

SUPARCO and its role in monitoring natural disaster in Pakistan

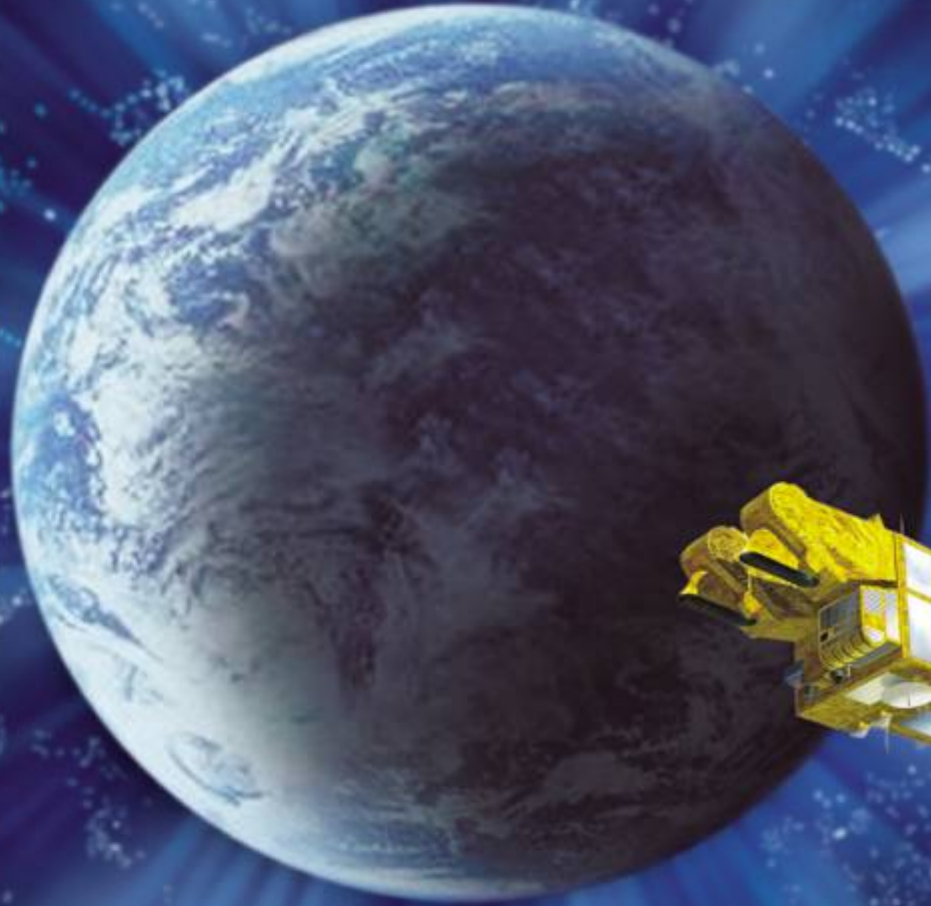


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PAKISTAN SPACE AND UPPER ATMOSPHERE RESEARCH COMMISSION

SUPARCO



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SUPARCO

National Space Agency of Pakistan

History

- A Space Science Research Wing was established, on advice of Dr. Abdul Salam, the Nobel Laureate, Chief Scientific Advisor to the President of Pakistan on 16th Sep 1964
- Acquired status of an independent Commission on 21st May 1981

Mandate

- Carry out R&D activities in the field of Space Sciences & Technology
- Promote space applications for socio-economic development of the country

Satellite Ground Station

- Established in 1989
- Acquires and processes SPOT constellation satellite data in both panchromatic & multi-spectral modes
- Capable of providing multi resolution imagery (2.5m to 20m)

Spot Receiving Station



Aqua / Terra Receiving Station



Spot Receiving Station



Aqua / Terra Receiving Station



Flood /Rain 2010

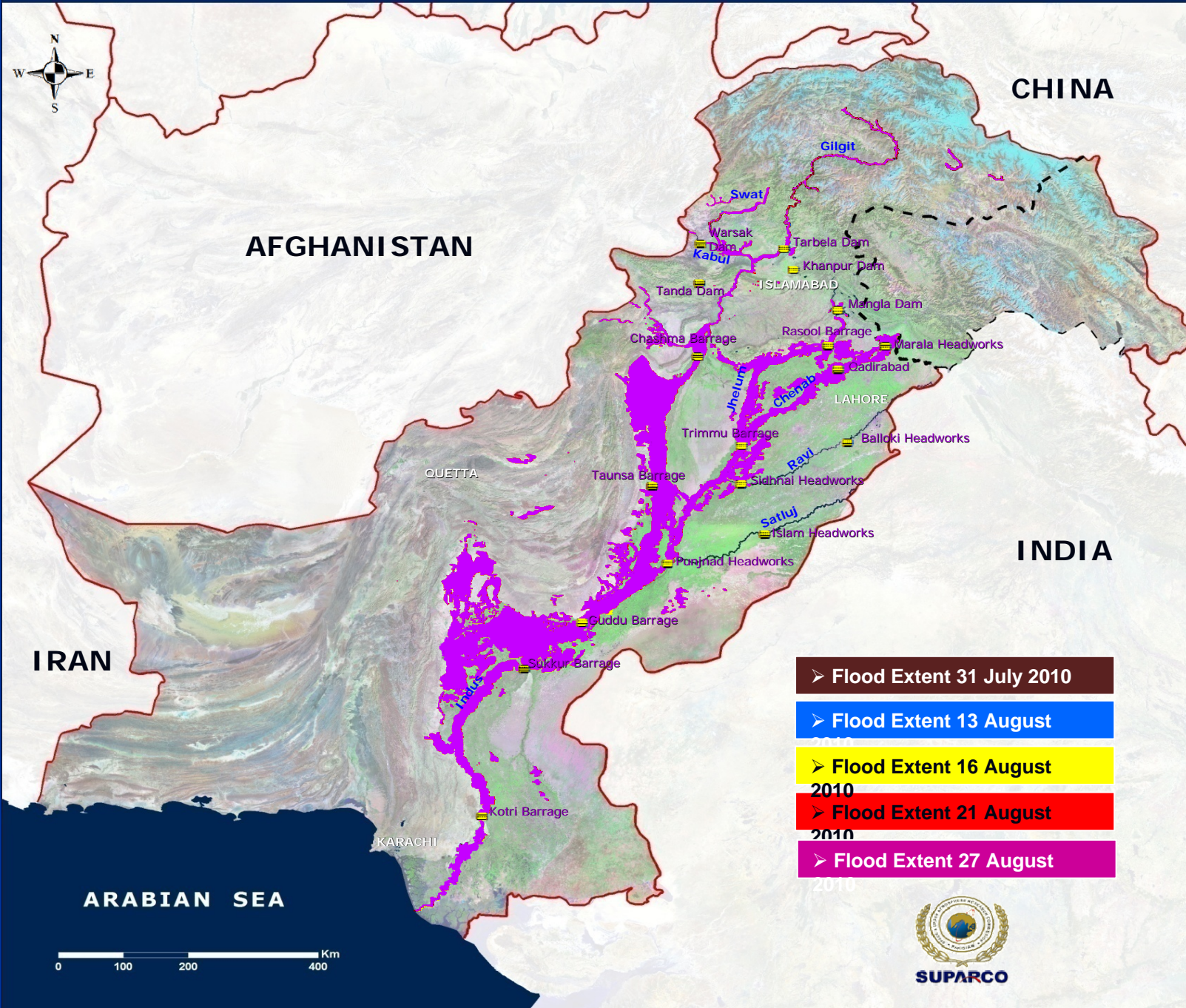
PAKISTAN FLOOD/ RAIN 2010 Pakistan

- During the summer of 2010, the worst flooding in Pakistan took place. This affected lives of millions of people and caused colossal damage to infrastructure.
- There was an urgent need to point out the major affected areas and to quickly carryout damage assessment exercise.

Pakistan Floods - 2010

- A rapid mapping of the flood affected areas was carried out using pre-post MODIS data.
- This was followed by use of SPOT 4 and SPOT 5 data for detailed damage analysis.
- The information was supplied in regard to monitoring damages to infrastructure, settlements, canal breaches, roads, bridges, railways and cropped area.
- Temporal flood inundation mapping, extent of flood water and statistics for various attributes regarding flood damage
- Geographic and agriculture area damaged and extent losses in crop yield and production for Kharif season
- The flood recession statistics

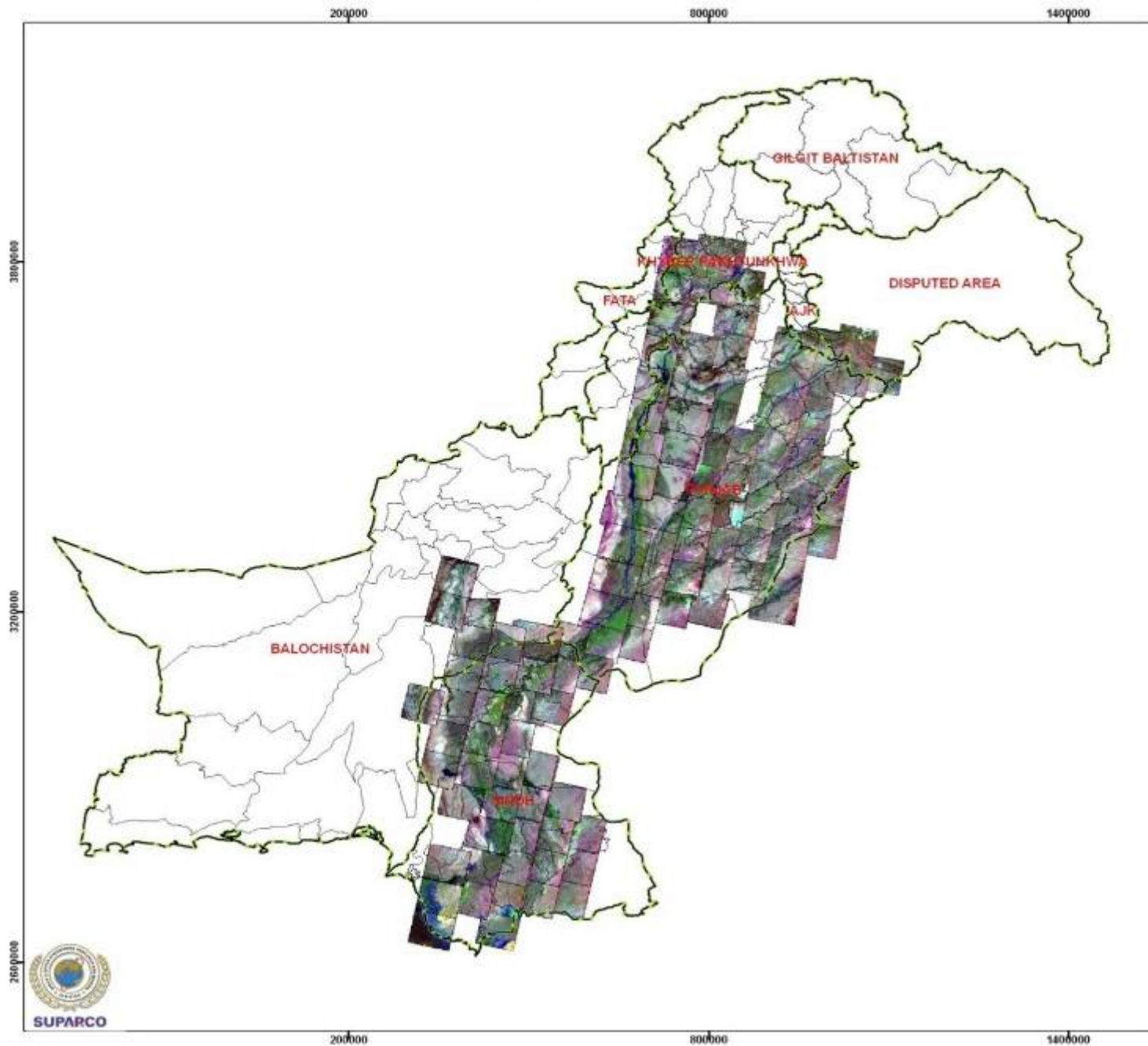
PAKISTAN: FLOOD/RAIN 2010





- Flood Extent 31 July 2010
- Flood Extent 13 August 2010
- Flood Extent 16 August 2010
- Flood Extent 21 August 2010
- Flood Extent 27 August 2010



