



**GOVERNMENT OF PAKISTAN  
MINISTRY OF WATER AND POWER  
PROJECT MANAGEMENT & POLICY IMPLEMENTATION UNIT (PMPIU)**

**Water Sector Capacity Building and Advisory  
Services Project (WCAP)**

**Development of National Flood Protection Plan-IV (NFPP-IV)  
and Related Studies to Enhance the Capacity of  
Federal Flood Commission-FFC**

**LANDUSE AND  
DISTRICT LEVEL SUBMERGENCE PLANS**

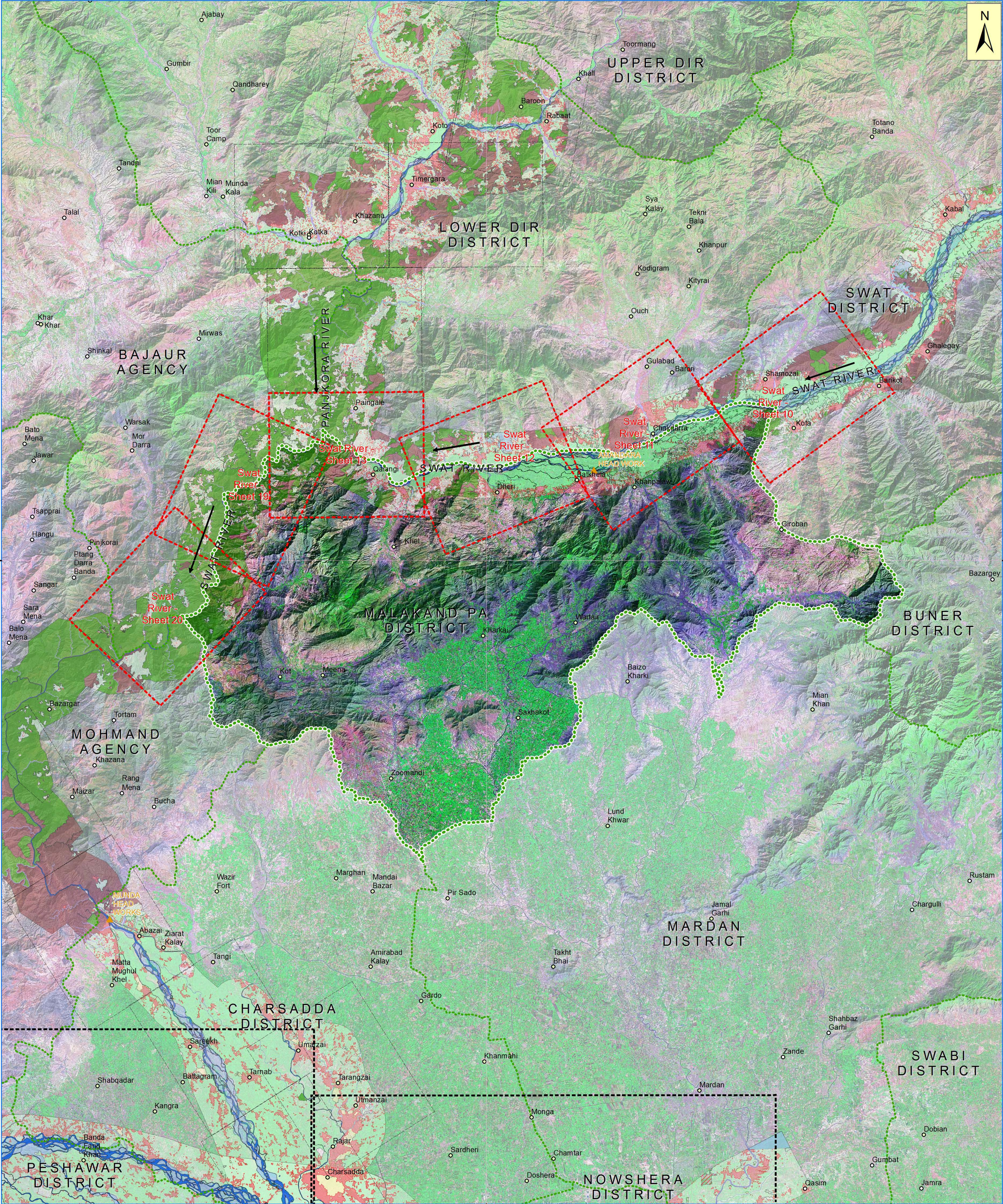
**DISTRICT MALAKAND  
KHYBER PAKHTUNKHWA PROVINCE**

**JUNE 2015**

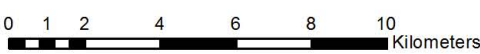
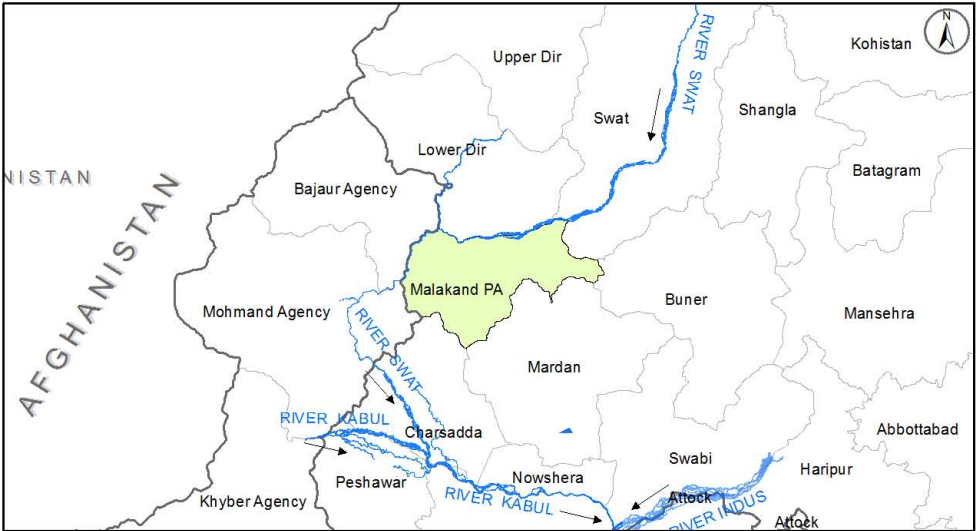


MALAKAND DISTRICT

3100000



3100000



DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV) AND RELATED STUDIES TO ENHANCE THE CAPACITY OF FEDERAL FLOOD COMMISSION-FFC

MALAKAND DISTRICT

Client :  
FEDERAL FLOOD COMMISSION  
Ministry of Water & Power

Consultants:  
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED  
1-C, Block-N, Model Town Extension,  
Lahore - Pakistan.

in association with  
DELTAES, THE NETHERLANDS

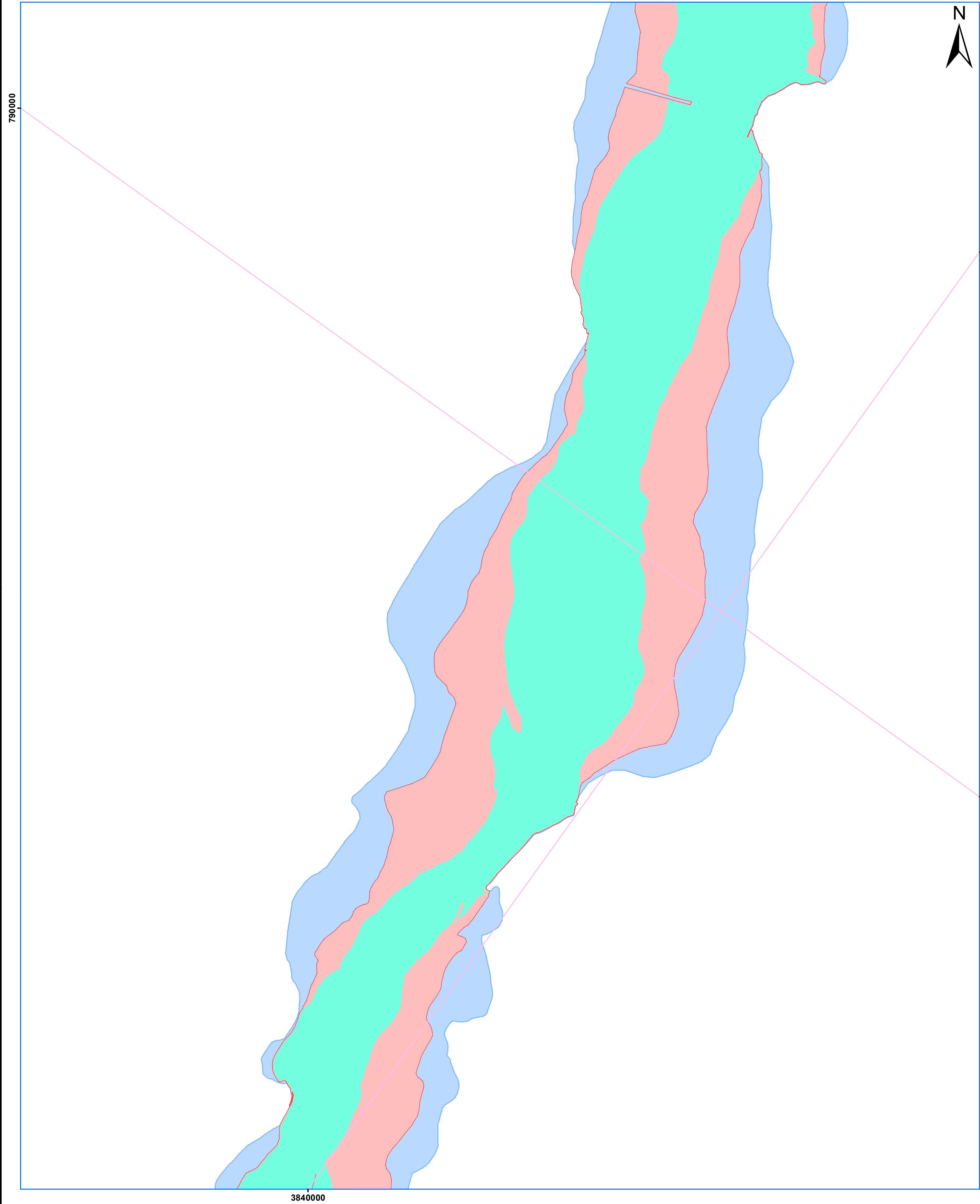
Rev.	Date:	Description	Ckd.	Ver.

