Figures

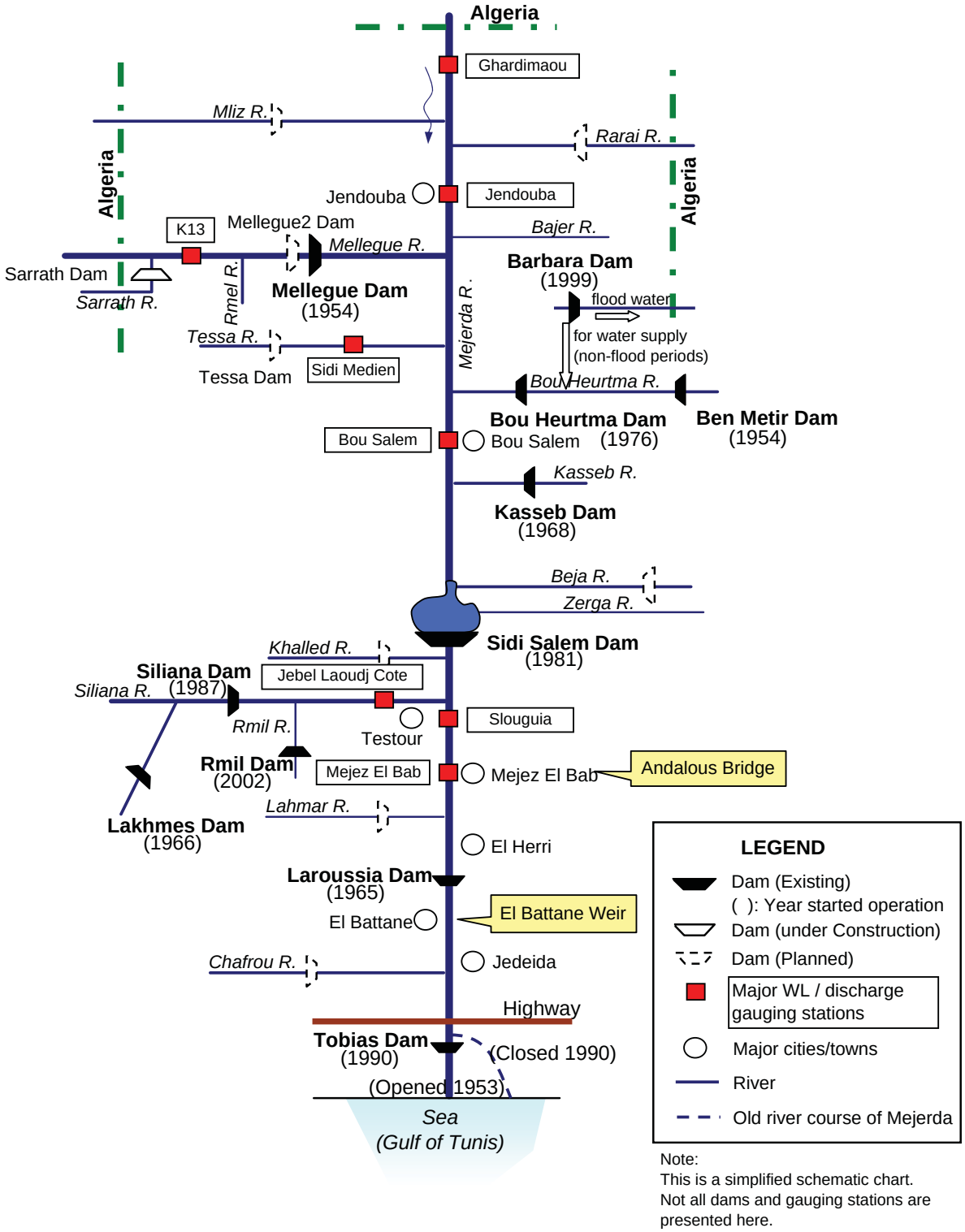


Figure 4.1.1 Schematic Locations of Major Stream Gauging Stations, Tributaries, Dams and Cities/Towns

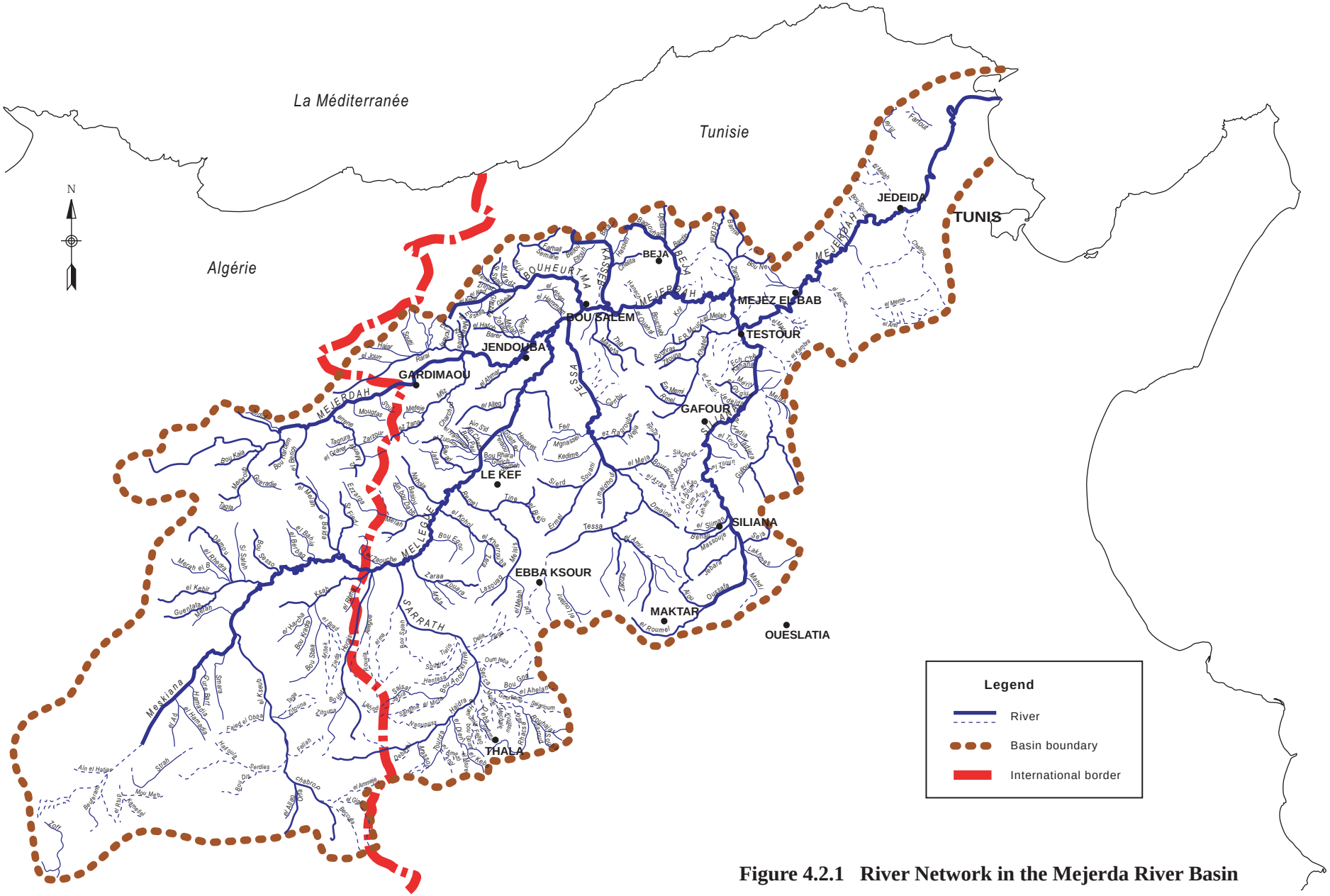
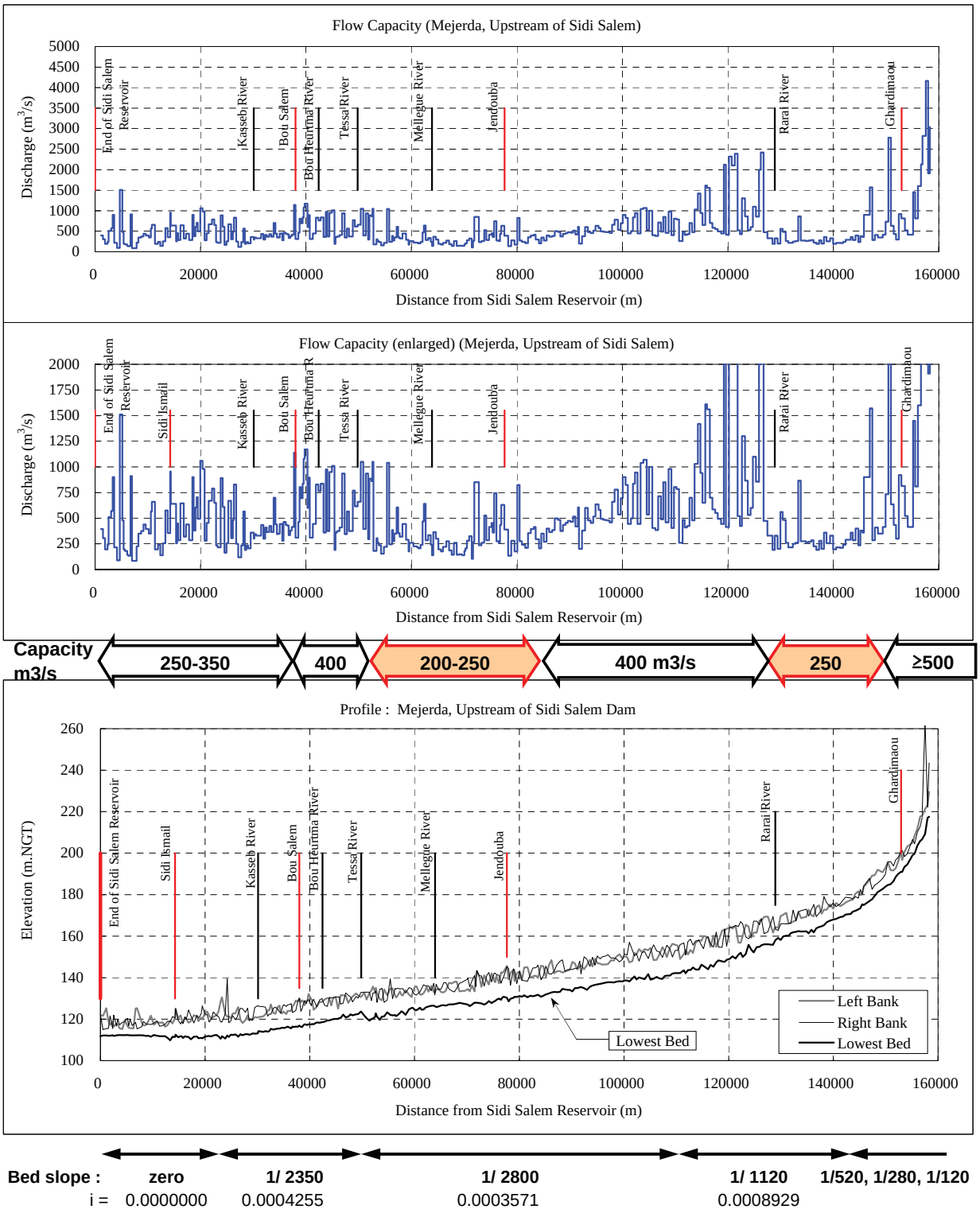


Figure 4.2.1 River Network in the Mejerda River Basin



Topographic Survey Applied : Survey in 2007 by JICA Study Team

Figure 4.2.2 Present Riverbed Profile and Flow Capacity (Mejerda, Upstream of Sidi Salem)

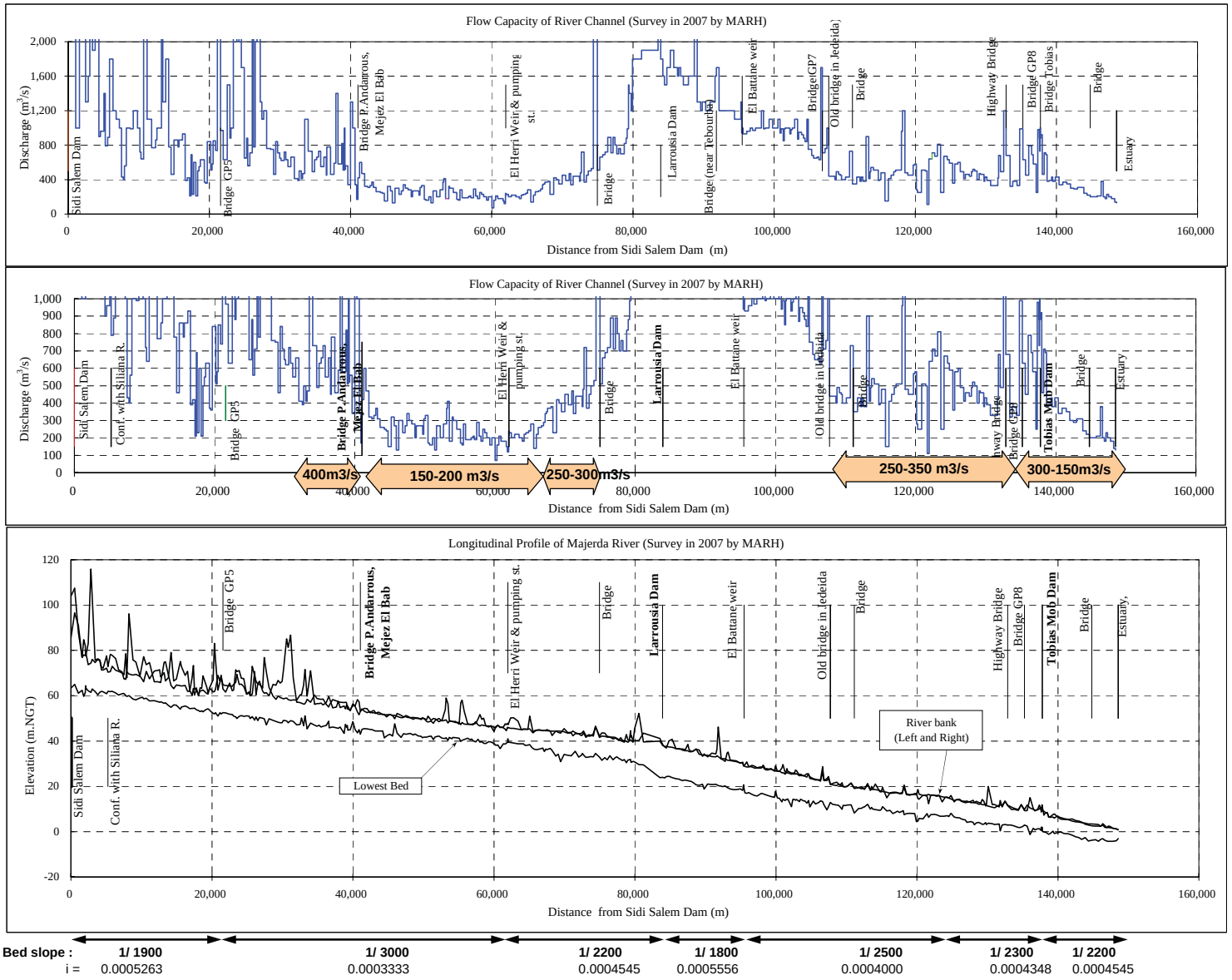


Figure 4.2.3 Present Riverbed Profile and Flow Capacity (Mejerda, Downstream of Sidi Salem)