PRE-FLOOD SPOT SATELLITE COVERAGE



Legend

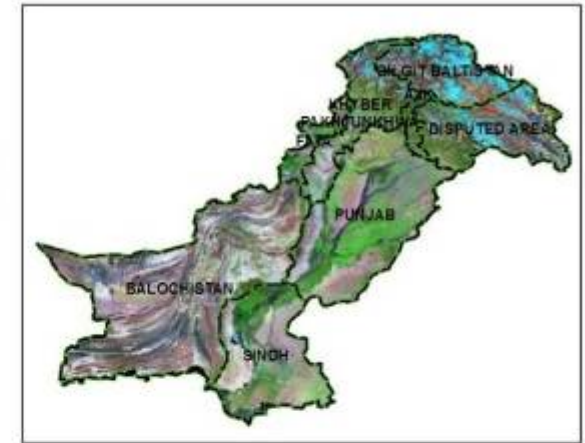
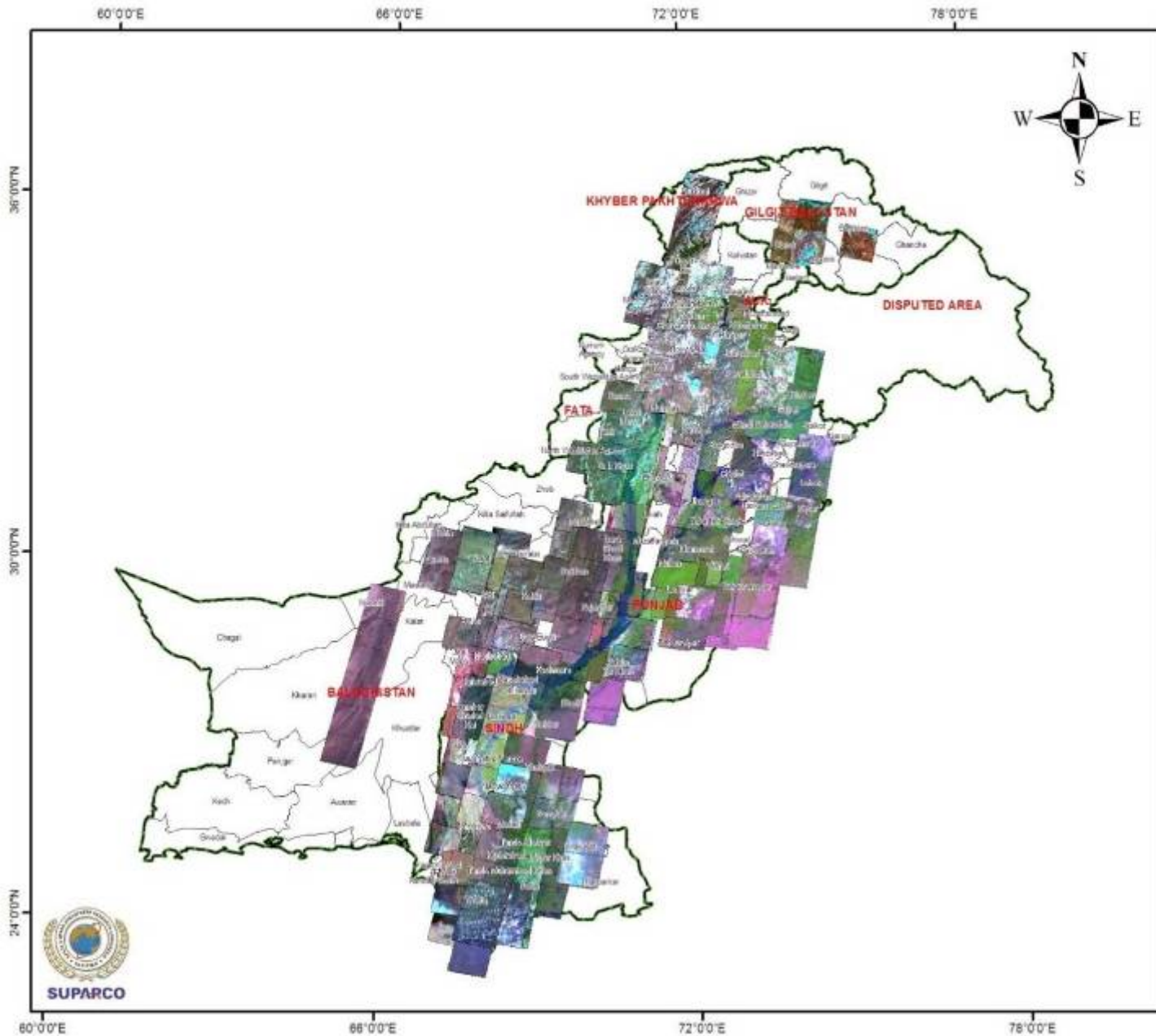
-  Province Boundary
-  District Boundary



Pre-Flood SPOT Imagery
acquired at SUPARCO, ISLAMABAD

Projection: UTM ZONE 42 N
Spheroid: WGS 84



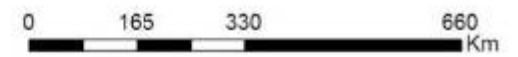
POST FLOOD SPOT SATELLITE COVERAGE



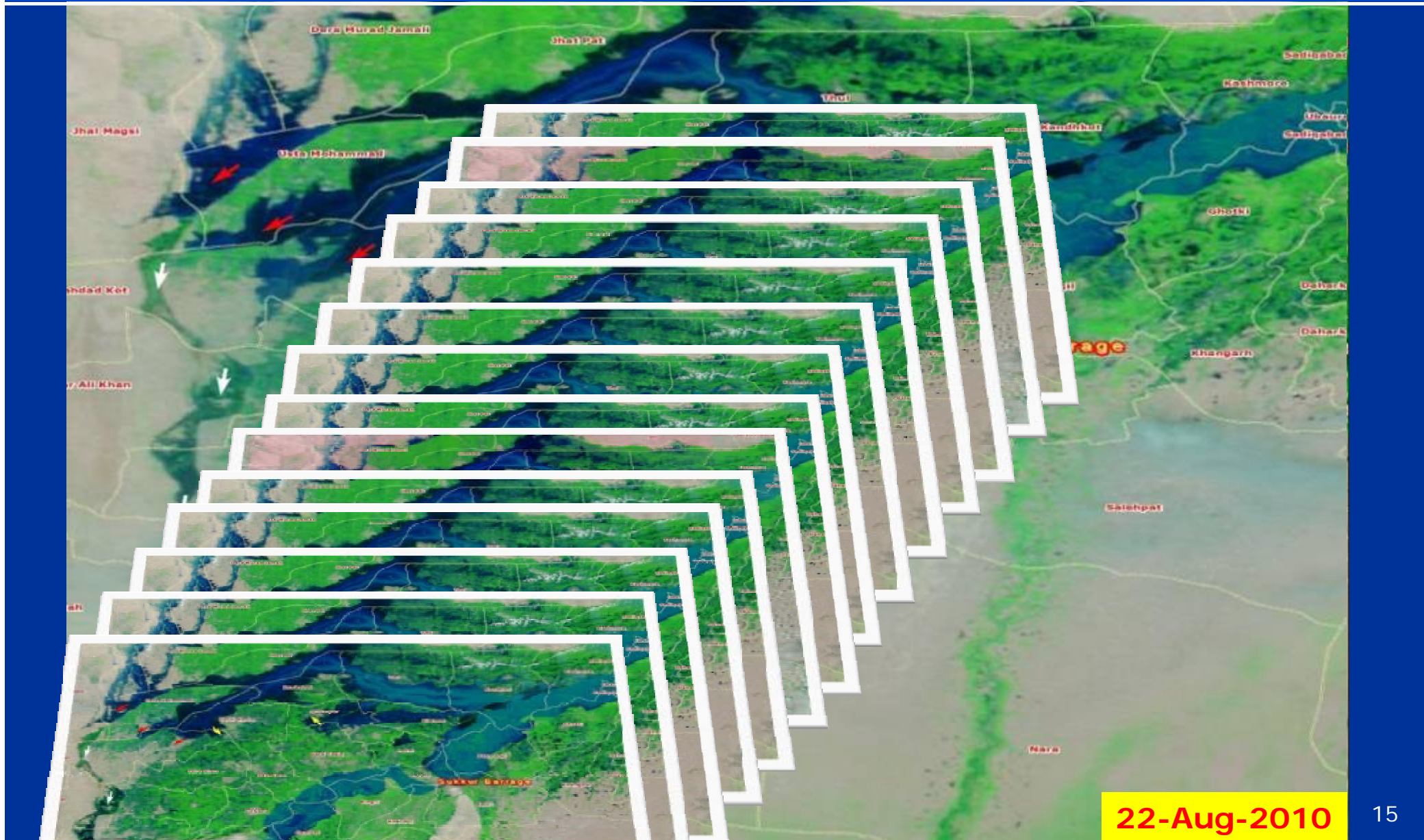
-  Province Boundary
-  District Boundary

