

Original Research Article

Floristic composition and indigenous uses of grass flora of western areas of Dera Ghazi Khan, Punjab, Pakistan

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Abstract

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Floristic composition and indigenous uses of grass flora in western areas of D.G.KHAN had been lacking. Therefore, the study was designed for identification of grass species, their life form, life tendency, abundance and indigenous uses of grass flora. Thirty six grass species belonged to 23 genera were identified. Result showed Aristida as being the most representative with 05 species (13.9%) followed in downward order by Cenchrus and Eragrostis with 04 species (11.11%) each and Panicum, Saccharum, Setaria and Tragus comprised of 02 species (5.6%) each. While the left over genera comprised of 01 species per genera collectively signifying 52.59% of family Poaceae. Therophyte was the most prolific life form comprised of 19 grass species (52.78%) followed by hemicryptophytes 14 species (38.89%), phanerophytes 02 species (5.56%) and chamaephyte 01 species (2.78%). Overall summary of grass flora showed 20 grass species (55.55%) as v.common, 09 species (25%) common and the only 07 grass species (19.45%) were categorized as rare. Life span of identified grass flora revealed 19 (52.78%) annual species and 16 (47.22%) perennial grass species. Furthermore, 31 grass species (86.11%) consumed as fodder for livestock, 5 grass species (13.89%) for roof thatching and 14 grass species (38.89%) were being utilized in curing various disorders such as fever, pain, skin and throat infections. This study will provide a valuable starting point for advance ecological and bio-prospective exploration of study area.

Keywords: Grass flora, floristic composition, life form, Indigenous uses

INTRODUCTION

The documentation concerning to floristic composition of a region or locality is alleged to be privilege for phyto-ecological, geographical and managing measures. Floristic structure reveals the variety or biodiversity of plant vegetation of a locale (Guevara *et al.*, 1992). Various factors including deforestation, overgrazing, soil attrition and reliance of neighboring pastoralists on local flora can affect the vegetation diversity (Livingstone and

Clayton, 1980). The identification and description of local vegetation is pivotal because it can endow with distinctive species of the area, species growing season and conditions, species resistance, information in term of establishing any new or exotic species and the influence of climatic undulation such as drought and temperature on native vegetation (Ali, 2008). Floristic explorations are frequently the only distinct resource for vegetation

information concerning a particular area and additionally can provide a appropriate initial summit for further comprehensive research (Keith, 1988). The enlisting of species, their composition and conciseness makes easier to handle and less-time consuming which facilitate in the recognition, classification, key source for bio-geographic analysis and biodiversity assessment (Saima *et al.*, 2010).

Naturally, grass species play essential role in an ecosystem. In addition to natural aspect, some grass species have wholesome agricultural intentions as a prime food source for herbivores and domestic ruminants. Moreover grass flora, being a mixture of diverse grass species, herbs and legumes, play pivotal function as erosion preventive, carbon sinks, birds directive locale, nitrogen fixation source and habitat for diverse group of small organisms (Skerman and Riveros, 1990 ; Chaudhary *et al.*, 2001; Saini *et al.*, 2007).

Rare studies on the subject of floristic composition and traditional uses of grass species of western parts of D.G.KHAN are available. Therefore, an immediate need was felt to explore and document existing diversity and indigenous uses of grass flora western areas of D.G.KHAN.

MATERIAL AND METHOD

Study Site

The study site is located between the Suleman mount and river Indus and extends over D.G.KHAN (Dera Ghazi Khan, Punjab, Pakistan). According to global positioning system (GPS), D.G.Khan zone lies between latitude 280.30' to 310.15' N and longitude 690.30' to 700.75' E (Malik and Rafique, 2012). Soil condition of major fraction of western areas comprise of deep, well-shattered, typically textured, *calcareous* and deficit in organic substances (Khan *et al.*, 1999; Malana and Khosa, 2011). Climatic condition is generally characterized by scorching summer and cold winter. Average annual rainfall recorded in summer season ranges to 140 mm (Chughtai *et al.*, 2013).