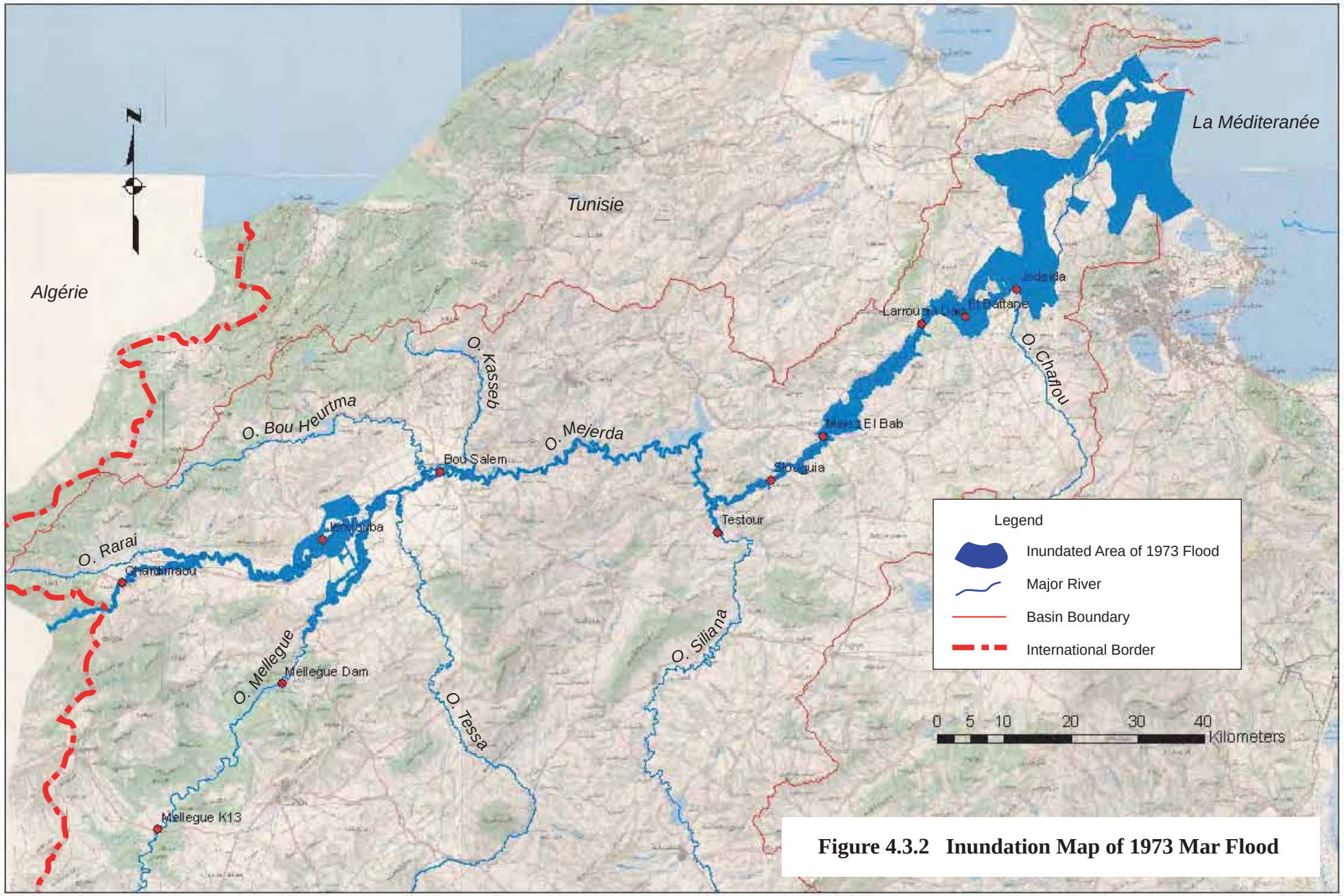


Figure 4.3.2 Inundation Map of 1973 Mar Flood

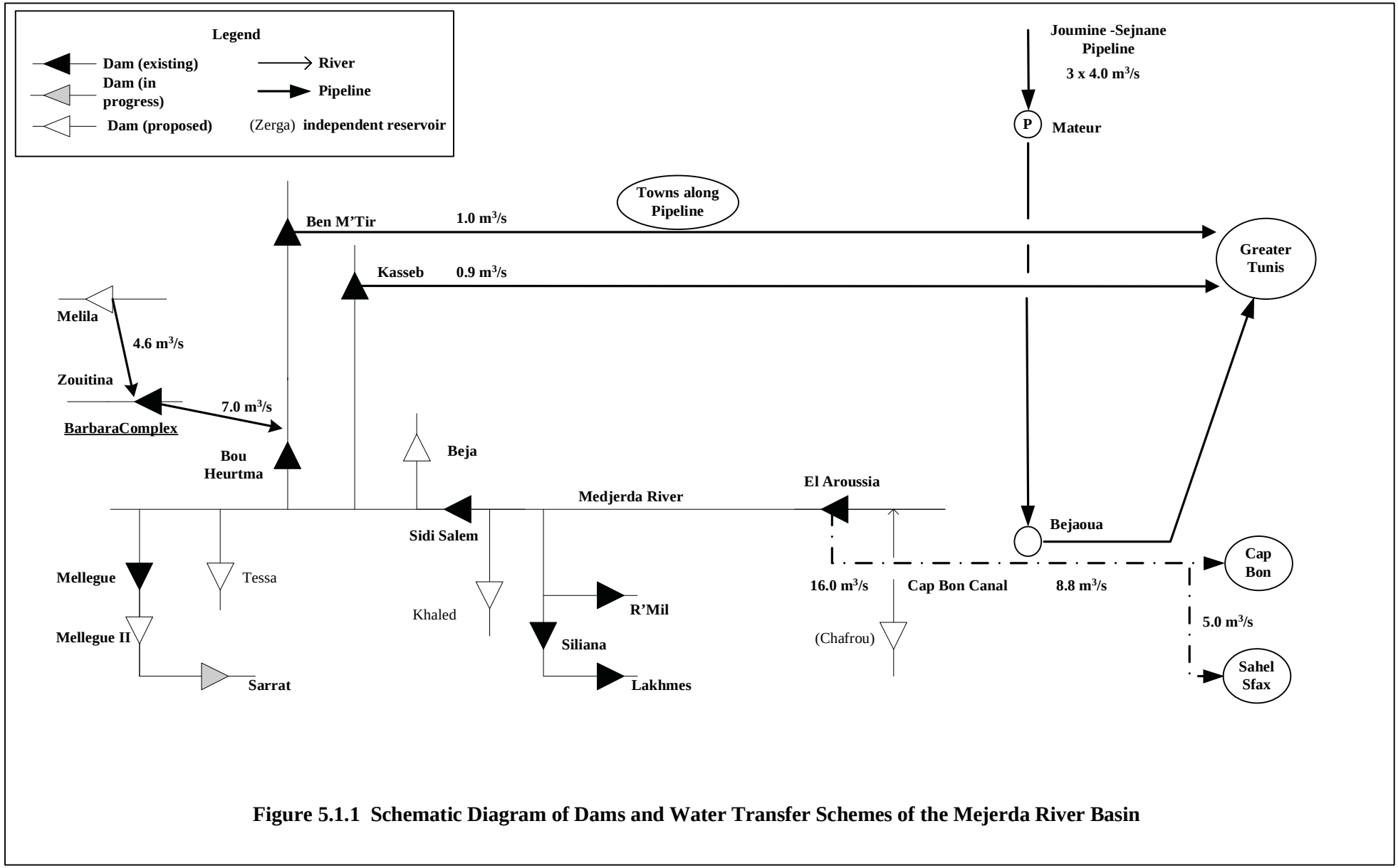


Figure 5.1.1 Schematic Diagram of Dams and Water Transfer Schemes of the Mejerda River Basin

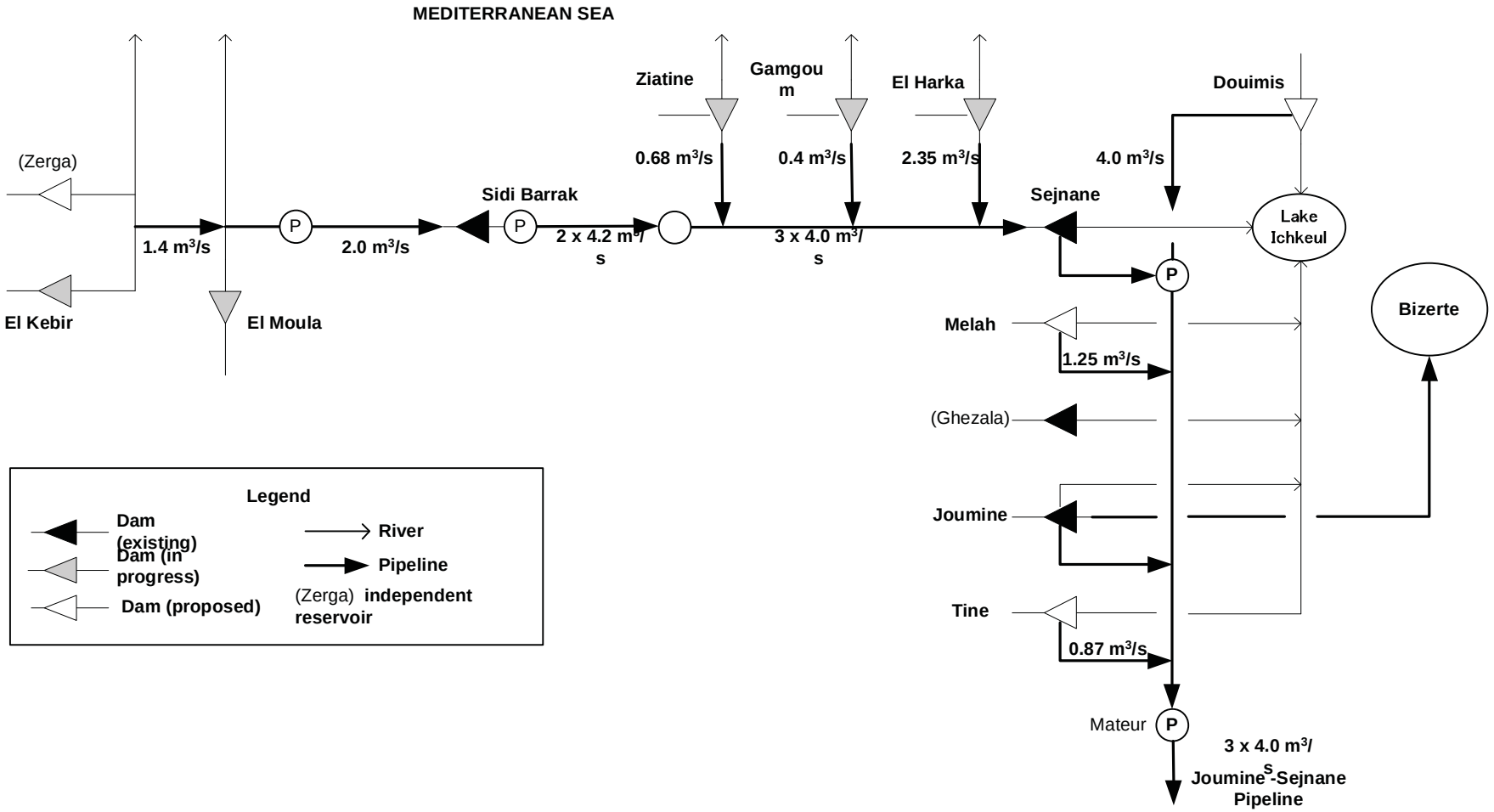


Figure 5.1.2 Schematic Diagram of the Dams and Water Transfer Schemes of the Extreme North

