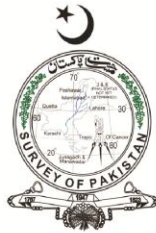


Atlas of Legal Boundaries of Murree State Forests





Developed and published under the direction of Lahore High Court Suo Moto Action
Writ Petition No. 1813-2010

About This Atlas

First Edition January 2013

The study has been conducted as per the orders of Lahore High Court under the Suo Motu Action, Writ Petition No. 1813/2010.

This atlas comprises of the maps containing legal boundaries of the state forest of Murree Forest Division. The atlas has been developed by Punjab Forest Department (PFD), Punjab Revenue Department, Survey of Pakistan (SoP) and World Wide Fund for Nature – Pakistan (WWF – Pakistan). Maps in this atlas have been developed by using field data collected during the joint surveys of the PFD, Revenue Department, SoP and WWF – Pakistan. The locations of boundary pillars were identified by the officials of the Forest and Revenue Departments whereas the coordinates of pillar marks were observed and worked out by SoP officials in the presence of GIS experts of WWF – Pakistan. The same verified boundary marks and lines are displayed on high resolution satellite image based maps. The accuracy of the boundary line is according to the standards of SoP.

Contact:

Officer in charge,
OC party 4
Cart Road, Survey of Pakistan, Murree
Phone No.:051-9269097
E-mail: akram522258@yahoo.com

Divisional Forest Officer, Murree Forest Division
Punjab Forest Department,
Office of DFO Murree Jhika Gali, Murree, Rawalpindi.
Phone No. 051-3413951, 9269040
E-mail: dfo_murree@hotmail.com
mjavidgill@gmail.com

Tehsildar Murree
Tehsil office Murree
Phone No.:051-3413100

Manager GIS,
Head Office
WWF-Pakistan, P.O. Box 5180
Ferozepur Road, Lahore.
Tel: 042 3586 2359-60
E-mail: gislab@wwf.org.pk

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Disclaimer

The maps in this atlas have been developed with precision and accuracy using high resolution images and state of the art equipments involving expertise of the partnering departments, however may liable to some human errors.



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Preface

Murree hills are part of the Western Himalayan Ecoregion, included in the G200 ecoregions, which refers to the global ranking of important ecological areas of the world. It is believed that any damage to the Western Himalayan Ecoregion would have a negative impact on the Indus River system. WWF - Pakistan involvement in the Lahore High Court's Suo Moto case was on the principle of forest conservation. WWF - Pakistan urged for the detailed assessment of the Punjab forest lands to evaluate the conversion of reserve forest into non forest uses through delineating legal boundaries of forest land through working with Punjab Forest Department, Survey of Pakistan and the Punjab Revenue Department.

We are pleased to collaborate with all the relevant government organisations to help in conservation of the precious mountain forests of Murree. We are pleased that these mapping efforts have already enabled the Punjab Forest Department to recover illegally encroached forest land. WWF-Pakistan is keen to continue this collaboration on a long-term basis to help restore natural forests on the recovered lands.

Ali Hassan Habib
Director General
WWF - Pakistan

Murree got its title "The Queen of Hill" not due to its altitude, location or human developments, but in fact it was named so due to its natural scenic beauty and the serenity it provides. Unfortunately, this beloved spot of tourists has lost its original landscape more rapidly during the past decade by the illegal interventions of the encroachers, land grabbers and timber mafia.

The beauty of the "Queen" further eclipsed due to haphazard mushroom growth of multi-storeyed building, most of them constructed either getting the building plans approved in total disregard of the laid down policy and rules or even without getting any such plan approved. The suburbs of Murree and even the remote corners fell victim of these illegalities. This process was aggravated by different Housing Societies including some of the tycoons in the business. Thus not only the merciless deforestation took place in the tract but the precious lands were also doled out.

In this respect, cognizance was taken by Chief Minister, Punjab, who after viewing the entire scenario constituted a Steering Committee on Murree with number of assigned targets, with ejection of forest land encroachment as a priority issue.

