IUCN Pakistan

Rapid Environmental Appraisal of Developments in and Around Murree Hills

May 2005

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Acronyms and Abbreviations

EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EPD	Environment Protection Department
IEE	Initial Environmental Examination
IUCN	The World Conservation Union
MBT	Main Boundary Thrust
MCE	Maximum Credible Earthquake
NESPAK	National Engineering Services Pakistan (Pvt.) Limited
NMDA	New Murree Development Authority
PEPA '97	Pakistan Environmental Protection Act 1997
SDC	Swiss Agency for Development and Cooperation
SDPI	Sustainable Development Policy Institute
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Agency

Executive Summary

In view of the increased building and construction activities in the Murree Hills, especially the proposed New Murree City, IUCN commissioned a study to identify the key issues that needed attention for sustainable development of the area. The study (a *Rapid Environmental Appraisal*) included review of available relevant documents, field visit and discussions with stakeholders. Based on these limitations, its conclusions are only preliminary, and do not aim to preempt, or be considered a substitute for, the results of a more detailed environmental assessment. Here is a summary of the outcome:

1. In general, the Murree Hills appear to be overcrowded with tourists. There are widespread construction activities, some of them illegal, in and around Murree including the lower stretches of the Rawal Dam catchment area. There are no proper arrangements for the management of solid waste and wastewater. A law suit filed in July 2003 with the Lahore High Court against some of these constructions is still under hearing.

2. A new mega project in Murree Hills, New Murree, is planned as a tourist city of international standard. Covering 4,111 acres of reserved forests at about 2000 meters to 2300 meters elevation in the Patriata area, New Murree will cater to some 50,000 visitors per day. The mandatory Environmental Impact Assessment (EIA) required under the Pakistan Environmental Protection Act 1997 (PEPA '97) for all such projects, has yet to be undertaken.

3. On the other hand, for executing this Rs 8 billion project, the Punjab Government has formed the New Murree Development Authority (NMDA), chaired by the Chief Minister. Under the NMDA Act 2004, full powers have been given to the Authority for overriding certain existing rules and assuming powers given to local governments. NMDA has short-listed Thai Fedcon and NESPAK for developing a Master Plan.

4. Main threats related to the development of New Murree include construction activities in a reserved forest area, geological instabilities, and water supply and sanitation related issues.

5. The proposed plan includes the removal of up to 8 percent of the trees (totaling a maximum number of 11, 680) within the New Murree boundaries which fall under a reserved forest area. And while the total building cover is not proposed to exceed 10.5 percent of this area, given that it is being done in a prime forested area, this drastic change in land use could have far reaching implications that need to be carefully considered.

6. In particular, a baseline study of the biological diversity in the Patriata forest needs to be undertaken to have a better understanding of the resources threatened by the proposed development.

7. The volume of surface runoff from snow melt and rainfall is likely to be affected by the cutting of trees and addition of paved surfaces in New Murree. Similarly, the plan to develop waterfront recreation at Khad Kas and Jehlum River needs careful review for its impact on downstream water quality and aquatic life.

8. Again, while according to the Feasibility Report by NESPAK, geologically stable ridges have been chosen for the construction of buildings, which would follow ground contours, some earlier geological reports suggest against any such construction in the area. A study needs to be carried out to ascertain the impacts of both erosion and seismic activity, especially in view of possible secondary developments in the area.

9. The New Murree Development Authority has been given full control over water resources of the area with the municipal water supply being planned from River Jehlum. Four wastewater treatment plants and a three acre sanitary landfill for solid waste are included in the proposed

plan. However, there is a need to examine the possible extent of secondary developments around New Murree and their possible impacts on water supply and sanitation in the area.

10. The under-construction 43 km long highway passes close to New Murree. This is part of the Islamabad-Muzaffarabad Dual Carriageway N-75. People relocated generally appear to be satisfied with the compensation provided. Nonetheless, road clearing continues to pose a threat to a number of graves at Mughal Abad. The road construction spoils in many areas have been dumped along the water channels and some of these spoil slopes have not been stabilized.

11. For Rawal and Simly dams, data already available need to be analyzed for ascertaining the correlation between different developmental activities in the Murree Hills and incoming water quality and sedimentation rate.