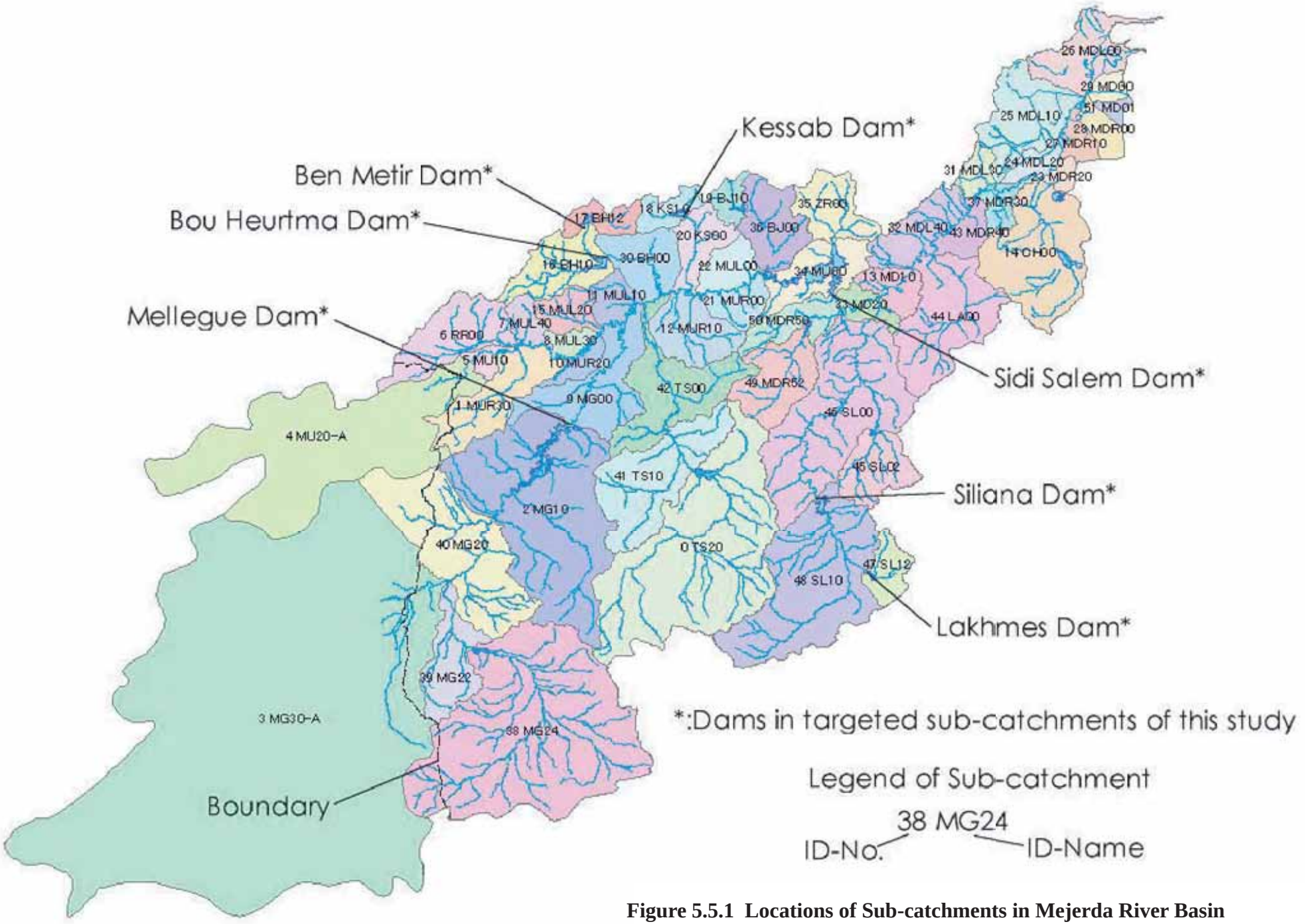


Figure 5.5.1 Locations of Sub-catchments in Mejerda River Basin

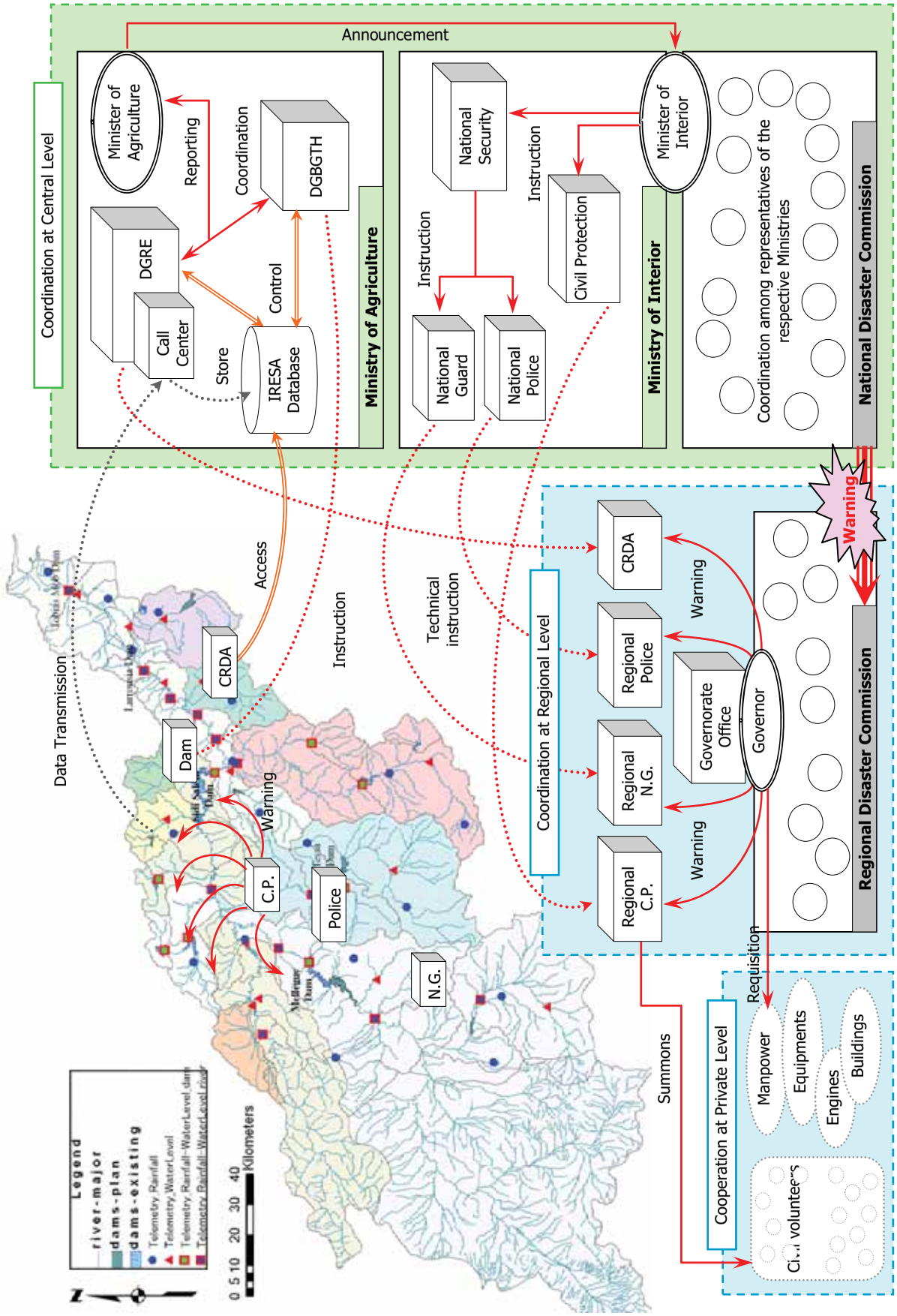


Figure 5.6.1Overall FFWS in the Mejerda River Basin

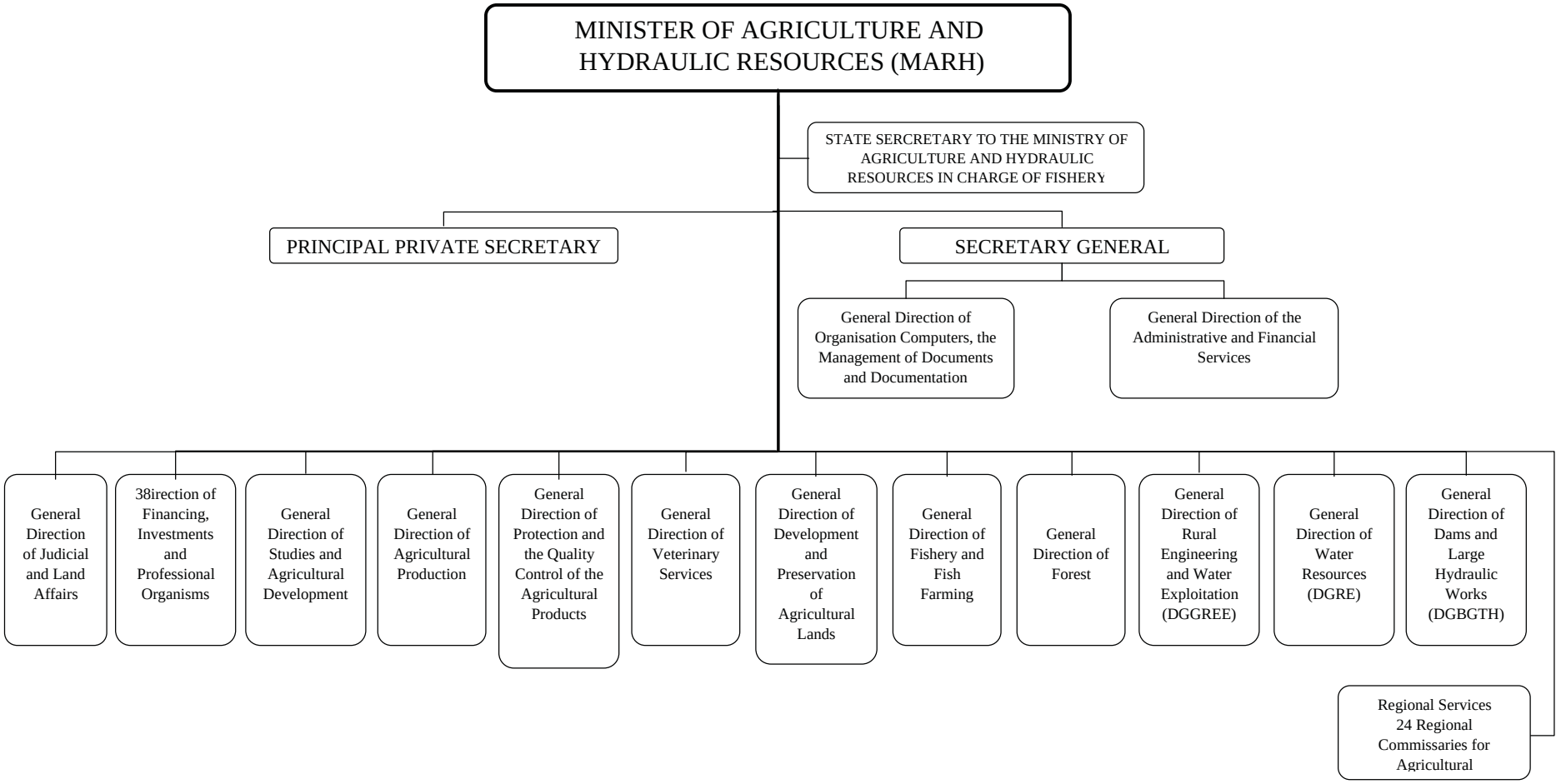
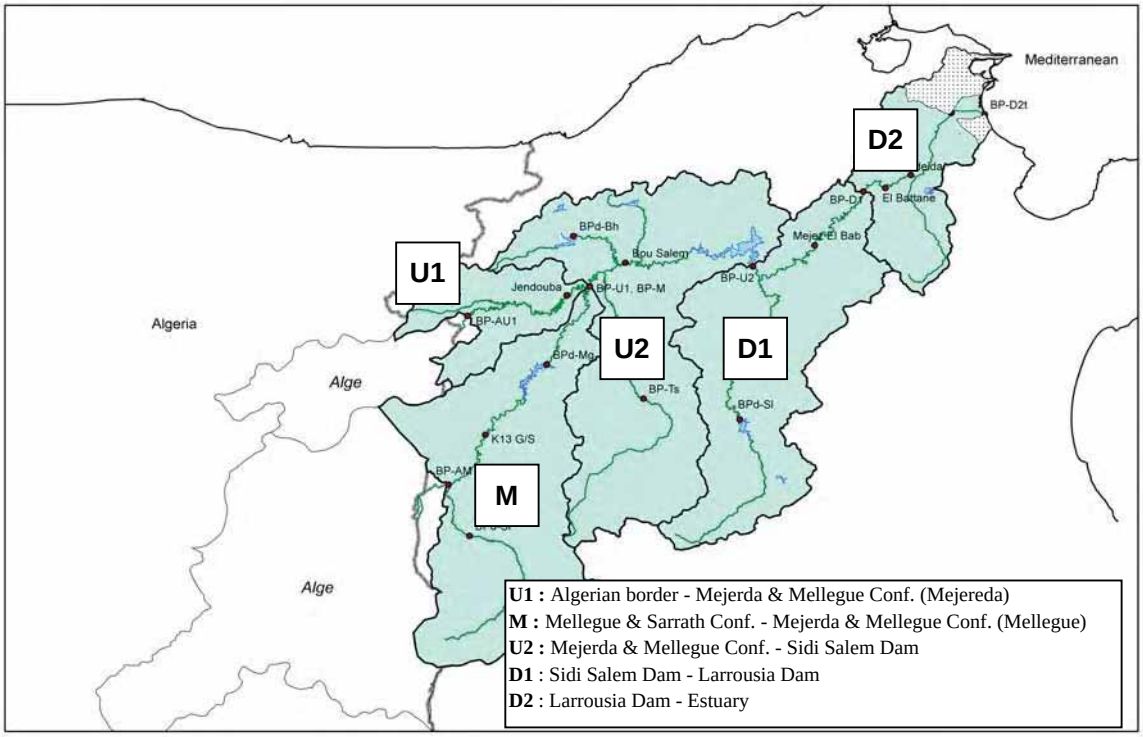
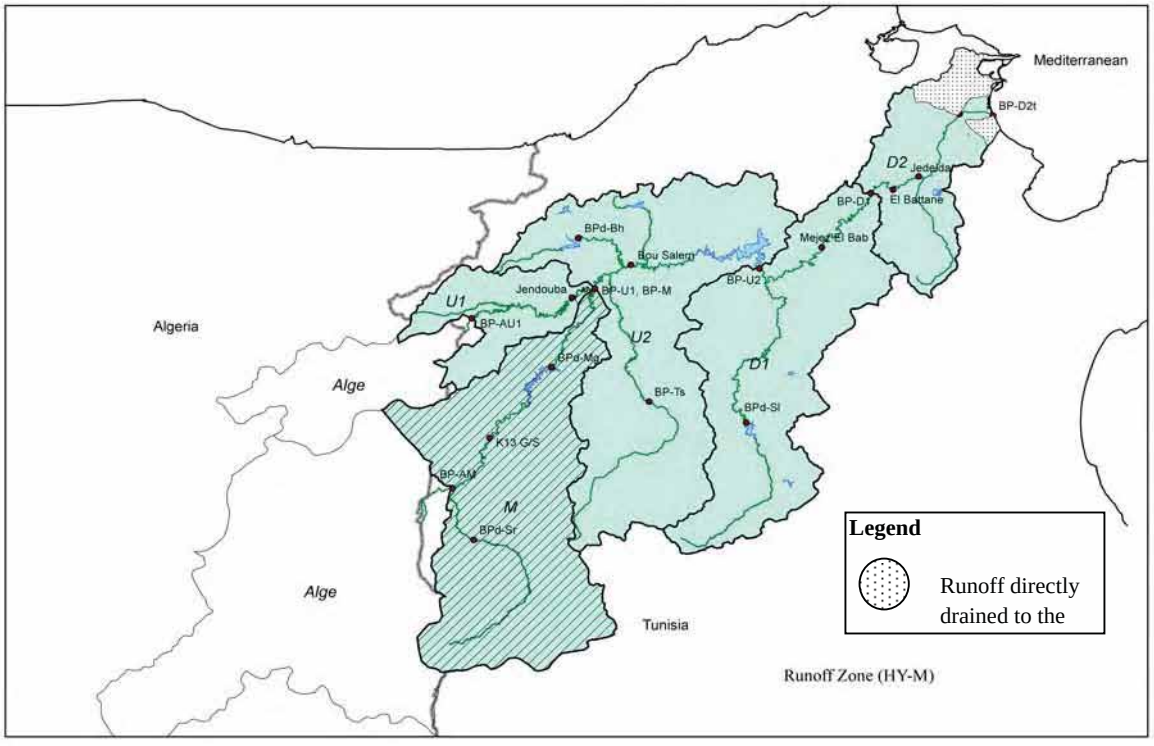


Figure 5.8.1 Organizational Structure of Ministry of Agriculture and Hydraulic Resources (MARH)

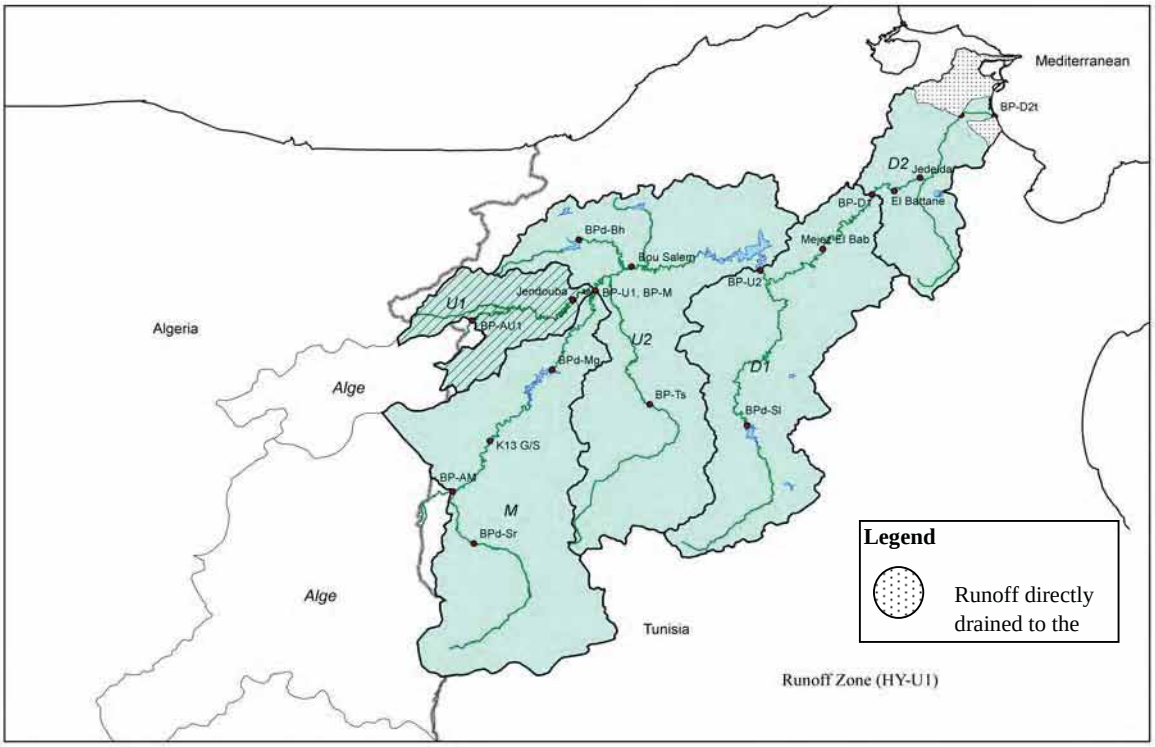


Overall Division of Study Area for Flood Control Planning

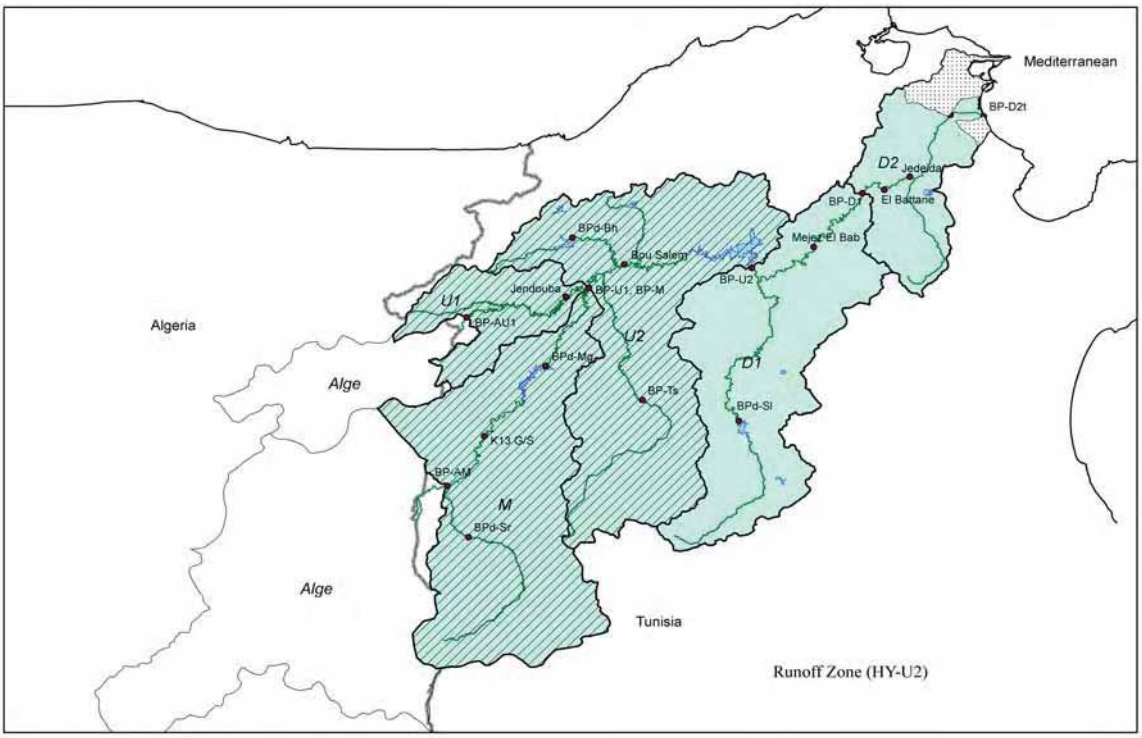


Runoff Zone: HY-M (4561 km2)
Base Point: BP-M Mejerda & Mellegue Conf.

Figure 7.2.1 Zone Divisions for Estimate of Basin Average Rainfall (1/3)

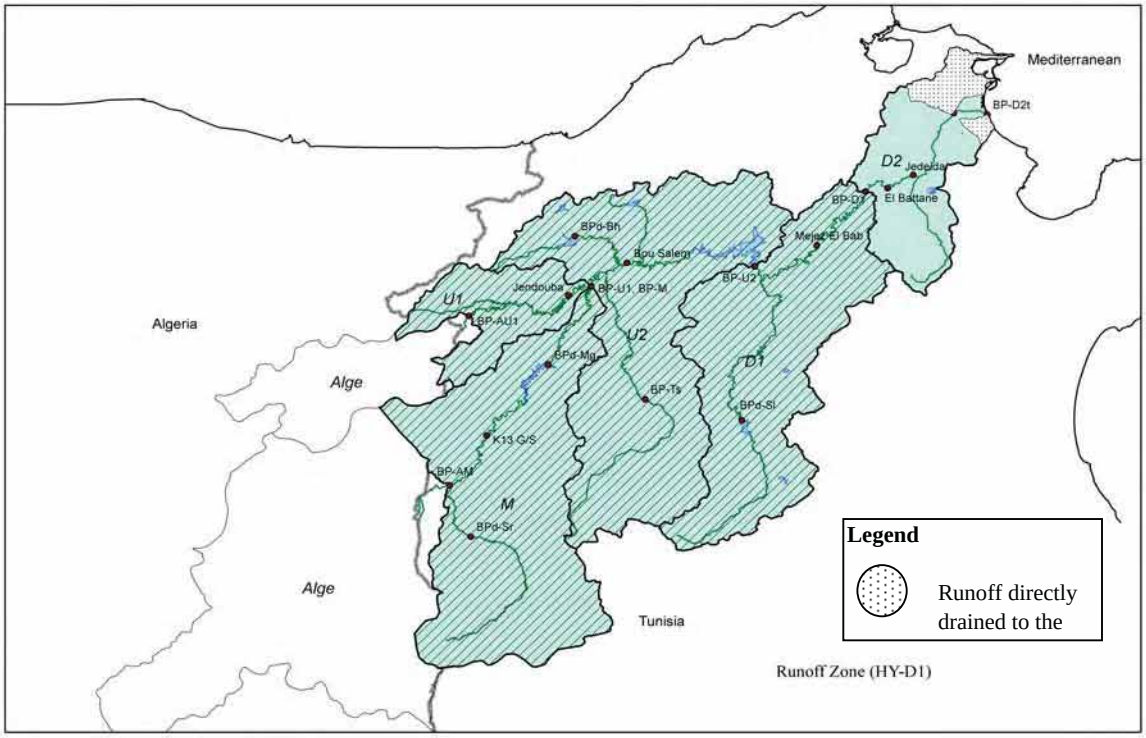


Runoff Zone: HY-U1 (1154 km^2)
Base Point: BP-U1 Mejerda & Mellegue Conf.