Collection of samples, Identification and Assessment

The meticulous field scrutinizes of western areas of D.G.Khan were carried out to collect specimen of grasses during September, 2015 to September, 2017 in each season. In field study visits, five specimen of each grass species were collected. All the plants life-form and classification were done following Raunkiaer (1934) and Mueller-Dombois and Ellenberg (1974). The common name, habit-wise division, life cycle and indigenous use of the grass flora were as well

considered. The specimens were identified with the assist of assorted floras, monographs and illustrations illustrated by Ahmad (1954), Chaudhary (1989), Ali and Nasir (2002). Whilst, to get information in term of indigenous use of grasses, 100 inhabitants (plant collectors, plant sellers, Hakims, shopkeepers and elders) were preferred for study scenario on account of their awareness concerning grass species (Figure 1.)

RESULTS

Floristic composition

In the present assessment, 36 grass species consisting of 23 genera belonged to Poaceae family were identified as presented in Table-1. Floristic structure revealed that genus *Aristida* as being the most representative with 05 species (13.9%) followed in downward order by *Cenchrus* and *Eragrostis* with 04 species (11.11%) each and *Panicum*, *Saccharum*, *Setaria* and *Tragus* comprised of 02 species (5.6%) each. While the left over genera comprised of 01 species per genera collectively signifying 52.59% of family Poaceae. The comprehensive catalog of genera is shown in Table-2. Furthermore, on account of life form tendency, therophyte was the most dominant form comprising of 19 species (52.78%) followed by hemicryptophytes with 14 grass species (38.89%), phanerophytes with 02 species (5.56%) and chamaephyte with 01 species (2.78%) respectively as presented in Figure-2. In case of life span of identified grass flora, their life tendency comprised of 19 (52.78%) annual species and 17 (47.22%) perennial grass species (Figure-3). Out of 36 identified grass species, 20 grass species (55.55%) were recognized as v.common, 09 species (25%) were in common category and the only 07 grass species (19.45%) were categorized as rare (Figure-4).

Indigenous use(s) of grass flora

Preferred 100 local respondents were sorted out in five categories as plant collectors (17, 17%), plant sellers (16, 16%), Hakims (25, 25%), shopkeepers (12, 12%) elders (30, 30%) presented in Figure-1. According to the confined inhabitants, identified grasses were being used for variety of purposes such as fodder, curing diseases, fuel and roof thatching, etc. Out of identified 36 species, 31 grass species (86.11%) consumed as fodder for livestock. While, 5 grass species (13.89%) were used as roof thatching purpose and 14 grass species (38.89%) were being used curing various disorders such as fever, pain, skin problems, throat infections and cough are some of those ailments (Table-1).

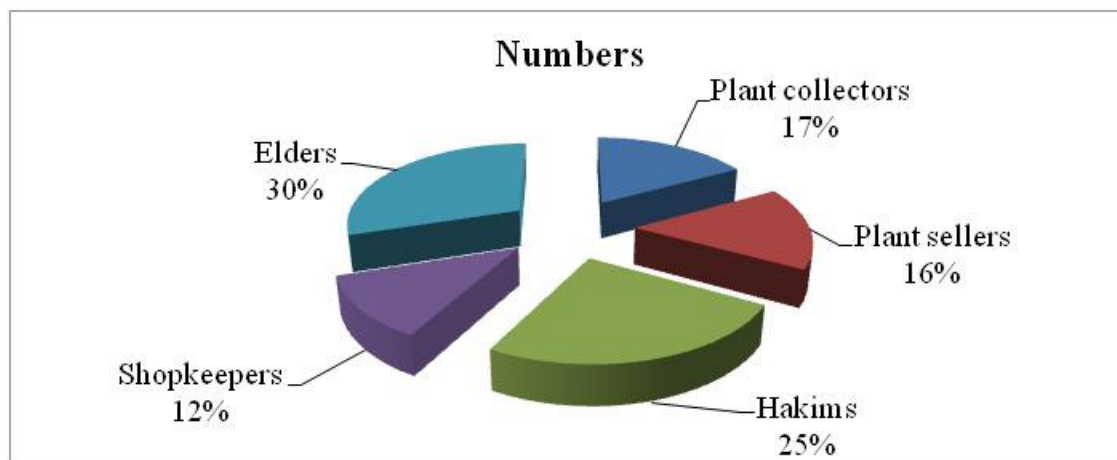


Figure 1. Percentage of various respondents interviewed at research site.