12. A Cumulative Impact Assessment encompassing the developments at both old Murree and Patriata (New Murree), would be more appropriate than an EIA for Simly and Rawal Catchment areas.

13. The Murree District Government needs to be strengthened – in terms of its technical capacity - to better manage the area and natural resources under its jurisdiction from a sustainability point of view.

14. Institutional mechanisms need be put in place and strengthened to prevent unilateral decision-making pertaining to the natural assets of the country.

Rapid Environmental Appraisal of Developments in and Around Murree Hills

1. Introduction

The Murree Hills are studded with different types of buildings, including many multistoried structures. Industrial buildings include sawmills, small-scale cottage operations and medium to large-scale multistory poultry farms. There are also many shopping areas and a wide range of recreation facilities including golf courses that attract a large number of tourists.

The number of houses in the area has increased partly due to the rise in local population and partly due to investments by government and private agencies in developing military colonies, offices, educational institutions, hotels and guesthouses, and residential areas. Many of these are occupied only seasonally.

The number of tourists in the area has expanded quite significantly with the improvement of the roads and transport facilities. Other contributing factors include restricted international travel that has prompted many to spend vacations within the country, and improved national economy that has given a boost to domestic tourism.

It is not uncommon to see kilometer long traffic jams on the roads of Murree Hills during the tourist seasons and on weekends and public holidays. Current estimates indicate the presence of about 111,000 tourists in the area during the peak season. This number is expected to grow by 3.2 percent per annum.

In view of the current situation it is natural to expect that investment will get channeled into further exploiting the tourist potential of Murree Hills. The current state of high liquidity and low interest rates are additional factors favoring investment in real estate. All these factors have led to the announcement by the Punjab Government to develop a mega project, New Murree. This report covers overall developmental activities in the Murree Hills with a focus on New Murree.

2. Developments in Murree Hills

Murree Hills are attracting increasing investment in real estate development activities. The new developments include establishment of many housing societies all the way from the outskirts of Islamabad to the main Murree area.

There are over 350 hotels of various capacities in Murree Hills. According to a report, most of these have violated some construction by-law. The by-law most commonly violated restricts any construction within 20 feet of all roadsides. In addition to this, many hotels are constructed over water channels including sewerage and storm water drains.

Illegal tree cutting is reportedly rampant in the area and some houses have illegal sawmills. Any visitor to the area can spot many individual houses under construction in different parts of Murree Hills. These are in addition to the land being developed for various housing societies. The brisk real estate business for the area can be judged from the increasingly large number of related advertisements appearing in the local newspapers.

In the main Murree area, the historical ‘Cecil Hotel’ is being converted into a multistory apartment complex. The construction of a large shopping mall (‘Millennium Mall’) is also planned. Many housing schemes are being developed in the Bhurban area, for example ‘Bhurban Continental Luxury Apartments’, ‘Bhurban Valley View Apartments’, etc.

At present there is no waste treatment facility in any of these housing schemes, or for that matter, in Murree Hills. Solid waste including plastic bags can be observed littered on slopes all over Murree Hills. It is not uncommon to see garbage being burned along roadsides, the fumes from which are detrimental to the air quality of the area. Rainwater runoff and sewage carry part of the waste down the slopes to Rawal Lake.

The Murree District Government appears ineffective against controlling illegal constructions. There is a need to strengthen its capacity for managing the area appropriately.

At Bhara Kahu, real estate agencies are promoting farmhouses. This would result in an increase of agricultural runoff. There is also a mushroom growth of residential and commercial buildings in the area all the way down to Banigala near Islamabad. The waste from these buildings is dumped into the channels that feed into Korang River, which eventually carries them down to Rawal Lake.

Many housing schemes and independent buildings are also being constructed in the Chhattar area. The largest of these is the 'Utility Housing Scheme', spread over 261 acres, followed by 'Silver Hills Housing Society' that occupies 250 acres of land. There are also the much advertised 'Sanam Garden' (200 acre), 'Doctors' Housing Scheme' (150 acres) and 'Judicial Town' (100 acres) etc., all located in the Rawal Lake catchment area.