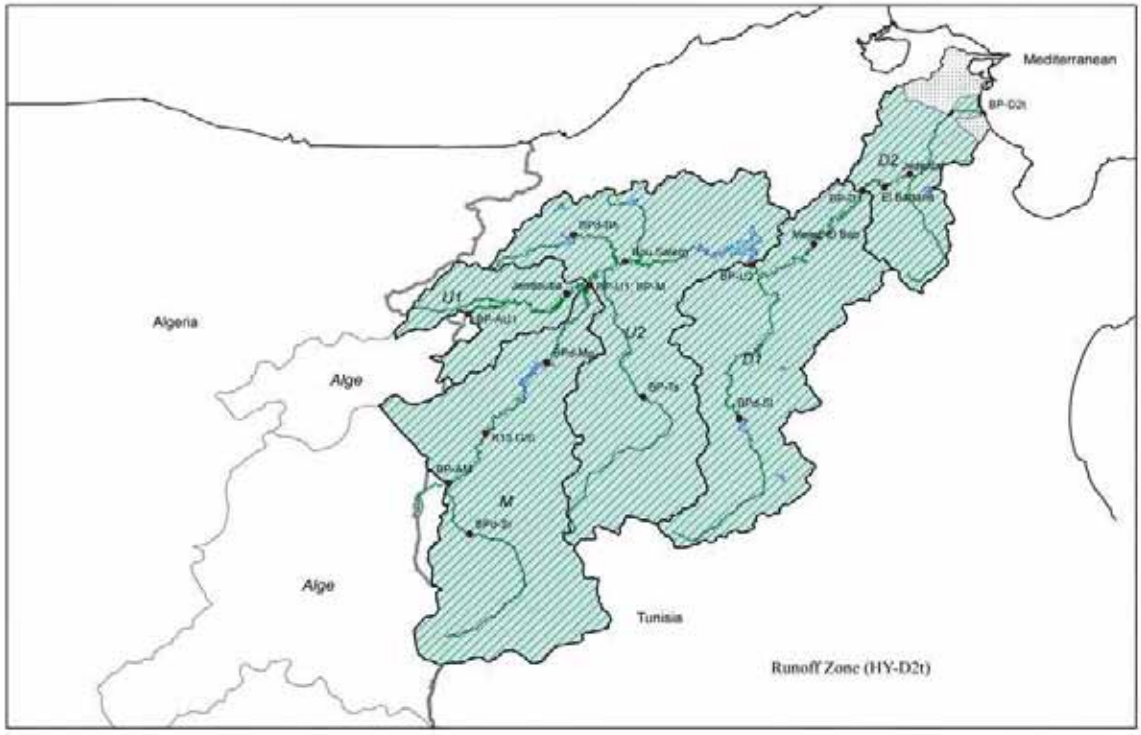


Runoff Zone: HY-U2 (10414 km^2)
Base Point: BP-U2 Sidi Salem Dam

Figure 7.2.1 Zone Divisions for Estimate of Basin Average Rainfall (2/3)



Runoff Zone: HY-D1 (14172 km^2)				
Base	Point:	BP-D1	Larrousia	Dam



Runoff Zone: HY-D2t (15645 km^2)			
Base	Point:	BP-D2	Estuary

Figure 7.2.1 Zone Divisions for Estimate of Basin Average Rainfall (3/3)

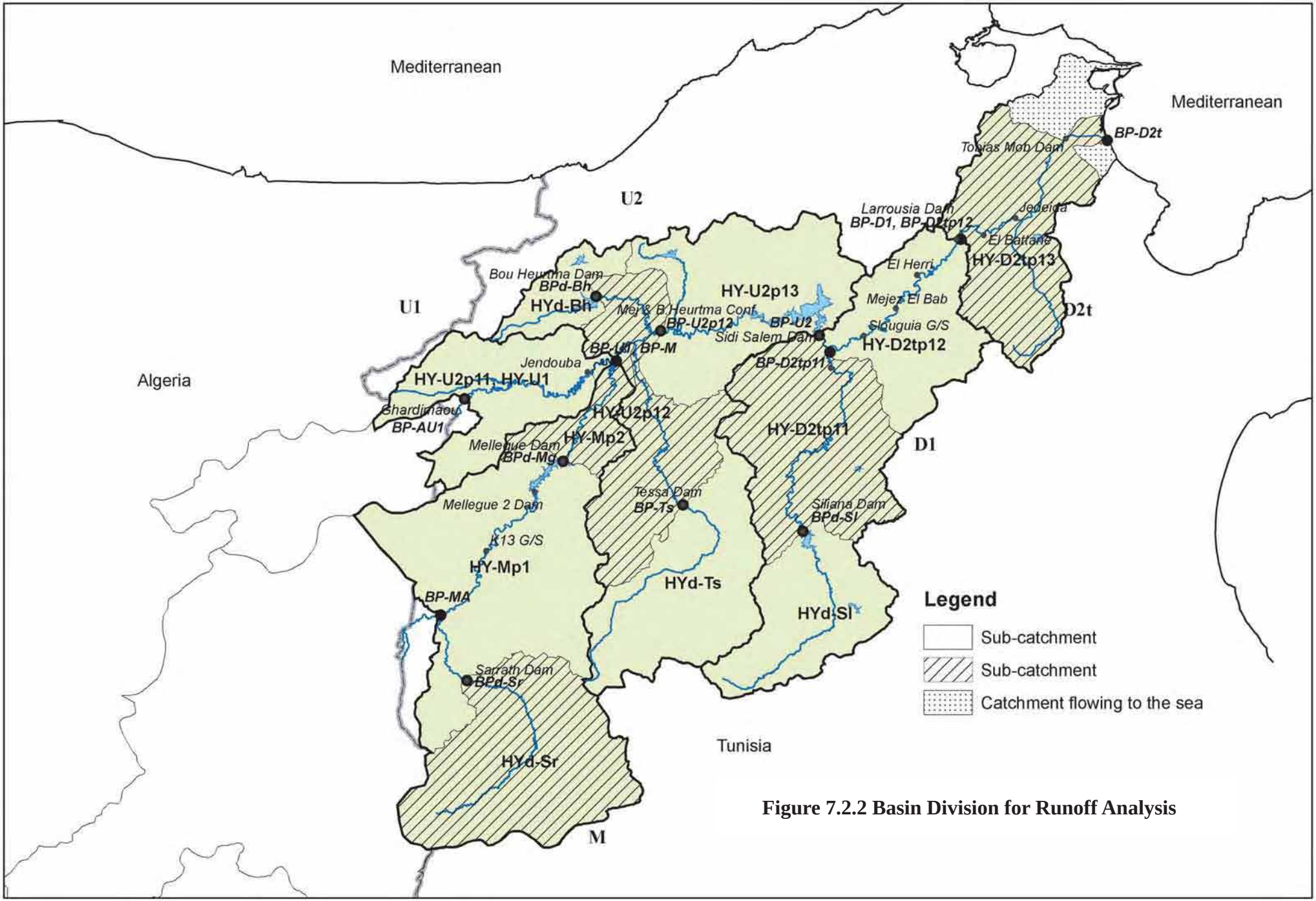
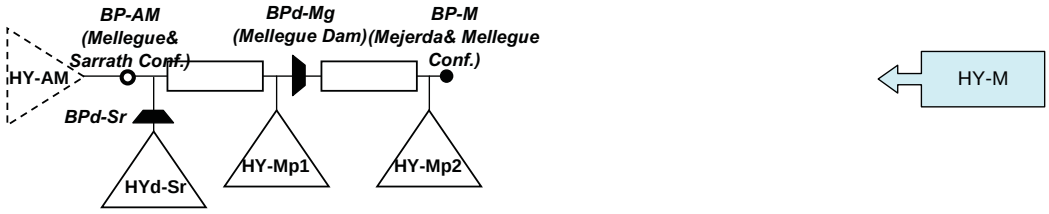
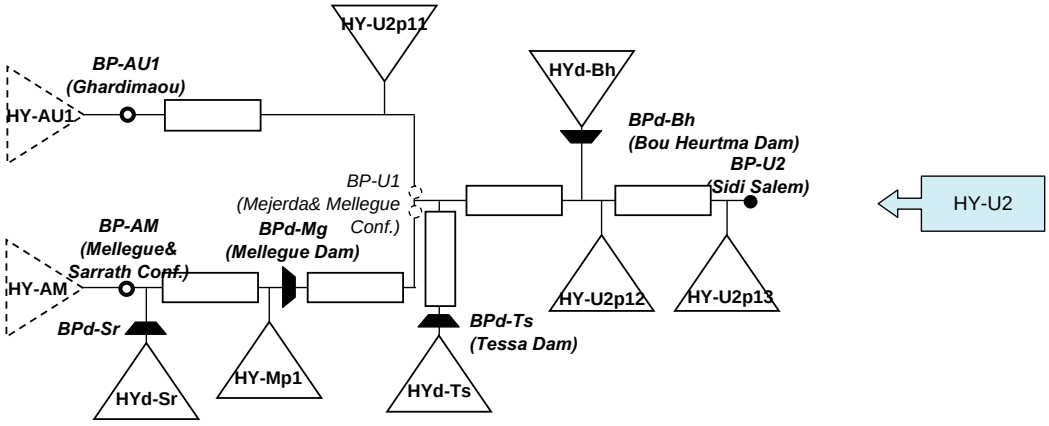


Figure 7.2.2 Basin Division for Runoff Analysis

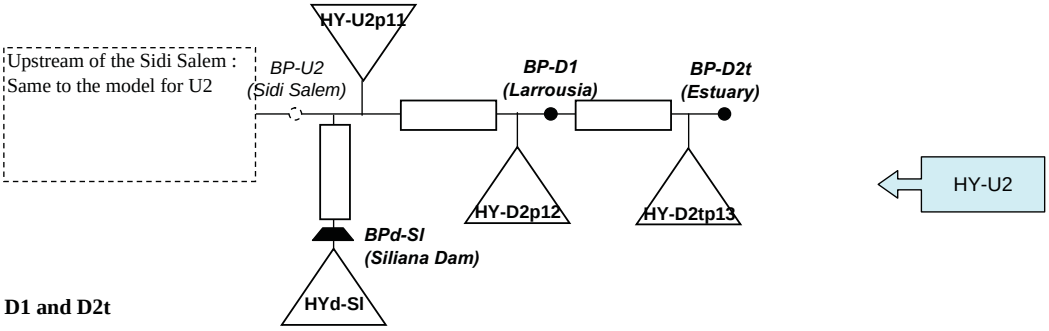
Probable Flood for U1



Design Flood for M



Design Flood for U2



Design Flood for D1 and D2t

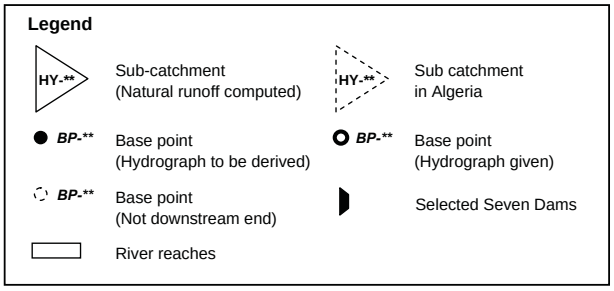
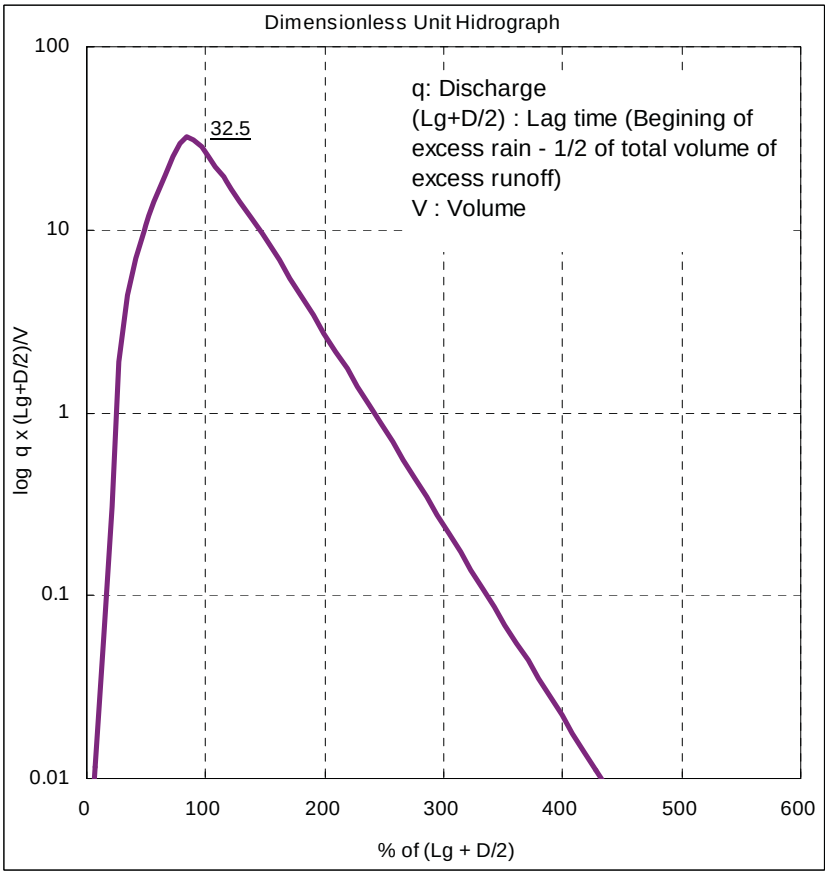
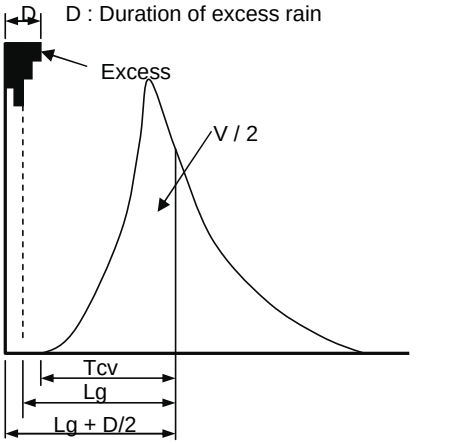


Figure 7.2.3 Schematic Diagram of River Network for Probable Flood Computation



(1) Dimensionless unit hydrograph applied



Lg+D/2 can be taken equal to Tcv when rainfall data availability is limited.

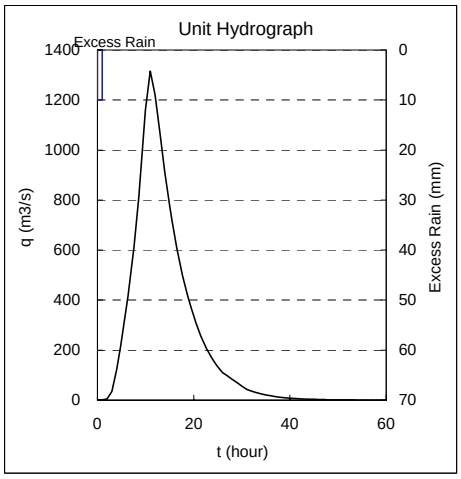
Instead of Lg+D/2 (Time from the centre of the excess rain to time of occurrence of on-half volume of hydrograph, Tcv (time from the beginning of rise of net hydrograph to time of occurrence of on-half volume of hydrograph) can be applied . The lag time can be explained by the following equation.

$Tcv = C \times (L \times Lca / \sqrt{Sst})^{0.38}$

where; Tcv: Lag time. Time from the beginning of rise of net hydrograph to time of occurrence of on-half volume of hydrograph .
C: Constant, 0.72 for foothill drainage area
L: Mainstream length from outlet to watershed
Lca: Mainstream length from outlet to watershed centroid
Sst: Overall slope of mainstream

(2) Definition of Tcv and (Lg+D/2)

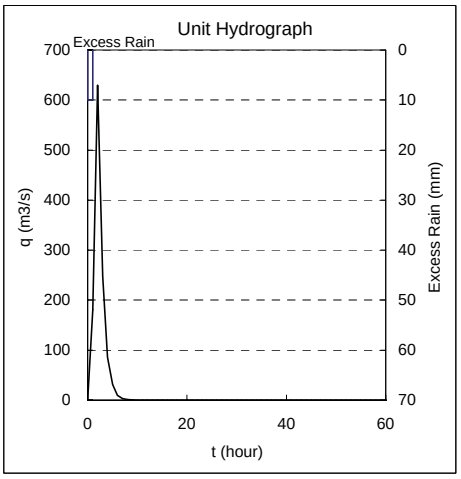
Figure 7.2.4 Dimensionless Unit Hydrograph



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 527 m3/s

Runoff Zone : HY-U1 (1154 km2)

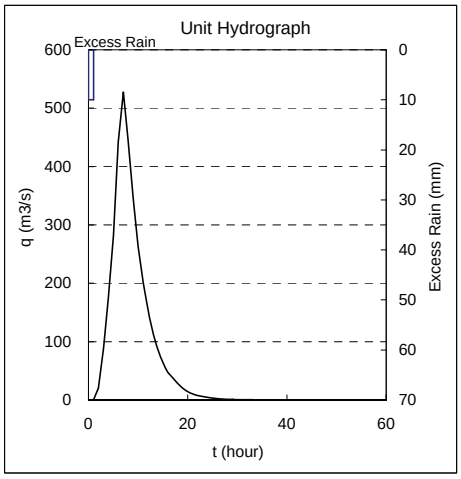
Base point : BP-U1 Mejerda & Mellgue Conf.



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 983 m3/s

Runoff Zone : HY-U2p12 (1664 km2)

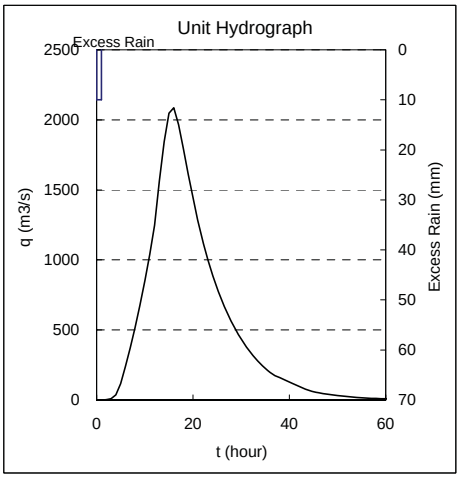
Base point : BP-U2up Mejerda & BouH. Conf.