In the meanwhile the Honourable Chief Justice Lahore High Court Lahore took Sue Moto notice and was pleased to pass an order for demarcation/detection of forest lands and simultaneously register the cases against the encroachers/land grabber. The learned Court was pleased to associate Survey of Pakistan, World Wide Fund for Nature-Pakistan (WWF - Pakistan), Revenue Department and Forest Department to accomplish the task of Demarcation/Delineation of boundaries and establishment of boundary pillars at sites etc. On account of persistent hectic efforts of all concerned, remarkable result were achieved.

The unprecedented rare feats were not possible to have been achieved without the support extended by Mr. Shahid Khaqan Abbasi, MNA Convener Steering Committee on Murree Affairs, Raja Muhammad Ashfaq Sarwar, Advisor to Chief Minister Punjab, Members Steering Committee on Murree Affairs. This department is highly indebted to them for their kind cooperation, guidance and patronage in this respect.

The services rendered by Maj. General Munawer Ahmad Solehria, Surveyor General of Pakistan and his team are worth appreciation. They all have worked tirelessly beyond their normal sphere of duties to accomplish these tasks.

I am also grateful to Mr. Imdadullah Bosal for his active participation right at the onset of the project, as District Coordination Officer Rawalpindi and subsequently as Commissioner Rawalpindi. The uphill task could be achieved due to logistic support and the keen interest taken by Mr. Ali Habib, Director General/CEO WWF - Pakistan.

In the end, I also must appreciate the tasks accomplished by Mr. Muhammad Javaid Gill, Divisional Forest Officer (DFO) Murree for erecting boundary pillars around the retrieved forest land and coordinating with all the concerned for detection of encroachments and demarcation of forest area.

Maj. (R) Shah Nawaz Badar
Secretary Govt. of the Punjab
Forestry, Wildlife and Fisheries Department

Preface

Land is one of the basic products of nature. All the living creatures are dependent on it either directly or indirectly for their existence and survival. As a consequence of population explosion witnessed in recent times, land has become more precious both in intrinsic and material sense.

As an important part of land, forests both natural and man-made, bring above innumerable tangible and intangible benefits including soil and water conservation, environmental improvement, tourism, wildlife and aesthetic beauty, etc. With increasing population, all types of lands including forests particularly closer to human settlements have become vulnerable. Forests in Murree fall in this vulnerable category as evident from the fact that a large chunk of forest land was encroached upon by the illegal encroachers in recent times. This not only deprived the Forest Department of its precious resource but also played havoc with the environment.

To prevent the unbridled de-forestation, the Forest Department started demarcation of forest lands in cooperation with the Revenue Department to identify the forest land in the first place and to clear a same from illegal possession, if found encroached. As a consequence, 43,300 acres of forest land has been demarcated over a period of two years which was an up-hill task. The joining of Survey of Pakistan and World Wide Fund for Nature, Pakistan in this endeavour gave it further impetus ensuring accuracy and transparency in the whole process.

Surveyor General of Pakistan and Director General, World Wide Fund for Nature, Pakistan and their teams deserve special appreciation for assisting the Forest Department in this noble initiative. Furthermore, Mr. Muhammad Javed Gill, Divisional Forest Officer, Murree also deserves appreciation as this process could not have been completed without his untiring efforts and un-wavering commitment. It is pertinent to point out that out of total encroached forest land of 2,862 acres, 1,279 acres of land have been retrieved from illegal possession.

This action on the part of above mentioned agencies is laudable and would surely contribute towards not only protection of valuable forests but also towards environmental improvement and preservation of nature over a period of time.

Imdad Ullah Bosal
Commissioner Rawalpindi Division
Rawalpindi

Natural resources like forests are vital assets to any economy. Developing countries like Pakistan depend more on natural resources and less on industry for its economy. The rapid consumption of such resources due to ever increasing population and unplanned urbanization demand formulation of strategies to safeguard them. Moreover, there is a dire need to address the most significant issues like environmental degradation and natural disasters that are a great threat to our natural resources. However formulation of effective and implementable strategies for the protection of these reserves and resources through efficient planning, require information that has been evaluated and synthesized persuasively. Information that is developed or accumulated from multiple sources is objective, reliable, accessible and usable. This is one of the reasons that many countries are developing Geographic Information System (GIS) to effectively manage their natural resources including forest resources. A similar kind of project was initiated by Punjab government to survey forestland in Murree.