2.1 Rawal Lake:

The Rawal Lake had a storage capacity of 47,230 acre-feet when it was developed in 1960. Sedimentation over the years has reduced its storage capacity to 31,000 acre-feet. This sedimentation originates from natural and human factors including many construction activities in its catchment area from Banigala up to Murree Hills. The sedimentation rate, water quality and quantity data already available with WASA need to be correlated with construction activities in the catchment area for ascertaining the real cost of these developments.

3. Legal Action

In July 2003, a group of concerned citizens filed a case in Lahore High Court to save the picturesque hills of Murree from a possible human catastrophe due to the growing danger of landslides that was haunting the locals owing to heavy constructions, ruthless deforestation and massive quarrying. The petition referred to the Swiss Agency for Development and Cooperation (SDC) study of 1988 that had pointed out the high potential for landslides in the Murree Hills. The hearing of this case continues to date. However, the New Murree issue was not included in this lawsuit.

The lead lawyer Mr. Ather Minnalla feels that not much headway is expected in this case, as many vested interests and huge investments are involved. Another factor, according to him, is that any judgment on this case will have a strong bearing on the development in New Murree. This, according to him, further reduces the chances of success of this lawsuit.

4. New Murree

Four alternate sites were examined within the Murree Hills for developing a tourist city. These areas were Ban, Barian, Charihan and Patriata. Eventually Patriata was selected as the most appropriate site for the development of New Murree.

Located at the highest point in the Punjab Province (2,223 m), New Murree is envisaged to be a tourist city of international standards. It will be spread over an area of 4,111 acres (about 16 square kilometers) at Patriata and would range in elevation from about 2,000 meters to around 2,200 meters. It will include 3,849 acres of the Murree Forest Division and 262 acres of Rawalpindi North Forest

Division. No acquisition of private land or relocation of the local population is planned, at least at this stage.

Facilities developed at New Murree will include a five star hotel, 7 international standard hotels, villas, cottages, and a wide range of recreational and amusement facilities. Reportedly, New Murree will have a planned capacity for 50,000 visitors per day.

A 43 kilometer long segment of dual carriage highway that links Murree Road from Satrameel to Lower Topa, is at an advanced stage of construction. This highway will eventually be extended to Muzaffarabad. The Islamabad-Muzaffarabad Dual Carriageway N-75 will provide easy access to New Murree.

For managing the proposed developments, the Punjab Government established the New Murree Development Authority (NMDA) in January 2004. The government has since been inviting both local and foreign investors for different projects in New Murree that have an estimated total capital cost of Rs 8.2 billion. Technical services are being provided by NESPAK and Thailand's architectural and construction giant, the Federation of Design and Construction Services (Fedcon).

4.1 New Murree Development Authority (NMDA)

Under the NMDA Act 2004, the Authority is chaired by the Chief Minister of Punjab. Members include Chief Secretary, Chairman Planning and Development Department, and Secretaries of Finance; Tourism and Resort Development; Housing, Urban Development and Public Health Engineering; Forestry, Wildlife and Fisheries; Communication and Works; and Environment Protection. The Director General NMDA is the Member/Secretary. In addition to these, there are 5 non-official members.

The Act gives NMDA the exclusive right to use water emanating from the main source situated outside the area and other supply resources within the area.

Under the Indemnity Clause of the Act, “No suit, prosecution or other legal proceedings shall lie against the Authority, the Chairman, any member, officers, servants, experts and consultants of the Authority in respect of anything done or intended to be done in good faith under this Act.”

Furthermore, “Notwithstanding anything contained in any other law for the time being in force, the Authority may exercise and perform any or all powers and functions of the local government as defined and provided under the Punjab Local Government Ordinance, 2001 (XIII of 2001).”

The Act also allows NMDA to override other laws. Hence, “in the event of any conflict or inconsistency between the provisions of this Act and the provisions of any other law for the time being in force, the provisions of this Act, to the extent of such conflict or inconsistency, shall have an overriding effect.”

The project plan has been presented to both the Prime Minister and the President and has reportedly received support from the highest levels. One of the ex-Prime Ministers is on record having said that the President was expected to become the Patron-in-Chief of New Murree project.