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 653 m3/s

Runoff Zone : HY-U2p13 (1630 km2)

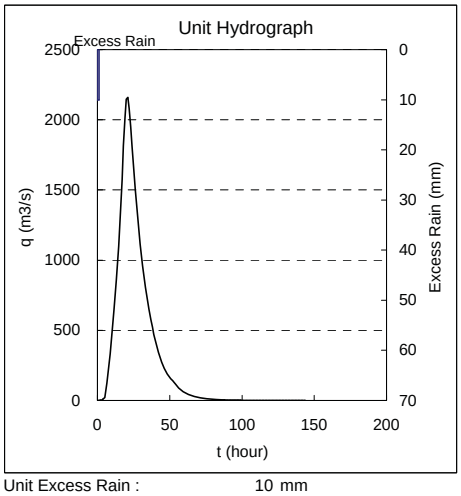
Base point : BP-D2 Sidi Salem Dam



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 1053 m3/s

Runoff Zone : HY-D2tp11 (1626 km2)

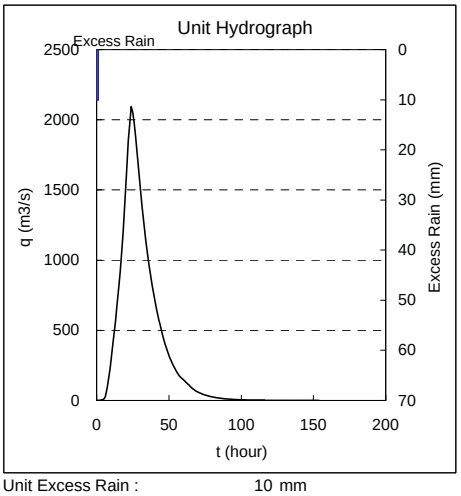
Base point : BP-D1up2 Mejerda & Siliana Conf.



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 441 m3/s

Runoff Zone : HY-D2tp12 (1092 km2)

Base point : BP-D1 Larrousia Dam



Unit Excess Rain : 10 mm
Unit rainfall duration: 1 hr
qmax : 678 m3/s

Runoff Zone : HY-D2tp13 (1473 km2)

Base point : BP-D2 Estuary

Figure 7.2.5 Examples of Unit Hydrographs for Sub-catchment

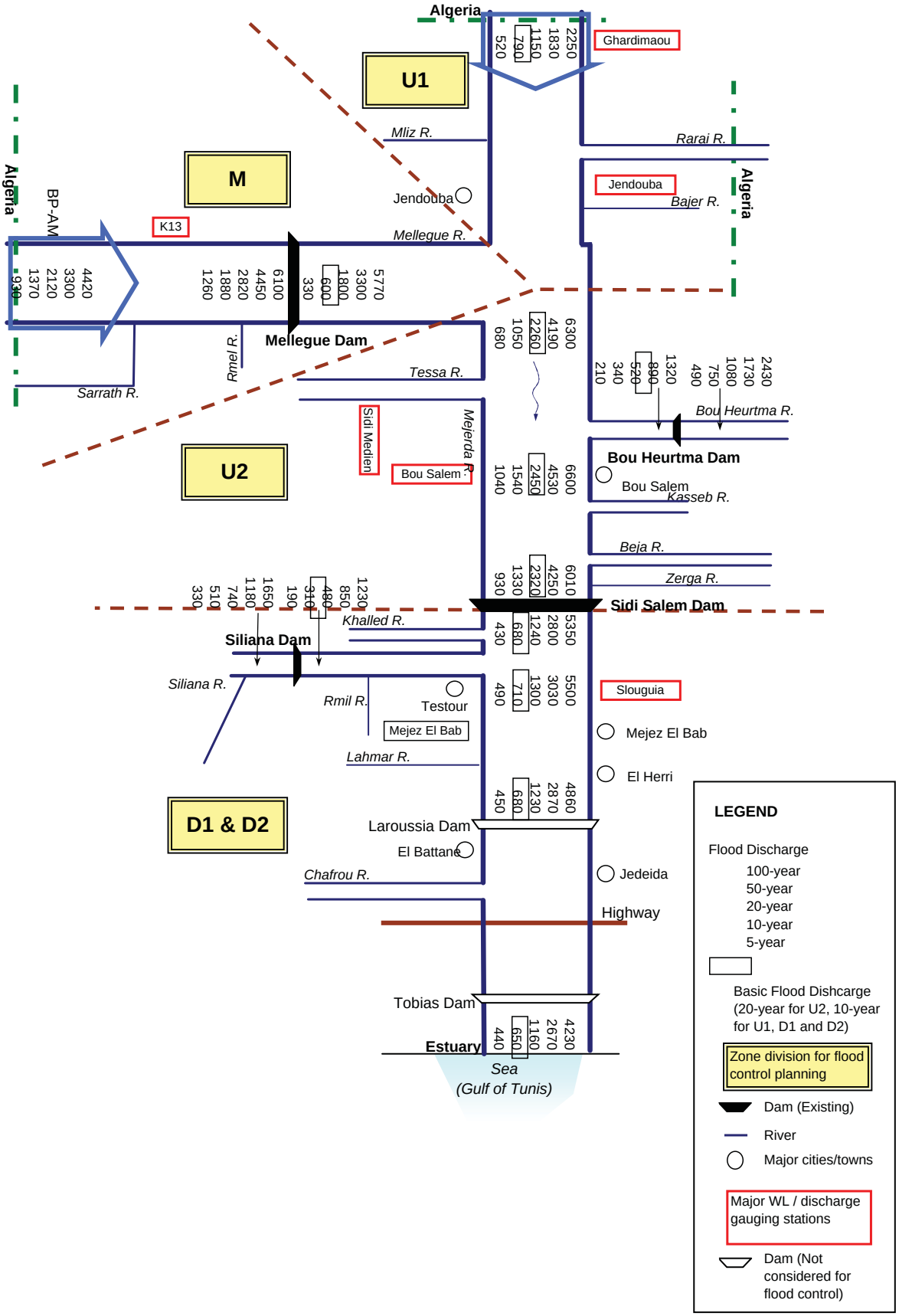


Figure 7.2.6 Probable Discharge Distribution (1/3)
Present Condition : Standard Dam Operation)

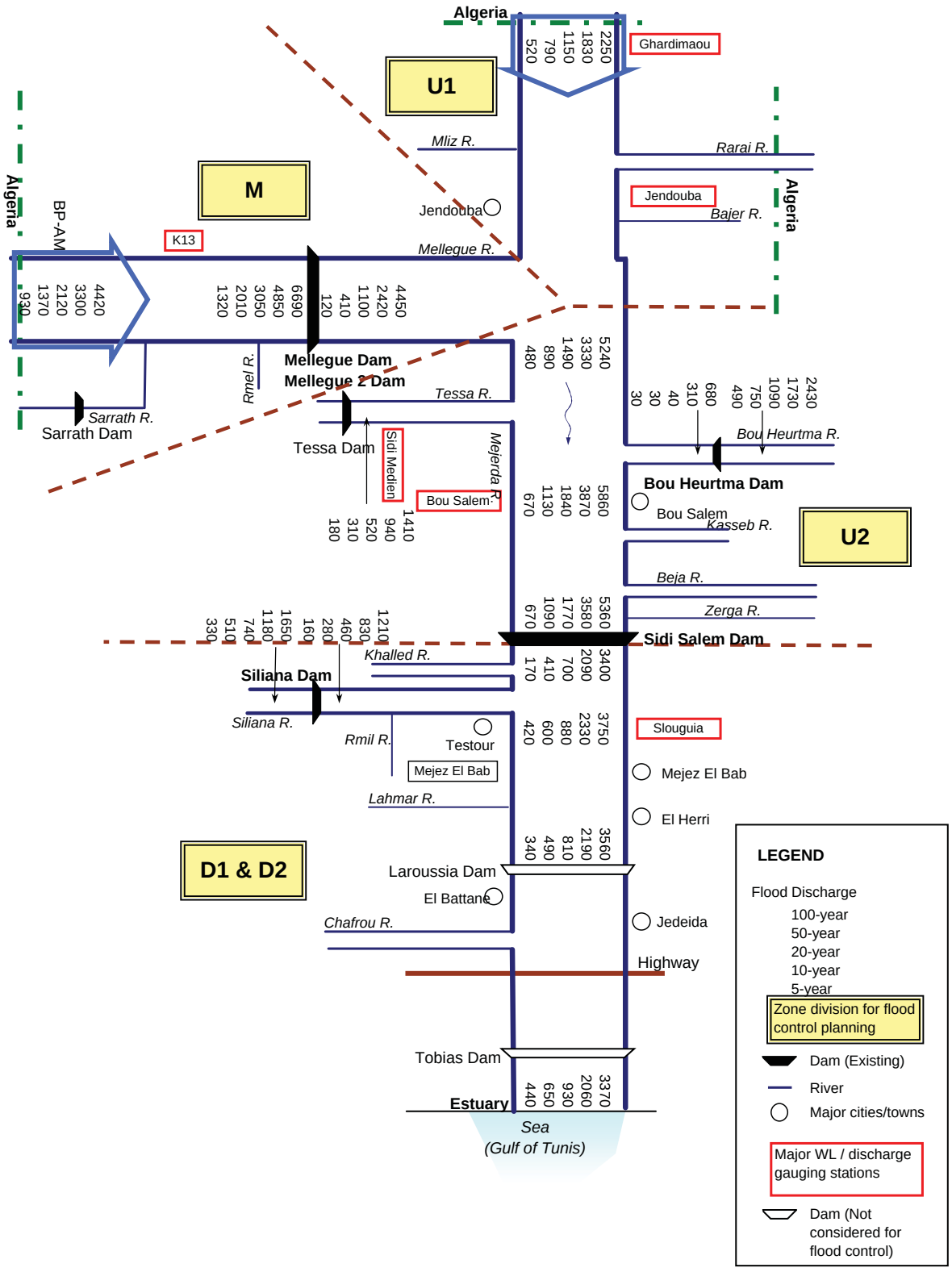


Figure 7.2.6 Probable Discharge Distribution (2/3)
(After Project : Recommended Improved Dam Operation 2030)

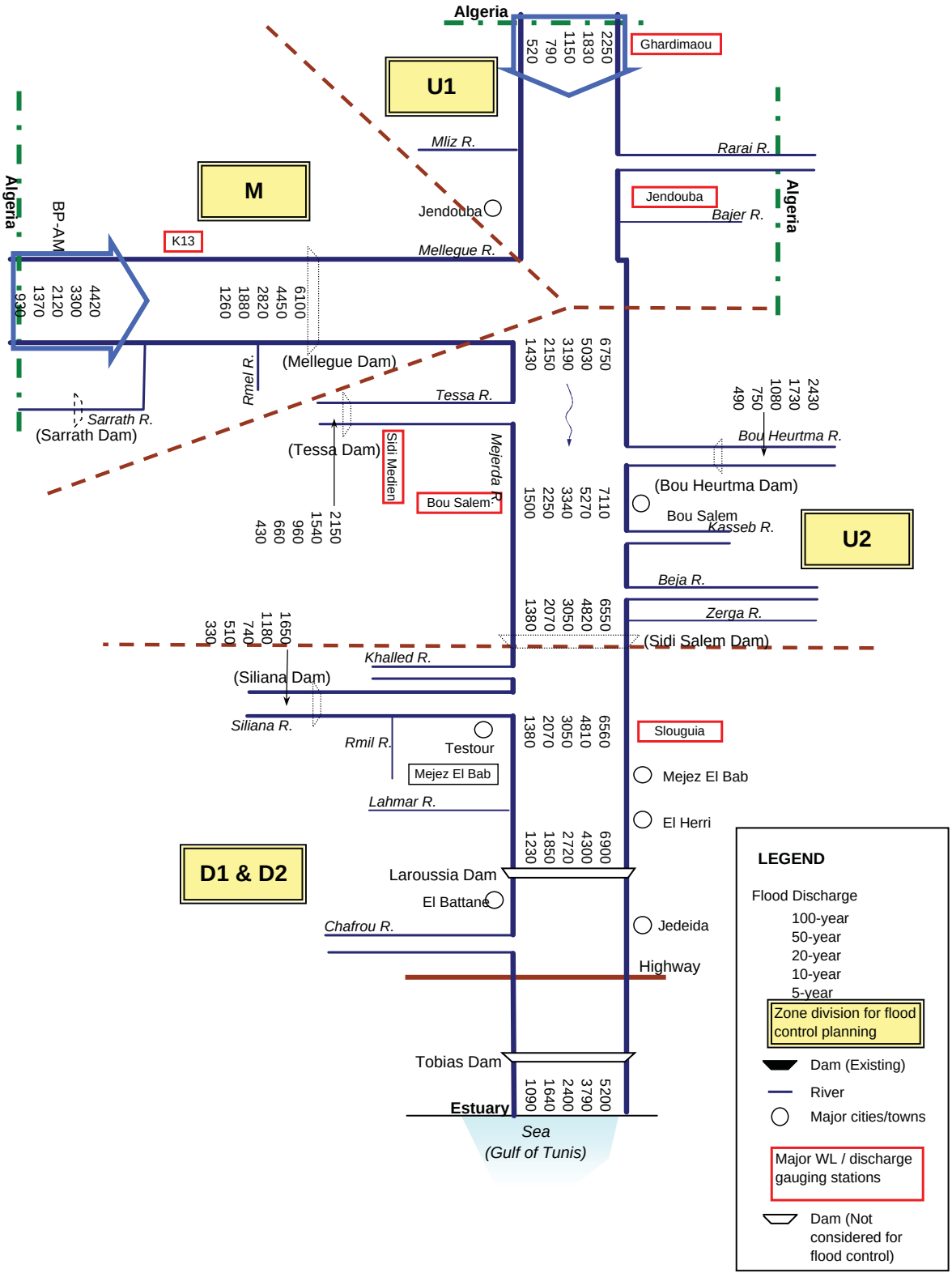


Figure 7.2.6 Probable Discharge Distribution (3/3)
(Assumed to be without Dam)