Post Flood Spot-5 5m Imagery
acquired at SUPARCO, Islamabad

Projection: UTM Zone 42 N
Spheroid: WGS 84



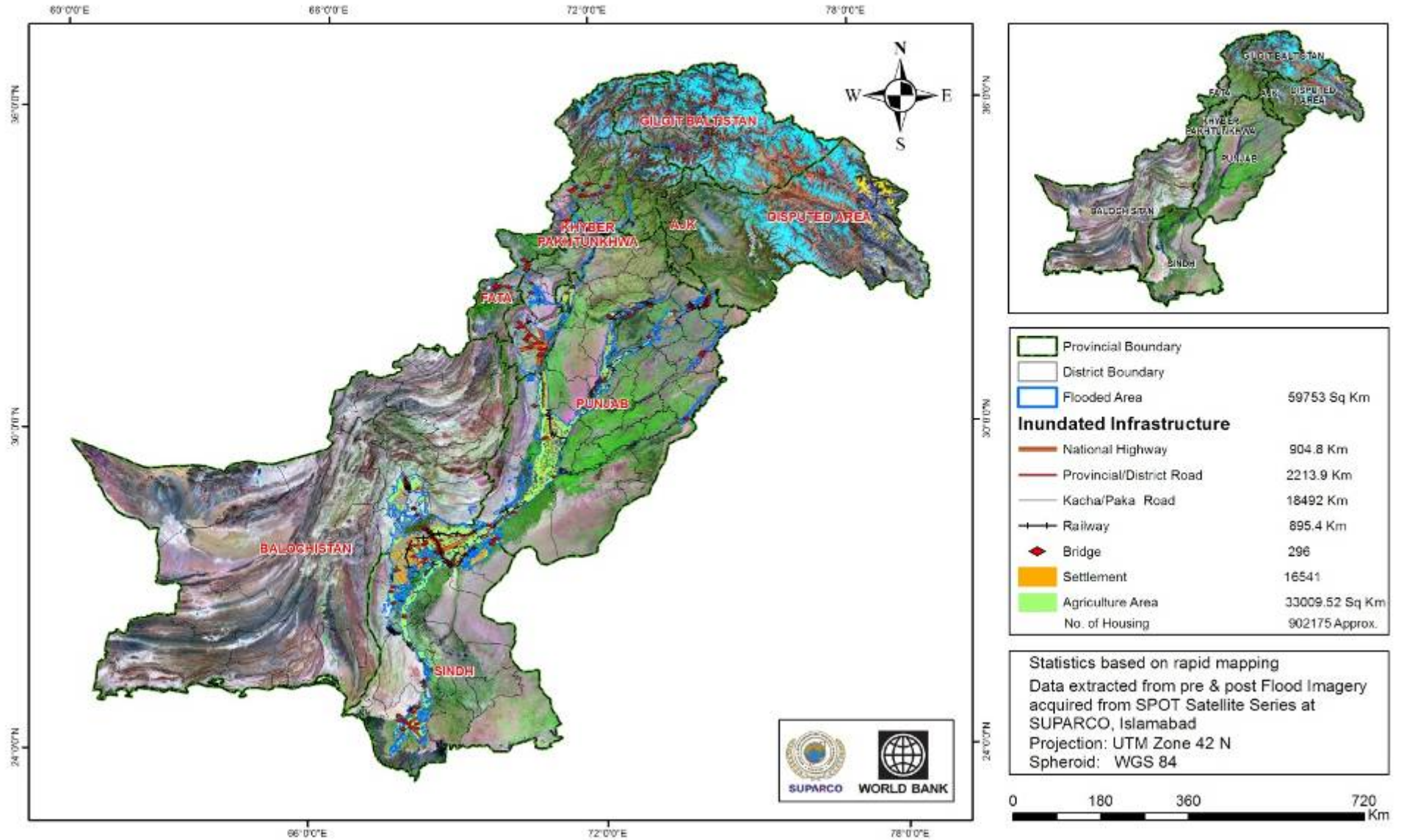
MODIS Data Acquisition



22-Aug-2010

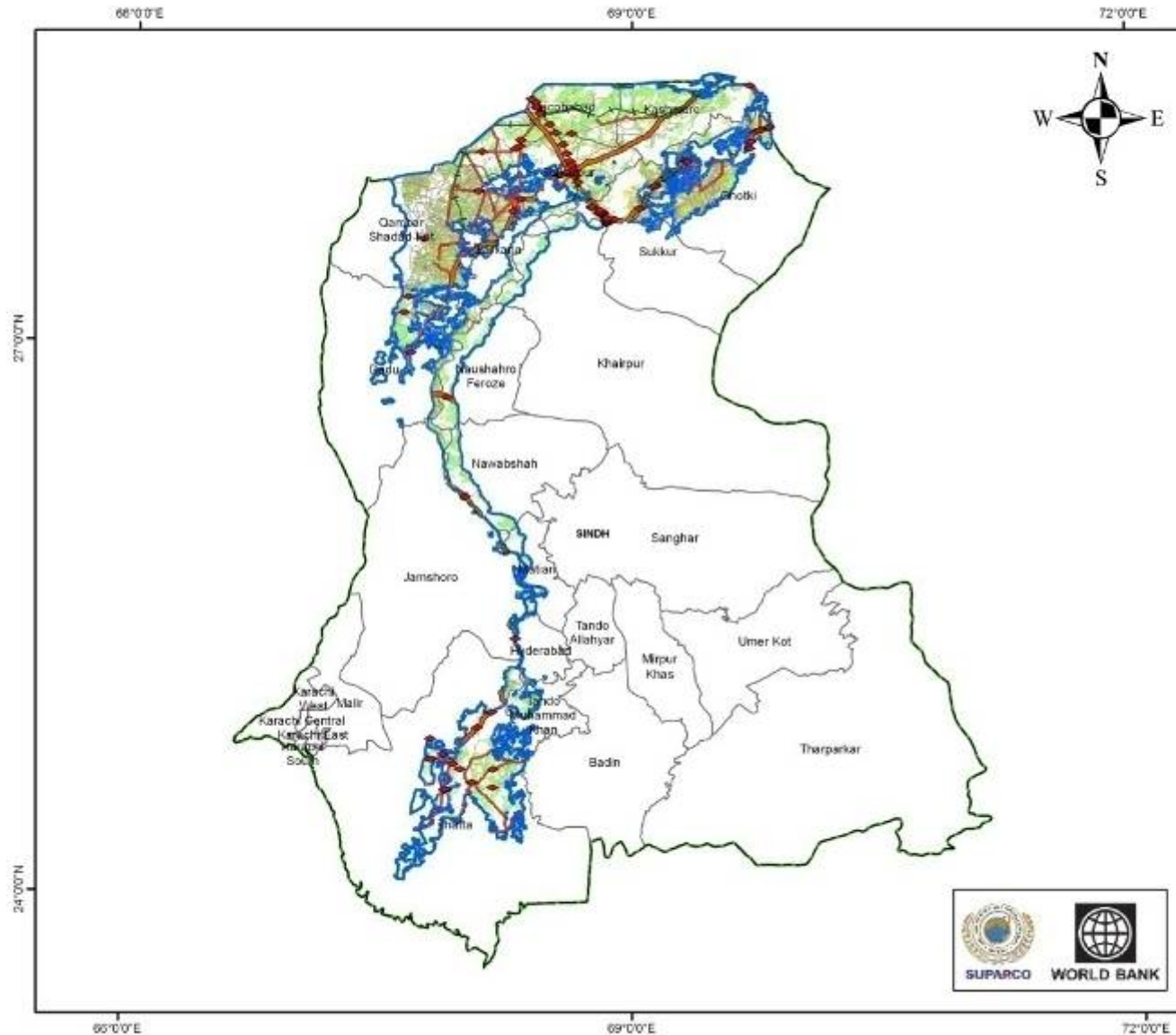
PAKISTAN FLOOD / RAIN 2010

Thematic Map - Affected Infrastructure



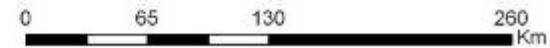
SINDH FLOOD / RAIN 2010

Thematic Map - Affected Infrastructure



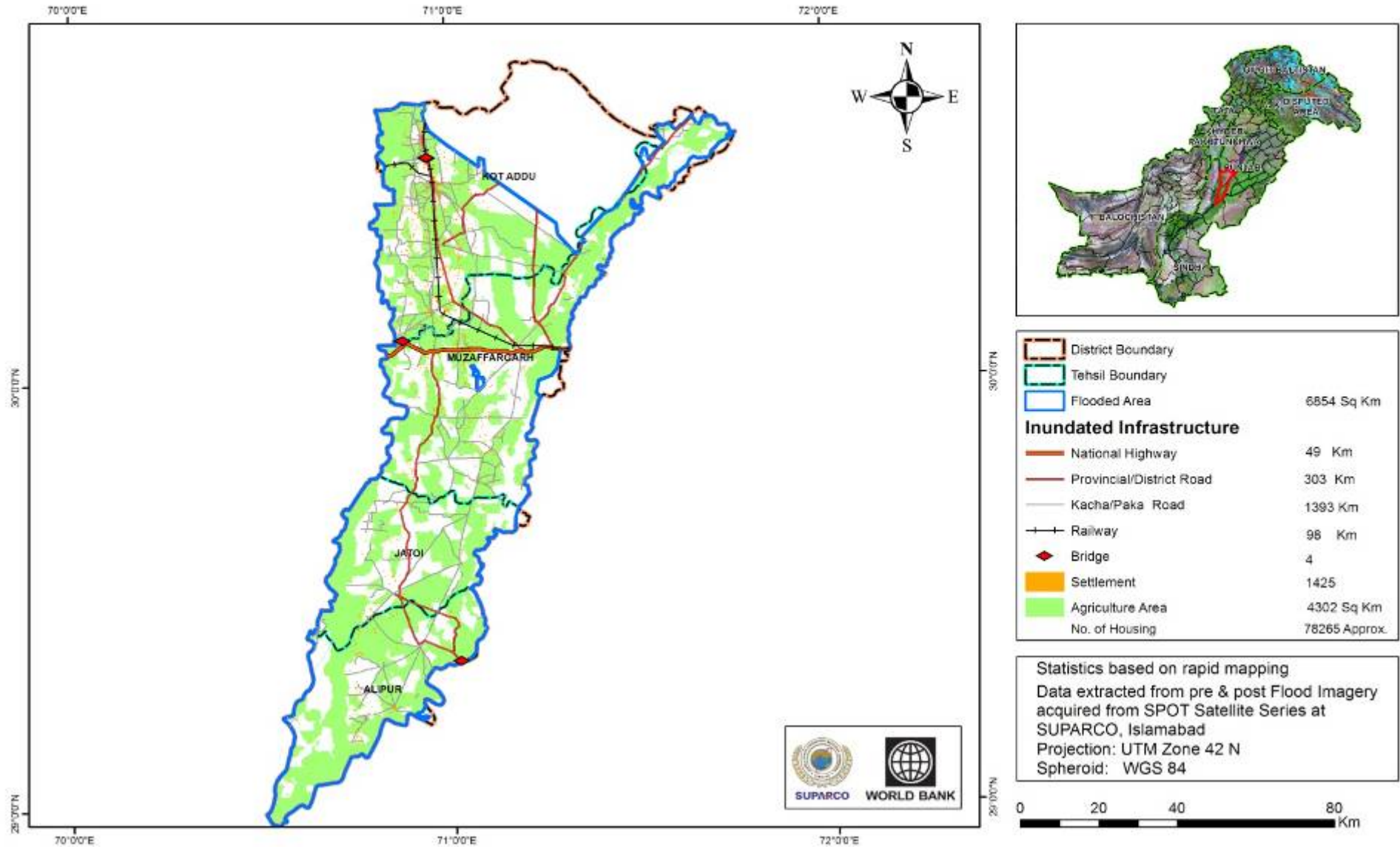
	Provincial Boundary	
	District Boundary	
	Flooded Area	22229 Km
Inundated Infrastructure		
	National Highway	406 Km
	Provincial/District Road	845 Km
	Kacha/Paka Road	8756 Km
	Railway	398 Km
	Bridge	85
	Settlement	6407
	Agriculture Area	11485 Sq Km
	No. of Housing	270814

Statistics based on rapid mapping
 Data extracted from pre & post Flood Imagery
 acquired from SPOT Satellite Series at
 SUPARCO, Islamabad
 Projection: UTM Zone 42 N
 Spheroid: WGS 84