It is no surprise, then, that in spite of clear directions by the Pakistan Environmental Protection Agency (Pak-EPA), no effort has so far been made to conduct an Environmental Impact Assessment of this mega project proposed in a reserved forest[1].

The Pakistan Environmental Protection Act 1997 (PEPA ’97)made Environmental Impact Assessment (EIA) a mandatory requirement for all developmental projects that qualify for an EIA under Schedule II of “Review of IEE and EIA” Regulations 2000. As per Schedule II (List of Projects Requiring an EIA), Clause H (Urban Development and Tourism), Part 1 (Landuse Studies and Urban Plans (Large Cities), EIA is a mandatory requirement for the proposed New Murree Township. It should form an

[1] See the Forest Act, 1927

integral part of the project feasibility which assesses the environmental and social impacts of the project, assesses alternatives, demand, site, technology, etc., suggests mitigation measures to eliminate or minimize impacts, and provides environmental management and monitoring plan. This is imperative to assist the decision-makers in making an informed decision. If an EIA of the project has not been undertaken, the Government of Punjab is in violation of the PEPA '97. The Environmental Protection Department (EPD) should have taken serious note of it and asked the relevant department for an EIA. Even if an EIA of the project has been undertaken, it should be made public and public hearings should be held to seek the input of stakeholders.

4.2 Key Issues related to New Murree

The pre-feasibility study had identified four key constraints in development of New Murree – reserved forests, difficult topography, landslides and seismic faults. Additional issues often raised by the general public and some professionals are water supply and sanitation, with possible impacts on water quality and supply in the downstream Islamabad.

4.2.1 Reserved Forest:

Pakistan is faced with the acute problem of forest resource scarcity coupled with the deteriorating natural environment. The meager forest cover, 4.8 percent of the total land area, is further deteriorating due to heavy demands of rapidly increasing population and urbanization. Particularly in the Punjab, the forest cover is only 3.7 percent of the total area, which is equivalent to only 0.771 million hectares[2].

Because of their watershed value and the highly fragile ecosystem, the forests in the Patriata area have been kept in the reserved category since British times vide notification No. 431 dated October 27, 1886[3]. Even after the creation of Pakistan, the status of Patriata Forest was not changed and it continued to be treated as a reserved forest. The very fact that these natural forests had been placed under the reserved category implies that it was indeed the best and most appropriate land use of this forested area. These forests receive/ trigger the highest rain and snowfall and are a source of fresh water for the region including the twin cities of Islamabad and Rawalpindi.

According to a NESPAK report, there are about 146,000 trees in the forest of the project area. The proposed plan accounts for removing 5 to 8 percent of these trees (a total number of 11,680). Clearing large areas of forest is not envisaged. Tree removal will be site specific with provision to modifying building layouts for minimizing tree felling. But given the record of enforcing such bans and quotas in the past, a wider damage to these prime forests can't be ruled out.

The surface runoff from snow melt and rainfall is likely to be affected by the cutting of trees and addition of paved surfaces in New Murree. The construction of roads, pavements and other structures reduce the infiltration area that will ultimately affect the recharging of the aquifer of the twin cities. Tube-wells cater to about 50 percent of the present water demand in Rawalpindi city, while almost 40 percent of the water demand in Islamabad is being met by abstraction from the aquifer, which is recharged by the flow from the surrounding hills[4], including Patriata. These factors need to be quantified for their likely downstream impacts. The groundwater table in Rawalpindi is falling rapidly at the rate of 1.5m/year[5]. Snow storage at Patriata will also be affected. A study conducted at the end of the past century in France[6] states that, "Those foreste in very high altitutes (2000 m+) harvest (18 percent) additional precipitation at the regional level. In the case of closed – canopy of conifer stands, the interception of precipitation is 25 – 50 percent more than bare mountains. Interception also increases with growing age and density of conifer stands and increases to 25 percent at 120 years.

[2] GoP Statistics Division
[3] Gazette Notification, Government of India.
[4] February 1998 JICA Report "Regional Study for Water Resources Development Potential for the Metropolitan Area of Islamabad – Rawalpindi".
[5] NESPAK Rawalpindi Environmental Improvement Project in the Islamic Republic of Pakistan, August 2004.
[6] Research Center of Nancy 54280 Champenoux, France.