Source of Information:  
1. Topographic sheets of Survey of Pakistan  
2. Freely available satellite imagery

Coordinate System  
PROJECTION: Lambert Conformal Conic (LMPAK-I),  
DATUM: WGS84  
Grid Reference is in meters

Date: June 30, 2015





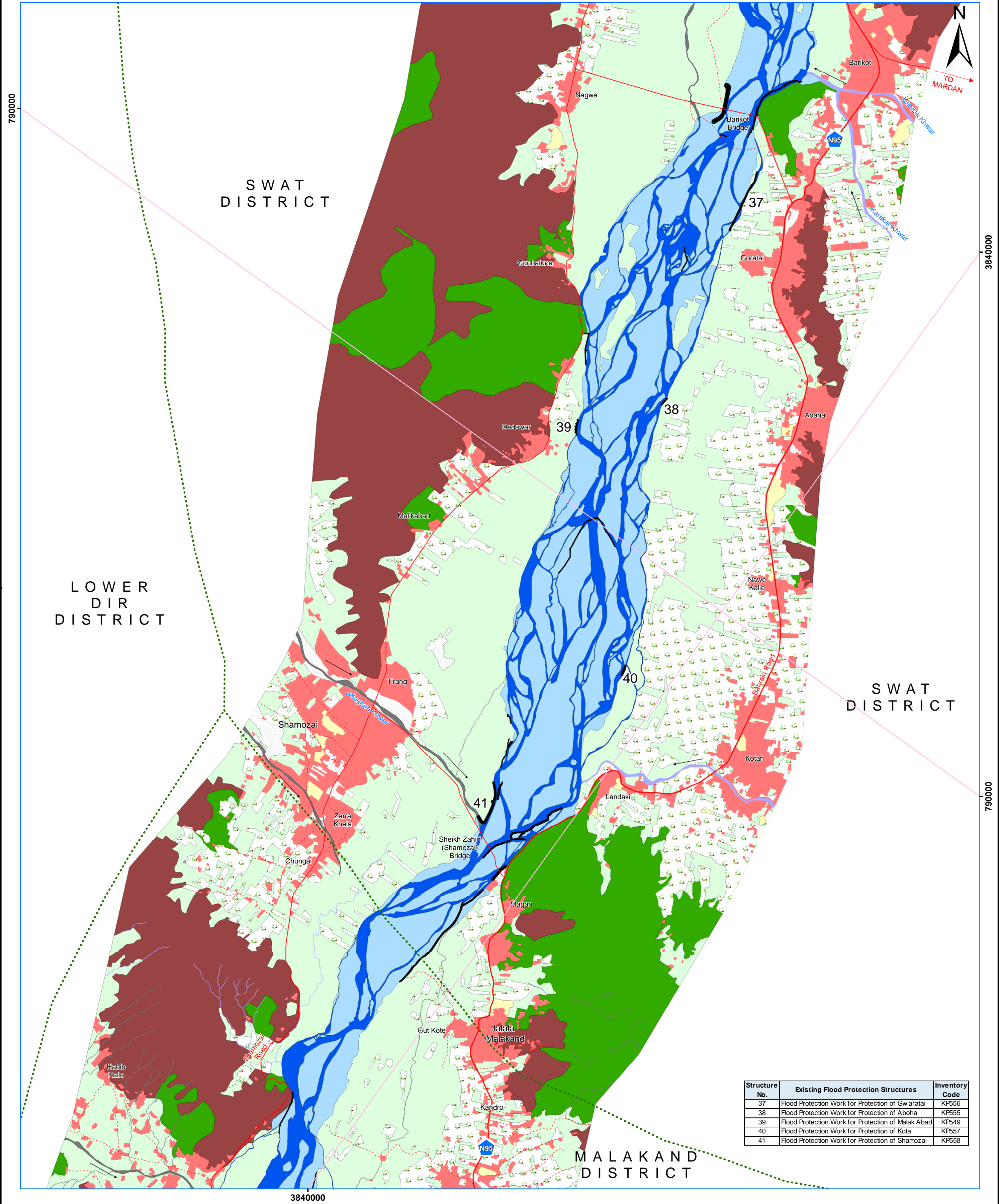
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LEGEND

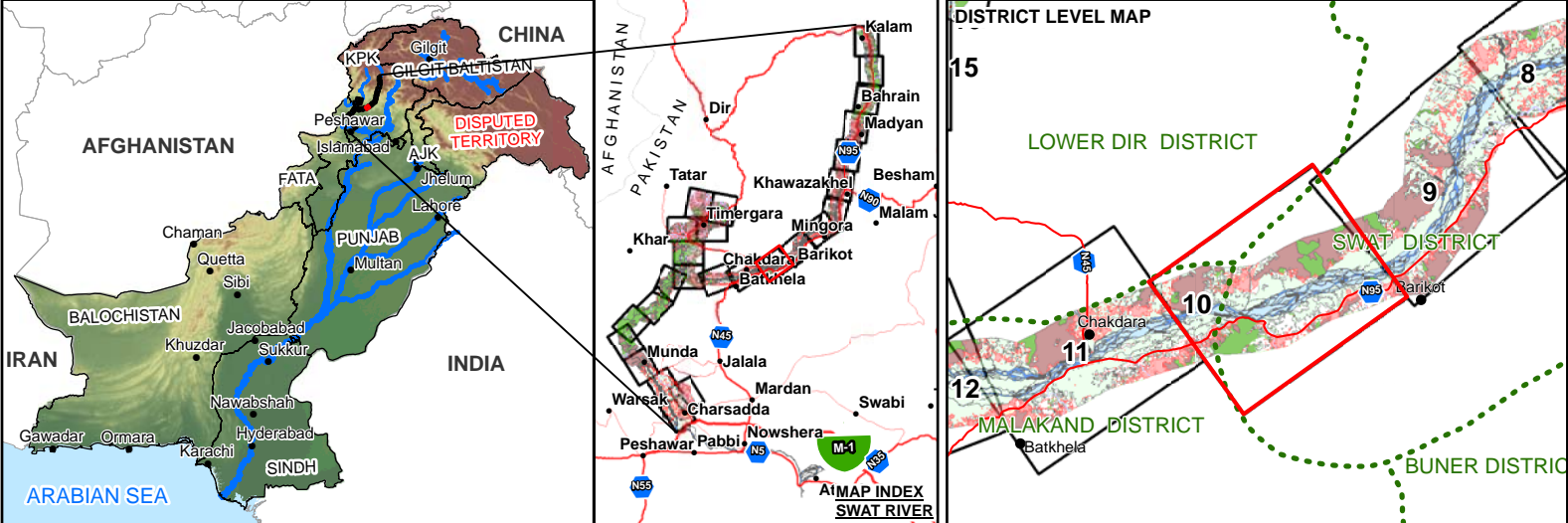
- High Risk Zone (Inundation Extent Corresponding to discharge of 16,845 cusecs below Kalam)
- Medium Risk Zone (Inundation Extent Corresponding to discharge of 19,246 cusecs below Kalam)
- Low Risk Zone (Inundation Extent Corresponding to discharge of 20,271 cusecs below Kalam)

Note: All flood extents are based on breachless conditions





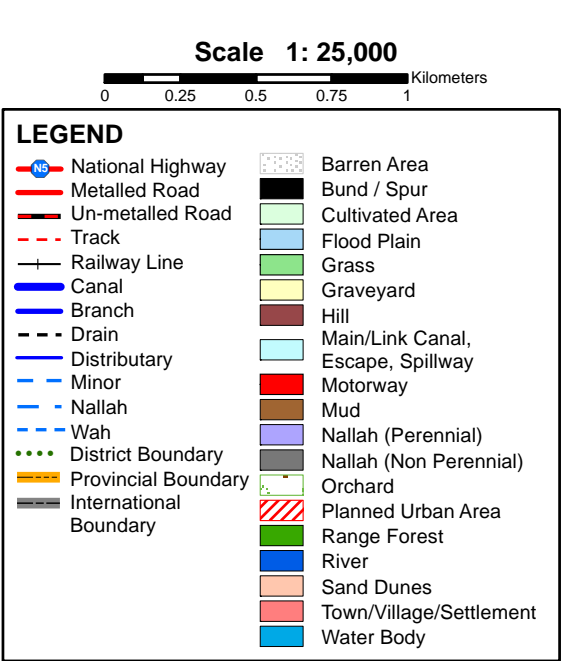
Structure No.	Existing Flood Protection Structures	Inventory Code
37	Flood Protection Work for Protection of Gw aratai	KP556
38	Flood Protection Work for Protection of Abaha	KP555
39	Flood Protection Work for Protection of Malak Abad	KP549
40	Flood Protection Work for Protection of Kota	KP557
41	Flood Protection Work for Protection of Shamozai	KP558



Source of Information:  
1. Topographic sheets of Survey of Pakistan  
2. Freely available satellite imagery  
3. Shuttle Radar Topographic Mission Data (Resolution:90 m)  
4. Survey data of Flood protection embankments and structures

Coordinate System  
PROJECTION: Lambert Conformal Conic (LMPAC-I) ,  
DATUM: WGS84  
Grid Reference is in meters

Date: May 29, 2015



DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV) AND RELATED STUDIES TO ENHANCE THE CAPACITY OF FEDERAL FLOOD COMMISSION-FFC

