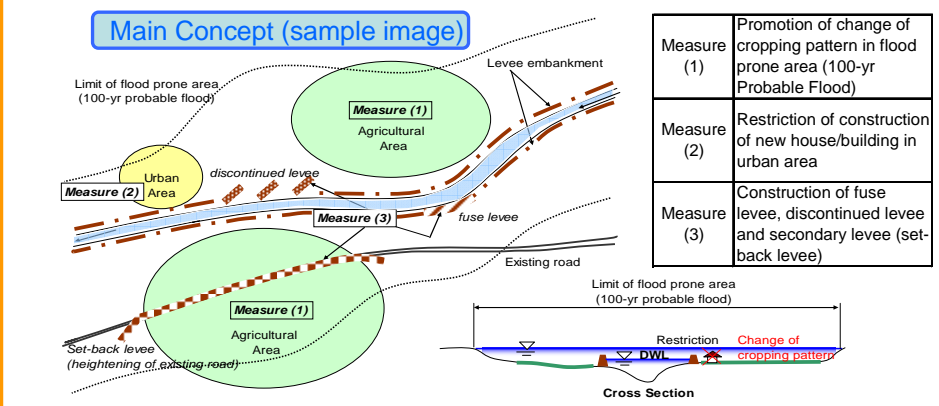
To establish new division in charge of Mejerda River Basin under DGBGTH

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    graph TD
        MARH --> DGBGTH
        DGBGTH --> Existing1[Existing]
        DGBGTH --> Existing2[Existing]
        DGBGTH --> New[New]
    
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- To establish an organizational framework for integrated flood management (IFM)
- To materialize 11 proposed programs for organizational empowerment to promote IFM under the framework