Survey of Pakistan (SoP), the National Surveying and Mapping Organization of the country contributed to the successful completion of the project through its offices located at Murree. Survey of Pakistan, in collaboration with WWF-Pakistan and Revenue staff completed the job of demarcation of forest lands in a record time by working 10 to 13 hours in a day. I congratulate the officers and staff for completing the job in a minimal possible time and delivering the output that is matchless in its accuracy and use. Survey of Pakistan is actively participating in the similar kinds of national development projects since 1947 and thus fulfilling the ever growing surveying and mapping demands of various government, semi-government and autonomous bodies using modern geospatial techniques, methods and equipment.

This project has set a good example of inter-organizational as well as institutional collaboration, coordination and cooperation to achieve common goals of national interest that is indeed, the dire need of the day. Survey of Pakistan will continue to promote inter-agency coordination by participating and contributing in all kinds of surveying and mapping projects for the uplift of socio-economic sectors of the country.

Major Muhammad Ilyas Ch.
Deputy Surveyor General
Survey of Pakistan

Acknowledgement

A number of departments and individuals provided support and contributions to this Map Atlas. The following text attempts to acknowledge the contributors for the successful completion of the Project. However, apologies are extended in advance, if an individual is missed unintentionally.

This atlas was made possible principally through the enthusiastic participation of the field staff of Punjab Forest Department (three DFOs, five SDFOs, three RFOs, fourteen Block Officers/Foresters, one hundred and twenty eight Forest Guards, fifteen Clerks/Stenos and three drivers), Survey of Pakistan (nine technical persons), Officials of Punjab Revenue Department (27 in number) and WWF – Pakistan (nineteen technical persons). The list of these officials/staff members is given in annexure.

Supporting Organizations

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Project Monitoring Committee

Mr. Raja Khalid Hussain, Chief Conservator of Forests Northern Zone, Rawalpindi, Punjab Forest Department
Mr. Ghulam Sarwar, Director, Survey of Pakistan
Mr. Imdad ullah Bosal, Commissioner, Rawalpindi
Dr. Omar Jahangir, Assistant Commissioner, Murree
Mr. Saqib Zafar, District Coordinator Officer, Rawalpindi
Mr. Shahid Rashid Aawan, Deputy Secretary (Planning), Forestry, Wildlife, and Fisheries Department, Lahore, Punjab.

Legal Advisory Team

Mr. Ahmer Bilal Soofi, LL.M, Cambridge, UK (Advocate Supreme Court of Pakistan)
Mr. Khalid Mian, (Advocate High Court)
Ms. Amna Warsi, LL.M, Pb. (Advocate High Court)
Ms. Ayasha Warsi, LL.M, Pb. (Advocate High Court)

Map production team and cartography

Irfan Ashraf, Naeem Shehzad, Urooj Saeed, Kaif Gill, Wasif Yousaf, Syed Muhammad Irteza, Zain-ul-Abdin
Geographic Information System Laboratory, WWF – Pakistan

Map Validation

Muhammad Javed Gill (DFO Murree), Raja Akram (Incharge SoP Murree), Rana Nayab Khan (Tehsildar Murree), Urooj Saeed (Manager GIS, WWF - Pakistan)

Software and Imagery Support

The authors would like to thank ESRI for the software grant. Google Earth images were significant for the initial assessments of the encroached lands. ESRI base map imagery was used for forest boundary overlay at outer peripheries of Murree Forest Division (where satellite images of GeoEye 1 were missing).

Editor

Uzma Khan, Director Biodiversity, WWF - Pakistan

The authors are thankful to Maj. (R) Shah Nawaz Badar (Secretary Govt. of the Punjab, Forestry, Wildlife and Fisheries Department), Mr. Ali Hassan Habib (Director General, WWF – Pakistan), Major Muhammad Ilyas Ch.(Deputy Surveyor General, Survey of Pakistan), Mr. Ghulam Sarwar (Director, Survey of Pakistan), Mr. Imdad ullah Bosal (Commissioner Rawalpindi) and Ms. Uzma Khan, (Director Biodiversity, WWF – Pakistan) for their guidance and support throughout the study.