Furthermore, mountains covered by frequent fog are able to condensate by 30 – 50 percent more than the open land. Snowmelt takes three weeks longer time in forests than on bare mountains".

The Punjab Government maintains that there is very little wildlife in the area and since New Murree will be confined to less than 0.2 percent of the overall mountain habitat, there will be no loss of wildlife. This claim could not be verified by field observations and further studies would be required to assess the situation. However, a forest of this age and extent is expected to have valuable biodiversity and loss of forestland would possibly lead to a direct loss of wildlife habitat.

As a measure for wildlife protection, the New Murree plan includes further development of the already delineated Morti Wildlife Park and Wildlife Game Reserve extending from Chijjana Forests down to River Jehlum. Some experts question the suitability of the Chijjana area for the protection of moist temperate species. The key question remains whether any notable wildlife is left in the already disturbed area that needs additional protection measures? This question can only be answered by carrying out a baseline study of biological diversity in the area.

Additionally, the plan to develop waterfront recreation facilities needs careful review. These developments are planned at Khad Kas, a very important source of water in the area that also feeds into Simly Dam. Likely impacts of such developments on water quality and aquatic life need to be ascertained and factored in the planning process.

4.2.2 Geological instability:

New Murree is planned on rocks belonging to Murree Formation of Miocene Age, which is characterized by alternating beds of sandstone, shale and siltstone that have varying thickness. Tectonic movements over the millennia have caused many structural disturbances. See Annex 1 for a detailed geological profile of the Patriata area.

Seismic risks to New Murree emanate from two active geological faults – The Main Boundary Thrust that passes about 15 km northwest of the area, and the Jehlum Fault that passes about 10 km east of the area. Within the twentieth century, earthquakes up to magnitude 6 on the Richter scale have been recorded within a 200 km radius of Patriata.

Most of the hill slopes in Murree and Patriata area are covered with variable thickness of colluvium. Excavation made for the construction of various structures especially at the toe of the slope destabilizes the existing state of stresses and promotes land sliding. A report by the Geologist to Government of India whose services were acquired by the Army in 1923, and another report by the Horst Boreerky, Soil and Material Specialist engaged by the PWD, opposed any more construction in the area. Mr. Horst categorically recommended that construction should not be allowed on slopes exceeding 20 degrees in the Murree area.

On the eastern slopes of Patriata, debris fall and small-scale rockslides are reported from a few locations along the existing road, which connects Patriata with Dhirkot Kethwalan. These slides are attributed to the combined effects of both natural forces and human activities. The Forest Department runs a largely deodar nursery in this area.

Several reports that examine the landslide issues in Murree Hills are available. One of these was undertaken by the Swiss Agency for Development and Cooperation (SDC) for the Murree-Kahuta Development Authority in 1988-89. The objective was to identify the area for an erosion control project, assess the local conditions and problems, ability of partner organizations in solving problems, and suggest erosion control activity with public participation. The report highlighted severe erosion problems, and emphasized that erosion in Murree Tehsil area will be intensive due to natural forces.

The SDC report suggested concerted efforts by the relevant government agencies and local populations, for which emphasis was laid on training programmes and extension work. The key reasons identified by this report include rapid infiltration of water during rainfall, causing soil saturation and temporary rise of pore water pressure in alluvium, which reduces its shear strength and eventually leads to landslides. The velocity of surface runoff is high on steep slopes causing high

erosion, destabilizing streambeds and banks, and developing tension cracks that lead to landslides. To reduce these risks, the report emphasized the need for a good and well-maintained drainage system. The New Murree plan appears to take stock of such reports and their suggestions, and thus includes an elaborate drainage system.

According to the National Engineering Services Pakistan (Pvt.) Limited's (NESPAK) feasibility report, most of the spots selected for New Murree development are located at or near the top of the ridge on thick sandstone beds that are quite stable. This area is mostly covered with moderately thick pine forest and is easily approachable from the Patriata Cable Car Terminal. Other New Murree blocks selected at the eastern side of the ridge facing the Jehlum River are located on alternating sandstone and shale beds, which are also stable in nature. This area is also mostly covered with thick pine forest. To deal with the geological instability factors, the existing land use plan is based on an area suitability map. The road alignment follows the existing tracks and building construction plans follow ground contours. The net building area is restricted to 10.5 percent of the total area.