Flood Plain Regulation/Management



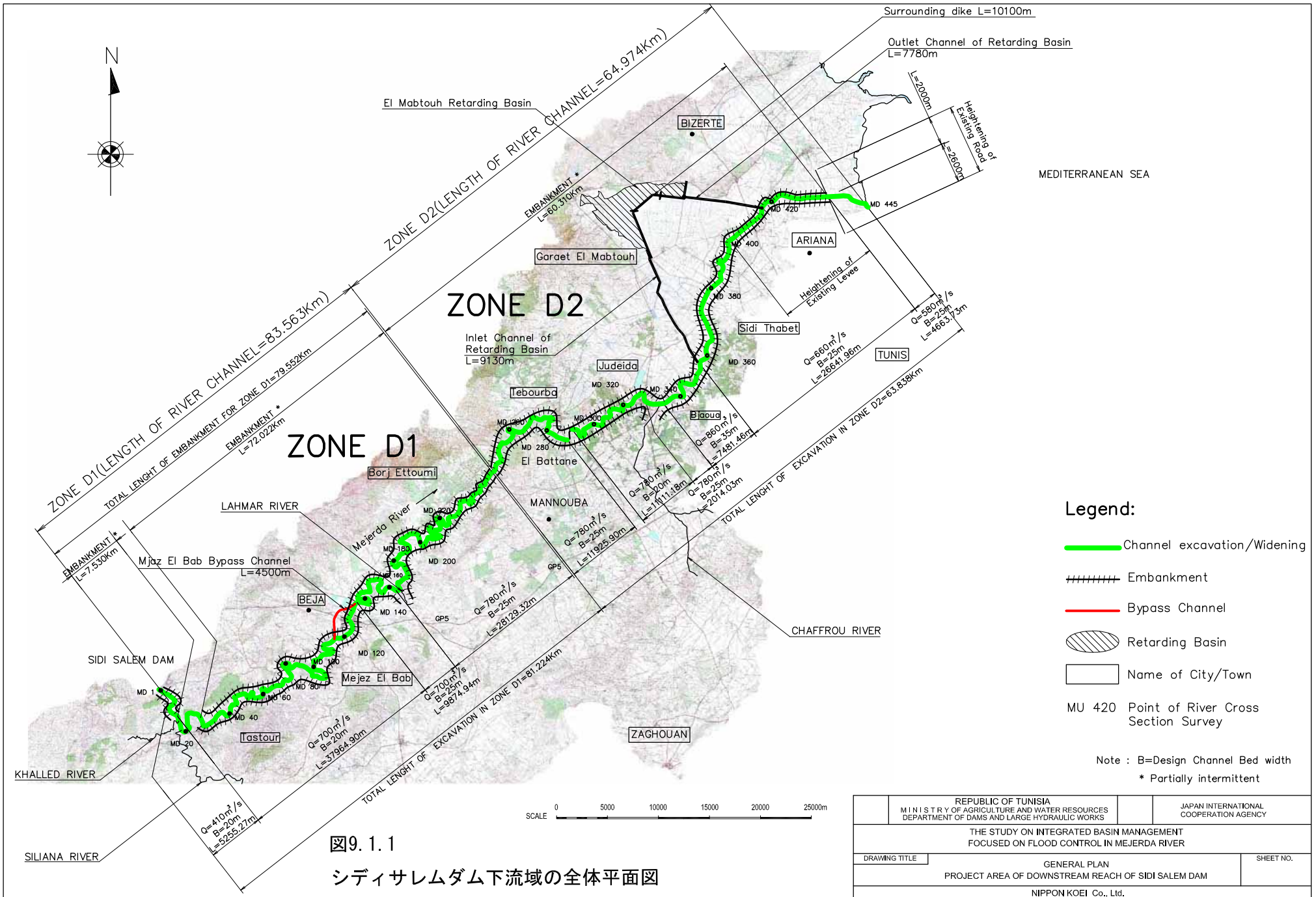


図9.1.1  
シディサレムダム下流域の全体平面図

REPUBLIC OF TUNISIA MINISTRY OF AGRICULTURE AND WATER RESOURCES DEPARTMENT OF DAMS AND LARGE HYDRAULIC WORKS		JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON INTEGRATED BASIN MANAGEMENT FOCUSED ON FLOOD CONTROL IN MEJERDA RIVER		
DRAWING TITLE	GENERAL PLAN PROJECT AREA OF DOWNSTREAM REACH OF SIDI SALEM DAM	SHEET NO.
NIPPON KOEI Co., Ltd.		

