Chashma Barrage

Location:
32º 25' N, 71º 22' E; 25 km southwest of Mianwali, off the Mianwali - Dera Ismail Khan road, Punjab Province. Also includes areas located in NWFP-Dera Ismail Khan District.

Area: 34,099 ha.

Altitude: 225m.

Biogeographical Province: Indus Ganges Monsoon Forest.

Wetland type: Water storage reservoir.

Description of site:
A large barrage on the Indus river with a series of embankments or flood bunds which, at low water levels, divide the reservoir into five shallow lakes each of up to 250 ha in area. The construction was completed in 1971. Maximum flooding occurs in spring. The depth of the five lakes varies from 0.2m in the dry season to 5.0m at the height of the flood season; the depth of the main river channel varies from 4.6m to 8.8m. PH values range from 6.5 to 7.2.

Climatic conditions:
Dry subtropical climate with hot summers and cool winters. The annual rainfall varies from 300-500mm, and the relative humidity from 22-85%. the average maximum temperature in June is 41ºc and the average minimum in January is 4.5ºc.

Principal vegetation:
The aquatic vegeation consists of Hydrilla verticillata, Nelumbium speciosum, Nymphaea lotus, Typha angustata, Typha elephantina, Phragmites australis, Potamogeton crispus-Myriophyllum sp.-Nymphaeoides cristatum, Potamogeton pectinatus, Saccharum spontaneum, Vallisneria spiralis and Zannichellia palustris. The natural vegetation of the region is a mixture of subtropical semi-evergreen scrub and tropical thorn forest with species such as Olea ferruginea, Acacia modesta, A. nilotica, Adhatoda vasica, Dodonaea viscosa, Gynmosporea royleana, Prosopis cineraria, Reptonia buxifolia, Salvadora oleoides, Tamarix aphylla, T. dioica, Zizyphus mauritania, z. nummularia, Chrysopogon aucheri, Lasiurus hirsutus, Heteropogon contortus and Panicum antidotale. Prosopis glandulosa has been introduced in the area. Most of the natural thorn forest on the plains to the east of the Indus has been cleared for agricultural land and for irrigated plantations of Dalbergia sissoo and other species.

Land tenure:
The wetland is state owned (Irrigation Department, Government of the Punjab); adjacent areas are partly state owned and partly privately owned.

Conservation measures taken:
The wetland was first declared as a Wildlife Sanctuary of 33,084 ha in 1974. The Sanctuary was re-notified in July 1984, and again in January 1989 and since then, the level of protection has greatly improved. Some important areas on the right bank of the River Indus and the reservoir were not included in the sanctuary. The areas have now

been thoroughly surveyed, and a stretch of 3km all around the resrvoir i.e., on both sides of the reservoir, and downstream of the Barrage structures, has been proposed to be included within the boundaries of the sanctuary.

Land use:
Storage of water for irrigation, generation of electricity, and fishing. Fishing leases are granted by WAPDA. Reeds (*Phragmites australis* and *Typha elephantina*) and kana *(Saccharum* spp.) are harvested for use in local cottage industries. A fish hatchery has been established at the reservoir, which became operational in 1987. Surrounding areas are used for agriculture, livestock grazing and forestry.

Disturbances and threats:
There are plans to construct a large storage dam at Kala Bagh, upstream of Chasma. The construction of this dam would affect the water regime at Chasma Barrage and could limit it's use for water storage. Fishing activities at the wetland and livestock grazing on the shoreline cause a considerable amount of disturbance, and the marked fluctuations in water level and harvesting of reeds have an adverse effect on the aquatic vegetation.

Economic and social value:
The principal values are flood control, storage of water for irrigation, generation of electricity and fisheries production. More than 1000 metric tonnes of fish were harvested in 1992. The yield has increased to a large extent in recent years. The marsh vegetation supports a local weaving industry. the barrage also provides excellent opportunities for scientific research and conservation education.

Fauna:
A very important staging and wintering area for a wide variety of waterfowl. The wetland has been supporting over 50,000 Anatidae and coots in mid-winter, and in some years many more. Over 114,000 birds were present in January 1975, and about 100,000 in January 1987 and January 1988 and more than 200,000 in January, 1989, 1990 and 1991. The most abundant species are *Anas penelope, A. crecca, A. acuta, Aythya ferina* and *Fulica atra*. Maximum counts of *Fulica atra* have been 165,400; 85,600 and 82,400 in January 1989, 1990 and 1991 respectively. There is a small wintering flock of *Anser anser* and *Anser indicus* occasionally occurs on passage and in winter (recent maxima of 277 in 1982 and 65 in 1985).