Table 1. Floristic composition of grass species from western parts of D.G.KHAN

Sr.#	Species (Family : Poaceae)	Local name	Life-form	Habit	Abundance	Traditional use(s)
1	<i>Aristida funiculata</i> Trin. & Rupr	Lumb	Therophyte	Annual	Common	Fodder
2	<i>Aristida mutabilis</i> Trin. & Rupr.	—	Therophyte	Annual	Rare	Fodder
3	<i>Aristida hystricula</i> Edgew.	—	Hemicryptophyte	Perennial	Common	Fodder
4	<i>Aristida adscensionis</i> L.	—	Therophyte	Annual	V.common	Fodder
5	<i>Aristida pungen-drinn</i>	—	Therophyte	Perennial	Common	fodder
6	<i>Aeluropus lagopoides</i> (Linn) Trin. ex.Thw	Kalargh aa	Hemicryptophyte	Perennial	Common	fodder
7	<i>Arundo donax</i> (L.)	Nar	Hemicryptophyte	Annual	Common	Diuretic and stimulates menstrual discharge. Dried used for fodder, roofing, fuel and diuretic agent
8	<i>Brachiaria reptens</i>	Para ghaa	Therophyte	Annual	Common	Used as Fodder, diuretic and against snake bite
9	<i>Cenchrus ciliaris</i> (Katewa & Jain, 2003)	Dhaman	Therophyte	Perennial	V. common	Used in kidney pain, lactagogue, sores and wounds treatment
10	<i>Cenchrus setigerus</i> Vahl, Enum.	Dhaman	Hemicryptophyte	Perennial	Common	Fodder and blood purifier
11	<i>Cenchrus prieurii</i>	—	Hemicryptophyte	Annual	Rare	Diuretic
12	<i>Cenchrus biflorus</i> Roxb.	—	Hemicryptophyte	Annual	Common	Used for Fodder and diuretic purposes
13	<i>Cymbopogon jwarancusa</i> (Jones.) schult	Khawai	Hemicryptophyte	Perennial	V.common	Fodder, cures cough and fever and mosquito repellent
14	<i>Cynodon dactylon</i> L.	Tala ghass	Hemicryptophyte	Perennial	V.common	Fodder, moderates blood pressure and paste acts as bleeding checker
15	<i>Chloris barbata</i> Sw.	—	Hemicryptophyte	Perennial	Common	Fodder
16	<i>Dactyloctenium aegyptium</i> (Linn.) Willd.	Ghandh ala Ghass	Therophyte	Annual	Common	Fodder, cures bellyache and typhoid fever
17	<i>Eragrostis tremula</i>	Love grass	Therophyte	Annual	Rare	Fodder for livestock and in making traditional breads
18	<i>Eragrostis minor</i>	Makni	Therophyte	Annual	Common	Used as Fodder
19	<i>Eragrostis barrelieri</i>	—	Therophyte	Annual	Common	Used as a mush or porridge and diuretic agent.

Table 1. Continue

20	<i>Eragrostis japonica</i>	Panghas	Therophyte	Annual	Common	Fodder, stubble is exploited for rooting, making brooms and sleeping mat
21	<i>Enneapogon desvauxii</i>	Nineawnghaa	Therophyte	Annual	Rare	Fodder and roofing
22	<i>Leptothrium senegalense</i>	Ghorka	Therophyte	Annual	Common	fodder
23	<i>Lasiurus scindicus</i>	Sewan	Phanerophyte	Perennial	V. common	Fodder
24	<i>Ochthochloa compressa</i>	Gandeel	Hemicryptophyte	Perennial	V. common	Fodder
25	<i>Pennisetum divisum</i>	Bansi	Hemicryptophyte	Perennial	V. common	used for forage and ornamental plant
26	<i>Panicum turgidum</i>	Cheena	Phanerophyte	Perennial	Common	Throat infections, small pox disinfectant and fumigative for wounds
27	<i>Panicum antidotale</i>	Morrot	Hemicryptophyte	Perennial	Rare	Fodder
28	<i>Phalaris minor</i> Retz.	Dumbicitti	Therophyte	Annual	V.common	Fodder, also used for cough and dysentery
29	<i>Stipagrostis plumosa</i>	Lumbkana	Therophyte	Perennial	V. common	Fodder
30	<i>Saccharum bengalense</i>		Hemicryptophyte	Perennial	Rare	Treatment of cattle mouth diseases, used for thatching and boating purpose
31	<i>Saccharum spontaneum</i> L.	sirr	Chamaephyte	Perennial	Common	Fodder, for ropes and cordages making, used as diuretic and demulcent, roofing
32	<i>Sporobolus ioclodus</i>	Swag	Hemicryptophyte	Perennial	Common	Fodder
33	<i>Setaria pumila</i> (Poir) Roem. & Schult.	Ban Kangn	Therophyte	Annual	Common	Fodder and porridge
34	<i>Setaria verticilla</i>	Barchittas	Therophyte	Annual	Rare	Fodder and making porridge
35	<i>Tragus racemosus</i>	Swanri	Therophyte	Annual	Rare	Fodder
36	<i>Tragus roxburghii</i>	Bur Grass	Therophyte	Annual	Common	Fodder