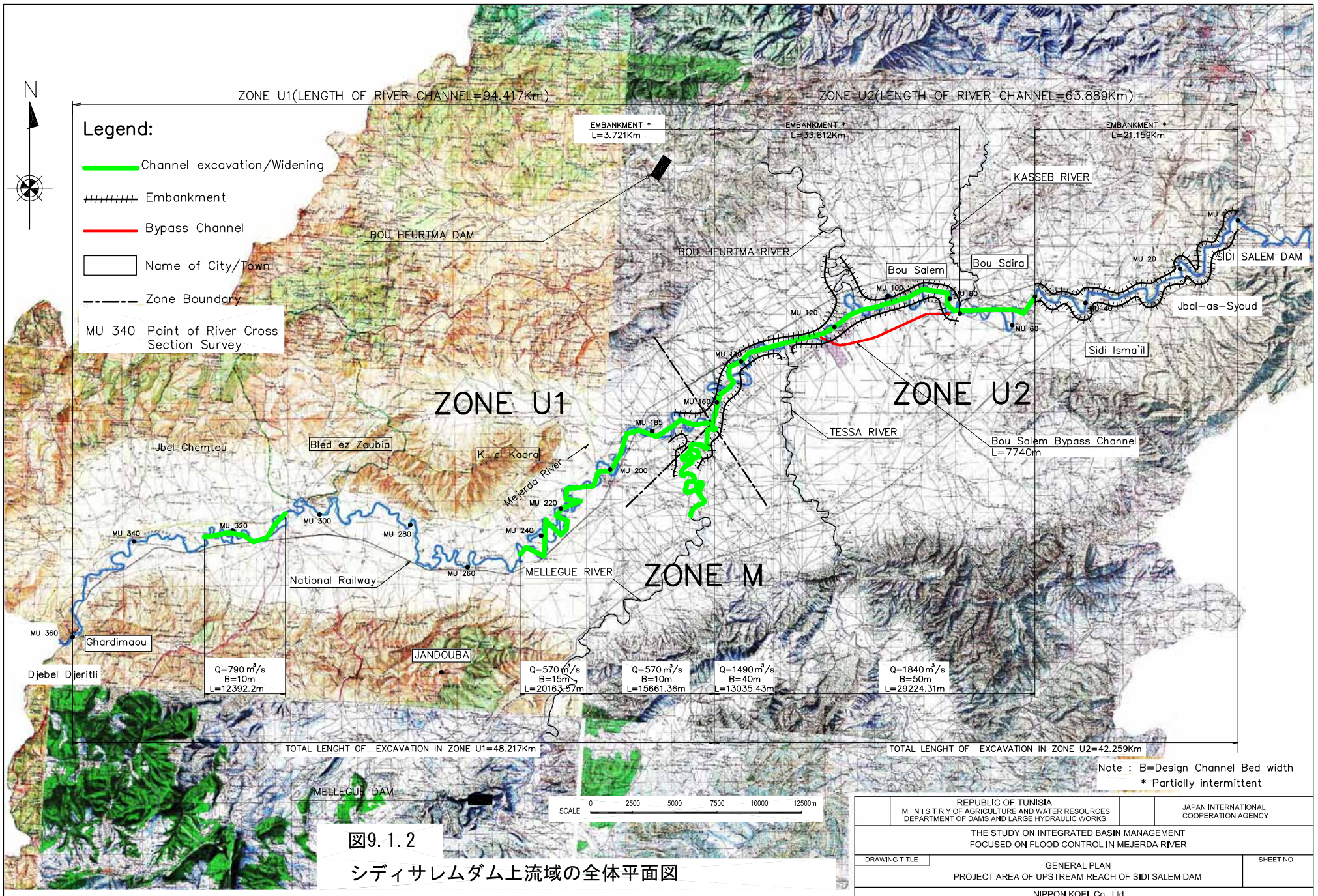


図9.1.2  
シディサレムダム上流域の全体平面図

REPUBLIC OF TUNISIA MINISTRY OF AGRICULTURE AND WATER RESOURCES DEPARTMENT OF DAMS AND LARGE HYDRAULIC WORKS		JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON INTEGRATED BASIN MANAGEMENT FOCUSED ON FLOOD CONTROL IN MEJERDA RIVER		
DRAWING TITLE	GENERAL PLAN PROJECT AREA OF UPSTREAM REACH OF SIDI SALEM DAM	SHEET NO.
NIPPON KOEI Co., Ltd.		