Peak counts have included:

710 *Phalacrocorax niger*
890 *Egretta garzetta*
220 *Ardea cinerea*
500 *Tadorna ferruginea*
7,436 *A. Strepera*
3,900 *A. Platyrhynhos*
29,840 A. clypeata
25,000 *Aythya ferina*
165,418 *Fulica atra*
560 *Larus ridibundus*
800 Nycticorax nycticorax
1,800 *E. alba*
220 *Platalea leucorodia*
13,000 *Anas penelope*

62,104 *A. crecca*
10,100 *A. acuta*
3,156 *Netta rufina*
3,100 *A. fuligula*
130 *Philomachus pugnax*
160 *Sterna aurantia*

Mid winter waterfowl counts in January have been affected in the years 1992 and 1993 when only 11,000 and 29,000 waterfowl were counted on the Reservoir. This has probably been the result of water management programmes adopted by WAPDA and the Punjab Department of Power and Irrigation. Barrage gates are closed in January and the water level rises above normal, thus submerging the aquatic vegetation. This reduces the food supply for diving ducks, which ultimately affects the waterfowl population. the population fluctuations are being monitored closely. Other regular winter visitors occurring in smaller numbers include *Podiceps cristatus, P. nigricollis, Phalcrocorax carbo* and many species of shore birds, gulls and terns. The barrage is also an important staging area in spring and autumn for the cranes (*Grus grus* and *Anthropoides virgo*). Other waterfowl which have been recorded include *Mycteria leucocephala, Ciconia nigra, Phoenicopterus ruber, Himantopus himantopus, recurvirostra avosetta* and *Glareola lactea*.

The sanctuary is also a haven for summer breeding birds. More than 50 species are normally recorded during a day in summer. Long-tailed Warbler *Prinia burnessi*, a globally endangered species has been recorded here.

The Indus Dolphin *Plantanista minor* occurs in some stretches of the Indus River upstream of the Barrage and has been recorded at Chashma, though not sighted recently. Other mammals occurring in the area include *Sus scrofa cristatus, Axis porcinus, Canis aureus, Felis libyca* and *Lutra perspicillata*.

The rich fish fauna includes *Gadusa chapra, Notopterus chitala, Catla catla, Cirrhinus mrigala, C. rego, Labeo rohita, L. microphthalamus, Puntius ticto, P. stigma, Barilius vagra, Wallago attu, Rita rita, Bagarius bagarius, Mystus aor, M. seenghala, Heteropneustes fossilis, Eutropiichthys vacha, Nandus, Mastacembelus armatus, m. pancalus, Ambassis nama, A. ranga* and *Channa punctatus*. Other aquatic fauna included *Hirudinaria* sp, *Palaeomon dayanus, P. lamarrei, Rana tigrina, Kachuga smithi, Trionyx gangeticus* and *Lissemys punctata*.

Special flora values: None known.

Research and facilities:
Annual mid-winter waterfowl counts have been carried out since 1971, and a study of the status of the Indus Dolphin is currently being conducted by the Wildlife Research Institute, Faisalabad. Summer breeding bird surveys are also conducted by the institute staff who are also busy writing a Management Plan for the Sanctuary.

Criteria for Inclusion: 1c, 2a, 2b, 2c, 3a, 3b (Rec C 4.2 (Rev)).

1c. Particularly good representative of a Wetland type in the region.

2a. Supports an appreciable assemblage of rare, vulnerable or endangered species or

subspecies of plant or animal or an appreciable number of individuals of any one or more of these species.

2b. Of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna.

2c. Of special value as the habitat of plants or animals at a critical stage of their biological cycles.

3a. Regularly supports more than 20,000 waterfowl.

3b. Regularly supports substantial numbers of individuals from particular groups of waterfowl indicative of wetland values, productivity or diversity.

Bibliography:

Ahmad, A (1986). Recent tragedies with the waterfowl population on some of their wintering habitats in Pakistan. WWF-Pakistan Newsletter 5 (2): 4-8.

Ahmad, A (1987). The wetland and waterfowl wealth of Pakistan. Paper presented at Conference on Wetland and Waterfowl Conservation in Asia, Malacca, Malaysia, 23-28 February 1987. IWRB and Interwader.

Anon (1982). Pakistan National Report. In: Spagnesi, M (ed), Proc. Conference on Conservation of Wetlands of International Importance especially as Waterfowl Habitat, cagliari, Italy, 24-29 November 1980. Suppl. Richerche di Biologia della Selvaggina, VIII(1): 893-905.

Anon (1984). National Report of Pakistan. In: Proc. Second Conference of the Contracting Parties, Convention on Wetlands of International Importance especially as Waterfowl Habitat, Groningen, Netherlands, 7-12 May 1984: 381-390. Gland, Switzerland: IUCN.

Anon (1987). National report of Islamic Republic of Pakistan. Paper presented at Third Conference of the Contracting Parties, Convention on Wetlands of International Importance especially as Waterfowl Habitat, Regina, Canada, May/June 1987.