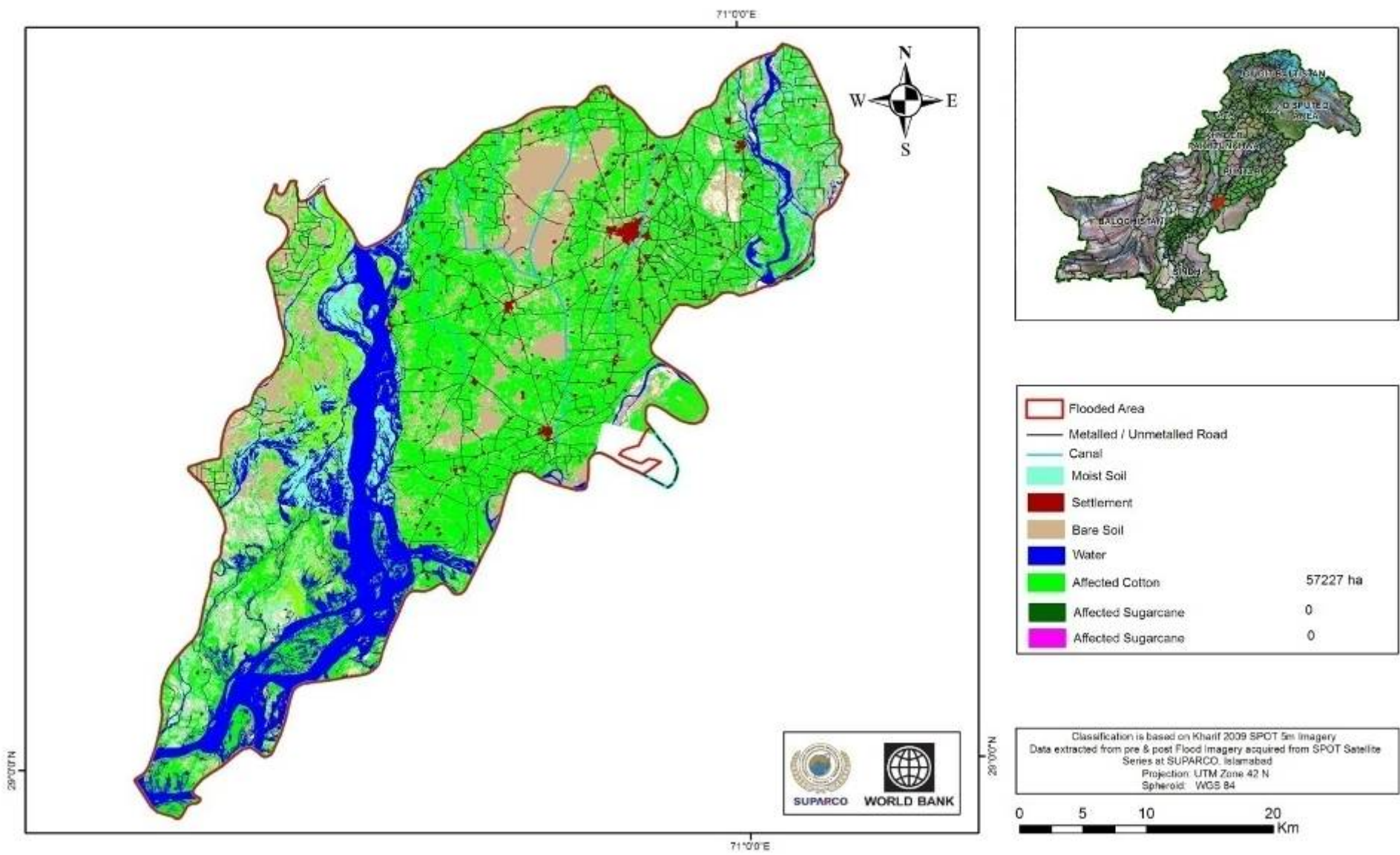


MUZAFARGARH DISTRICT FLOOD / RAIN 2010

Thematic Map - Affected Infrastructure

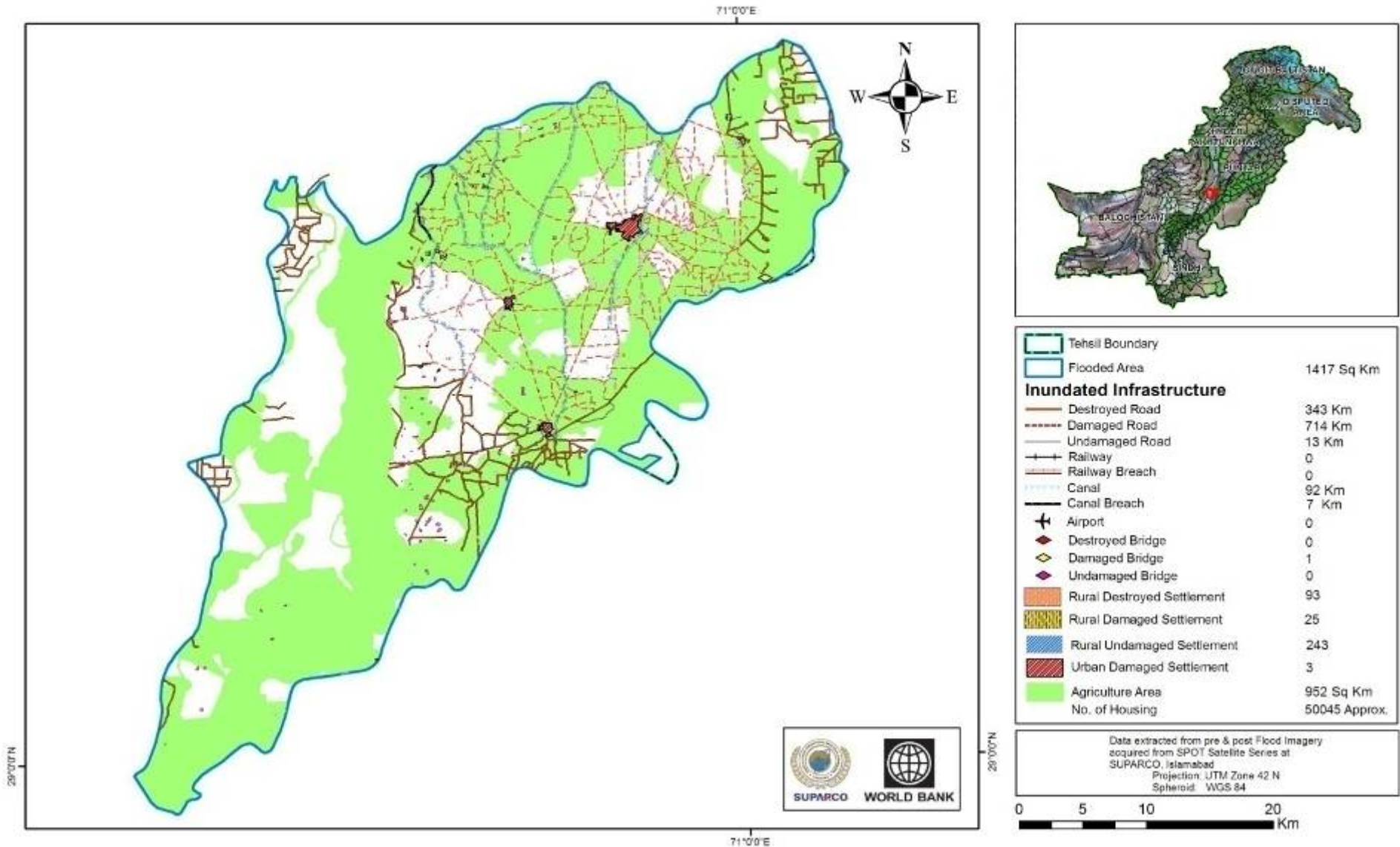


ALI PUR TEHSIL FLOOD / RAIN 2010



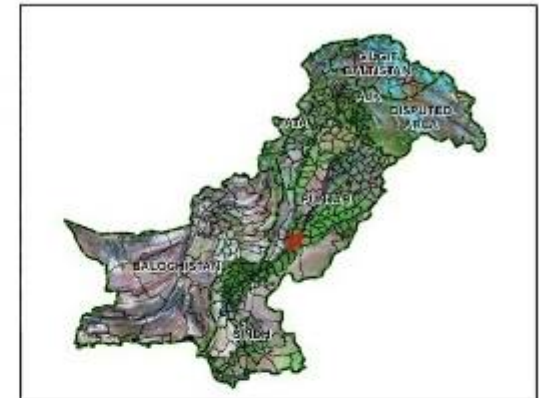
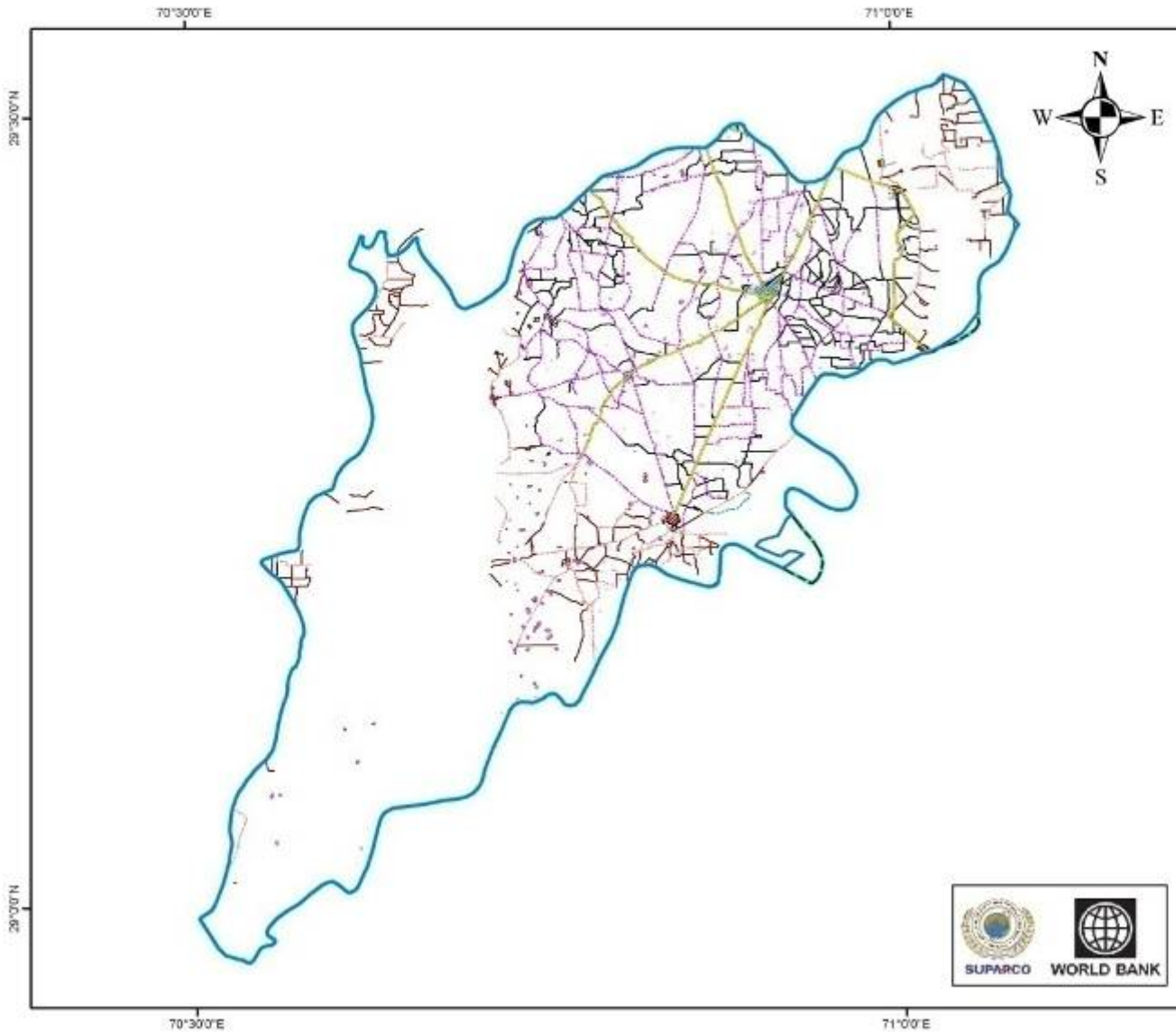
ALI PUR TEHSIL FLOOD / RAIN 2010

Thematic Map - Affected Infrastructure



ALIPUR TEHSIL FLOOD / RAIN 2010

Thematic Map - Affected Infrastructure



	Tehsil Boundary	
	Flooded Area	1417 Sq Km
Inundated Infrastructure		
	Destroyed Main Road	0 Km
	Damaged Main Road	93 Km
	Undamaged Main Road	0 Km
	Destroyed Minor Road	145 Km
	Damaged Minor Road	332 Km
	Undamaged Minor Road	4 Km
	Destroyed Kacha Road	198 Km
	Damaged Kacha Road	289 Km
	Undamaged Kacha Road	9 Km
	Bridges	1
	Rural Destroyed Settlement	93
	Rural Damaged Settlement	25
	Rural Undamaged Settlement	245
	Urban Damaged Settlement	1



Data extracted from pre & post Flood imagery acquired from SPOT Satellite Series at SUPARCO, Islamabad
 Projection: UTM Zone 42 N
 Spheroid: WGS 84