LANDUSE MAP  
SWAT RIVER

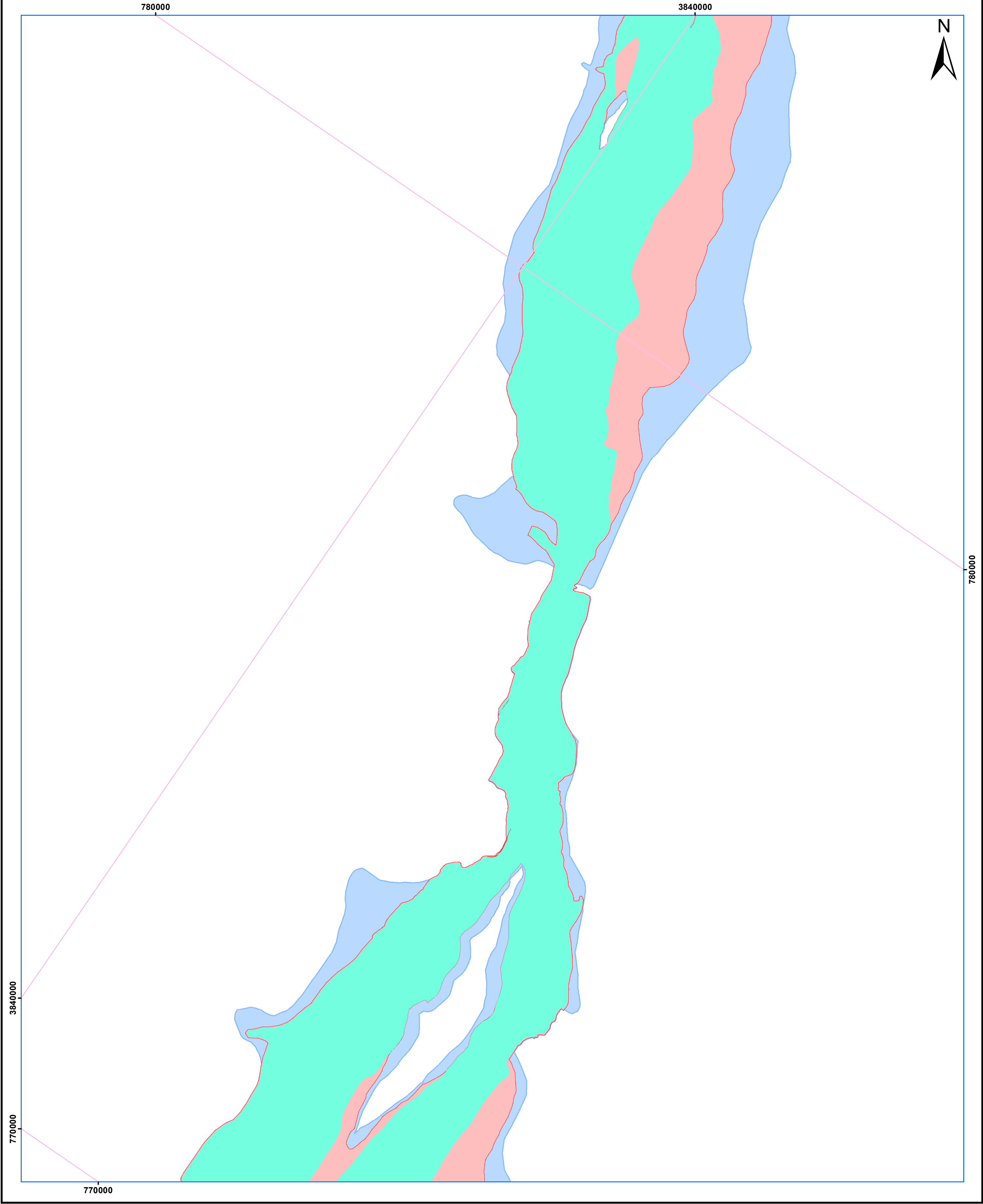
Client :  
FEDERAL FLOOD COMMISSION  
Ministry of Water & Power

Consultants:  
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED  
1-C , Block-N, Model Town Extension,  
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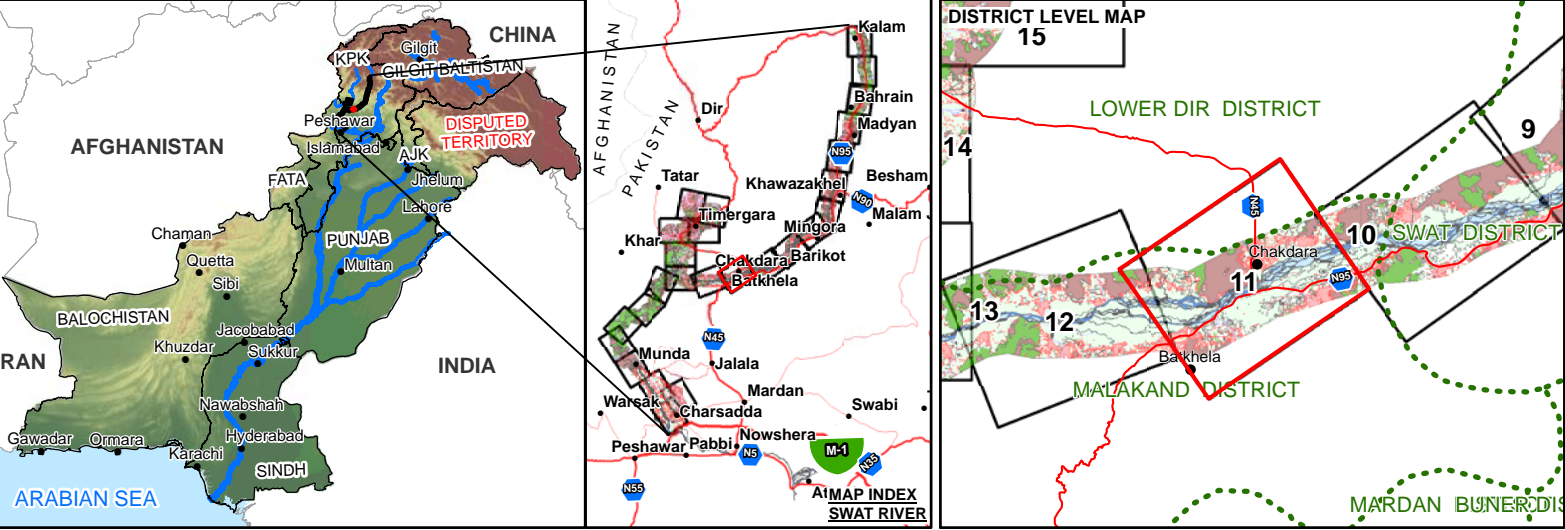
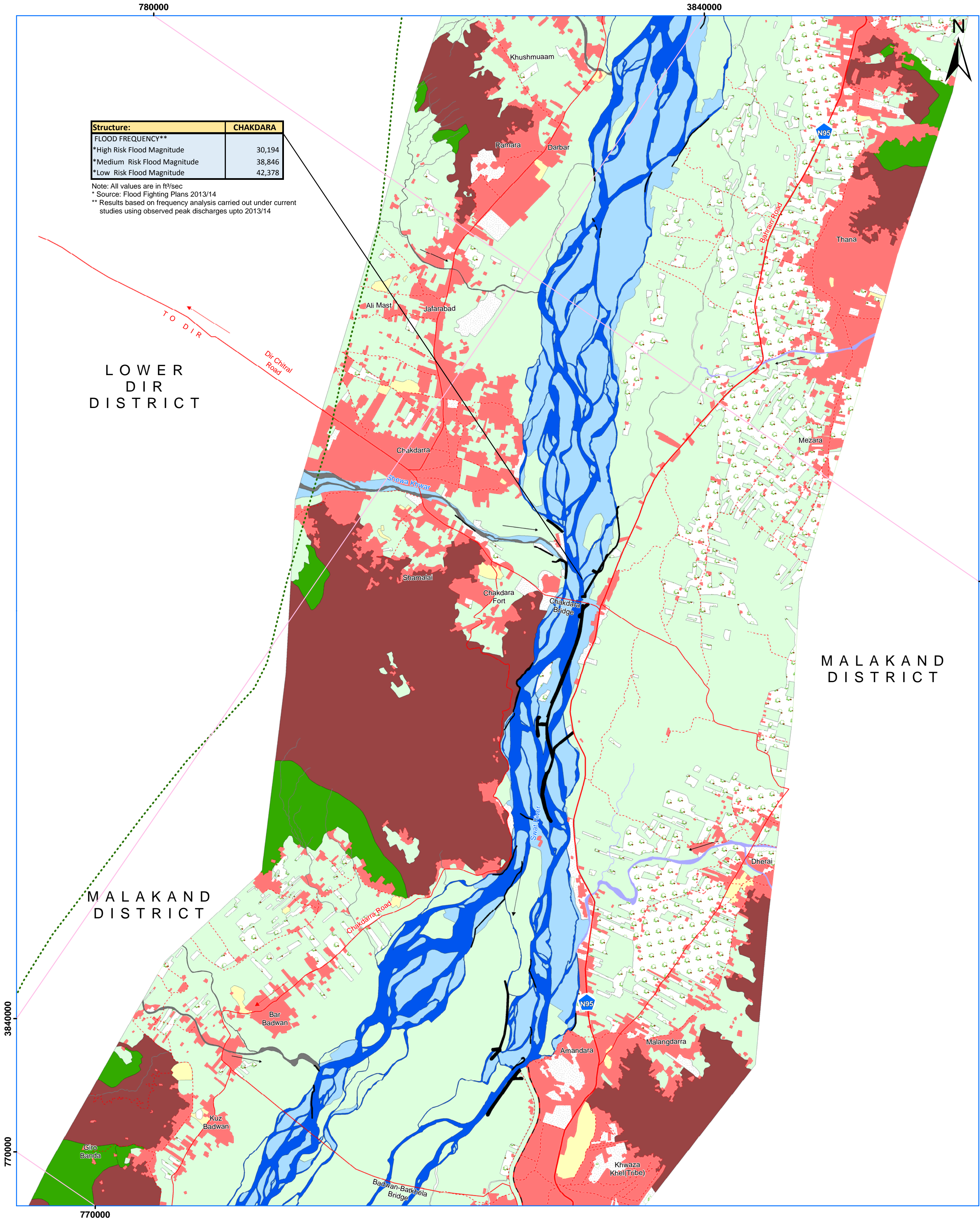
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LEGEND

- High Risk Zone (Inundation Extent Corresponding to discharge of 30,194 cusecs below Chakdara)
- Medium Risk Zone (Inundation Extent Corresponding to discharge of 38,846 cusecs below Chakdara)
- Low Risk Zone (Inundation Extent Corresponding to discharge of 42,378 cusecs below Chakdara)

Note: All flood extents are based on breachless conditions

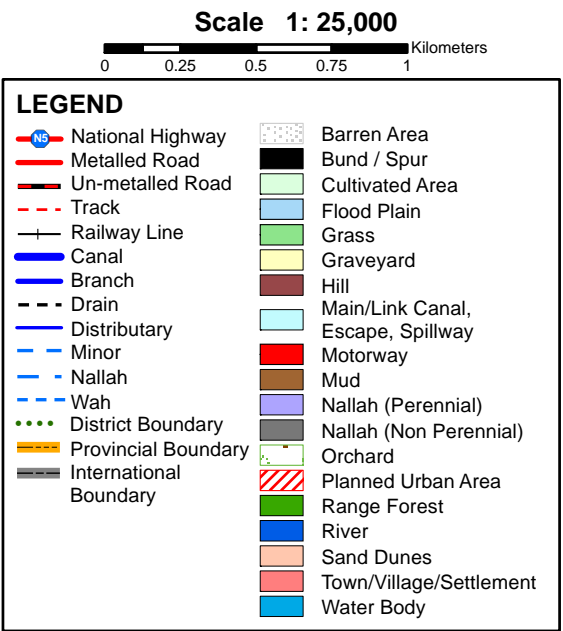




Source of Information:  
1. Topographic sheets of Survey of Pakistan  
2. Freely available satellite imagery  
3. Shuttle Radar Topographic Mission Data (Resolution:90 m)  
4. Survey data of Flood protection embankments and structures