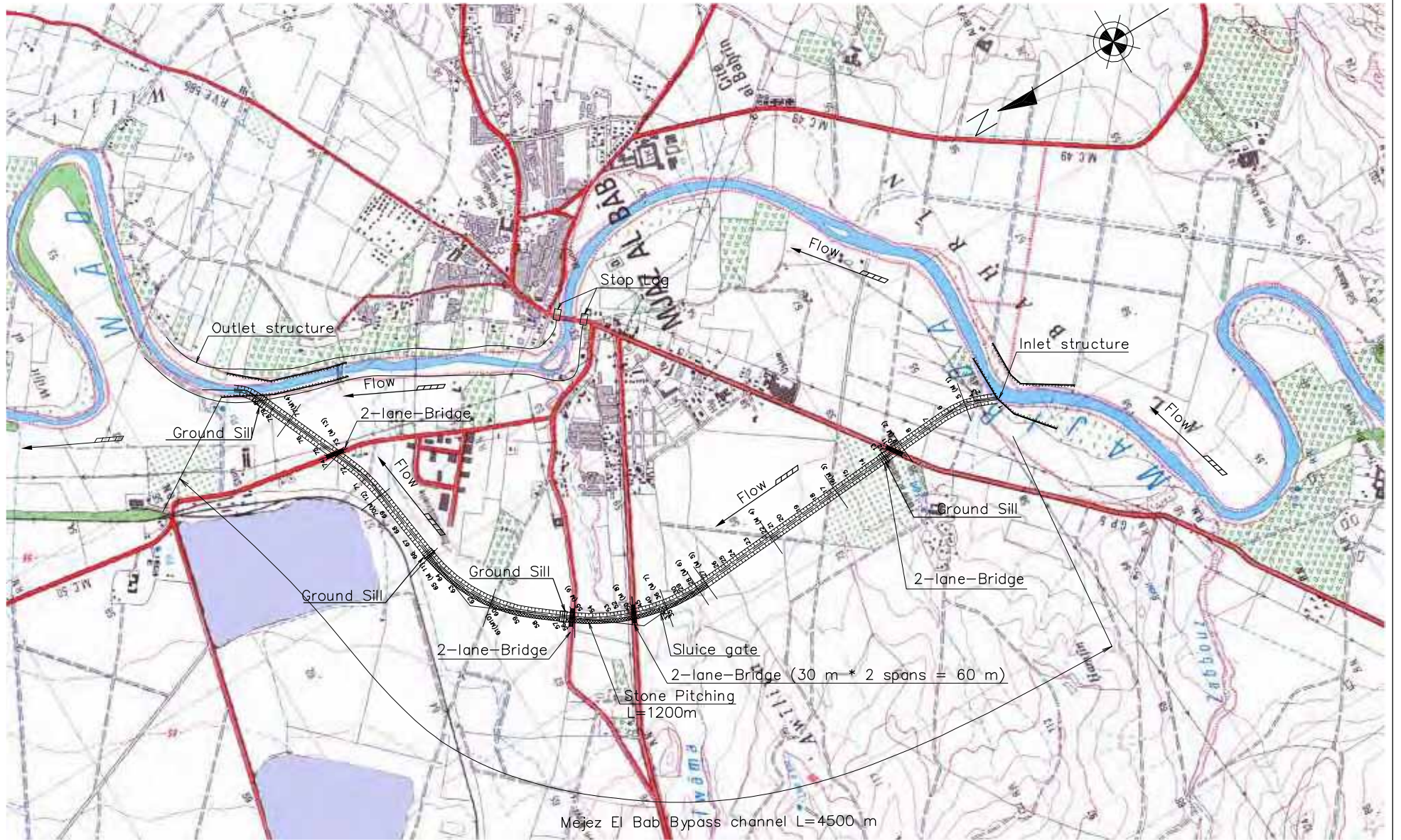
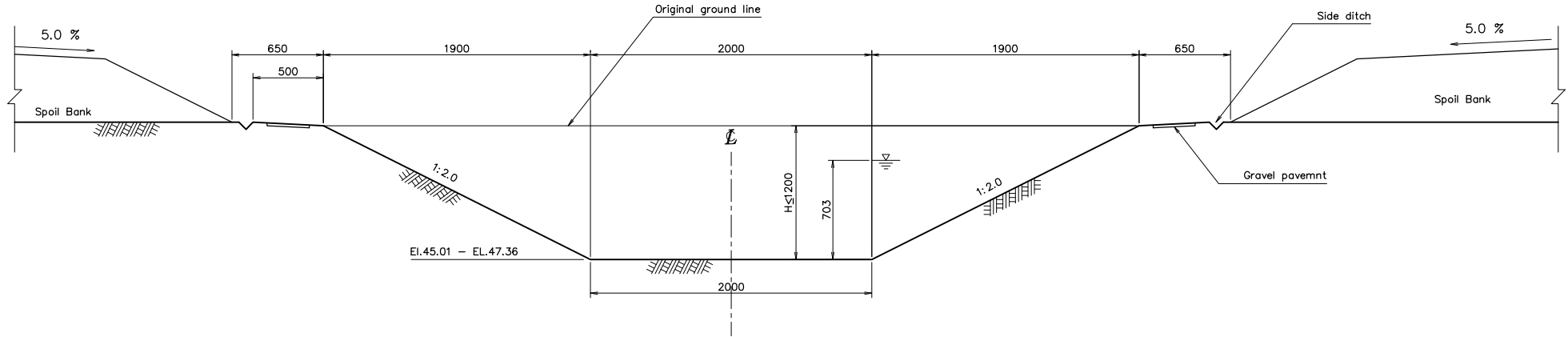