Settlement Sector

NOWSHERA CITY

Pre Disaster : 10 Feb 2010

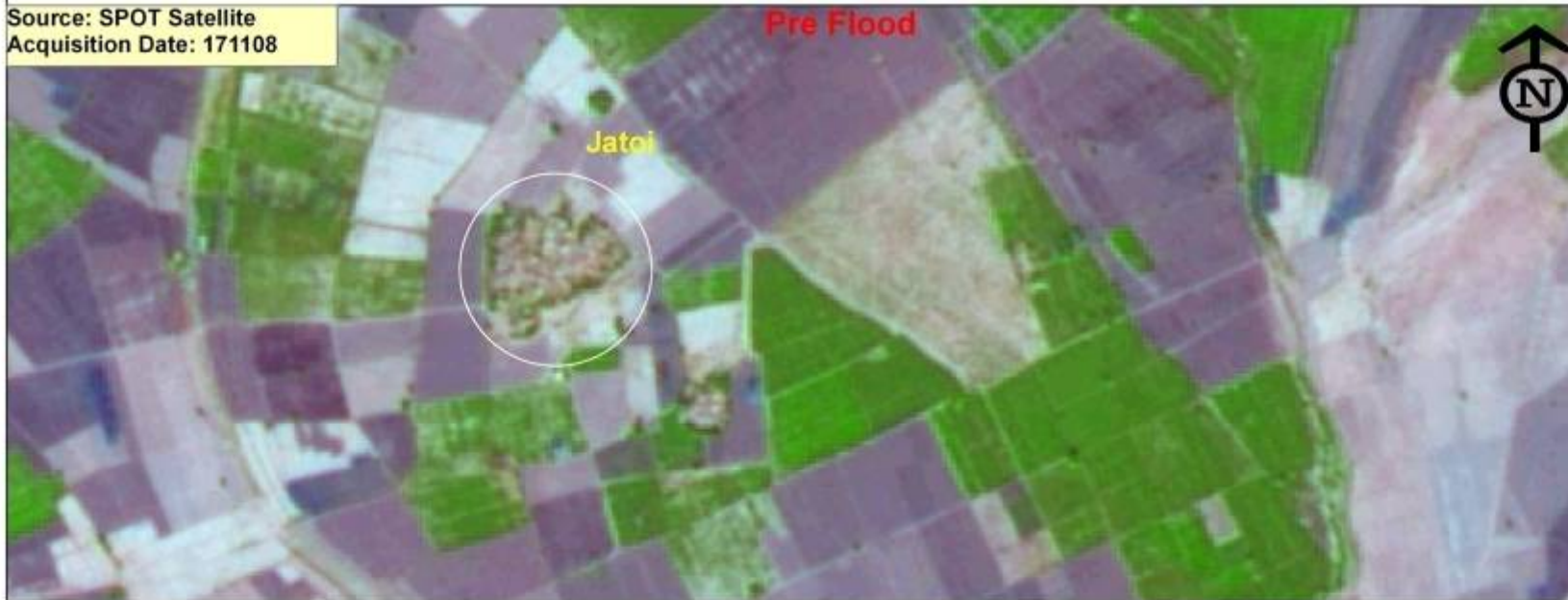


Post Disaster : 05 August 2010

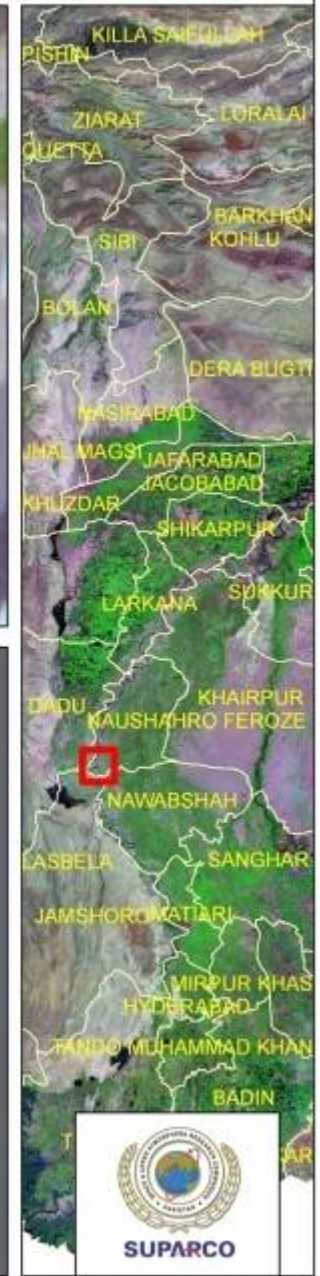
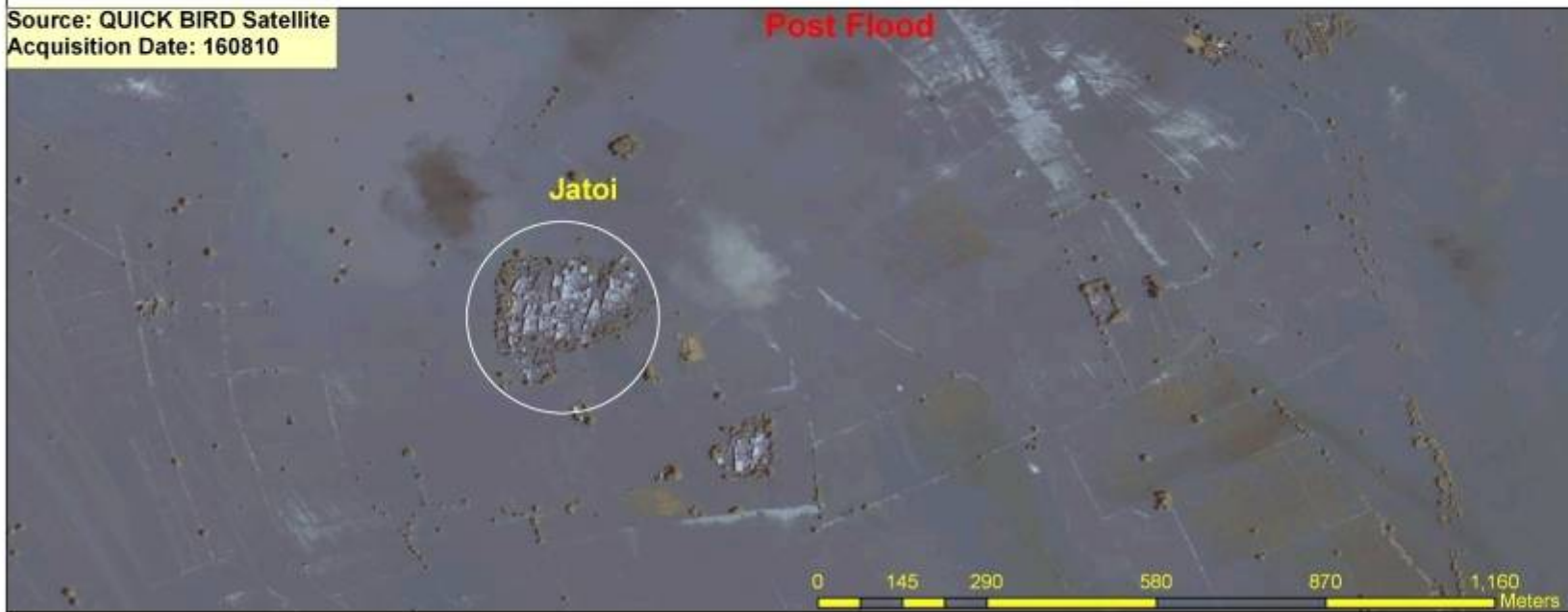