GIS Team, WWF – Pakistan

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List of Abbreviations/Acronyms

ABS & Co.	Ahmer Bilal Soofi and Company	SDC	Sub Division Clerk
akm	<i>acre-kanal-marla</i>	SDFO	Sub Divisional Forest Officer
BOs	Block Officers	SoI	Survey of India
BR	Ban Range	SoP	Survey of Pakistan
CDA	Capital Development Authority	sq. km	Square Kilometre
cm	Centimetre	SS	Second (Double Digit)
Cpt.	Compartment	TS	Total Station
DD	Degree (Double Digit)	UTM	Universal Transverse Mercator
dd	Degree decimal	W.P.	Writ Petition
DEM	Digital Elevation Model	WGS	World Geodetic System
DFO	Divisional Forest Officer	WWF – P	World Wide Fund for Nature Pakistan
DGPS	Differential Global Positioning System		
Distt.	District		
Div.	Division		
ESRI	Environmental Systems Research Institute		
FAO	Food and Agriculture Organization		
FD	Forest Division		
FG	Forest Guard		
FIR	First Information Report		
GCS	Geographic Coordinate System		
GG	Ghora Gali		
GIS	Geographic Information System		
GPS	Global Positioning System		
HS	Housing Society		
ICT	Islamabad Capital Territory		
IMDCW	Islamabad-Muzaffrabad Dual Carriage Way		
KP	Khyber Pakhtunkhwa		
LT	Lower Topa		
m	Metre		
MCM	Military College Murree		
MFD	Murree Forest Division		
MM	Minute (Double Digit)		
MR	Municipal Range		
NOC	No Objection Certificate		
OGDC	Oil and Gas Development Company		
PF	Protected Forest		
PFD	Punjab Forest Department		
RC	Range Clerk		
RF	Reserved Forest		
RFO	Range Forest Officer		
RMK	Rawalpindi-Murree-Kashmir		
RS	Remote Sensing		
SA	Sambli		
SB	Sehr Bagla		



Facts Murree

Importance: Only hill station in the Punjab for tourists

Altitude: 1,100 - 7,800 feet (335 - 2,380 metres)

Population: 202,056 (according to 1998 census)

Subdivisions and Ranges: Four Forest Sub Divisions (Ghora Gali , Sambli , Lower Topa and Sehr Bagla), two Ranges (Municipal Forest and Ban Forest)

Forest Pillars: 4,300 approx.

Forest land: 200 sq km approx.

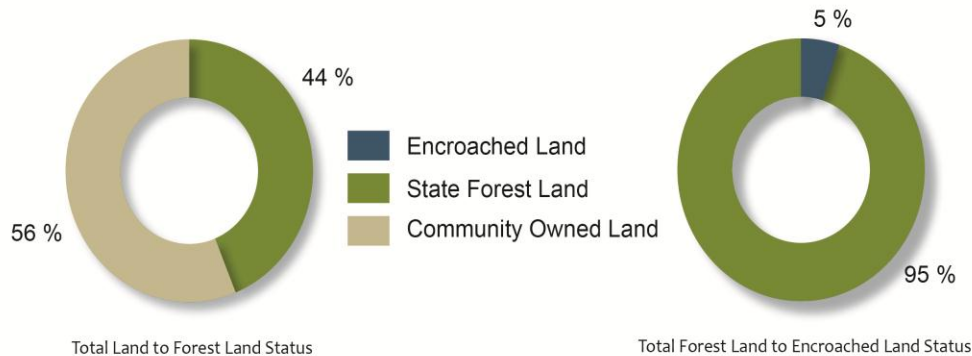




Fauna: Key fauna of Murree includes Common Leopard (*Panthera pardus*), Rhesus Monkey (*Macaca mullata*), Barking Deer (*Muntiacus muntjak*), Asiatic Jackal (*Canis aureus*), Wild Boar (*Sus scrofa*), Murree Vole (*Hyperacrius wynnei*), Indian crested Porcupine (*Hystrix indica*), Indian Hare (*Lepus nigricollis*), Koklass pheasant (*Pucrasia macrolopha*), Khaleej Pheasant (*Lopura leucomelana*), Black Partridge (*Francolinus francolinus*), Grey partridge (*Francolinus pondicerianus*), Indian Sparrowhawk (*Accipiter badius*) Plum-headed Parakeet (*Psittacula cyanocephala*) and variety of song birds.