Coordinate System  
PROJECTION: Lambert Conformal Conic (LMPAC-I) ,  
DATUM: WGS84  
Grid Reference is in meters

Date: May 29, 2015



DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV)  
AND RELATED STUDIES TO ENHANCE THE CAPACITY OF  
FEDERAL FLOOD COMMISSION-FFC

LANDUSE MAP  
SWAT RIVER

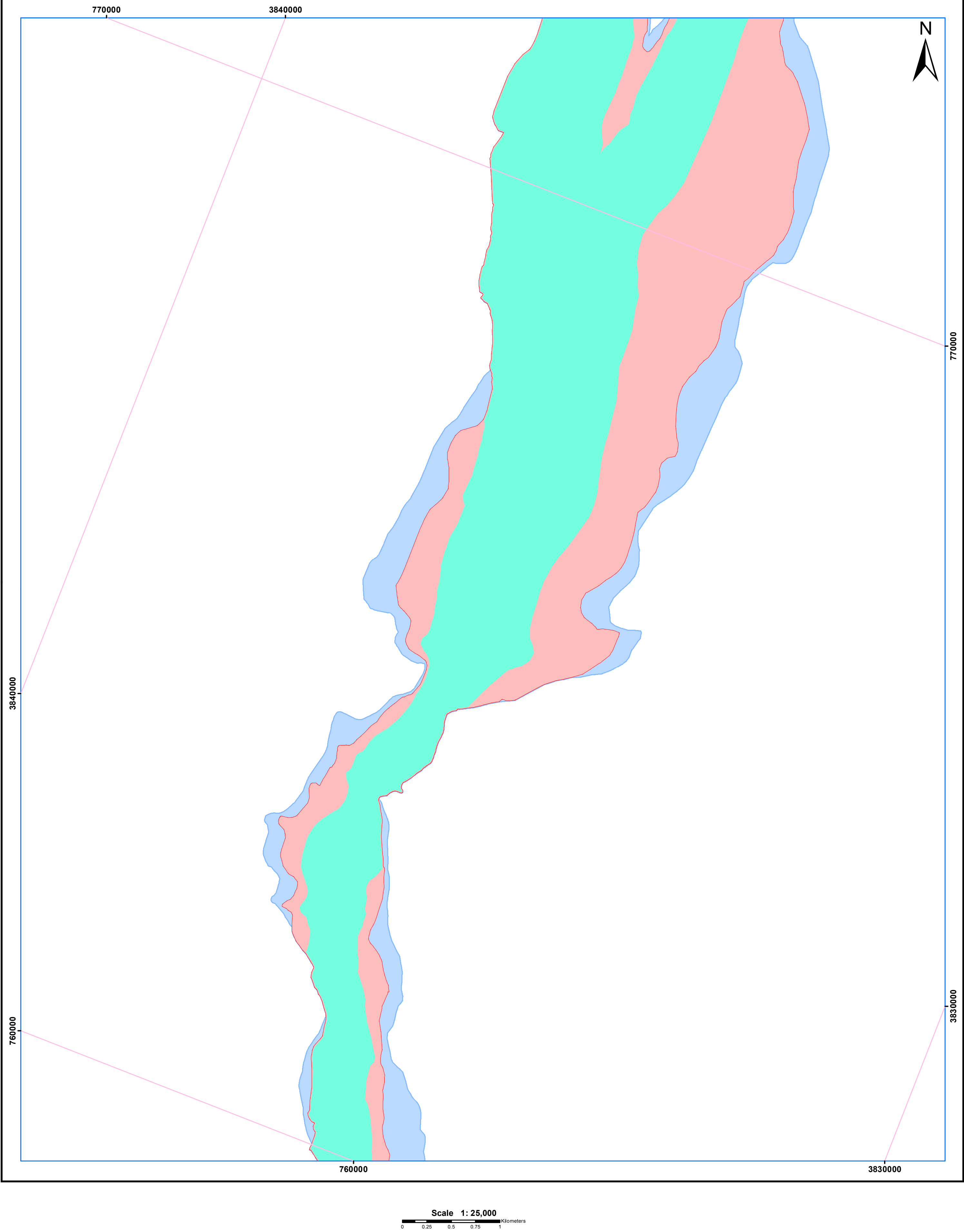
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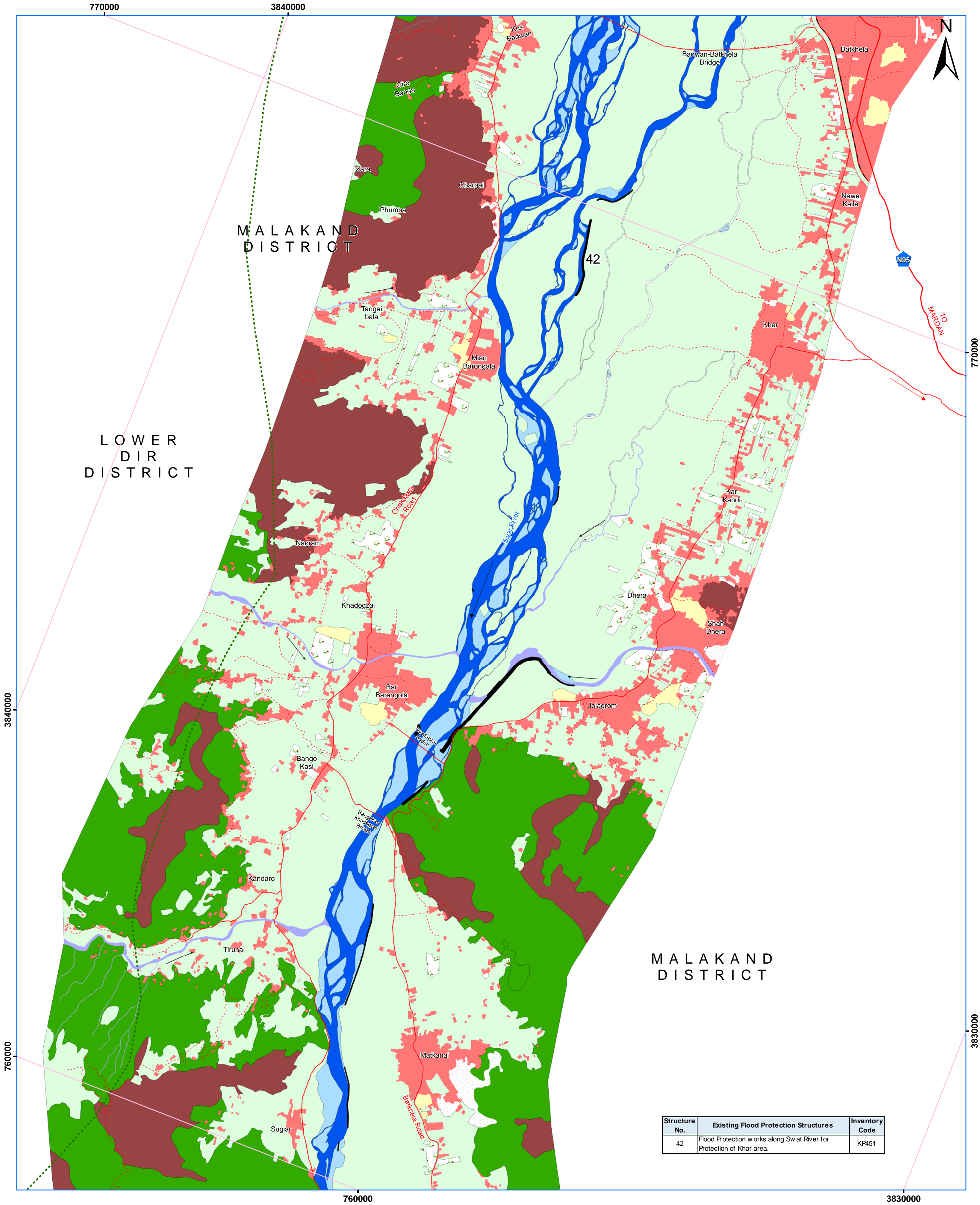


**LEGEND**

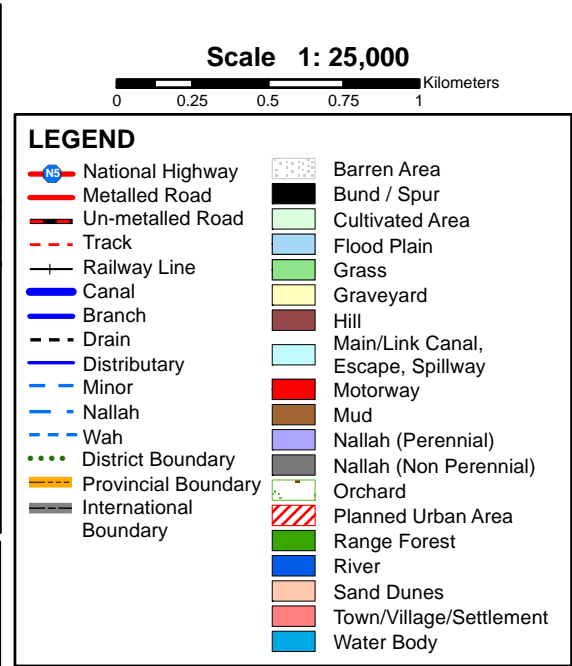
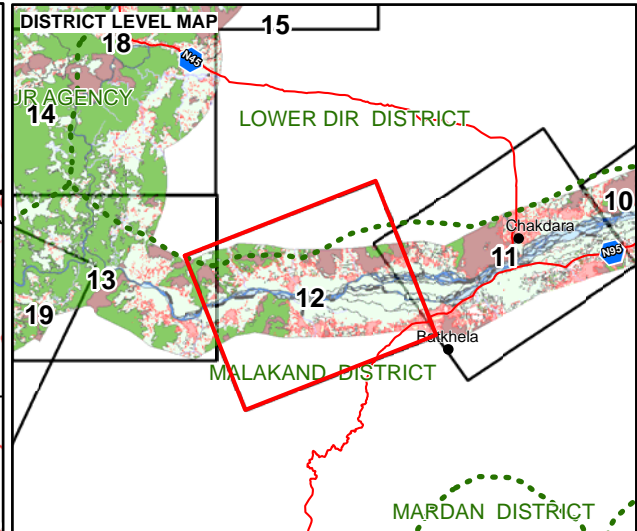
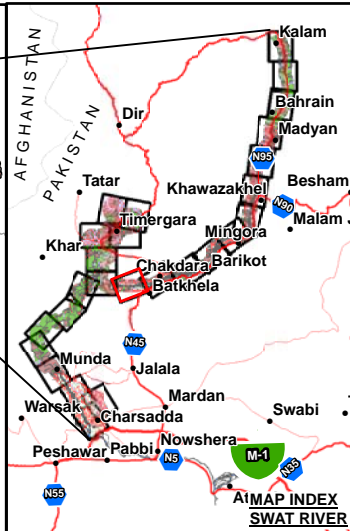
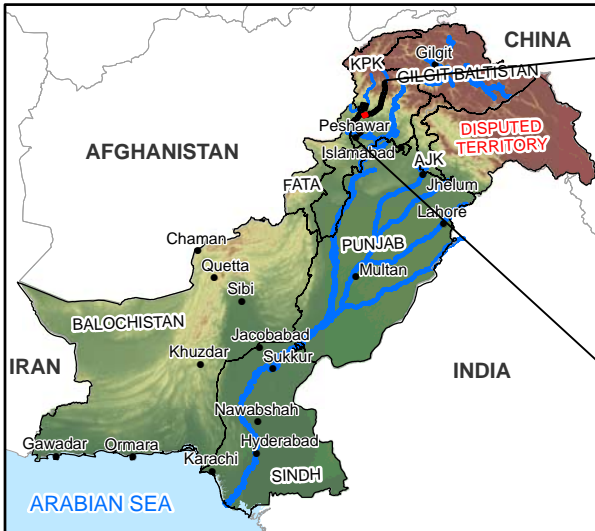
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- Low Risk Zone (Inundation Extent Corresponding to discharge of 42,378 cusecs below Chakdara)