Carp, E. (1980). Directory of Wetlands of International Importance in the Western Palearctic. Gland, Switzerland: IUCN.

Chaudhry, A. Aleem. (1988). Indus Dolphin. WWF-Pakistan Newsletter. Vol. 7. No. 2. PP. 6 - 7.

Chaudhry, A. Aleem and Chaudhry, S. A. (1988). Indus dolphin population on the increase in Punjab. proc. Pakistan Congr. Zool. Vol. 8 PP: 209 - 214.

Chaudhry, A. Aleem and Khalid, Umeed. (1989). Indus dolphin in the Punjab. Proc. Pakistan Congr. Zool. Vol. 9 PP:291 - 296.

Chaudhry, A. Aleem and Khan, ashiq Ahmad. (1988). Waterfowl population on the wetlands of the Punjab. Proc. Pakistan Congr. Zool. Vol. 8 PP: 241 - 214.

Groombridge, B. (1982). The IUCN Amphibia-Reptilia Red Data Book, Part 1: Testudines,

Crocodylia, Rhynchocephalia. Gland: IUCN.

IUCN. (1975) A Classification of the Geographical Provinces of the World. Gland.

Karpowicz, Z. (1985). Wetlands in East Asia - A Preliminary Review and Inventory. ICBP Study Report No. 6. Cambridge: ICBP.

Khan, Ashiq Ahmad and Chaudhry, A. Aleem (1988). Chashma Barrage: A Wetland of International Importance WWF-Pakistan, Newsletter, Vol. 7 No.2 PP12.

Koning, F. J. and Dijksen, L. J. (1971). IWRB Mission to Pakistan and Afghanistan, February 1971. Unpublished report submitted to IWRB.

Koning, F. J. & Koning-Raat, M. J. (1974). IWRB Mission to Pakistan, Winter 1973/1974. Unpublished report submitted to IWRB.

Koning, F. J. & Koning- Raat, M.J. (1975). IWRB Mission to Pakistan, winter 1974/1975. Unpublished report submitted to IWRB.

Koning, F. J. and Koning-Raat, M.J. (1976). IWRB Mission to Pakistan, 1976. Unpublished report submitted to IWRB.

Koning, F. J. & Walmsley, J.G. (1972). IWRB Mission to Pakistan, February 1972. Unpublished report submitted to IWRB.

Koning, F. J. & Walmsley, J. G. (1973). IWRB Mission to Pakistan, February 1973. Unpublished report submitted to IWRB.

Naik, I. u. (1986). Inland fisheries and aquaculture in Pakistan: review of the progress and new activities. Paper presented at FAO/IPFC Workshop on Strategies for the Management of Fisheries and Aquaculture in Mangrove Ecosystems, Bangkok, Thailand, 23 - 25 June 1986.

Reeves, Randall; Chaudhry, A. Aleem and Khalid, Umeed, (1991). Competing for water on the Indus Plain: Is there a future for Pakistan's River dolphins? Environmental Conservation. vol. 18, No. 4: 341-350.

Rao, A. L. (1989). Wetlands of International Importance - Pakistan. In: A Directory of Asian Wetlands, IUCN 295 - 365 (Ed. Derek Scott).

Ramsar Convention Bureau (1990). Proceedings of the Fourth Meeting of the Conference of Contracting Parties Vol. 1.

Roberts, T. J. (1984a) Pakistan National Report on Wetlands and Waterfowl Conservation. Paper presented at the 10th Asian Continental Section Conference ICBp, Kandy, Sri Lanka, April 1984. ICBP.

Roberts, T. J. (1984b). Brief Review of the Status of wetlands in Pakistan. Paper presented at the 10th Asian Continental Section Conference of ICBP, Kandy, Sri Lanka, April 1984. ICBP.

Roberts, T.J. (1991). The Birds of Pakistan, Vol. I, Non-Passeriformes Oxford.

Roberts, T.J. (1992). The Birds of Pakistan, vol. II, Passeriformes Oxford.

Savage, C. D. W. (1968). the Wildfowl and Wetland Situation in West Pakistan. in: Proc. Technical Meeting on Wetland Conservation, Ankara - Bursa - Istanbul, 9 - 16 October 1967. IUCN Publications new series, No. 12: 122 - 128.

Savage, C. D. w. (1972b). Wetlands of Asia. The Outdoor man Vol. 2 (9 & 10): 57 - 63.

Scott, D. (1989). A Directory of Asian Wetlands. IUCN. 1181 PP.

Scott, D. , Rao, A. L. , and Beg, A. R. (1990). The Wetlands of Pakistan and the Ramsar Convention. Unpublished Report to Ramsar Secretariat, 29PP.