



## Floral diversity of Chashma Barrage Mianwali at Indus River in Punjab Pakistan

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### Abstract

Present study work was conducted to investigate about the current status of floral diversity at chashma barrage in district Mianwali which is rich with floral diversity and is located on Indus River in Pakistan. Area has unique importance due to presence of Nuclear power station and other energy generating resources along with beautiful lakes and diversity of plants. Fish industry is the main economic source for the populace of the area. Extensive study survey was conducted during May 2018 to August 2019 and sample from 43 plant species belong to 19 families were collected, pressed and dried for herbarium record in university of agriculture Faisalabad.

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## Introduction

Floral diversity play uncountable role for biosphere (Ali, 2008). Plants play great role for changing social and economic condition of human along with deprivation of lands and destruction in the area. Diverse kind of floral diversity is found in Pakistan which is contributing for wood, fuel, medication and forming tools (Ahmad *et al.*, 2010).

Plant diversity is different in different kind of environment and their medicinally importance is well known with minimum side effects. Plants are contributing more due to their pharmaceutical importance (Ajaib *et al.*, 2010).

There is increasing research for the importance of rivers, geomorphological, ecological and for environmental point of view. Scientific study about the river diversity is expanding day by day (Van der Velde *et al.*, 2004).

Pakistan is rich with potential of natural water resources that are in the form lakes, Rivers and ponds. River Indus is one of the most important and longest rivers in Pakistan (Fao, 2003). Rivers are rich source of floral diversity *Acacia nilotica*, *Acacia cineraria* and *Tamarix aphylla* are major tree species that are found on river forest (Arfeen, 2015).

Pakistan has the largest canal system that is run by rivers. (Altaf *et al.*, 2014). Freshwater is very important for animal and plants. (Bartram and Ballance, 1996). History about the water bodies is very old (Gleick *et al.*, 2002).

Quality of water is very important for plants and it is decreasing day by day (Singh *et al.*, 2007). Pakistan is blessed with significant River and lakes which are rich sources of floral diversity (PWP, 2008).

Water bodies changes with seasonal fluctuations and floral diversity also changes with the passage of time (Odum, 1971). Today Water resources like rivers and lakes that are important for floral diversity are being depleted by local communities (Shelly *et al.*, 2011).

Indus river ecosystem of Pakistan has very unique kind of floral diversity and it is distributed all across the length. Deforestation and grazing pressure results in degradation and habitat loss (Hamzah, 2007).

Chashma barrage is 34,099 ha large barrage on Indus river 32° 25' N, 71° 22' E; 25 km southwestern side of Mianwali District in Punjab Pakistan.

Area is famous due to Nuclear power station and diversity of habitats. Annual rain fall varies from 300-500mm. Average maximum temperature in June-July is 41°C while in January is 4°C. Aims and objective of the study were to explore the floral diversity of Chashma barrage in Mianwali which is located on Indus River that is famous place for biodiversity researchers and visitors due to its beautiful topography. Beautiful lakes in the area have worldwide importance and site for many migratory birds.