Note: All flood extents are based on breachless conditions





Structure No.	Existing Flood Protection Structures	Inventory Code
42	Flood Protection works along Sw at River for Protection of Khar area.	KP451



DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV) AND RELATED STUDIES TO ENHANCE THE CAPACITY OF FEDERAL FLOOD COMMISSION-FFC

**LANDUSE MAP**  
**SWAT RIVER**

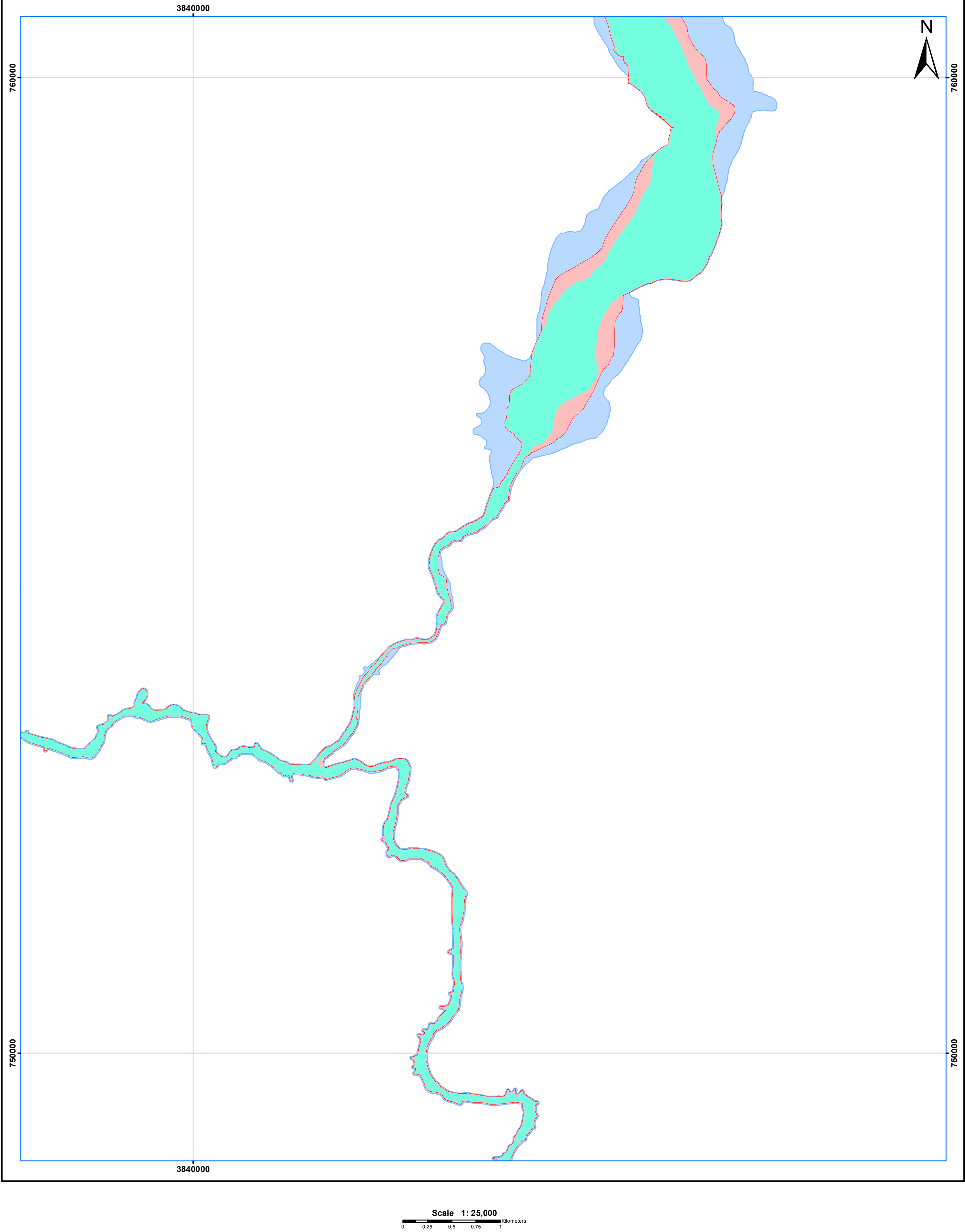
Client :  
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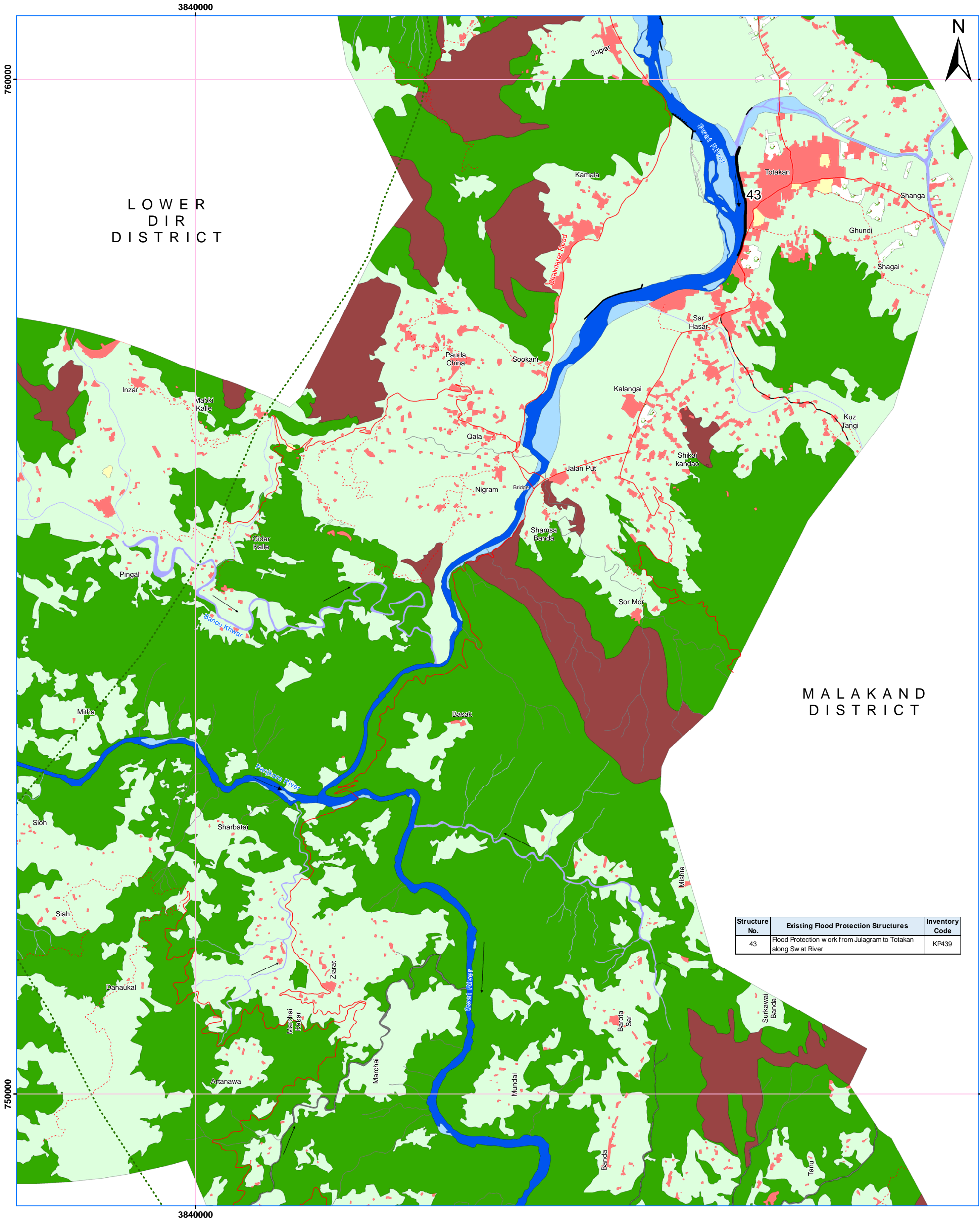