Affected Settlements - District Nausheroferoz

Source: SPOT Satellite
Acquisition Date: 171108



Source: QUICK BIRD Satellite
Acquisition Date: 160810



Irrigation Sector

CONFLUENCE OF KABUL & INDUS RIVER

Pre Disaster : 18 Jun 2010

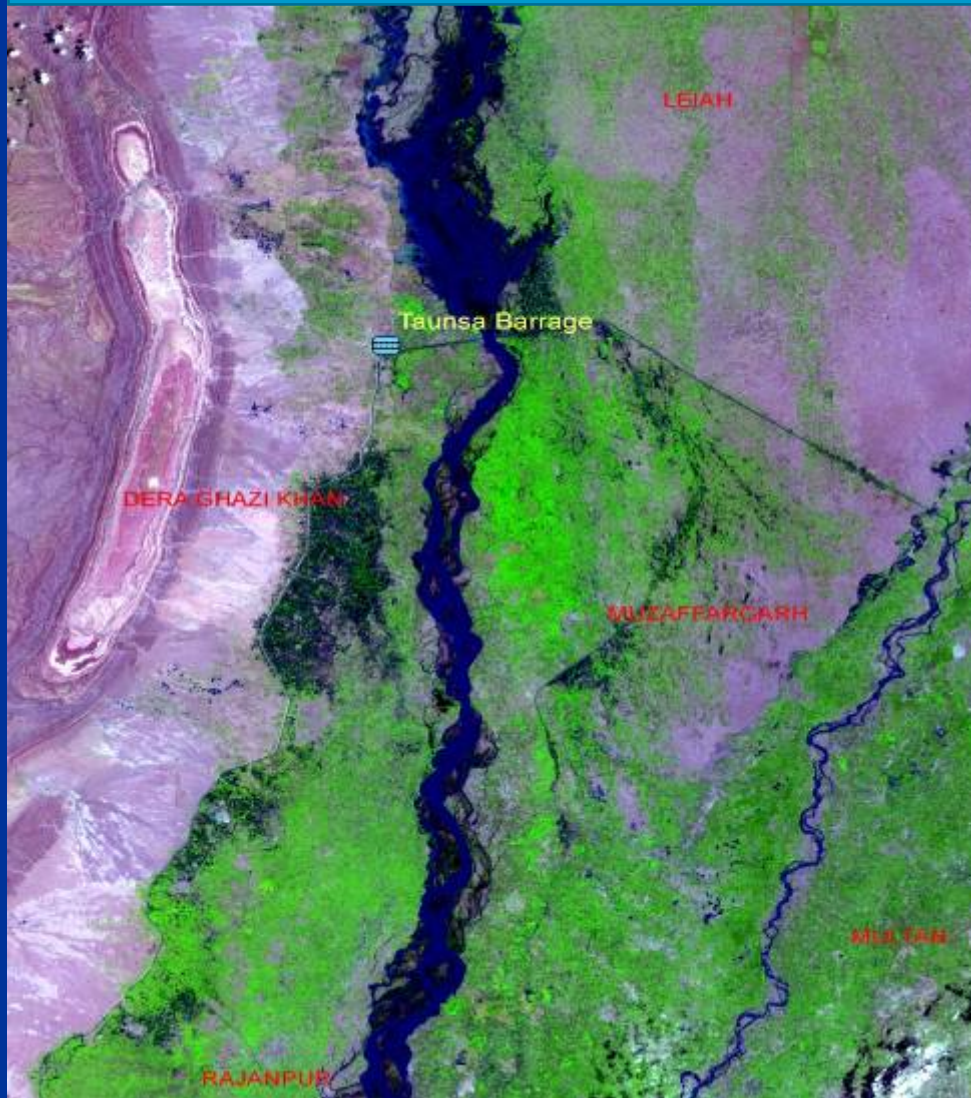


Post Disaster : 02 August 2010

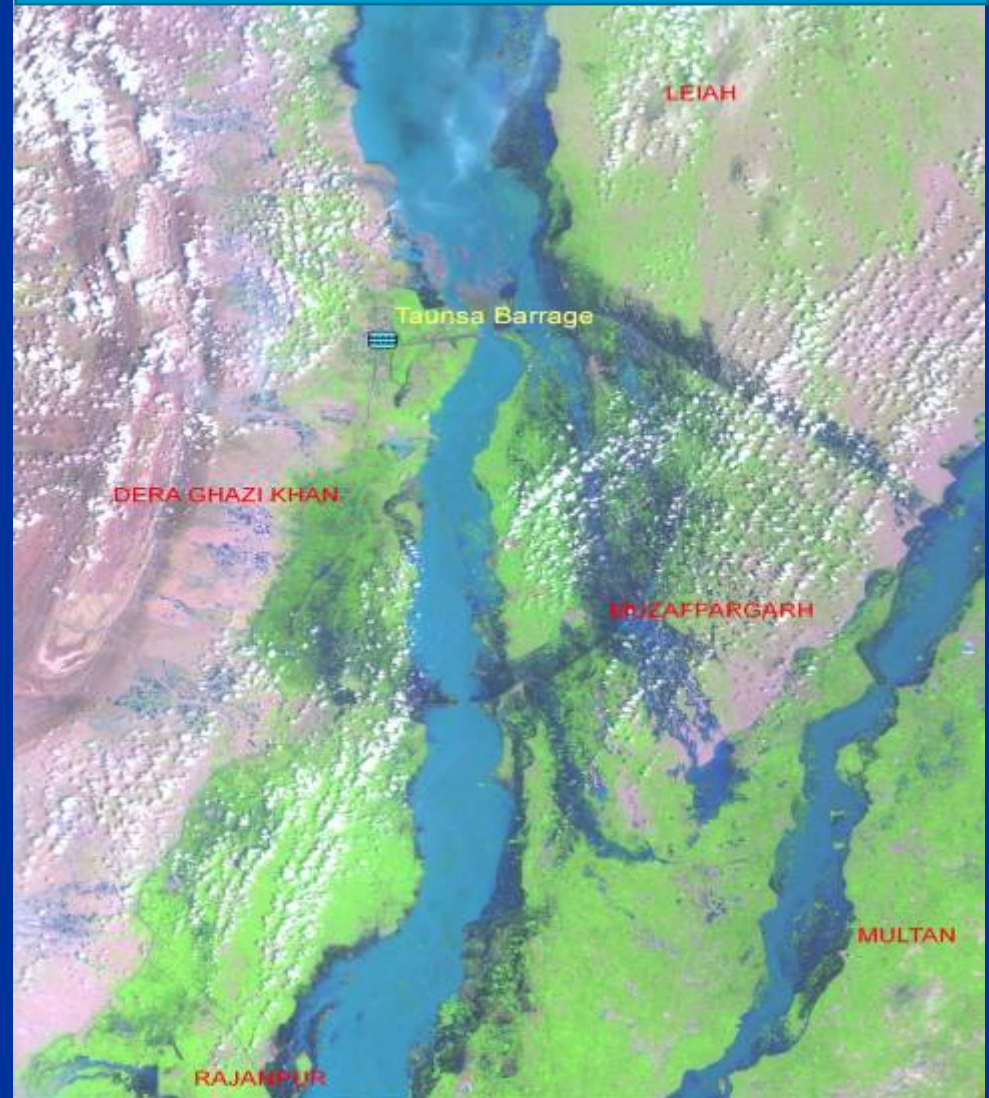


TAUNSA BARRAGE

Pre Disaster : 11 Jul 2010



Post Disaster : 12 Aug 2010



TORI BUND

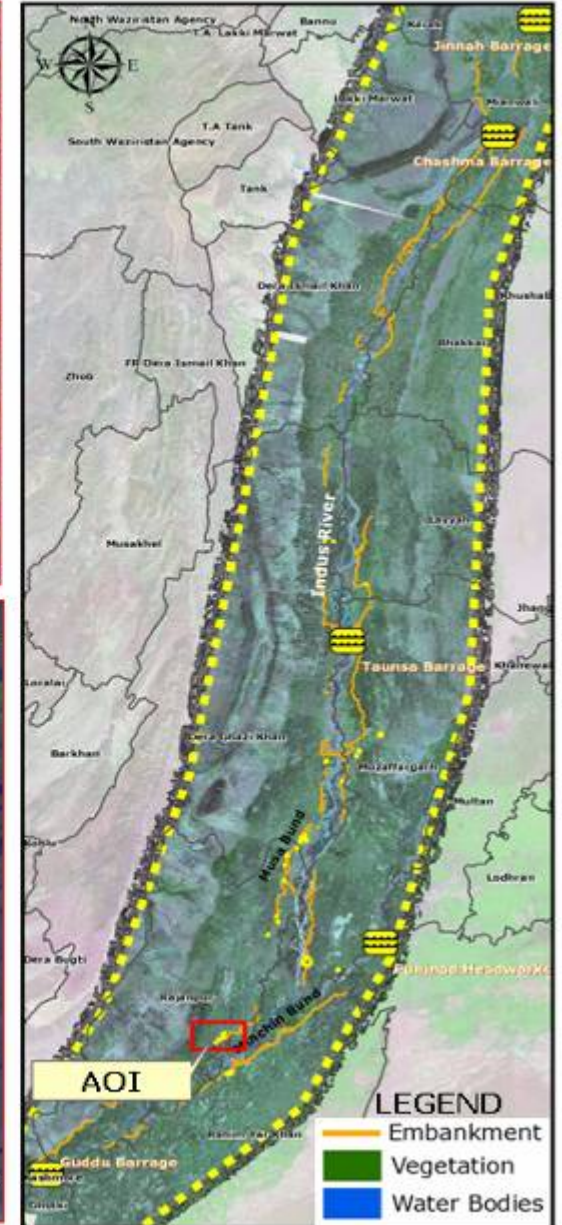
Pre Disaster : 02 June 2010

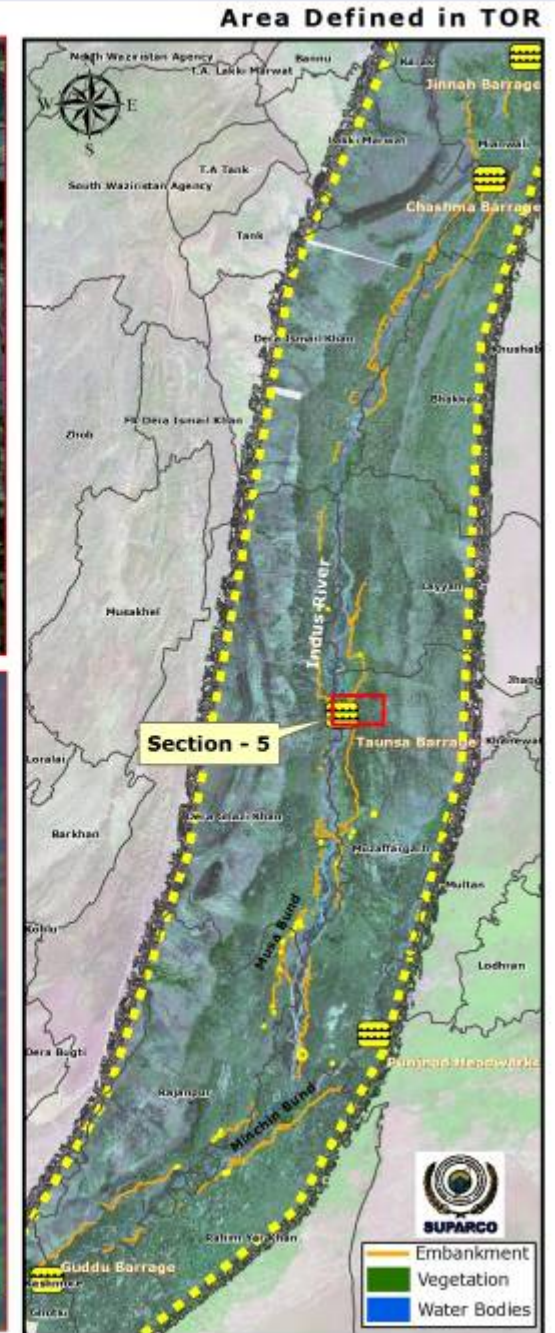
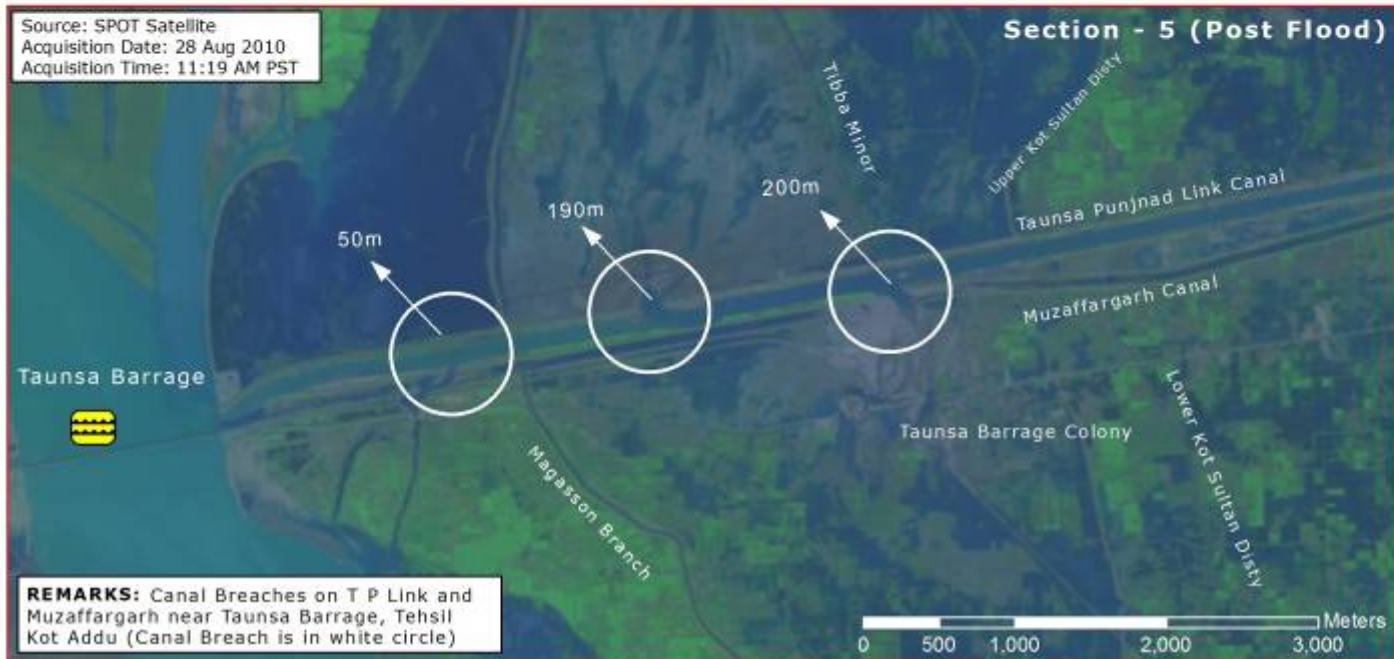
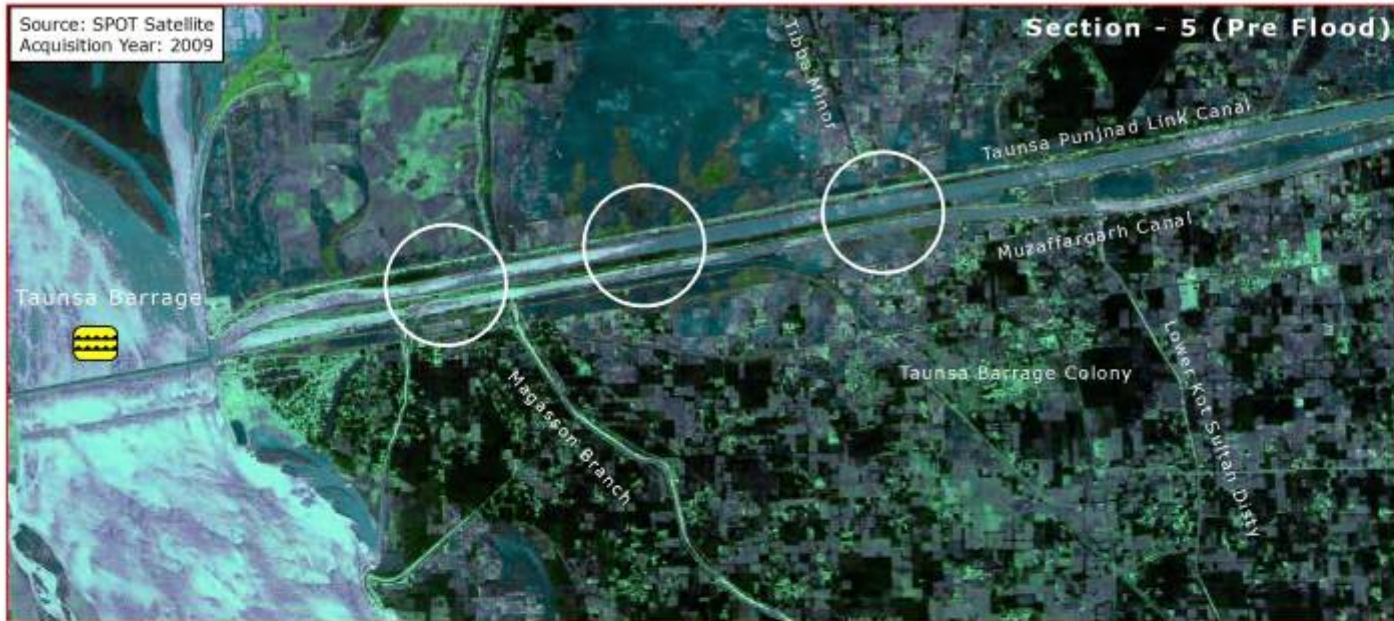


Post Disaster : 22 Aug 2010



Breached Areas - District Rajanpur

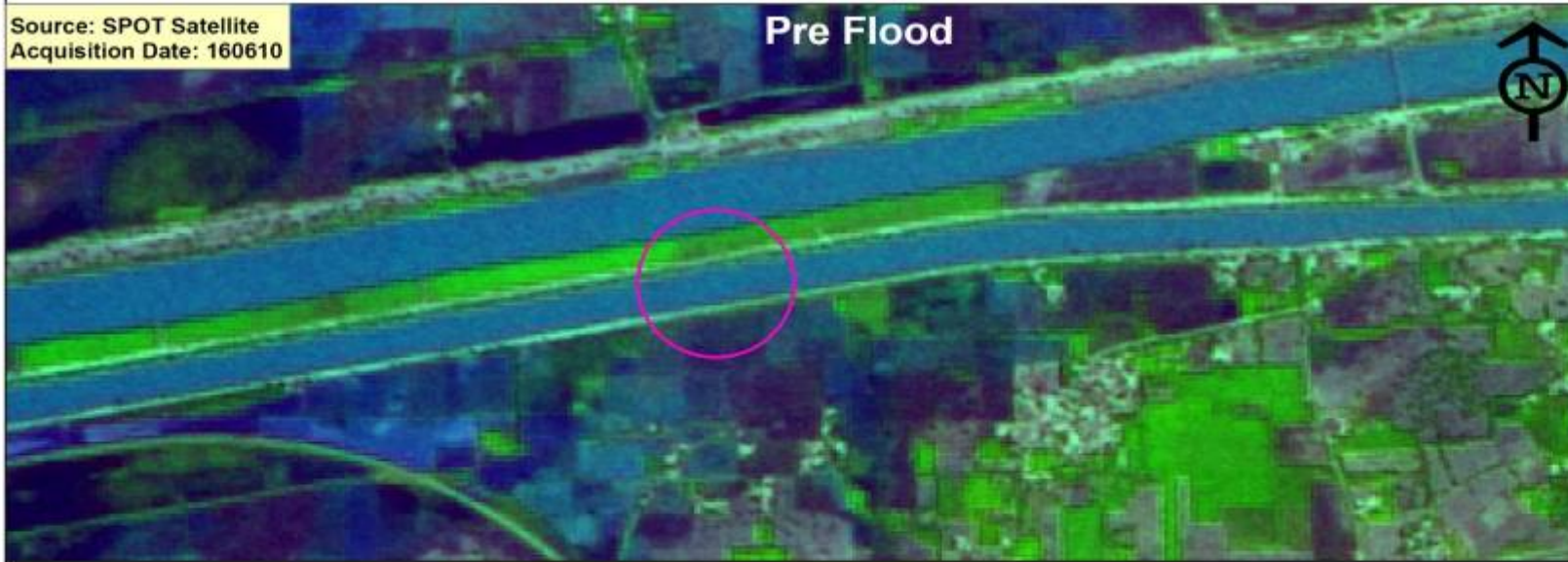




Canal Breaches - District Muzafargarh

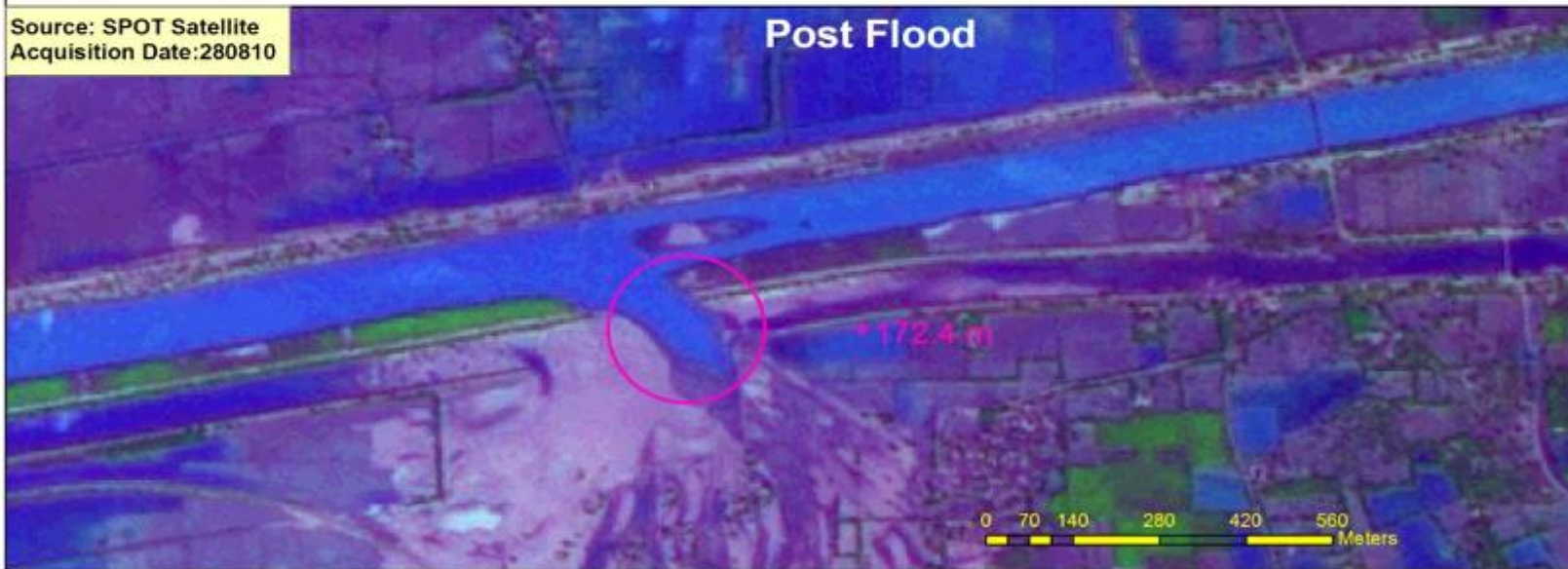
Source: SPOT Satellite
Acquisition Date: 160610