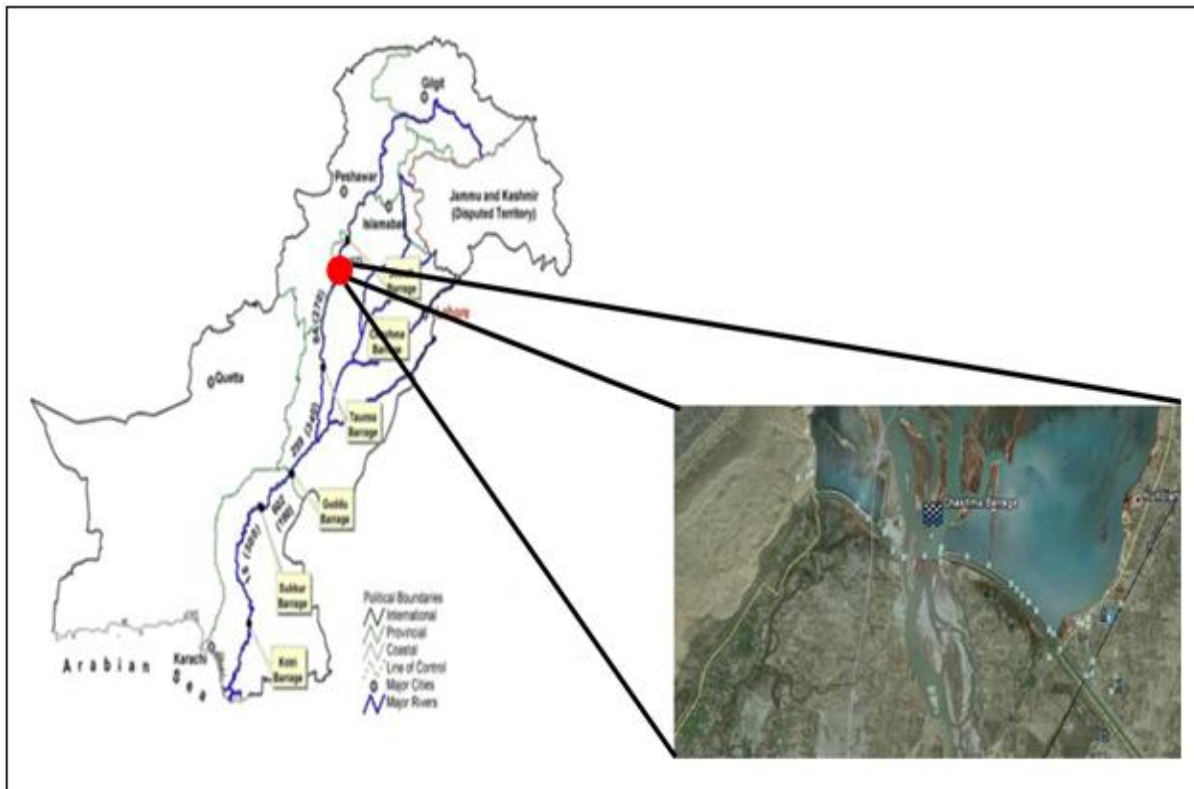
## Material method

Chashma barrage is located at 32° 25' N, 71° 22' E; southwest of district Mianwali in Punjab to Dera ismail khan Road. Chashma barrage is beautiful place and rich source of floral diversity it is about 33,110 hectares and altitude of 225m (Scott, 1989).

Study area has many beautiful lakes. First of all extensive study surveyed were arranged during May 2018 to August 2019 and sample of plant species from different sites of Chashma barrage at Indus river were collected, hard pressed and dried specimens were labeled along with voucher number.

Later mounted over herbarium sheet to maintain the record in University Agriculture Faisalabad Pakistan. Aid was taken for correct naming of specimens from (Flora of Pakistan) (Nasir and Ali, 1970-2003).

Identified plant species were documented and Photographs of the original habitat of the area were taken with good quality camera. 10 Permanent quadrates each of 05m<sup>2</sup> was laid at every habitat along straight transect line.



**Fig. 1.** Map of Chashma Barrage.

## Results

Present research work was conducted to explore the floral diversity of Chashma barrage on Indus River that is located in district Mianwali Punjab Pakistan.

Study area is famous due to Pakistan nuclear power station and other beautiful lakes that attract the researchers.

**Table 1.** Floral diversity recorded.

Sr. no.	Scientific name	Family
1	<i>Aeluropus lagopoides</i>	Poaceae
2	<i>Saccharum bengalense</i>	Poaceae
3	<i>Cgrysopogon serrulatus</i>	Poaceae
4	<i>Cymbopogon jwarancusa</i>	Poaceae
5	<i>Digitaria adscendens</i>	Poaceae
6	<i>Aristida adscensionis</i>	Poaceae
7	<i>Cenchrus setigerus</i>	Poaceae
8	<i>Dactyloctenium scindicum</i>	Poaceae
9	<i>Cenchrus pennisetiformis</i>	Poaceae
10	<i>Ochthochloa compressa</i>	Poaceae
11	<i>Sporobolus arabicus</i>	Poaceae
12	<i>Eragrostis ciliaris</i>	Poaceae
13	<i>Alopecurus aequalis</i>	Poaceae
14	<i>Cynodon dactylon</i>	Poaceae
15	<i>Bambusa bambos</i>	Poaceae
16	<i>Saccharum bengalense</i>	Poaceae
17	<i>Citrus limon</i>	Rutaceae
18	<i>Citrus aurantifolia</i>	Rutaceae
19	<i>Cyperus rotundus</i>	Cyperaceae

20	<i>Cyperus compressus</i>	Cyperaceae
21	<i>Fimbristylis dichotoma</i>	Cyperaceae
22	<i>Schoenoplectus juncooides</i>	Cyperaceae
23	<i>Prosopis glandulosa</i>	Mimosaceae
24	<i>Acacia modesta</i>	Fabaceae
25	<i>Prosopis juliflora</i>	Fabaceae
26	<i>Acacia cineraria</i>	Mimosaceae
27	<i>Suaeda vera</i>	Amaranthaceae
28	<i>Achyranthes aspera</i>	Amaranthaceae
29	<i>Conyza ambigua</i>	Asteraceae
30	<i>Xanthium strumarium</i>	Asteraceae
31	<i>Tamarix aphylla</i>	Tamaricaceae
33	<i>Malvastrum coromandelianum</i>	Malvaceae
33	<i>Bombax cieba</i>	Malvaceae
34	<i>Fagonia ovalifolia</i>	Zygophyllaceae
35	<i>Morus alba</i>	Moraceae
36	<i>Paganum harmala</i>	Nitrariaceae
37	<i>Lantana indica</i>	Verbenaceae
38	<i>Mangifera indica</i>	Anacardiaceae
39	<i>Punica granatum</i>	Punicaceae
40	<i>Dalbergia sissoo</i>	Papilionaceae
41	<i>Boerhavia diffusa</i>	Nyctaginaceae
42	<i>Nelumbo nucifera</i>	Nelumbonaceae
43	<i>Typha latifolia</i>	Typhaceae

Floral diversity in the area was found to be different across the length of river. *Nelumbo nucifera* and *Typha latifolia* were dominating in the lakes while on the sides' *Prosopis juliflora*, *Prosopis cineraria*,

*Tamrix aphylla* and grass species were in large numbers. Poaceae family was dominating in the total area as shown in table 1 and fig 3.