Table 2. Record of identified genera collected from western areas of D.G.KHAN

Serial No.	Genera	No. of species	Percentage (%)
1	Aristida	5	13.9
2	Aeluropus	1	2.78
3	Arundo	1	2.78
4	Brachiaria	1	2.78
5	Cenchrus	4	11.11
6	Cymbopogon	1	2.78
7	Cynodon	1	2.78
8	Chloris	1	2.78
9	Dactyloctenium	1	2.78
10	Eragrostis	4	11.11
11	Enneapogon	1	2.78
12	Leptothrium	1	2.78
13	Lasiurus	1	2.78
14	Ochthochloa	1	2.78
15	Pennisetum	1	2.78
17	Panicum	2	5.55
18	Phalaris	1	2.78
19	Stipagrostis	1	2.78
20	Saccharum	2	5.6
21	Sporobolus	1	2.78
22	Setaria	2	5.6
23	Tragus	2	5.6
	Total	36	100

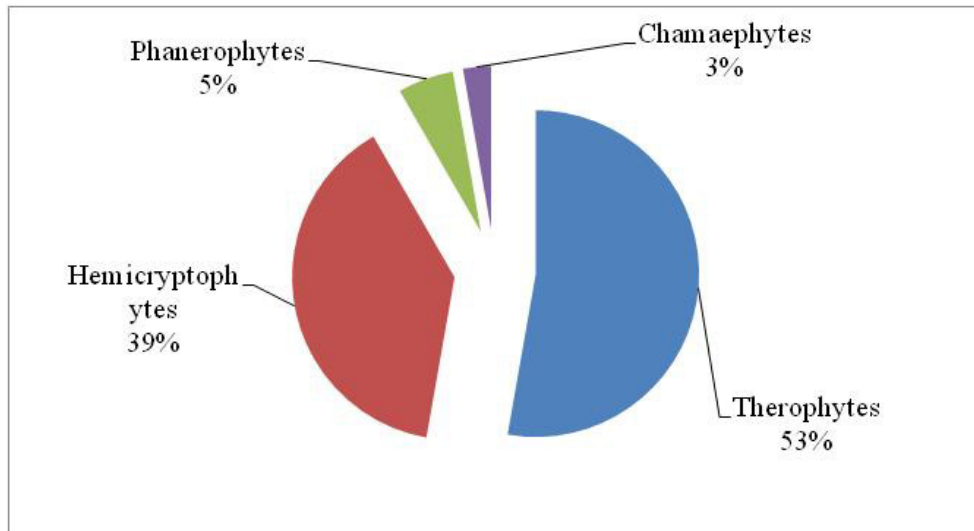


Figure 2.. Life form tendency of grass species

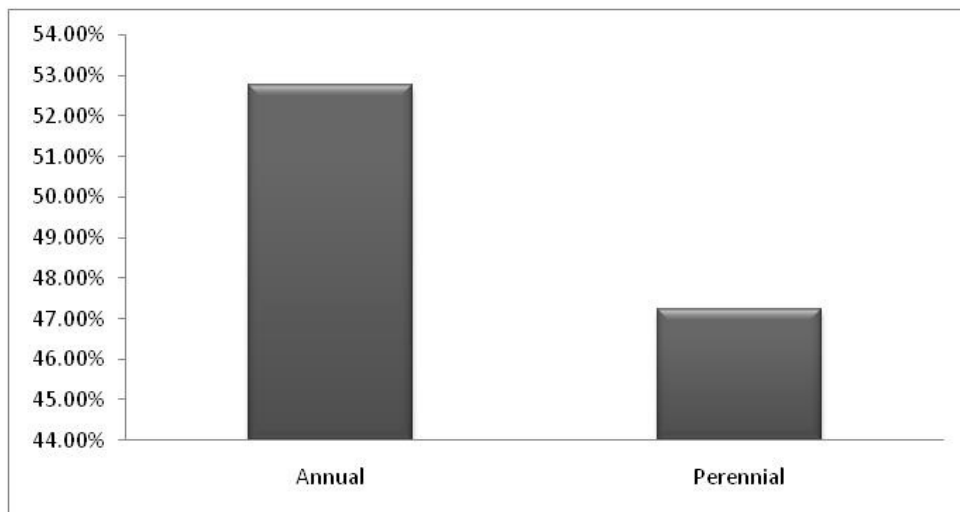


Figure 3. Life period of grass species from western areas of D.G.KHAN

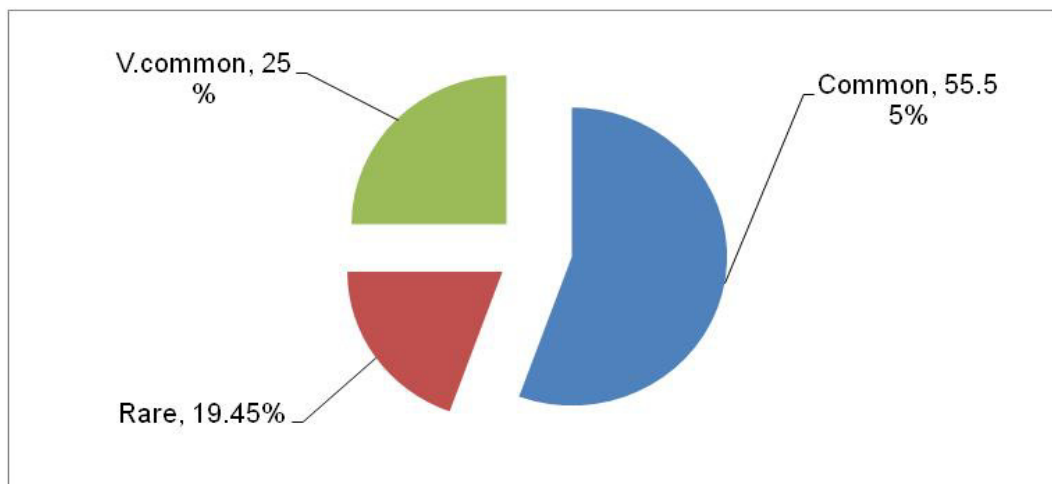


Figure 4. Abundance of grass species

DISCUSSION

Current analysis provides a comprehensive floristic list and composition of grass flora present in western zone of Dera Ghazi Khan, Punjab, Pakistan. In view of our results evaluation, 36 grass species belonging to family Poaceae were identified. Genus *Aristida* was found the most prevailed. The prominence of genus *Aristida* is in accordance to Scholes (1997) which confirms the dominance of *Aristida* species in the arid and subtropical areas. Results showed that therophyte was the prominent life form followed by the hemicytrophite, phanerophyte and chameophyte in descending order respectively. The domination of therophyte life form tendency over other life form spectra in the area is generally due to various causes such as over grazing, extreme climatic condition and anthropogenic influence. Earlier report by Barik and Misra (1998) is in support of our findings. Barik and Misra (1998) exposed that therophytes had the more tendency to withstand the harsh environmental conditions like dry and chilly climate. Also, Durrani *et al.* (2010) and Qureshi *et al.* (2011) reported in their report the prominence of therophytes which is in accordance to our findings. Dominance of therophytes life form is the response of harsh environmental conditions as well as anthropogenic influences (Arshad and Akbar, 2002; Ullah *et al.*, 2012). Asri (2003) elucidated that therophyte life form trend is the indication of arid condition. In addition, precipitation or rain is another cause dependable for plant growth in arid and subtropical region. The dominance of annual grass species against perennial species as area receives sufficient rainfall annually. Low rainfall area comprised of major perennial grass species (Ashraf *et al.*, 2009). In current study, it was found that many grass species have become rare. The common and rare species were observed in undersized patches. According to Qureshi and Ahmmad (2010) and Saeed *et al.* (2012) human influence is a incessant threat which is leading to the indigenous species elimination. For that reason, many grass species were found rare.