Pre Flood



Source: SPOT Satellite
Acquisition Date: 280810

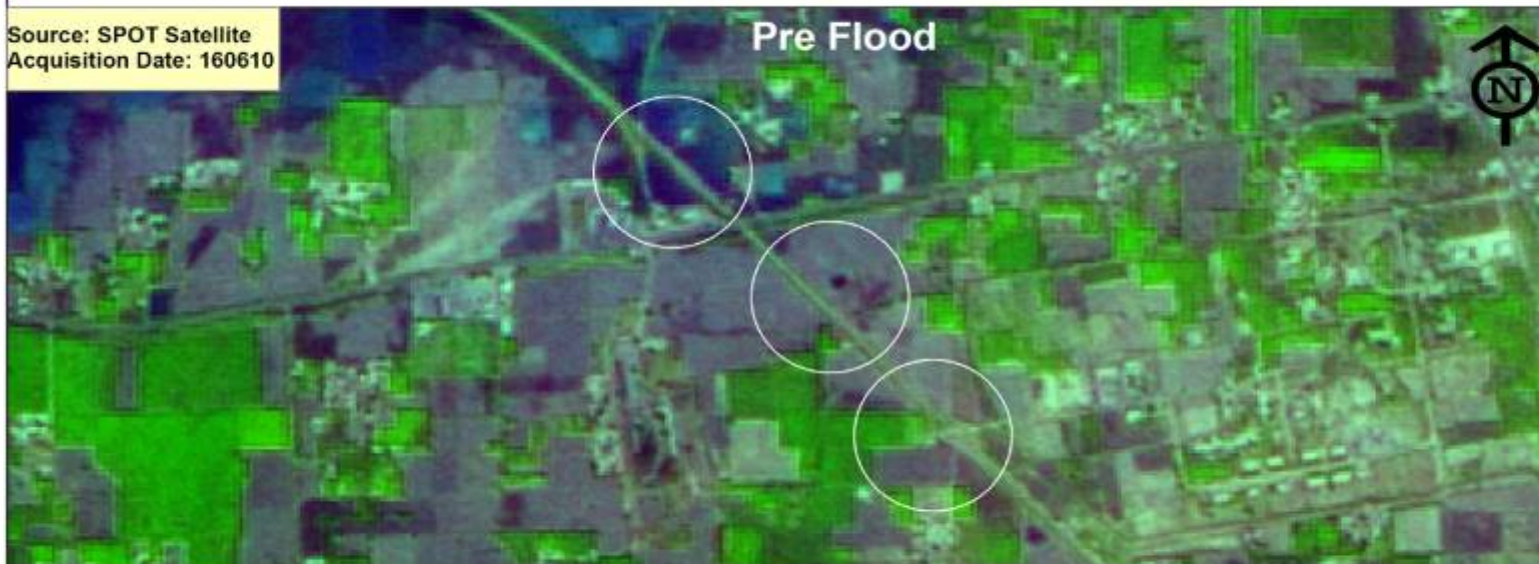
Post Flood



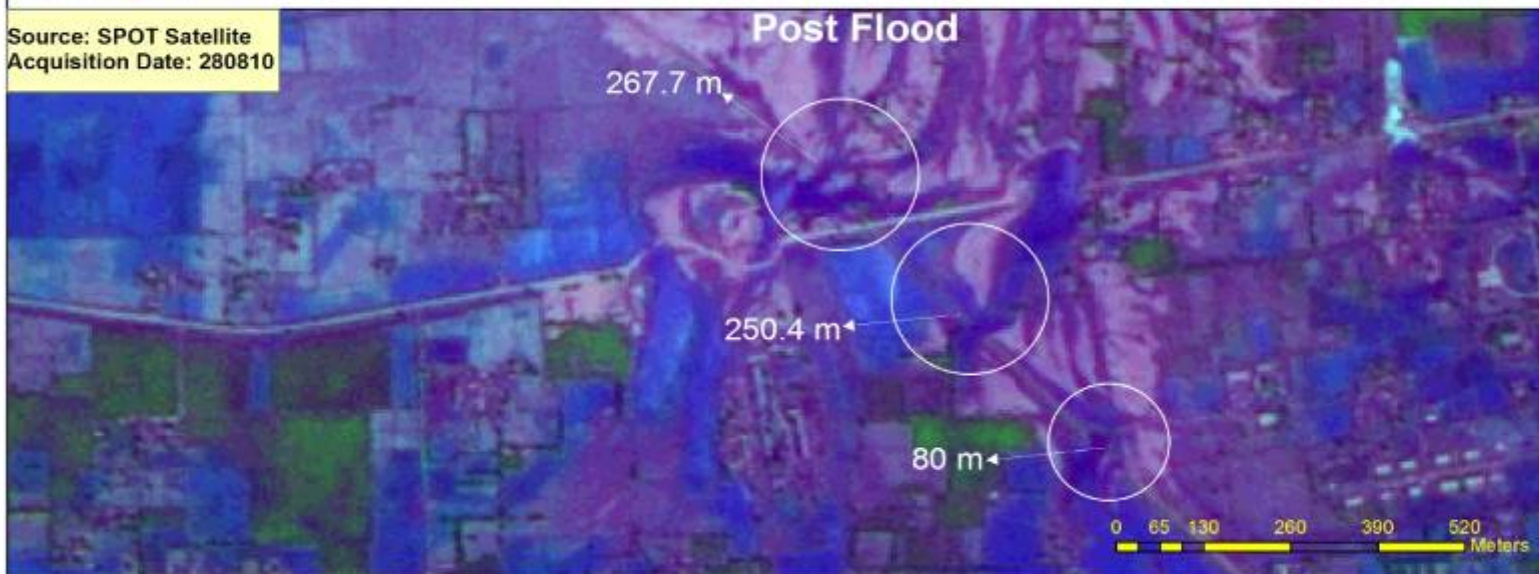
Railway Sector

Railway Breaches - District Muzafargarh

Source: SPOT Satellite
Acquisition Date: 160610



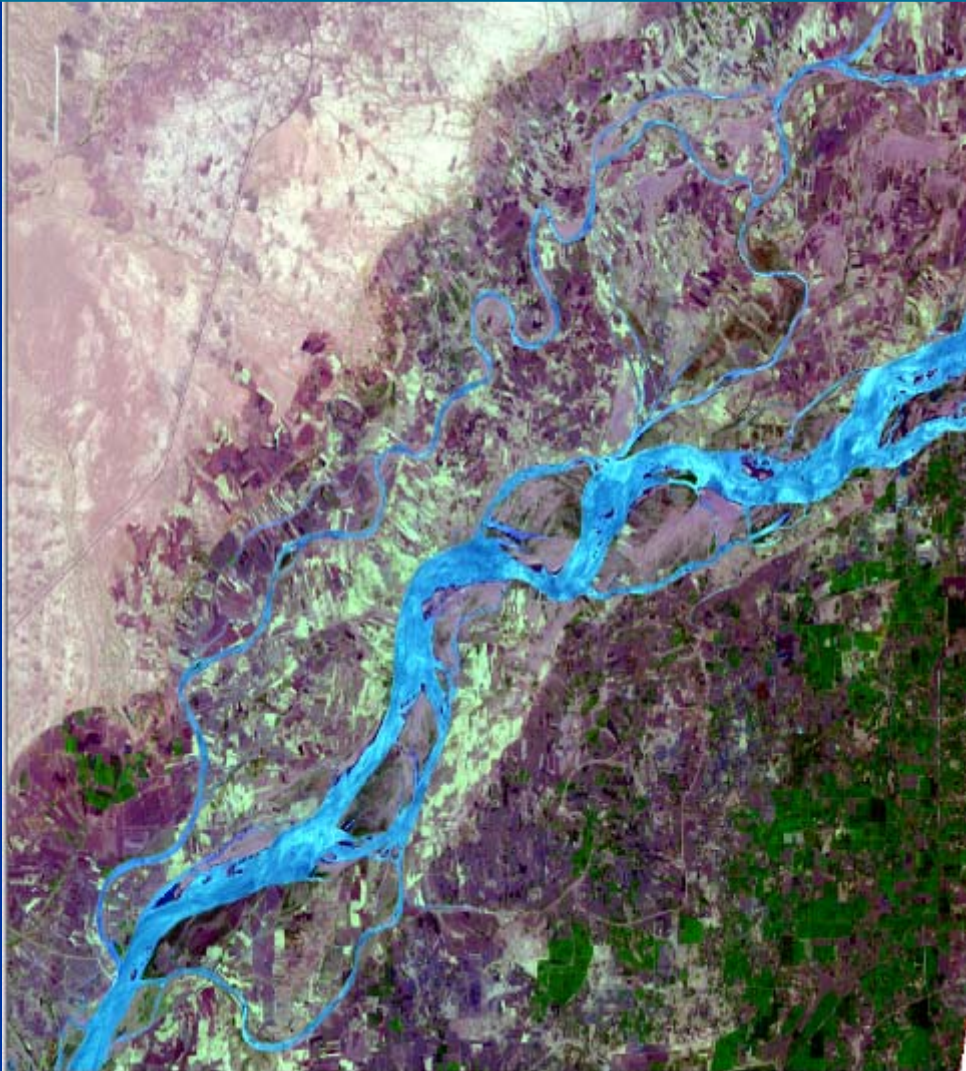
Source: SPOT Satellite
Acquisition Date: 280810