**Fig. 2.** Habitat of Chashma barrage Mianwali.

Overgrazing, deforestation and overexploitation were the limiting factors that were serious threat to floral diversity.

### Discussion

In present research work it was noted that Chasma barrage Mianwali on Indus River in Pakistan is very important place for research point of view it has beautiful lakes, ponds and streams that are enriched with biodiversity. Floral diversity in the ponds, lakes and all across the river varies. Overgrazing,

overexploitation and deforestation were the serious threats to floral diversity that were degrading the natural habitats. *Nelumbo nucifera* and *Typha latifolia* were dominating in the lakes while on the sides' *Prosopis juliflora*, *Prosopis cineraria*, *Tamrix aphylla* and grass species were in large numbers. Poaceae family was dominating in the total area.

Hydrophytes were recorded submerged in the water and to be best in their growth due to their adaptation in water.

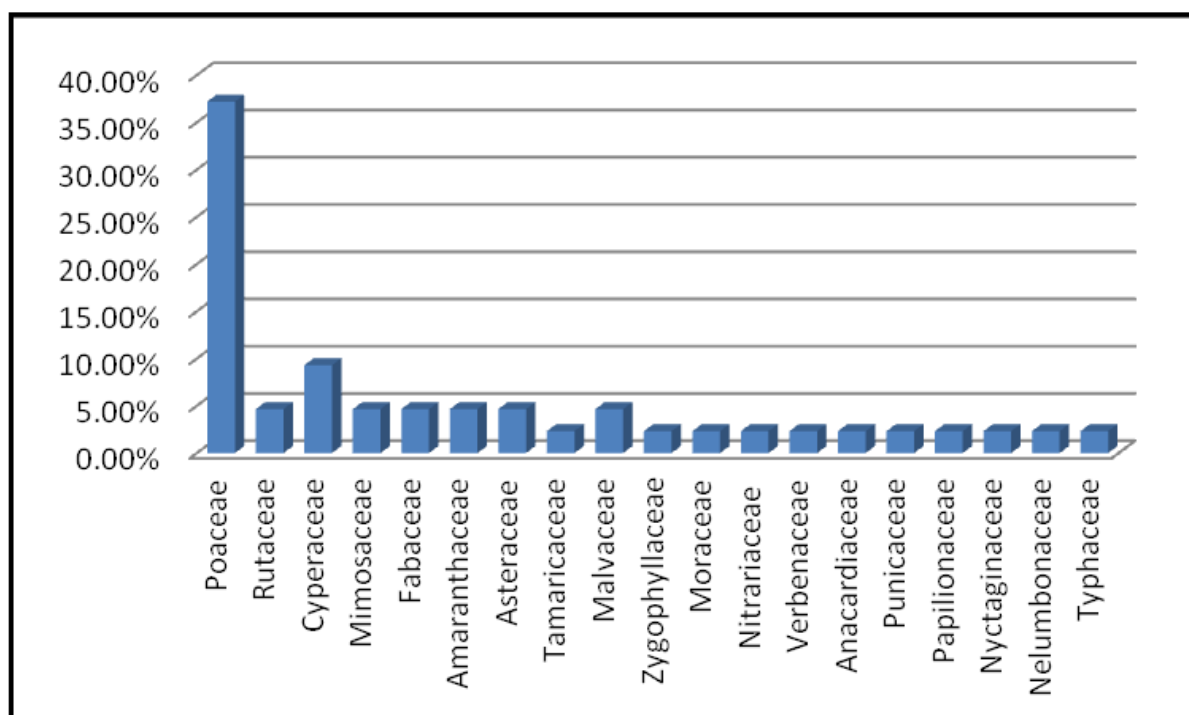


Fig. 3. Percentage% of plant species belong to family.

In earlier studies it was noted that Indus river is rich with floral diversity that are economically very important, water quality and its chemical composition of the area changes with seasonal fluctuations and it has a large impact on floral diversity because floral diversity also changes with the passage of time according to seasons and water quality. (Odum, 1971).

From above discussion about floral diversity of Chashma Barrage Mianwali located on Indus river in Pakistan can easily be concluded that Rivers, lakes, barrages, streams and ponds are rich source of floral diversity that are economically very important. Floral

diversity according to geographical location changes. Fluctuations of the seasons have a large impact on floral diversity. Overgrazing, overexploitation and deforestation are the serious threats to biodiversity.

Serious awareness about conservation policies is required in local communities inhabiting in the area.

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