The grass flora is ethnically well connected with the public because of their foodstuff, fodder as well as curative significance. They contribute considerable role in the lives of natives. In current study, a total of 36 grass species were identified belonged to the family Poaceae. The discussion with the selective inhabitants showed that a lot of locals of under study area still depend on the grass species. Most of the grass species including *Aristida funiculata*, *Aristida mutabilis*, *Aristida hystricula*, *Aristida adscensionis*, *Aeluropus lagopoides*, *Arundo donax*, *Brachiaria reptens*, *Cenchrus setigerus*, *Cenchrus biflorus*, *Cymbopogon jwarancusa*, *Cynodon dactylon*, *Chloris barbata*, *Dactyloctenium aegyptium*, *Eragrostis tremula*, *Eragrostis minor*, *Eragrostis japonica*, *Enneapogon desvauxii*, *Leptothrium senegalense*, *Lasiurus scindicus*, *Ochthochloa compressa*, *Pennisetum divisum*, *Panicum antidotale*, *Phalaris minor*, *Stipagrostis*

plumosa, *Sacharum spontaneum*, *Sporobolus iocladus*, *Setaria pumila*, *Setaria verticilla*, *Tragus racemosus* and *Tragus roxburghii* were being used as significant source of fodder. Interestingly the majority of the grass flora listed in present study have been accounted earlier too for their fodder properties. Pal and Mudgal (2001) in their study exposed that *Aeluropus lagopoides*, *Arundo donax*, *Brachiaria reptens* are consumed as fodder. *Pennisetum divisum*, *Panicum antidotale*, *Phalaris minor* are good means to fulfill livestock food requirements of *Cholistan Desert* (Ashraf *et al.*, 2008). Schuster (1967) report justifies our findings. Different parts of grasses especially *Tragus racemosus* and *Tragus roxburghii* leave are consumed as supplementary food for livestock (Ivory 1990; El-Ghani *et al.*, 2017). Animals particularly cattle and sheep in dryland areas depend upon grass species; hence grasses are key feed for their survival. Furthermore, grasses such as *Enneapogon desvauxii*, *Saccharum bengalense*, *Sacharum spontaneum* and *Arundo donax* were being utilized as roofing and thatching purposes. Similar results were also reported by Ayantunde *et al.* (2009) and Pilu *et al.* (2013).

The locals of selected area were utilizing various presented grass species as remedy for curing several diseases such as dysentery, cough, ulcer, stomach problem, headache, and skin problems etc. We particularly interviewed Hakims who are directly concerned in this practice. Medically used grass species by local community include *Arundo donax*, *Brachiaria reptens*, *Cenchrus setigerus*, *Cenchrus biflorus*, *Cymbopogon jwarancusa*, *Cynodon dactylon*, *Dactyloctenium aegyptium*, *Eragrostis tremula*, *Eragrostis minor*, *Eragrostis japonica*, *Enneapogon desvauxii*, *Panicum antidotale*, *Phalaris minor*, *Stipagrostis plumose* and *Sacharum spontaneum* grass species. *Arundo donax*, *Brachiaria reptens*, *Cenchrus setigerus* are used as remedy curing diverse disorders such as cough, stomach problem and headache etc (Ahmad *et al.*, 2010). Agharkar (1991) reported the therapeutic potential of *Cynodon dactylon* treating bleeding and skin problems. Therapeutic potential of *Cenchrus biflorus* is witnessed by Khan *et al.* (2003). Hameed *et al.* (2011) also highlighted the ethnic use of *Cymbopogon jwarancusa* and *Cynodon dactylon* utilized to treat cough, blood pressure and fevers. Current findings on therapeutic uses of grass species are also in agreement with other reports by Ayantunde *et al.* (2009), Ahmad *et al.* (2006) and Jabeen *et al.* (2009).

CONCLUSION

Study on floristic structure and indigenous uses of grass flora endow with preliminary information of western areas of D.G.KHAN. The proportion of grass flora used as source of fodder progressively increased by increasing the distance from D.G. Khan City. Large numbers of

residents of western areas still use ethnic knowledge of medicinal grass species. Although, it was a valuable glimpse of the area but it is further recommended a detailed ecological work about the vegetation of D.G.KHAN.

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