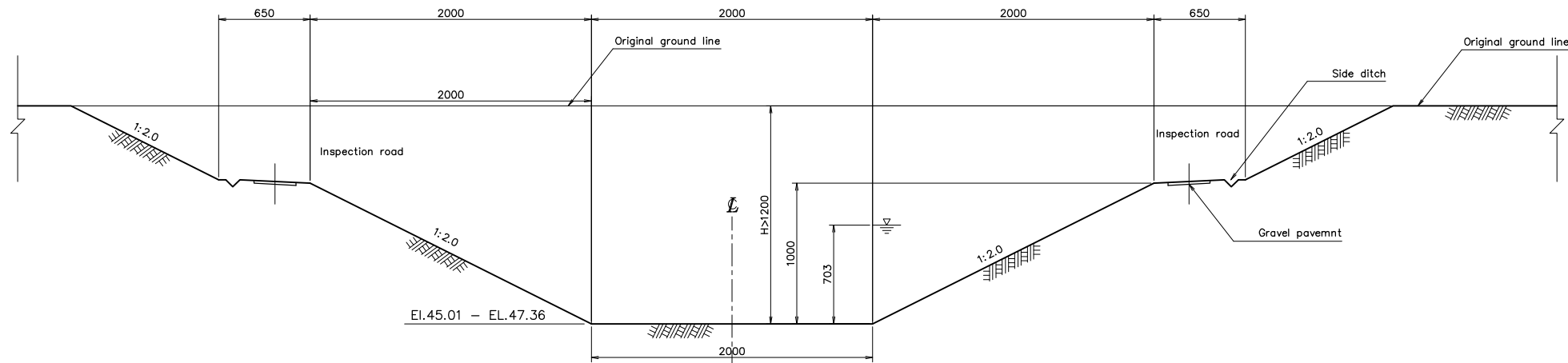
図9.1.3 メジェズエルバブバイパス水路 (Zone D1) 平面図

SCALE 0 200 400 600 800 1000 m

REPUBLIC OF TUNISIA MINISTRY OF AGRICULTURE AND WATER RESOURCES DEPARTMENT OF DAMS AND LARGE HYDRAULIC WORKS		JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON INTEGRATED BASIN MANAGEMENT FOCUSED ON FLOOD CONTROL IN MEJERDA RIVER		
DRAWING TITLE	MEJEZ EL BAB BYPASS CHANNEL (ZONE D1) PLAN	SHEET NO.
NIPPON KOEI Co., Ltd.		

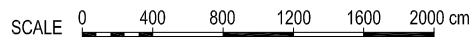


SECTION TYPE A ( $H \leq 12m$ )



SECTION TYPE B ( $H > 12m$ )

図9.1.4 メジェズエルバブバイパス水路 (Zone D1) の標準断面図



REPUBLIC OF TUNISIA MINISTRY OF AGRICULTURE AND WATER RESOURCES DEPARTMENT OF DAMS AND LARGE HYDRAULIC WORKS		JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON INTEGRATED BASIN MANAGEMENT FOCUSED ON FLOOD CONTROL IN MEJERDA RIVER		
DRAWING TITLE	MEJEZ EL BAB BYPASS CHANNEL (ZONE D1) TYPICAL SECTIONS OF BYPASS CHANNEL	SHEET NO.
NIPPON KOEI Co., Ltd.		