However, this apparent contradictions between this feasibility report and those of the earlier geological studies mentioned above, needs to be resolved. Given the availability of geological surveys and high level of investment, it is not likely that any block of New Murree will be developed on a known landslide prone area. Nonetheless, any secondary development, especially at the lower elevations in the area may not be that carefully planned. This could potentially increase risks to uphill locations belonging to New Murree.

The combined impacts of erosion and seismic activities need to be considered in view of possible secondary developments in the area.

4.2.3 Water Supply & Sanitation:

Presently, there are no waste management or sanitation facilities in and around the proposed location of New Murree. The waste generated by the local populations and tourists is seen dumped on the slopes in the Patriata area.

Patriata drains through many water channels into the River Jehlum. Several springs can be seen on either sides of the Patriata ridge. Part of the runoff from this ridge feeds Simly Dam (Islamabad) and Soan River. Many springs flowing down into the valley supply water to over a dozen small communities in places like Gulehra Gali, Ban and Kotli Sattian. The annual average rainfall in Muree Hills is about 1,770 mm, half of which occurs during the monsoons. The area remains under snow cover during parts of December and February, and during most of January.

The existing water supply in Patriata is provided through natural springs. These are tapped with pipes and the water is stored in small tanks and reservoirs, from where the local communities carry it home. For official buildings and restaurants, water is electrically pumped from the springs to above ground and overhead tanks.

To meet the water requirements of New Murree, the plan includes pumping water up from the River Jehlum that flows about 22 km northeast of the hill station. This will supply 5.5 MGD (million gallons per day) of water in the first phase, and up to 11 MGD in the second developmental phase beginning from the year 2025.

For treating the wastewater generated from New Murree, the plan includes four sewage treatment plants to take care of the needs of four different building clusters. This approach minimizes disturbance to the natural settings that would have happened in running long sewerage lines. The total cost of the sewerage system is estimated at Rs 240 million. The New City is divided into eleven major drainage zones for storm drainage. The cost of the storm drainage system is approximated at Rs 115 million.

Solid waste generation in the area is expected to be 14,000 tons per year for which a three acre sanitary landfill in proposed.

The natural gas supply to the area, including the old part of Murree, has been planned and will cost Rs 500 million. The provincial and federal governments will split this cost evenly.

However, experience elsewhere shows that, there is always some unplanned development around any planned area. Nonetheless, the study did not find any local landowner willing to sell land to outsiders. This appears to be a community decision, which is so far discouraging any such move. On the other hand, one does find newspaper advertisements by real estate agencies luring prospective buyers in to purchasing plots of various sizes in New Murree. This can be taken as an indication that NMDA will definitely face secondary development problems like many other similar Authorities in the country.

There is a need thus to examine the possible extent of secondary developments around New Murree and their possible impacts on water supply and sanitation in the area. Other related issues that need examination include increased risks of landslides due to unplanned construction around New Murree, and impacts of additional waste from the area on downstream water quality. This would in turn affect the quality and quantity of water coming into the Simly Dam with possible implications for users in Islamabad.

5. Islamabad - Muzaffarabad Dual Carriageway N-75

This Rs. 4815.394 million highway is of strategic importance and links the Pakistan's Capital, Islamabad, with the capital of Azad Jammu and Kashmir, Muzaffarabad. Under the first phase, a 43 km long four-lane divided carriageway is under construction by a local contractor HAKAS. It links Satrameel (Islamabad) and Lower Topa in Murree Hills. The scope of work includes the construction of five bridges and 200 cross-drainage structures. However, no EIA seems to have been undertaken for this project in clear violation of PEPA 1997. Such an EIA report also needs to be made public and public hearings are required to be carried out to share its findings and seek input of stakeholders.

Staff at the site was unable to provide information on the number of trees removed for the under construction road, though they did refer to tree plantation later, "where necessary". People relocated for road construction generally appeared to be satisfied with the compensation. At one location near Murree (Mughal Abad) people were unhappy because of the destruction of 17 graves. They had put up a signboard on site warning the National Highway Authority and the contractor HAKAS that any further removal of earth from the foothill would cause the sliding down of the graveyard with 28 new graves. But generally people were pleased that the road was passing near their settlements.