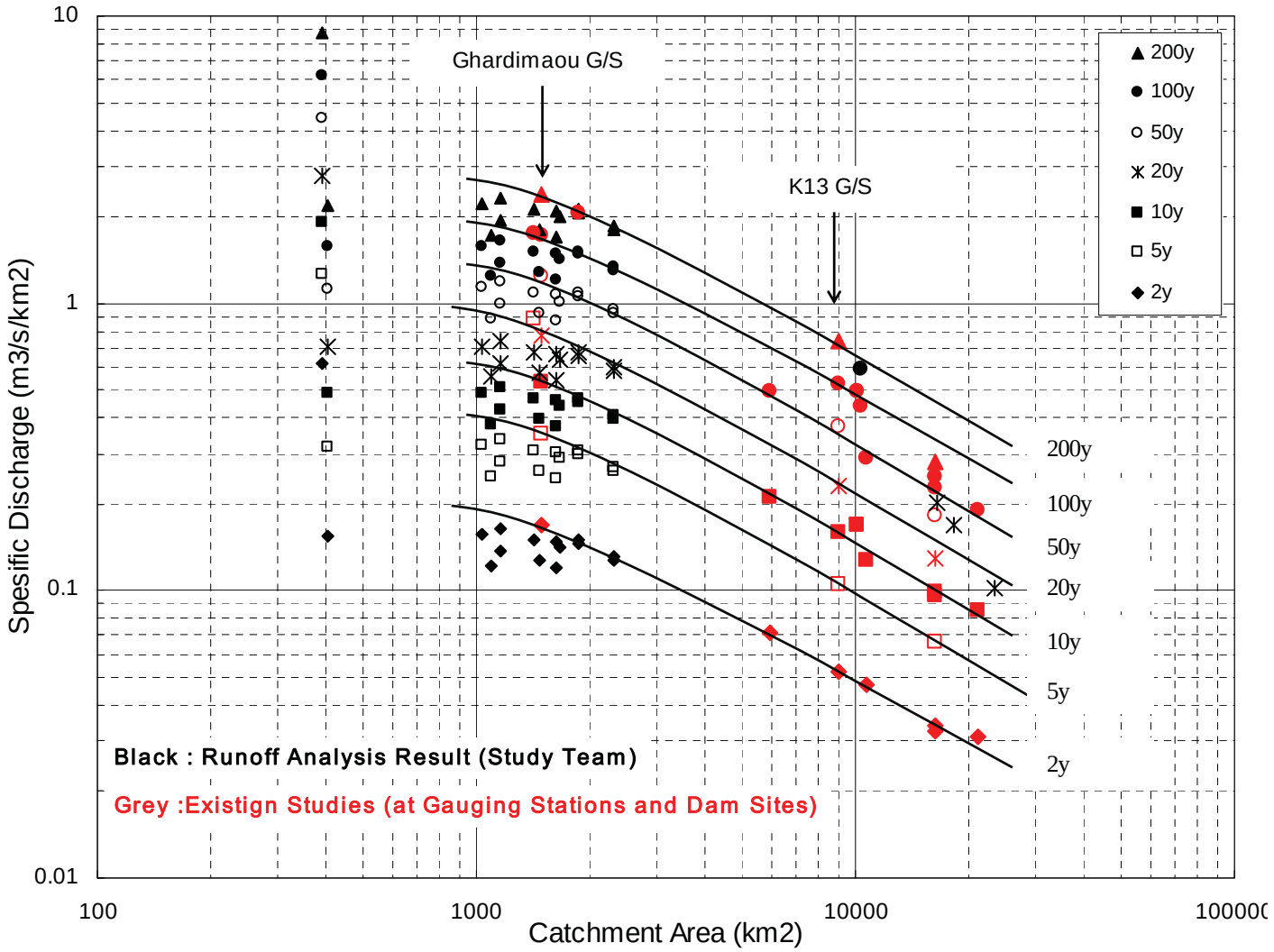
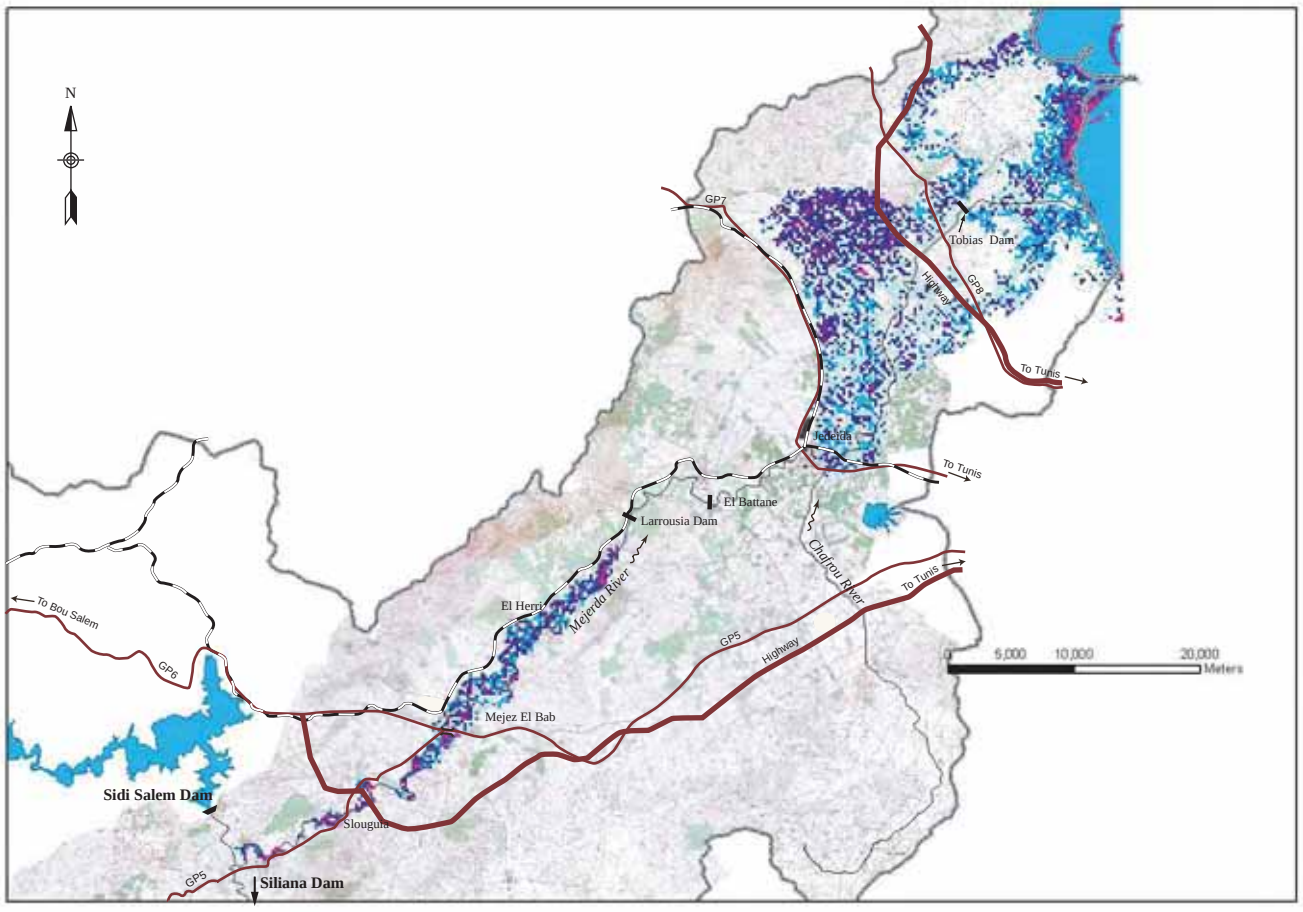
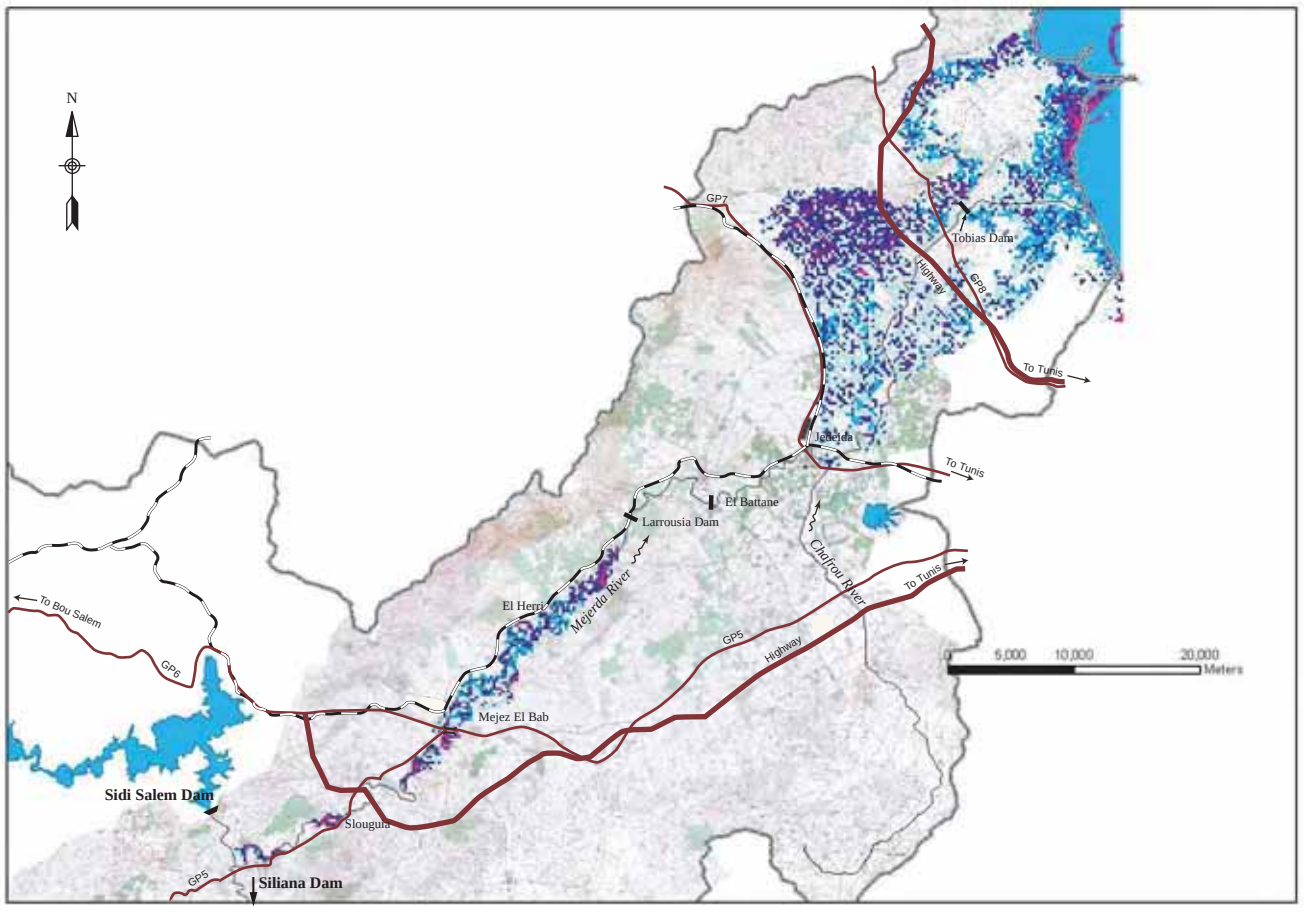


Figure 7.2.7 Specific Discharge



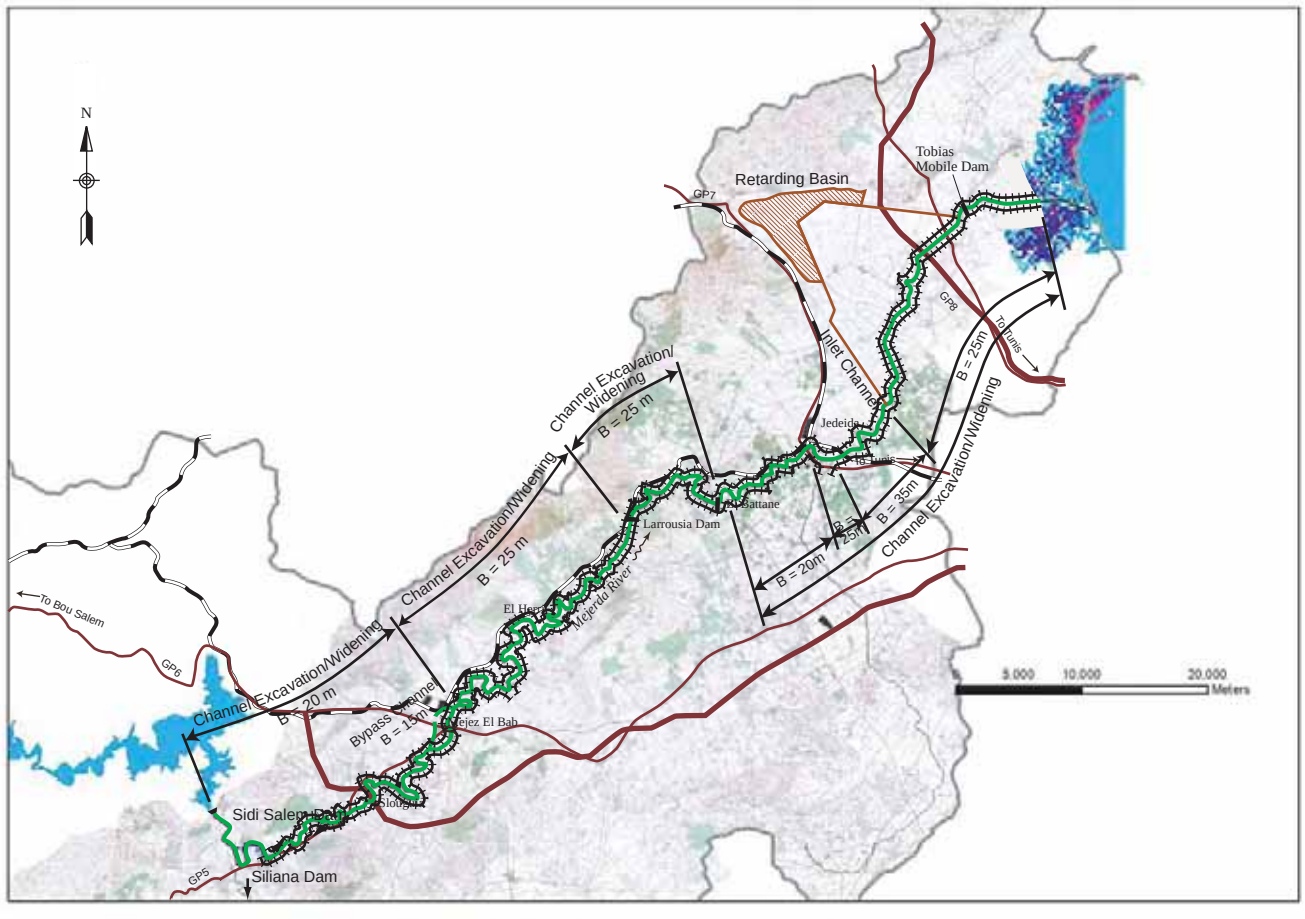
BEFORE PROJECT
(Present Condition)

With
Present standard dam operation of selected existing dams :
- Sidi Salem Dam
- Siliana Dam



AFTER PROJECT (Step 1)
(Improved Dam Operation)

With
Improved Dam Operation (2030) of selected dams :
- Sidi Salem Dam
- Siliana Dam



Inundation Depth (m)
- 0
- 0.001-0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 or more

Legend
Proposed River Improvement
- Channel Excavation/ Widening (B: Bottom width)
- Embankment *
- Bypass Channel
- Retarding Basin
- Railway
- Major Road

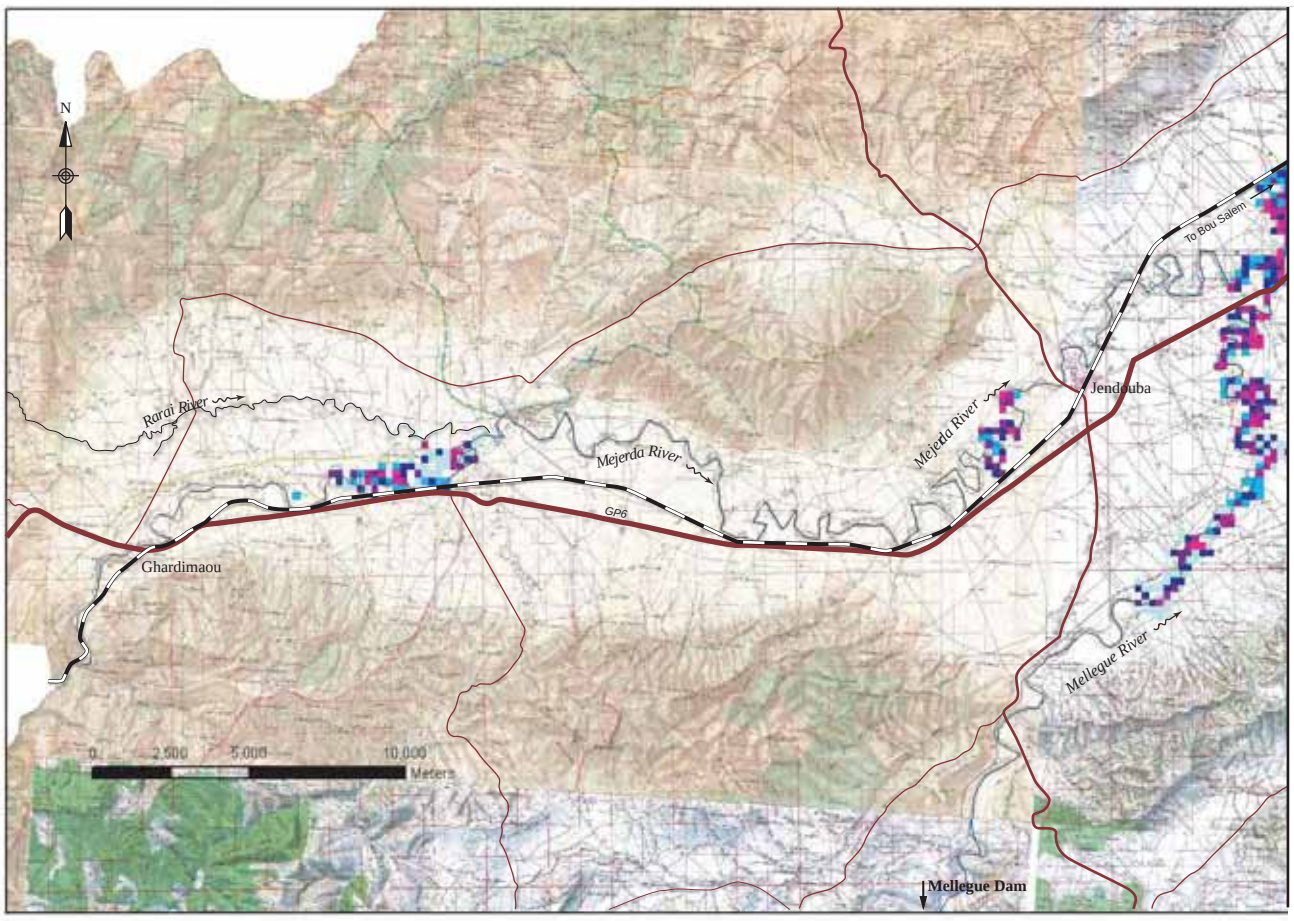
* : Not all reaches along this symbol require embankment. Embankments are to be partially installed on reaches whose bank elevation is lower than design water level.