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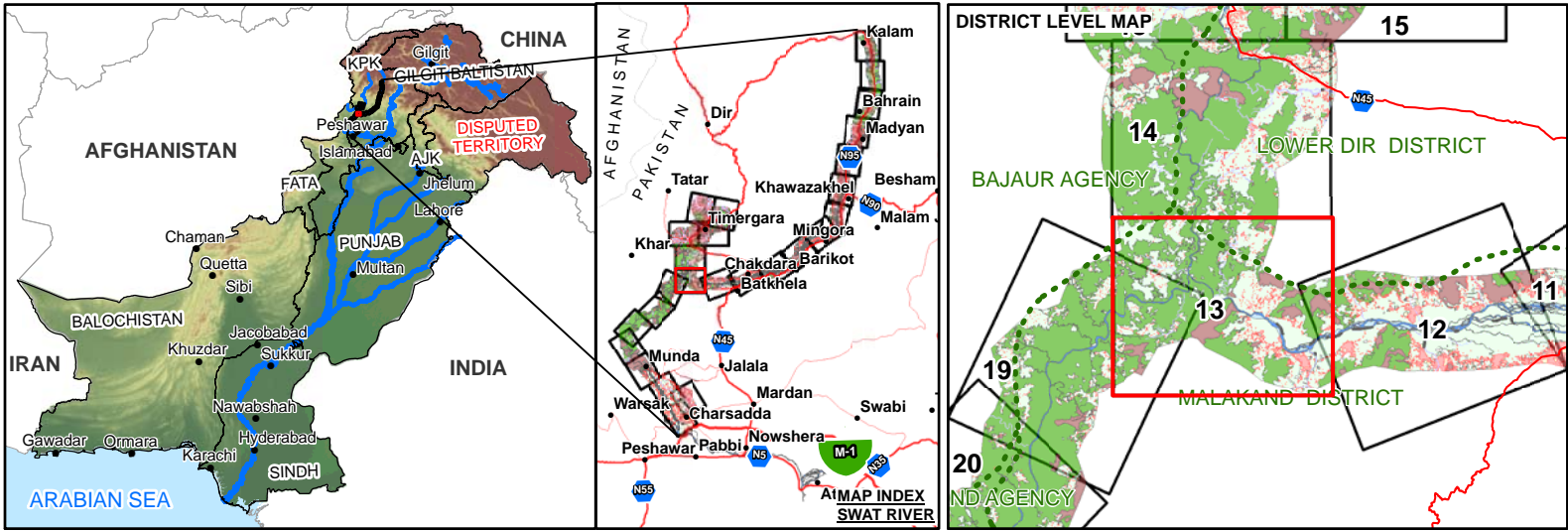
- High Risk Zone (Inundation Extent Corresponding to discharge of 30,194 cusecs below Chakdara)
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Note: All flood extents are based on breachless conditions

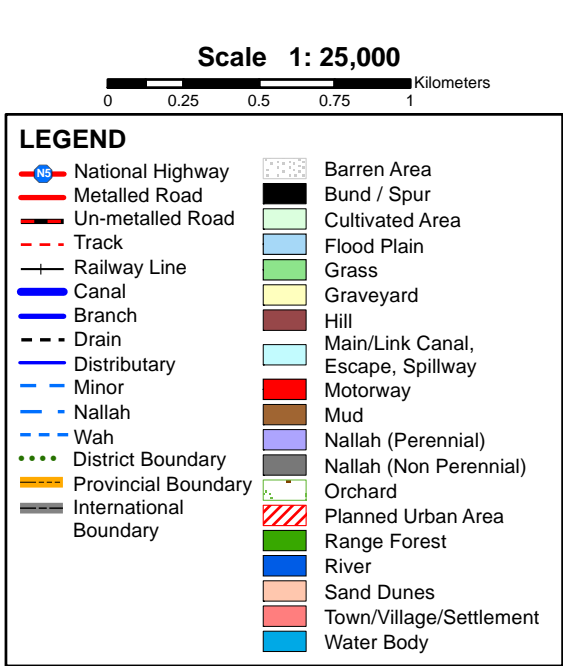




Structure No.	Existing Flood Protection Structures	Inventory Code
43	Flood Protection work from Julagram to Totakan along Sw at River	KP439



<b>Source of Information:</b> 1. Topographic sheets of Survey of Pakistan 2. Freely available satellite imagery 3. Shuttle Radar Topographic Mission Data (Resolution:90 m) 4. Survey data of Flood protection embankments and structures	