Flora: Key flora of Murree includes Amaltas (*Cassia fistula*), Amlok (*Diospyros lotus*), Ailanthus (*Ailanthus altissima*), Ban Akhroot/Ban Khor (*Aesculus indica*), Batangi (*Pyrus pashia*), Bebrang (*Myrsine africana*), Bhekar (*Justicia adhatoda*), Blue Pine/Kail (*Pinus wallichiana*), Chir Pine/Chir (*Pinus roxburghii*), Dhrek/Bakain (*Melia azedarach*), Deodar (*Cedrus deodara*), Sufeda (*Euclyptus*), Fir (*Abes pindrow*), Garanda (*Carissa opaca*), Kanair/Kanehra (*Nerium oleander*), Kangar (*Pistacia integerrina*), Kau (*Olea ferruginea*), Phulai (*Acacia modesta*), Poplus (*Populus alba*), Rein/Barungi (*Quercus dilatata*), Rein (*Quercus incana*), Sanatha (*Dodonaea viscosa*), Shamshad (*Buxus wallichiana*), Sheesham/Talli (*Dalbergia sissoo*), Willow (*Salix acmophylla*) and Rubinia (*Robinia pseudo-acacia*)

Pine forest generate high revenue in terms of source of timber wood and broad leaved vegetation participate in maintaining the watershed and catchment areas of Indus/Jehlum river (Mangla-Simli Dams) vallies. The forest of this area has great environmental, scenic and aesthetic value due to its locality and altitude.





Executive Summary

Pakistan has rapidly depleted forest resources. According to the Food and Agriculture Organisation (FAO, 2012), Pakistan has the highest rate of forest degradation in Asia and the country is ranked at 110 in the forest cover of the world. Forests in Pakistan have suffered from encroachments, conversions (transfers/leases), timber/fuel wood extractions etc. In the Punjab Province, since 1947, a total of 80,038 ha (197,780 acres) of forest land have been transferred for non-forestry purposes (PFD, 2013). In Punjab, the coniferous forests are confined to the Murree Hills and are the watershed of Simli dam, Rawal dam, Khanpur dam and Mangla dam. The Murree Forest Division (MFD) comprises of a total of 467 sq. km area with 200 sq. km is under the custody of the Punjab Forest Department. Entire Murree Forest Division is covered under six administrative units i.e. four Forest Sub Divisions (Ghora Gali, Sambli, Lower Topa and Sehr Bagla) and two Forest Ranges (Ban Forest and Municipal Forest). The six Forest Sub Divisions/Ranges consist of 22 'Protected Forest', covering an area of about 70 sq. km and 23 'Reserved Forest', covering an area of about 130 sq. km. This 200 sq. km (20,051 ha) of forest land has two categories Protected Forest (declared vide the Government Notification No. 63 dt 17 February, 1887) and Reserved Forest (declared vide the Government Notification No. 431 dt 27 October, 1886 whereas Municipal Reserved Forest was declared vide the Government Notification No. 791-c dt 17 February, 1887). These Reserved and Protected Forests are being managed under section 4 to 26 and 29 to 34 of the Forest Act 1927 (amended up to October 2010) respectively. The rights (ownership and usage) of the local population were admitted in these forests at the time of settlement* . Which includes Right of Way, water, grazing, burial purpose, timber for house construction or repair, fuel wood and for agriculture implements. Another class of forest that falls in Murree is the privately owned tenure which is referred as *Guzara Forest* (subsistence). It comprises of patches of forest lands close to the habitations to meet the needs of the local communities. The ownership has been vested to the local people. According to Section 4-A and 4-B of "West Pakistan Forest Rules *Guzara* under the Acts", no one in any estate can partition or clear jointly-owned lands (*Shamilat Deh*) without the sanction of Provincial Government.