AFTER PROJECT (Step 2)
(Improved Dam Operation + River Improvement)

With
Improved Dam Operation (2030) of selected dams :
- Sidi Salem Dam
- Siliana Dam

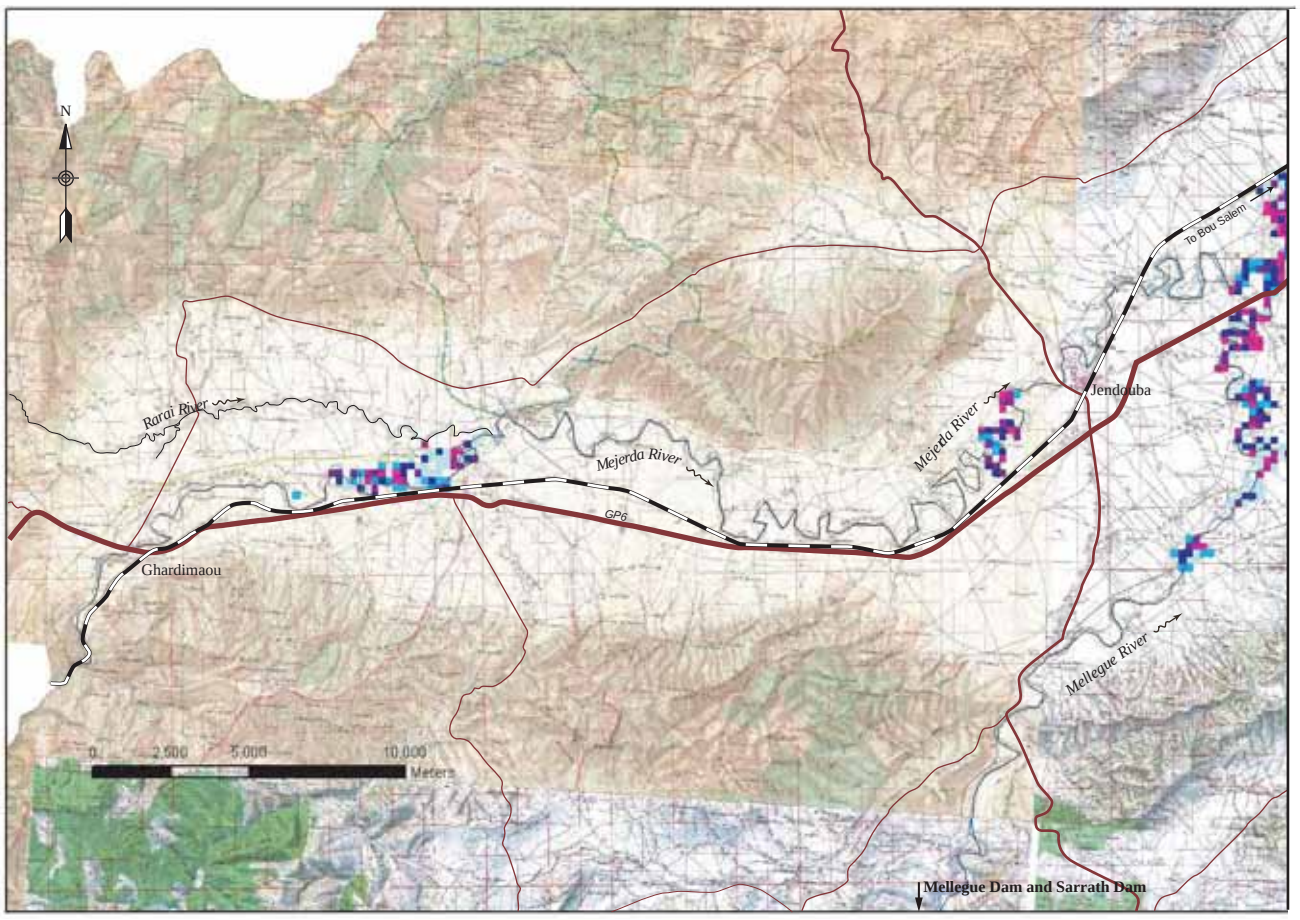
River Improvement :
- Channel excavation/widening
- Embankment
- Bypass channel
- Retarding basin

Figure 7.3.1 Inundation before and after Project (1/3) : Zone D1 and D2 (for Selected Flood Protection Level : 10 year probability)



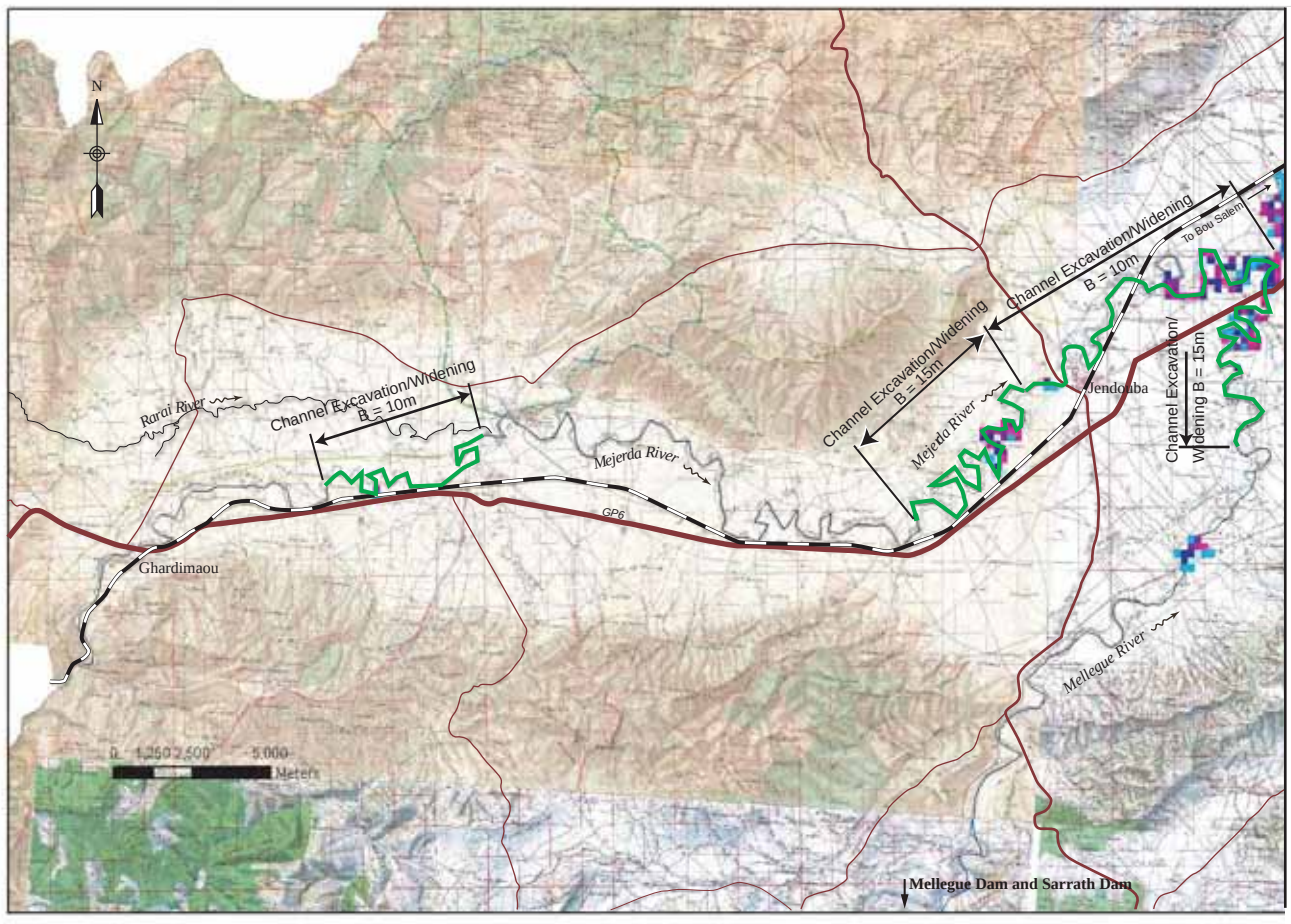
BEFORE PROJECT
(Present Condition)

With
Present standard dam operation of selected existing dams :
Mellegue Dam



AFTER PROJECT (Step 1)
(Improved Dam Operation)

With
Improved Dam Operation (2030) of selected dams :
Mellegue Dam
Sarrath Dam



Inundation Depth (m)

0
0.001-0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 or more

Legend

Proposed River Improvement
- Channel Excavation/ Widening (B: Bottom width)
- Embankment *
- Bypass Channel

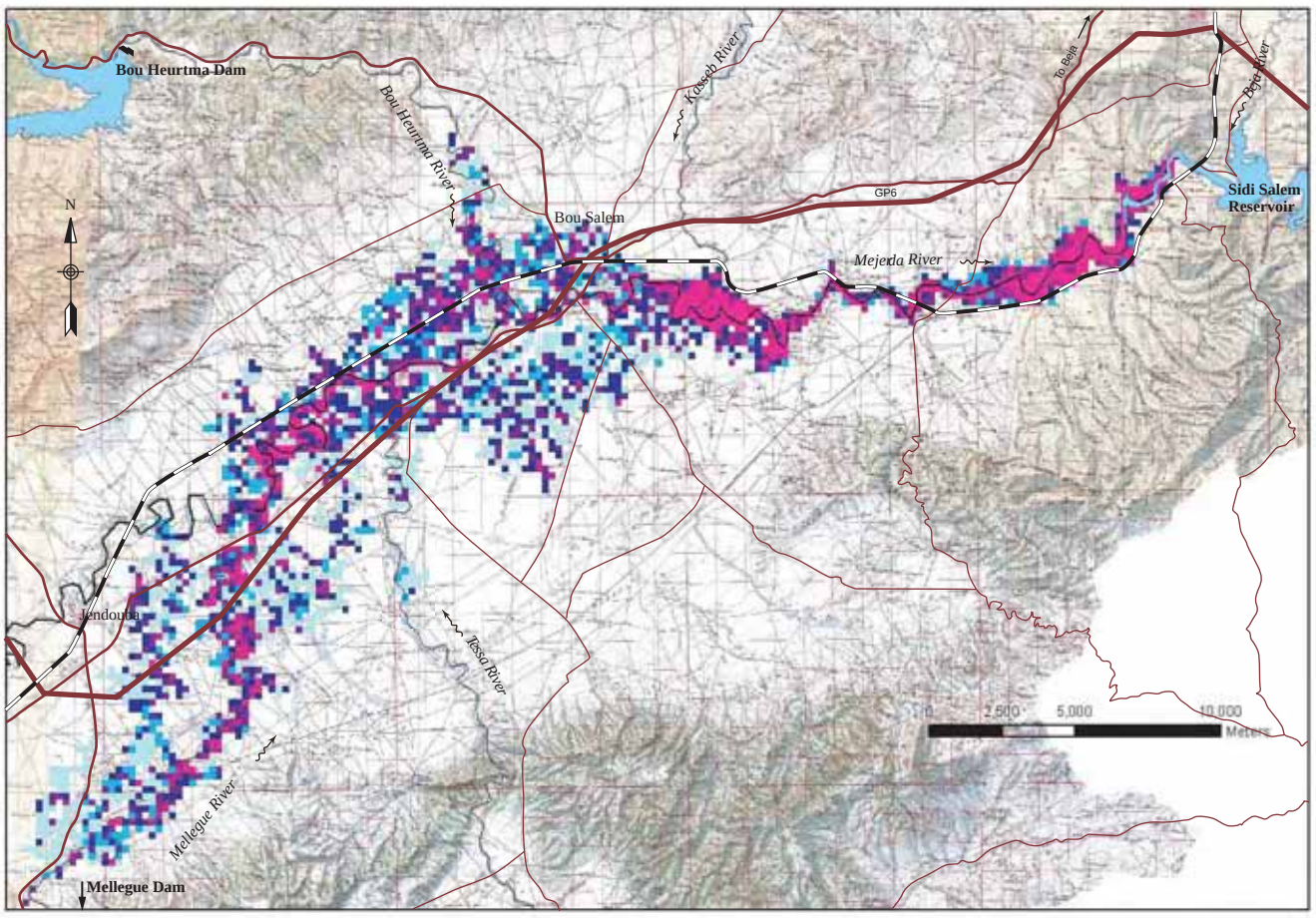
Railway
Major Road

* : Not all reaches along this symbol require embankment. Embankments are to be partially installed on reaches whose bank elevation is lower than design water level.

AFTER PROJECT (Step 2)
(Improved Dam Operation + River Improvement)

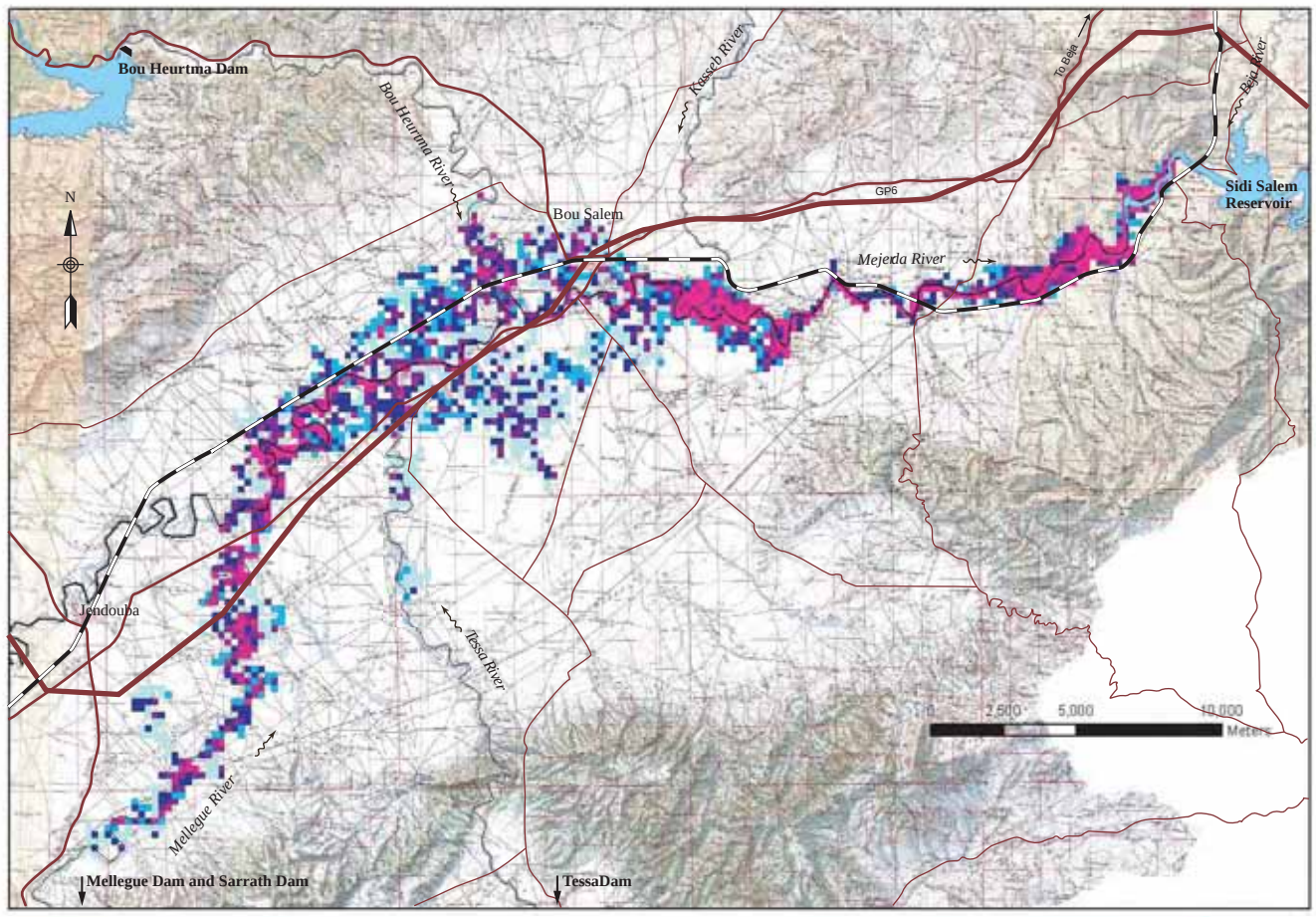
With
Improved Dam Operation (2030) of selected dams :
Mellegue Dam
Sarrath Dam
River Improvement :
Channel excavation/widening

Figure 7.3.1 Inundation before and after Project (2/3) : Zone U1 and M (for Selected Flood Protection Level : 10 year probability)



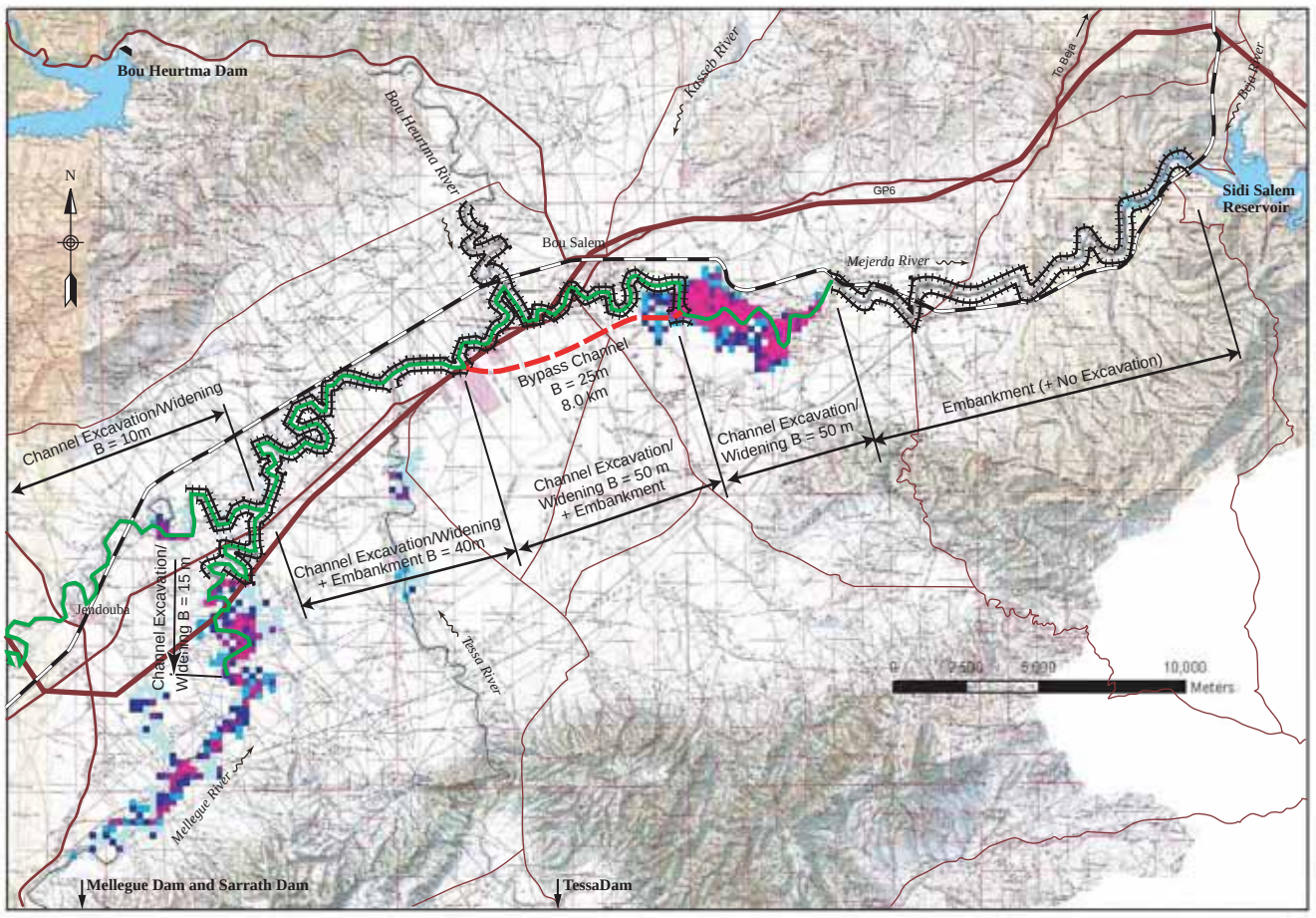
BEFORE PROJECT
(Present Condition)

With
Present standard dam operation of selected existing dams :
- Mellegue Dam
- Bou Heurtma Dam



AFTER PROJECT (Step 1)
(Improved Dam Operation)

With
Improved Dam Operation (2030) of selected dams :
- Mellegue Dam
- Bou Heurtma Dam
- Tessa Dam
- Sarrath Dam



* : Not all reaches along this symbol require embankment. Embankments are to be partially installed on reaches whose bank elevation is lower than design water level.