<b>Coordinate System</b> <b>PROJECTION:</b> Lambert Conformal Conic (LMPAC-I) , <b>DATUM:</b> WGS84 Grid Reference is in meters	<b>Date:</b> May 29, 2015
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DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV) AND RELATED STUDIES TO ENHANCE THE CAPACITY OF FEDERAL FLOOD COMMISSION-FFC

**LANDUSE MAP  
SWAT RIVER**

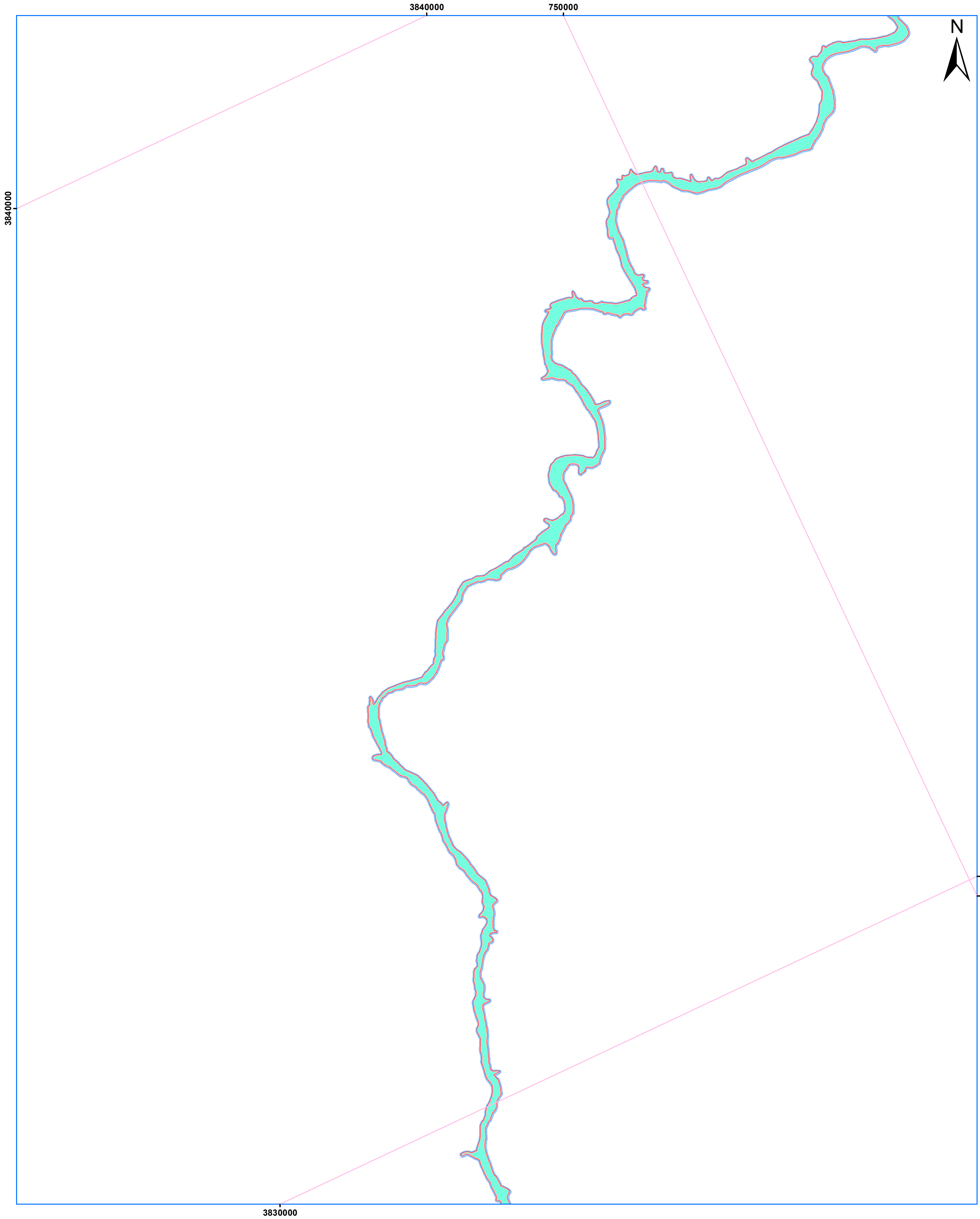
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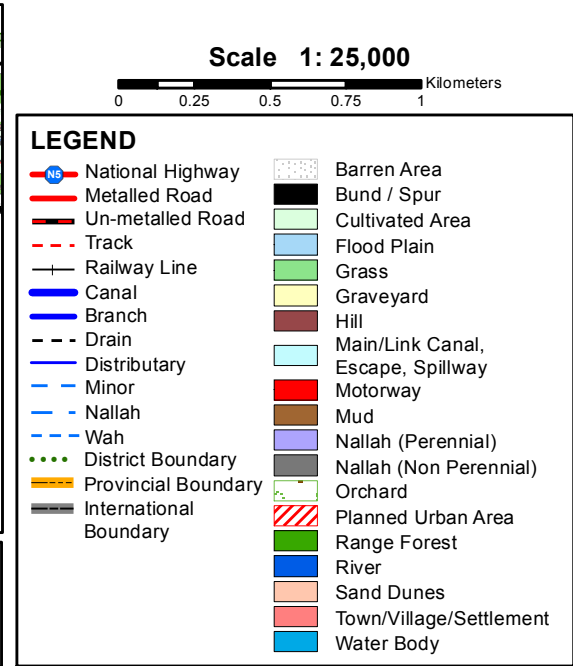
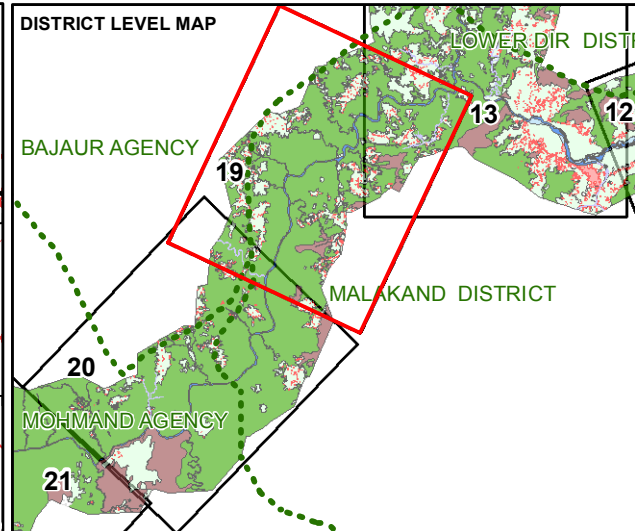
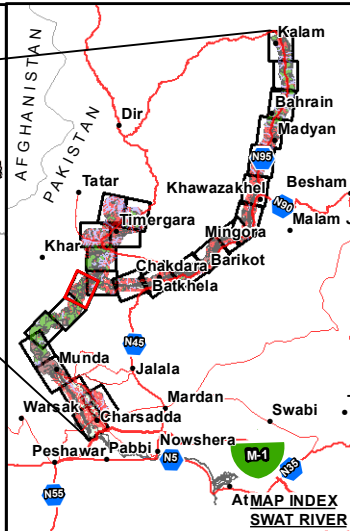
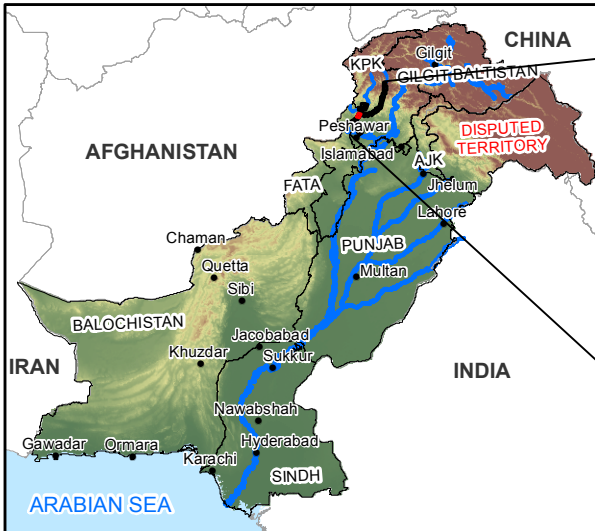
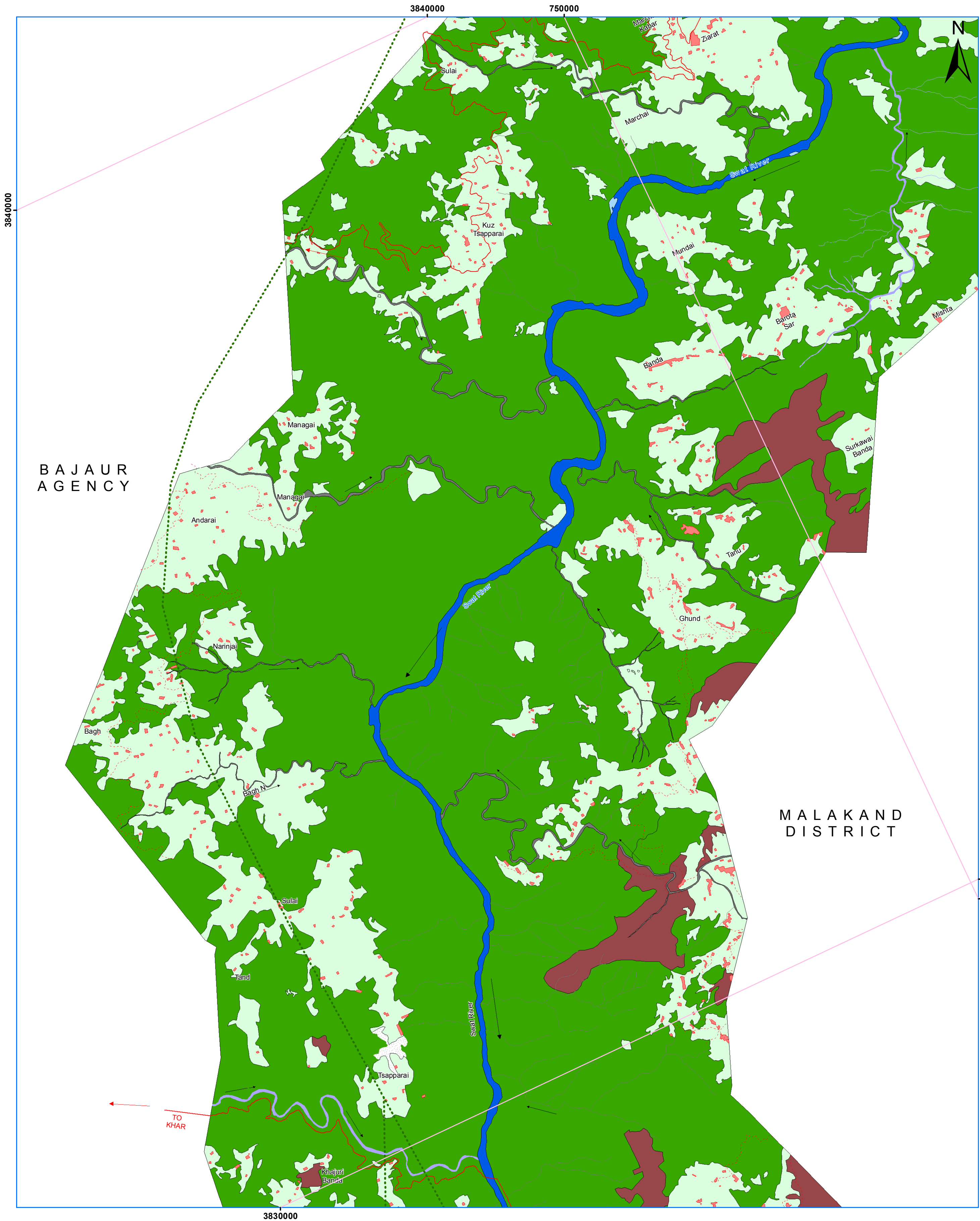
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LEGEND