Murree Forest Division is part of the Western Himalayan Ecoregion (WHE) that is recognized as one of the Global 200 Ecoregions of the World. Referred to as G200, this classification is a ranking of the world's most ecologically significant areas. MFD is situated in three ecological zones i.e. Moist Temperate zone comprising Coniferous Forests (Blue and Chir Pine), the Subtropical Pine Forests zone (Chir Pine) and Subtropical Evergreen Scrub Forests comprising of broad leaved species (Phulai, Kao, Sanatha etc.). The area is rich in biodiversity. With approximately 192 plant species, 146 bird species, 15 mammals, 22 reptiles and six amphibians. It is an important area for endangered species such as the Grey Goral and the Common Leopard.

In Murree Forest Division, forests are divided into two major tenure categories i.e. 'state owned' and 'privately owned' (community forests). By the end of January 2013, 1,158.8 ha (2,862 acres) of forest land was

*Settlement is a term describing a revenue procedure by which the Government determined the rates and account of land-revenue payable to it by the persons in whom it recognized a permanent right to occupy and till the land or arrange for its tillage. To assess the land-revenue is the primary objective of settlement.

detected as encroachment out of 19,135.56 ha (47,744 acres) of state forest land. The drastically increased forest degradation and encroachment led to a Suo Moto notice (27th January, 2010) case vide W.P. no. 1813/2010 by the Honourable Chief Justice Khwaja Muhammad Sharif of the Lahore High Court (LHC). WWF – Pakistan became a party to this case in February 2010 to provide help to the court in protecting rapidly degrading forest resources. The Punjab Forest Department, Punjab Revenue Department, Survey of Pakistan (SoP) and WWF – Pakistan worked in partnership to conduct a comprehensive exercise of forest delineation. The Lahore High Court also ordered for demarcation of forest boundaries and initiation of criminal proceedings against the forest land encroachers

Originally demarcation of the forest boundaries and fixation of boundary pillars was carried out during the first settlement i.e. 1886-87 and upgradation/verification of settlement etc 1956-57. With the passage of time, there was deterioration or/and removal of the boundary pillars and this was exasperated by the development of housing societies. Land mafia and business tycoon forcefully or with the connivance



of the stakeholders demolished the forest boundary pillars by clearing the vast chunk of state land along the lands of *shamlat deh guzara-malkiat*. Joint demarcation of external forest boundaries by Punjab Revenue and Forest departments' officials was carried out and reports were submitted in the Lahore High Court in connection with the proceedings of writ petition # 1813/2010.

A detailed Geographic Information System (GIS) and Remote Sensing (RS) based mapping was conducted using DGPS (Differential Global Positioning System), single frequency GPS and Total Station (TS) with high level of spatial accuracy. The analysis used images with 0.46 metre resolution in combination with SPOT 2.5 metre resolution satellites images to delineate the boundary and pillars and to highlight major localities and encroachments. A total of 2,149 pillar marks were extracted from the historical data (Survey of India (SOI), 1876-1880 topographic sheets). Furthermore, historical maps did not contain record of pillar marks of forest in the Municipal Forest Range. Out of these 2,149, only 23 numbers of pillars were observed on ground, remaining had been deteriorated or removed.

The joint team conducted field surveys covering a total length of 625 km of forest boundaries from October 2011 to November 2012 and approximately 4,390 GPS/Total Station points were observed. So far, Punjab Forest Department has erected 1,928 pillars over a four year demarcation period from August 2008 to November 2012 to fill in the missing physical references on ground. However, this study

highlights that there is still need to erect 2,462 boundary pillars at their delineated locations to complete the demarcation on ground.

By January 2013, 140 First Information Reports (FIRs) have been registered in the police stations of Murree *tehsil*. The Punjab Forest Department has so far retrieved 517.68 ha (1,279.21 acres) of encroached area out of a total of 1,155.8 ha (2,856 acres) identified. The delineation process identified 2,325 numbers of encroachers in and along the boundaries of the forest currently occupying 638.09 ha (1,576.80 acres) of State Forest land in Murree Forest Division.

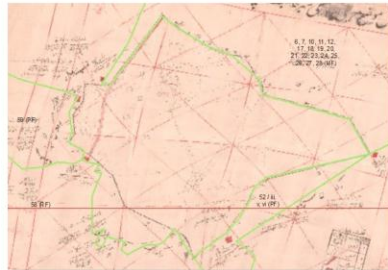
This atlas contains more than 150 maps that have been endorsed by the Punjab Forest Department, Punjab Revenue Department, Survey of Pakistan and WWF – Pakistan.