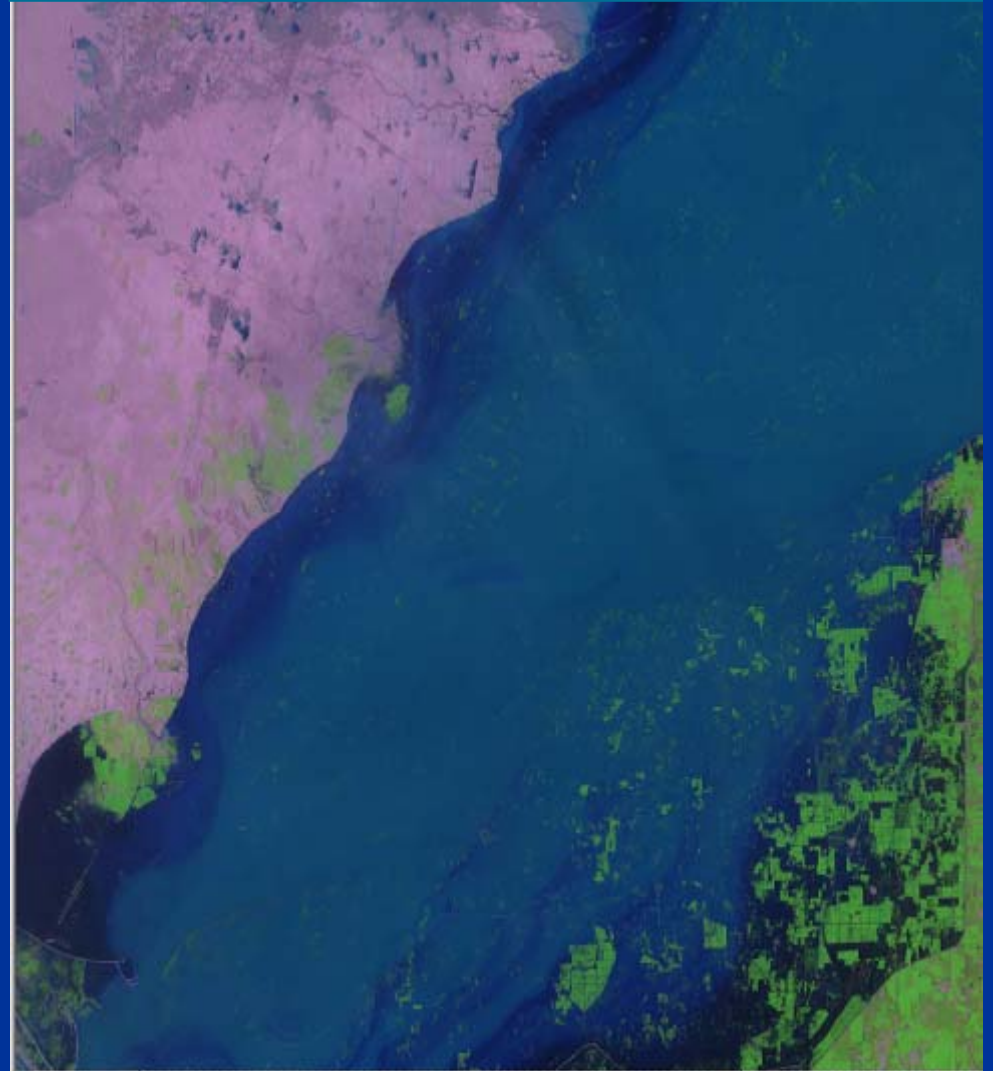
Agriculture Sector

RAJANPUR

Pre Disaster : 01 June 2010



Post Disaster : 12 August 2010



NOSHERO FEROZE

Pre Disaster : 07 June 2010

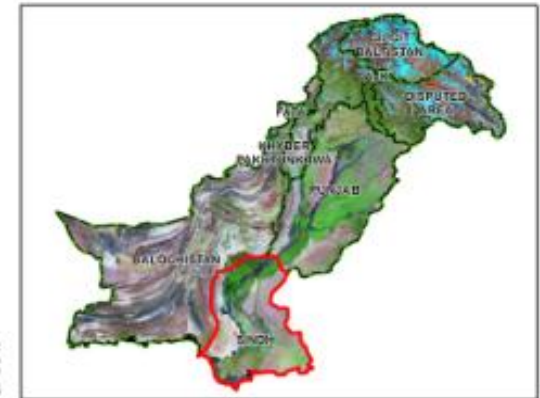
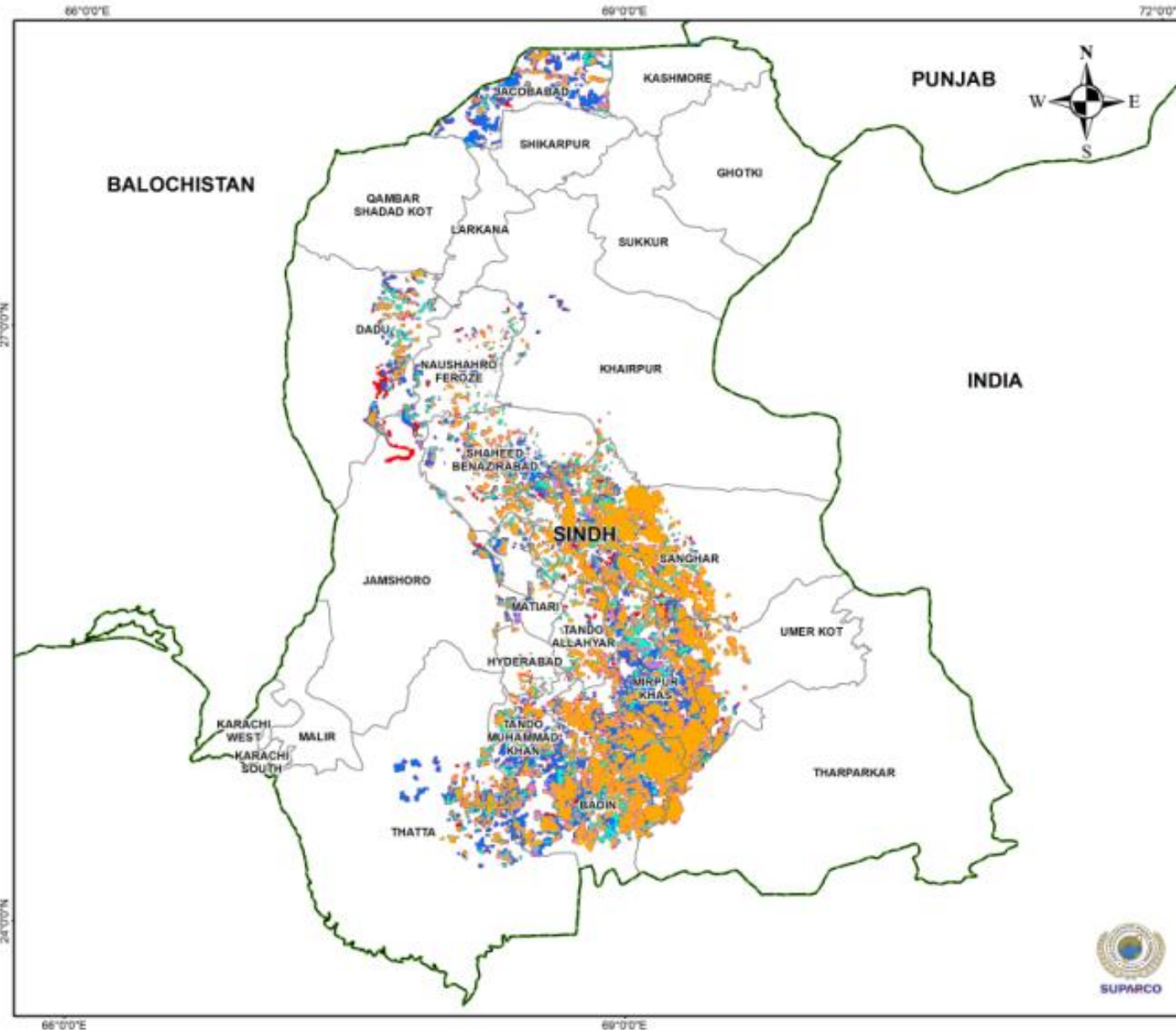


Post Disaster : 17 August 2010



Flood /Rain 2011

SINDH : FLOOD / RAIN 2011 Flood Receding

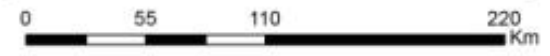


This map presents preliminary analysis of flood affected areas.

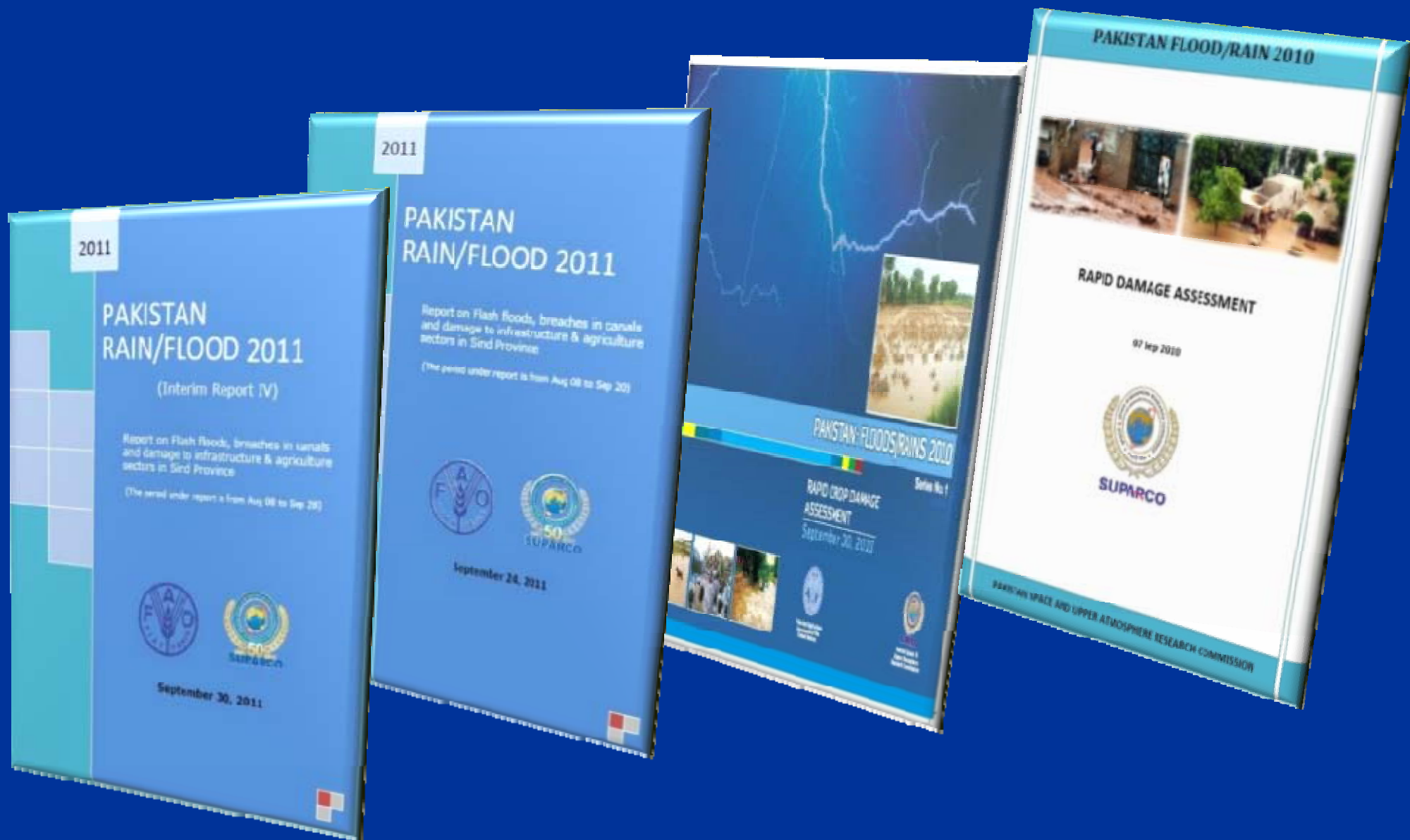
Data extracted from pre & post Flood Imagery acquired from MODIS Satellite Series at SUPARCO, Karachi.

This analysis has yet to be validated in the field

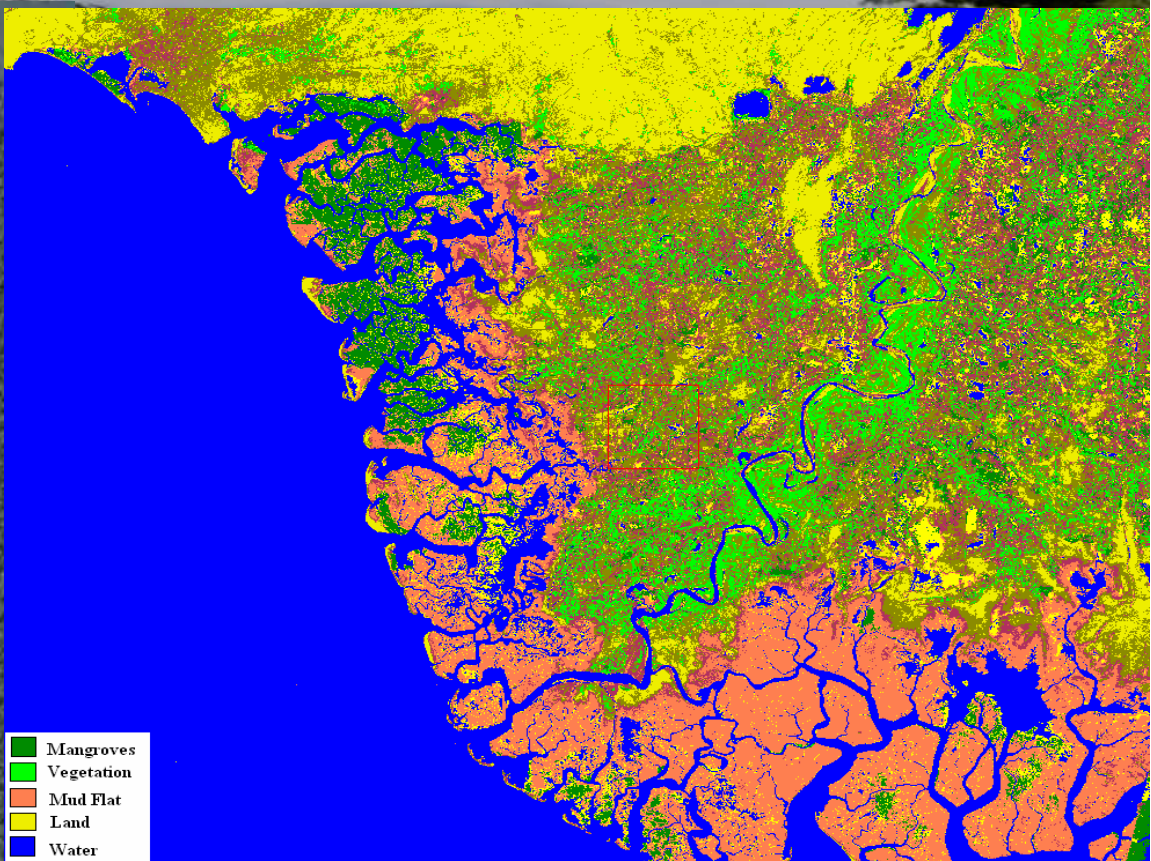
Projection: UTM Zone 42 N
Spheroid: WGS 84



PUBLICATIONS



Mangroves monitoring



Conclusion

Space science and technology can be effectively used for socio-economic development. Pakistan would be pleased to share its knowledge and experience with other countries

Thank you