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- Low Risk Zone (Inundation Extent Corresponding to discharge of 42,378 cusecs below Chakdara)

Note: All flood extents are based on breachless conditions





DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV) AND RELATED STUDIES TO ENHANCE THE CAPACITY OF FEDERAL FLOOD COMMISSION-FFC

**LANDUSE MAP**  
**SWAT RIVER**

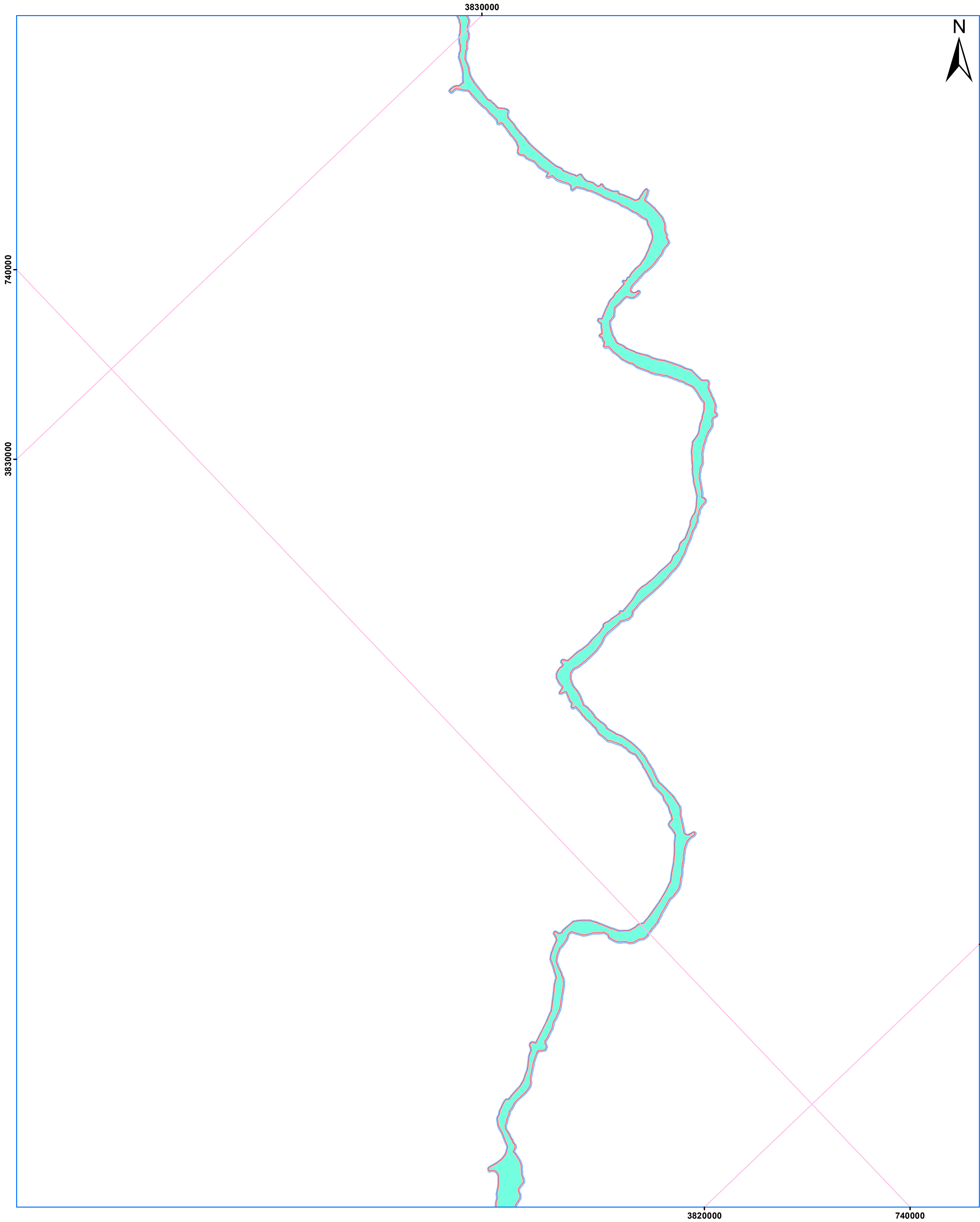
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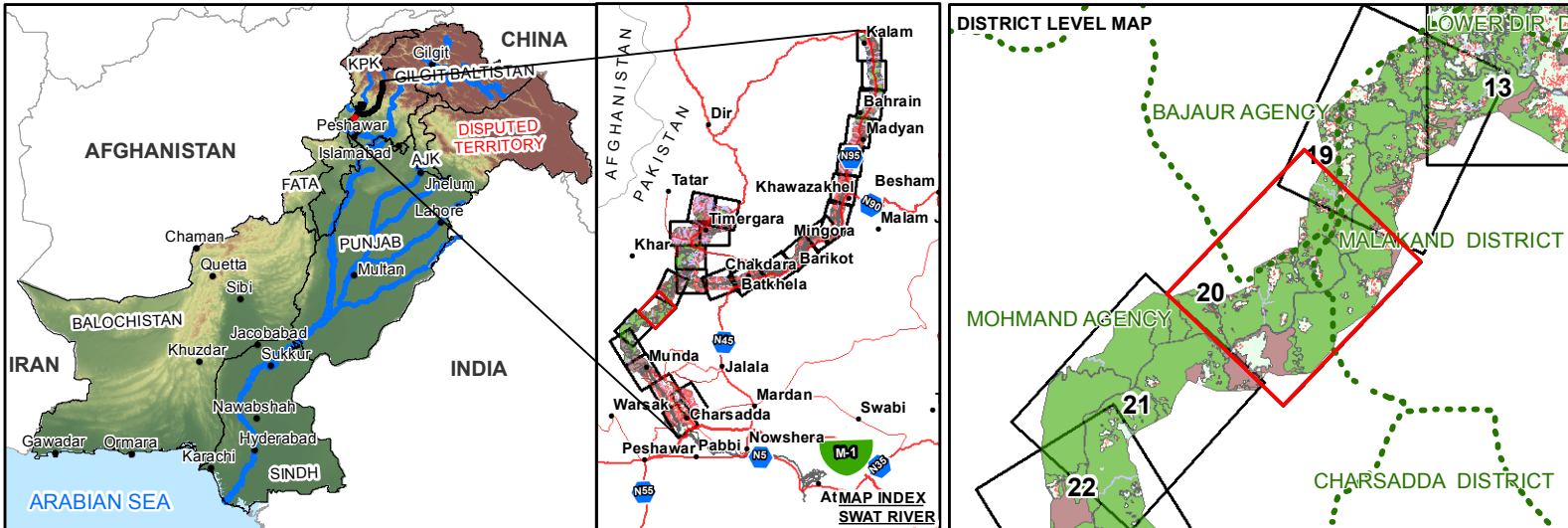
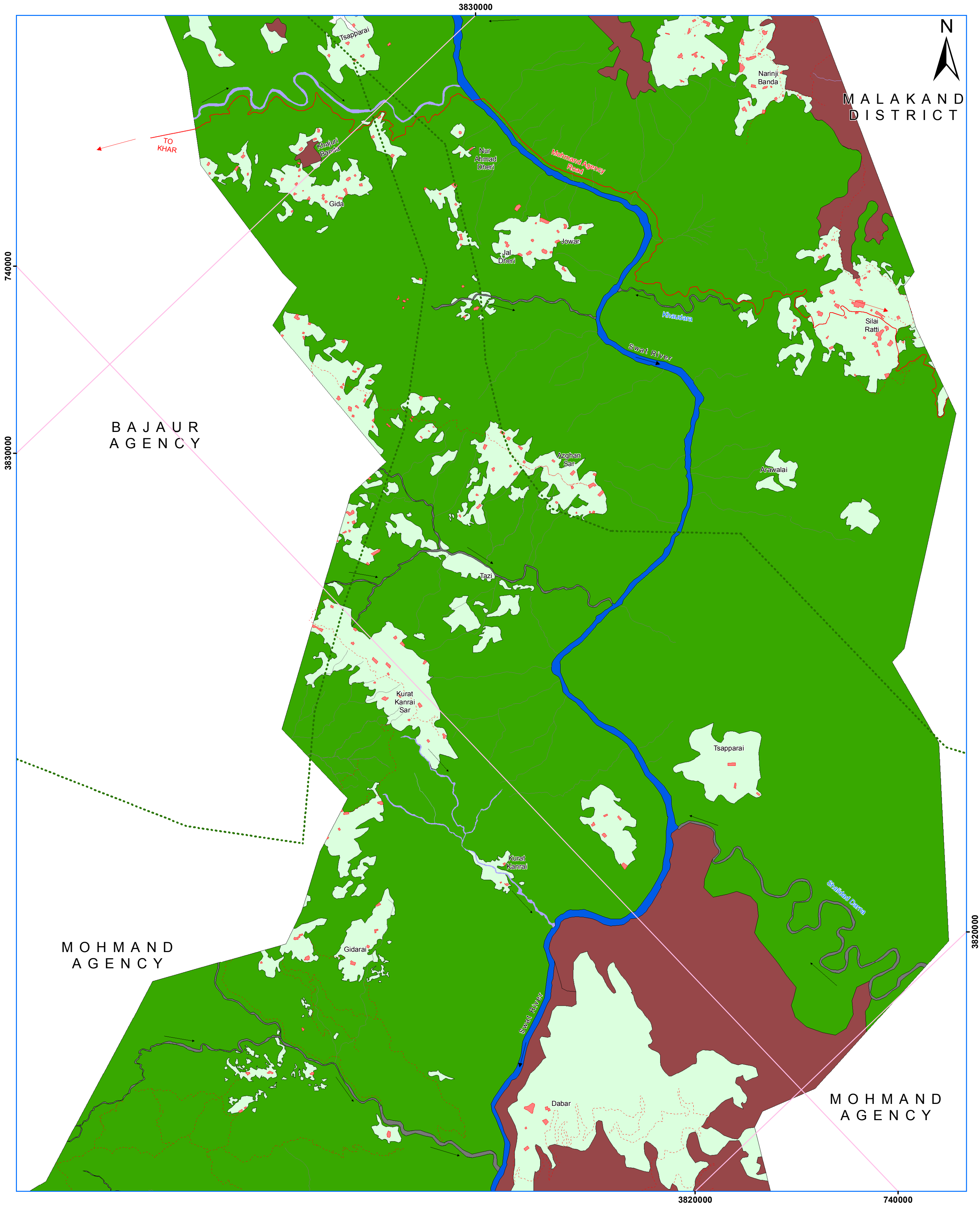
Scale 1: 25,000  
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Note: All flood extents are based on breachless conditions

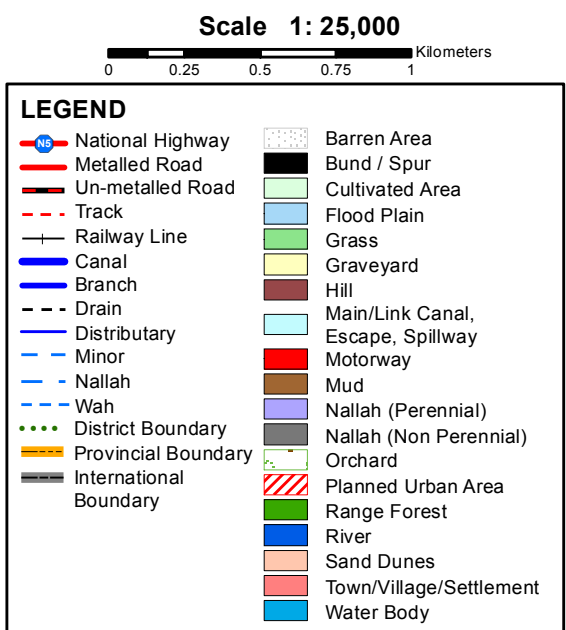




Source of Information:  
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2. Freely available satellite imagery  
3. Shuttle Radar Topographic Mission Data (Resolution:90 m)  
4. Survey data of Flood protection embankments and structures

Coordinate System  
PROJECTION: Lambert Conformal Conic (LMPAK-I) ,  
DATUM: WGS84  
Grid Reference is in meters

Date: May 29, 2015



DEVELOPMENT OF NATIONAL FLOOD PROTECTION PLAN-IV (NFPP-IV)  
AND RELATED STUDIES TO ENHANCE THE CAPACITY OF  
FEDERAL FLOOD COMMISSION-FFC

**LANDUSE MAP  
SWAT RIVER**

Client :  
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# Inundation Depth of Settlements in District Malakand PA

Swat River - Sheet No. 10

Sr. No.	Settlement Name	Zone*	District	Inundation Depth at Discharge of 16,845 Cusec below Kalam		Inundation Depth at Discharge of 19,246 Cusec below Kalam		Inundation Depth at Discharge of 20,271 Cusec below Kalam	
				Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
1	1 settlement nearby Magan	M,L	Malakand PA	0.00	0.00	0.10	1.14	0.93	1.23
2	Jalala	L	Malakand PA	0.00	0.00	0.00	0.00	0.05	0.73

Swat River - Sheet No. 11

Sr. No.	Settlement Name	Zone*	District	Inundation Depth at Discharge of 30,194 Cusec below Chakdara		Inundation Depth at Discharge of 38,846 Cusec below Chakdara		Inundation Depth at Discharge of 42,378 Cusec below Chakdara	
				Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
1	13 settlements nearby Thanna	M,L	Malakand PA	0.00	0.00	0.08	1.08	0.50	1.48
2	4 settlements nearby Dherai	M,L	Malakand PA	0.00	0.00	0.02	1.02	0.04	1.57
3	Amandara and nearby 4 settlements	M,L	Malakand PA	0.00	0.00	0.01	0.81	0.03	1.29

Swat River - Sheet No. 12

Sr. No.	Settlement Name	Zone*	District	Inundation Depth at Discharge of 30,194 Cusec below Chakdara		Inundation Depth at Discharge of 38,846 Cusec below Chakdara		Inundation Depth at Discharge of 42,378 Cusec below Chakdara	
				Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
1	Khor	M,L	Malakand PA	0.00	0.00	0.06	1.45	0.87	2.28
2	Matkanai and nearby 4 settlements	M,L	Malakand PA	0.00	0.00	0.92	2.33	0.86	2.42
3	Nawe Kalie	M,L	Malakand PA	0.00	0.00	0.20	1.93	0.83	2.45
4	5 settlements nearby Dhera	L	Malakand PA	0.00	0.00	0.00	0.00	0.05	0.28
5	8 settlements nearby Kar Kandi	L	Malakand PA	0.00	0.00	0.00	0.00	0.07	0.29
6	Jolagrom	L	Malakand PA	0.00	0.00	0.00	0.00	0.07	0.28

Swat River - Sheet No. 13

Sr. No.	Settlement Name	Zone*	District	Inundation Depth at Discharge of 30,194 Cusec below Chakdara		Inundation Depth at Discharge of 38,846 Cusec below Chakdara		Inundation Depth at Discharge of 42,378 Cusec below Chakdara	
				Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
1	Sar and nearby 2 settlements	H,M,L	Malakand PA	1.78	3.52	1.83	4.25	1.92	4.66
2	Totakan and nearby 3 settlements	M,L	Malakand PA	0.00	0.00	0.85	3.04	0.93	3.27

Zone\*

H= High Risk Inundation Zone corresponds to 5 yr return period flood

M=Medium Risk Inundation Zone corresponds to 15 yr return period flood

L= Low Risk Inundation Zone corresponds to 50 yr return period flood