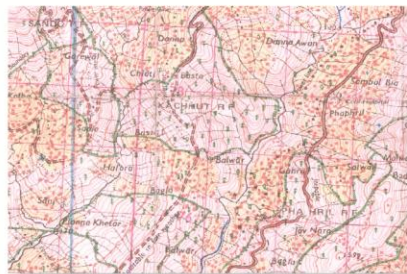
Source Data



Forest History files 1926



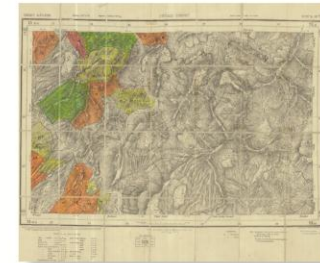
Massavi maps Murree tehsil



SoP 1: 50,000 topographic maps 43G5 4th edition 2003 (3rd edition 1996)



Google Earth Imagery (Multi temporal 2002 to 2011)



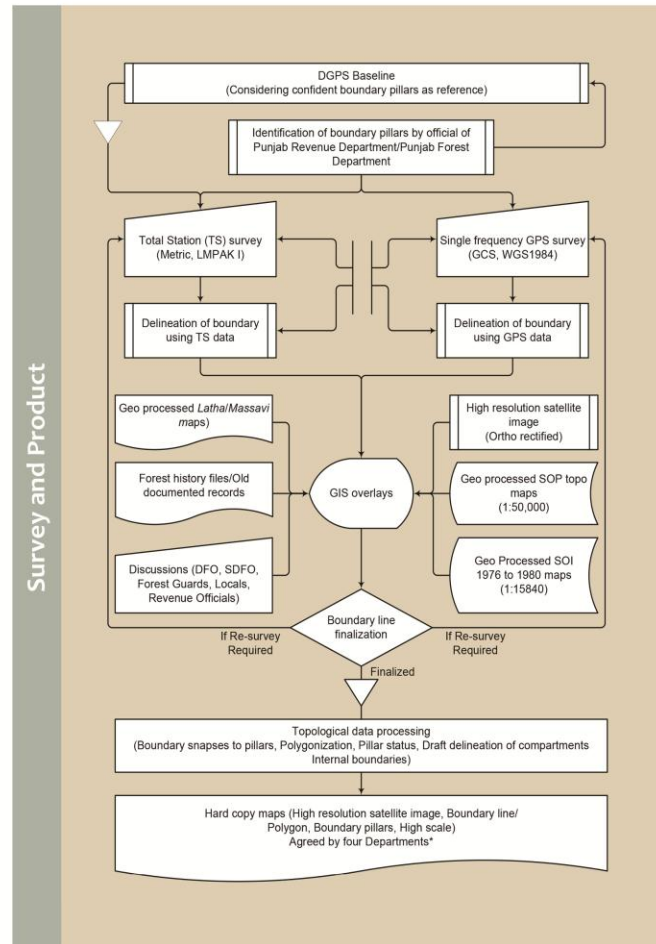
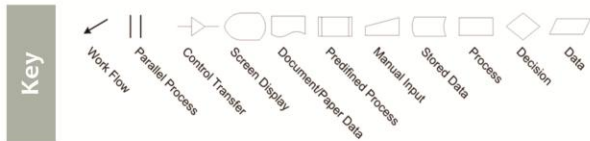
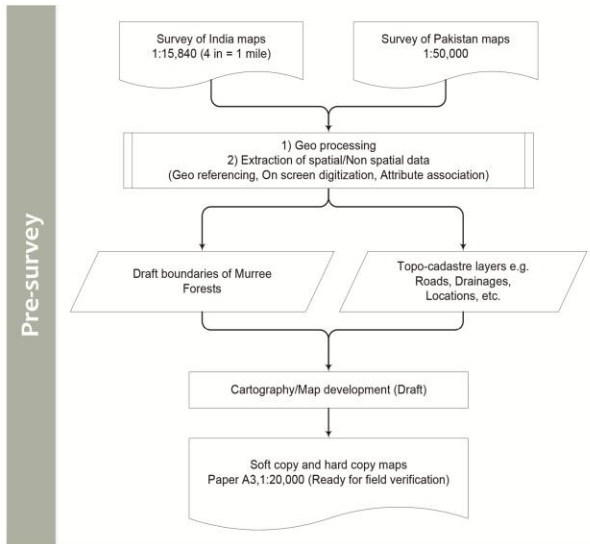
Sol topographic maps of scale 1:15,840 dated 1876 to 1880