A 17 km stretch of this road passes through the catchment area of the Simly Dam. Part of the Rawal Catchment area is also affected. The road construction spoils in many areas have been dumped along the water channels. Some of these spoil slopes have not been stabilized. On the other hand some of the existing slopes were stabilized with engineering structures as a road protection measure. It is difficult to judge from a field visit if the creation of new slopes and stabilization of old slopes will result in a net increase, or otherwise, in the sedimentation rate of Simly Dam.

5.1 Simly Dam

The Simly Dam is located 35 kilometers northeast of Islamabad and was constructed in 1982 at a total cost of Rs. 643.443 million. Presently, the Simly reservoir has a storage capacity of 23,000 acre-feet, which will be increased to 33,000 acre-feet by mid 2005. This water reservoir is also recognized as an essential constituent of the bulk water supply scheme for Islamabad. It stores not only the perennial flow from the springs of the Murree/ Patriata mountain aquifer but also a considerable part of flood water of the Soan River. Water released from the reservoir is conveyed to Islamabad through twin conduction main pipes and is the cheapest source of fresh drinking water for the city.

There are two main streams feeding the Simly Dam catchment namely the Soan Nullah and the Khad Nullah. The area receives heavy precipitation in the form of snow and rainfall. The mean annual

rainfall around Patriata is about 1770 mm per annum, most of which occurs during July – September and February – April. The precipitation causes rapid erosion of colluvial soils and soft rocks over steep sloping areas.

According to a WAPDA study, sedimentation had a "minor impact on the reservoir yield" during the period of 1994-99. The observed sedimentation rate was indeed factored in the original design of the reservoir. Sedimentation in both Rawal and Simly reservoirs is examined on a regular basis. These records need to be analyzed and any fluctuations in sedimentation need to be correlated to events like tree felling, earthwork and construction activities in the catchment areas in order to understand which type and what extent of activities lead to how much sedimentation. This correlation can show the loss of storage capacity and hence the actual cost of development in the catchment area.

6. Recommendations

1. Pak EPA has suggested an EIA of the New Murree Township to be undertaken as per Pakistan EPA's "Guidelines for Sensitive and Critical Areas". A detailed Environmental Management and Monitoring Plan should also be developed to ensure that the proposed mitigation measures are implemented in their true spirit. This is a mandatory requirement of the law under PEPA 1997.

2. While supporting Pak EPA's suggestion in principle, better planning would be possible if a Cumulative Impact Assessment approach is adopted. Such an approach would allow for an improved understanding of the threats to both Rawal and Simly catchment areas. The multitude of developmental activities including New Murree would be factored in the study.

3. Either separately or as part of the cumulative impact assessment, detailed geological and hydrological studies of the project area should be conducted by a competent authority. Decisions regarding the proposed development activities should be based on the findings of these studies.

4. A baseline study of the biological diversity in the Patriata forest needs to be undertaken to have a better understanding of the resources that may be threatened by the proposed development in the area.

5. The Murree District Government needs to be strengthened – in terms of its technical capacity - to better manage the area and natural resources under its jurisdiction from a sustainability point of view.

6. Institutional mechanisms should be put in place to prevent unilateral decision-making pertaining to the natural assets of the country.

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Consultations

Because of the sensitive nature of the issue, public consultations were made discreetly, through casual conversations, without divulging the purpose of the exercise. Names of people interviewed were thus not recorded.

This report is based on the work carried out by the following consultants:

1. Dr. Parvaiz Naim
2. Mr. Arshad Abbasi

A number of other experts were also consulted, the most notable being:

Mr. Ather Minnallah, Advocate - the lawyer who filed a case against developments in Murree Hills

Mr. Shaheen Rafi Khan, and Mr. Mohsin Babbar from SDPI

Mr. Zia-ul-Islam, Director EIA, Pak-EPA

IUCN – The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organisations in a unique world partnership: over 1000 members in all, spread across some 140 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

IUCN Pakistan has six programme offices in cities from the north to the south, multiple field offices and a large portfolio of projects. It is one of the seven Country Offices of