AFTER PROJECT (Step 2)
(Improved Dam Operation + River Imrovement)

With
Improved Dam Operation (2030) of selected dams :
- Mellegue Dam
- Bou Heurtma Dam
- Tessa Dam
- Sarrath Dam

River Improvement :
- Channel excavation/widening
- Embankment
- Bypass channel

Figure 7.3.1 Inundation before and after Project (3/3) : Zone U2 (for Selected Flood Protection Level : 20 year probability)

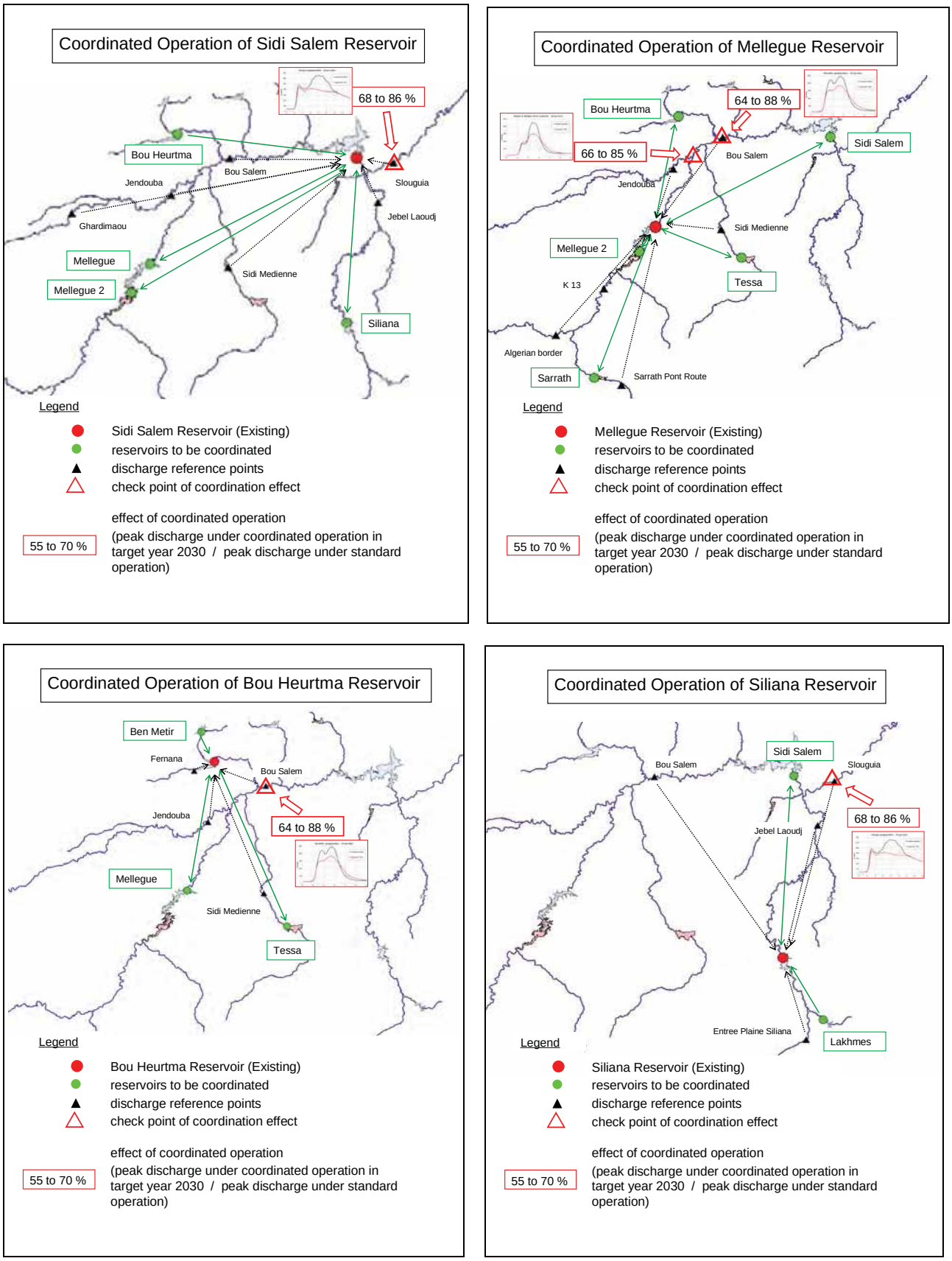
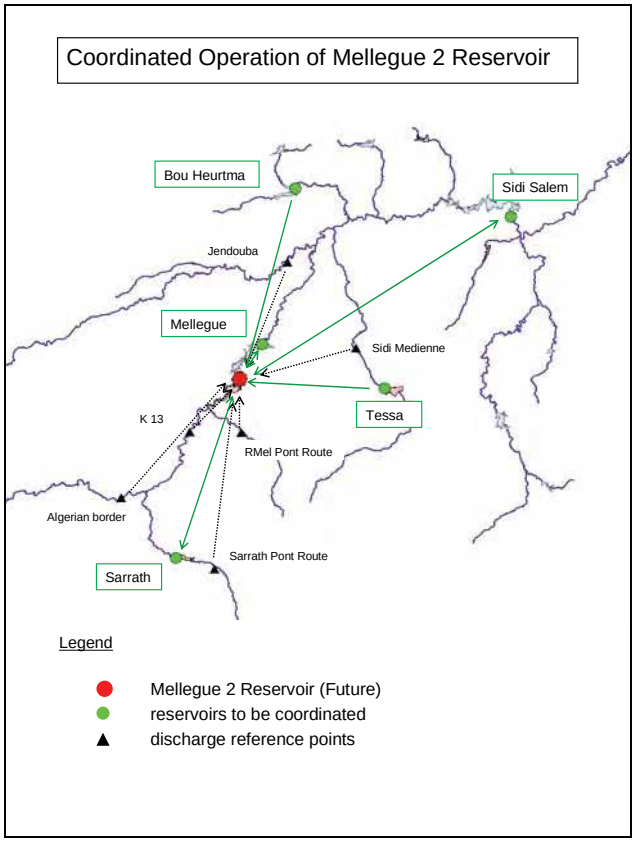
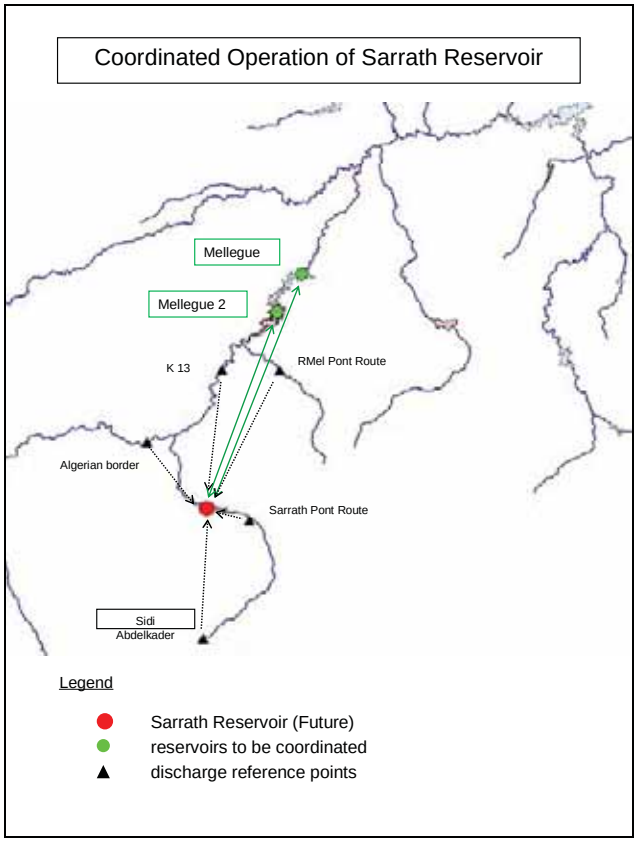


Figure 8.2.1 General Plan of Coordinated Operation of Dams (1/2)





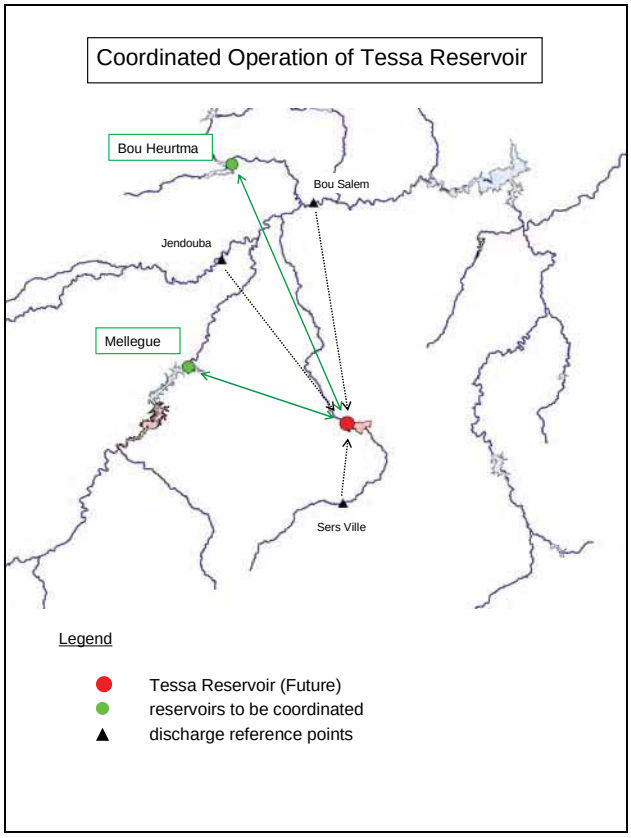


Figure 8.2.1 General Plan of Coordinated Operation of Dams (2/2)

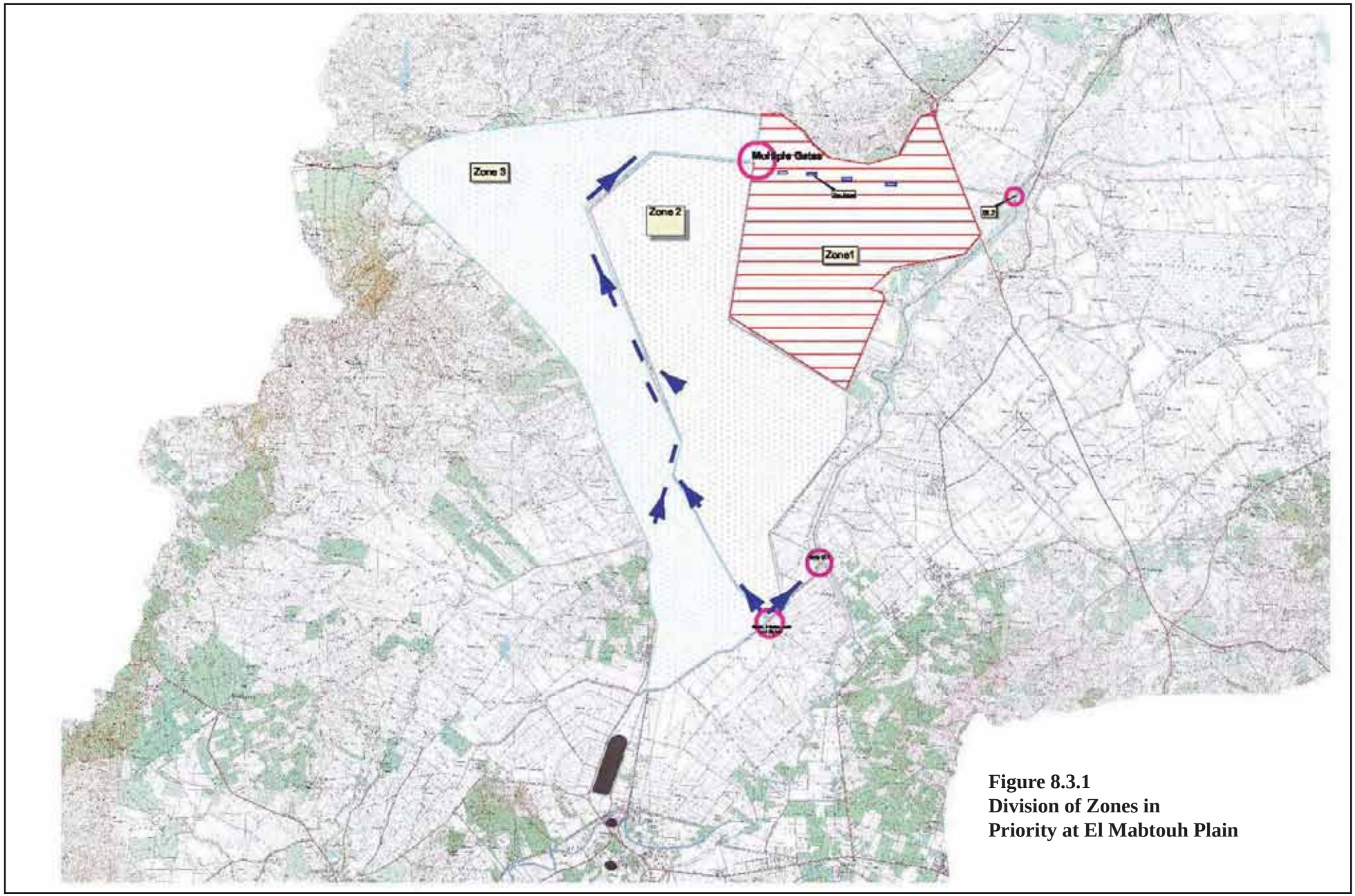


Figure 8.3.1
Division of Zones in
Priority at El Mabtouh Plain

Figure 8.3.2 Present Conditions of Sluiceways along El Mabtouh Canal

Figure 8.3.3 Present Conditions of Sluiceways along El Mabtouh Canal

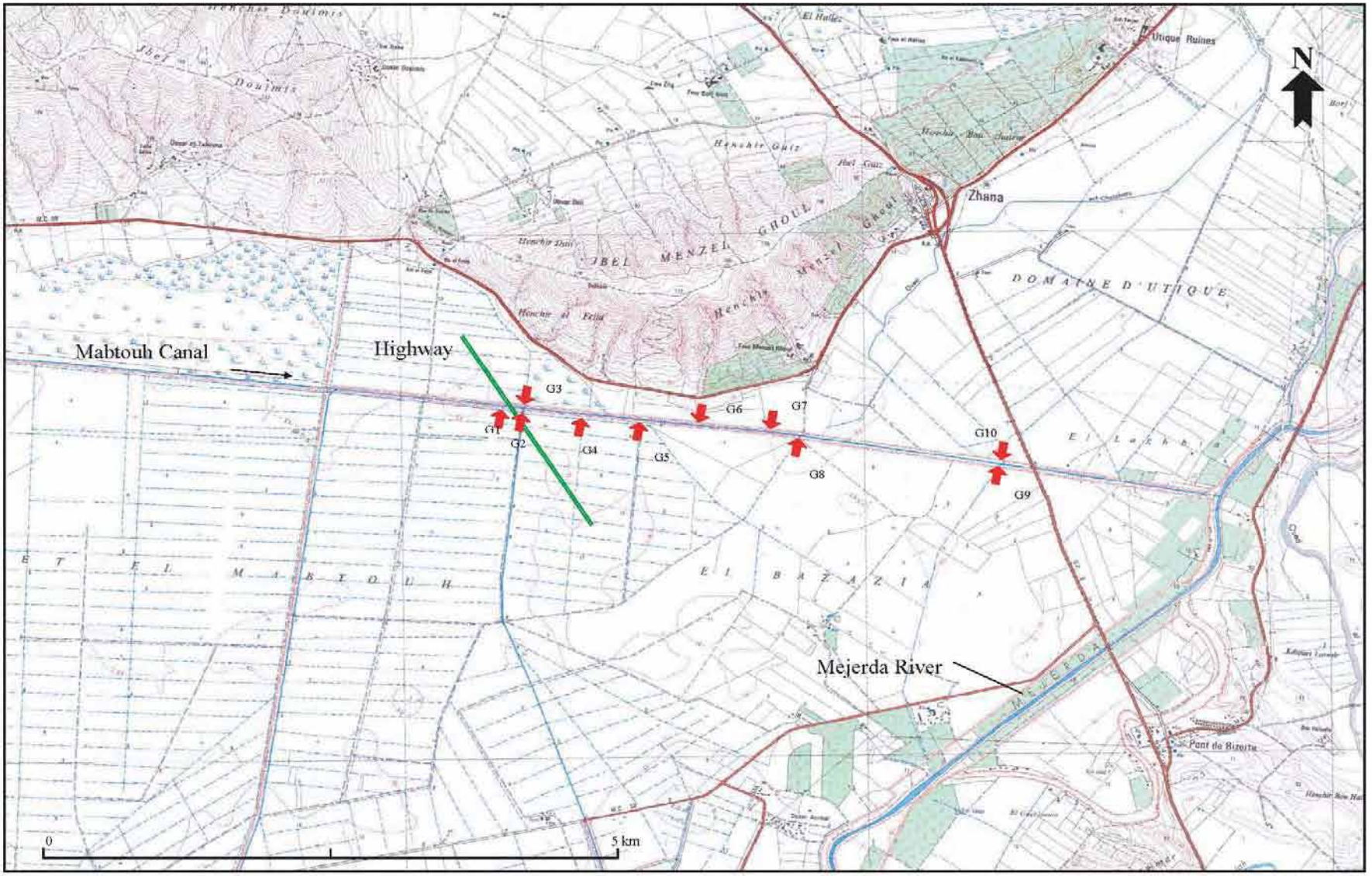


Figure 8.3.4 Location Map of Existing Sluiceways along El Mabtouh Canal