GeoEye (46 cm resampled) September 2010

*The encroachment location and area information of the encroached land was provided by the officials of Murree Forest Division and has accuracy of single frequency GPS receiver.

General Workflow



List of Forest (Protected/Reserved) in Murree Forest Division

Sr.No.	Forest	Area* (Acres)		Category
		Acres	Hectares	
1	Angoori/Plasi PF	357	144.47	Protected Forest
2	Ariari PF	1,759	711.84	Protected Forest
3	Aucha PF	609	246.45	Protected Forest
4	Bagla PF	912	369.07	Protected Forest
5	Bara Hotar PF	286	115.74	Protected Forest
6	Baroha RF	899	363.81	Reserved Forest
7	Bhambrot PF	480	194.25	Protected Forest
8	Bhurban RF	607	245.64	Reserved Forest
9	Birgran RF	548	221.77	Reserved Forest
10	Chakka RF	2,744	1,110.46	Reserved Forest
11	Charehan RF	2,005	811.40	Reserved Forest
12	Daleh RF	1,178	476.72	Reserved Forest
13	Darnoiian PF	615	248.88	Protected Forest
14	Dewal PF	657	265.88	Protected Forest
15	Dharjawa PF	235	95.10	Protected Forest
16	Ghanthal RF	448	181.30	Reserved Forest
17	Ghoi RF	1,583	640.62	Reserved Forest
18	Ghora Gali PF	125	50.59	Protected Forest
19	Hukara Ker PF	400	161.87	Protected Forest
20	Jaman PF	895	362.19	Protected Forest
21	Karathian RF	2,630	1,064.32	Reserved Forest
22	Karlot PF	1,464	592.46	Protected Forest
23	Kaseri PF	561	227.03	Protected Forest
24	Kathar RF	2,940	1,189.78	Reserved Forest
25	Khajut RF	628	254.14	Reserved Forest
26	Khanitak PF	861	348.43	Protected Forest
27	Kohatti RF	752	304.32	Reserved Forest
28	Manga RF	1,273	515.17	Reserved Forest
29	Mangal RF	1,049	424.52	Reserved Forest
30	Masot RF	475	192.23	Reserved Forest
31	Municipal Forest	3,580	1,448.78	Reserved Forest
32	Nandkot PF	1,958	792.38	Protected Forest
33	Pail PF	306	123.83	Protected Forest
34	Patriata RF	4,026	1,629.27	Reserved Forest
35	Phaphril PF	683	276.40	Protected Forest
36	Potha PF	632	255.76	Protected Forest
37	Salgran RF	698	282.47	Reserved Forest
38	Salkhetar PF	678	274.38	Protected Forest
39	Sambli RF	1,256	508.29	Reserved Forest
40	Saneo PF	599	242.41	Protected Forest
41	Sangsari RF	365	147.71	Reserved Forest
42	Seribari RF	2,380	963.15	Reserved Forest
43	Simli PF	608	246.05	Protected Forest

List of major encroachments along the boundaries of Forest area (FY 2012)

Sr. No.	Names of Housing Societies	Approximate area encroached (Kanals)
1	Aslam and Brothers Cpt: 83	25
2	Bahria Town Golf City 111/RF	31
3	Cara Green/Sanam Garden HS	94
4	Fraz S/O Azad etc. Cpt:85	31
5	HAKAS Limited	75
6	Hanif Gardawar, Brig Tippu and Shamrez Brothers	320
7	Judicial Town	620
8	OGDC Housing Society	428
9	Sarwar and Brothers	20
10	Others viz. many local residents	8,272

*Areas are as per revenue record.