Sustainable use of local fodder grasses: a case study from Mayurbhanj district of Odisha

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Research

Abstract

Background: Indigenous knowledge of grasses as livestock feed plays a vital role in maintaining sustainable agricultural practices and preserving biodiversity. This research investigates the diverse uses of wild grasses as fodder in the Mayurbhanj district of Odisha, India, exploring their prioritization and the factors influencing their selection.

Methods: A thorough ethnobotanical survey was conducted among 198 participants, employing semi-structured interviews and pairwise ranking exercises. Data analysis utilized the Relative Frequency of Citation (RFC) and Pairwise Comparison (PWC) methods.

Results: The study identified 67 grassland taxa, spanning 35 genera, used as livestock fodder, with *Cynodon dactylon* and *Oryza sativa* emerging as the most preferred species. RFC values ranged from 0.99 to 0.09, with 34 species exhibiting high priority. The correlation analysis among respondents revealed a strong consensus on fodder grass species, with significant positive correlations (RFC = 0.81, $p < 0.01$ and RFC = 0.69, $p < 0.05$) indicating shared knowledge and consistent ranking patterns. Furthermore, the priority level of fodder grasses was significantly correlated with their commonality, suggesting that prevalent species are often considered most important for livestock use.

Conclusions: This research underscores the importance of wild grasses as a fodder source and highlights the significance of indigenous knowledge in sustainable livestock practices. The findings suggest that conservation efforts should focus on high-priority species and implement community-based initiatives to protect these valuable resources.

Keywords: Wild grass, Fodder, Livestock, Mayurbhanj, Odisha

Background

India is renowned globally for its impressive array of floristic diversity. Despite being a significant element of agroforestry, grasses flourish in diverse environments across the globe (Myers *et al.* 2000; Priyadarshini *et al.* 2023). Mostly, grasses are found in terrestrial habitat that ranges from tropical rainforests to arid deserts and high-altitude grasslands. Indigenous grasses, which have evolved in specific ecosystems, possess unique adaptations that enable them to thrive under local environmental conditions. Their adaptability to diverse climates and soil conditions, coupled with their rapid growth and regenerative capacity, enables them to play a vital role in ecosystem functioning, agriculture, soil stabilization, carbon

sequestration, and biodiversity conservation (Shrestha and Dhillion 2006). Grasslands play a vital role in human and animal nutrition, underscoring their economic and ecological value (Boddupalli 2024; Geng *et al.* 2017). It has long been integral to human livelihoods, providing sustenance, shelter, and medicinal resources. A substantial body of ethnobotanical research has already been accumulated on the documentation and utilization of grasses in India (Acuna *et al.* 2002; Mall and Tripathi 2016; Kumar *et al.* 2011; Shukla 2019; Rao *et al.* 2015; Bhatia *et al.* 2014; Agra *et al.* 2007; Shaheen *et al.* 2020; Upadhyay *et al.* 2010; Sinha *et al.* 2023; Suman and Singh 2022; Gupta *et al.* 2020; Srikala and Manjunath 2023; Majeed *et al.* 2020).

Grasses are not only ecologically vital but have long supported traditional livelihoods through their role in animal husbandry (Geng et al., 2017; Harun et al., 2017). While some species possess medicinal value, this study emphasizes their primary function as fodder. Indigenous grasses provide essential feed for livestock, especially in rural and tribal communities where alternative resources are limited (Nunes et al., 2015; Majeed et al., 2020). Their availability, palatability, and nutritional content significantly influence livestock productivity (Garcia et al., 2008). Understanding these aspects is crucial for promoting sustainable grassland management and improving rural livelihoods (Bahta et al., 2022a).

Approximately one billion people rely on grasses for their sustenance and livelihoods, recognizing their significant contribution to environmental sustainability (Shrestha and Dhillion 2006; Sundriyal *et al.* 2004). Grassland taxa are a valuable resource for rural communities, providing essential feed for domestic animals and serving as a traditional remedy for human and animal health (Njorogl *et al.* 2006). Extensive research has documented traditional knowledge of medicinal plants used in veterinary care, highlighting the significance of grasses in this context (Pieroni *et al.* 2006; Lans *et al.* 2007; McGaw *et al.* 2008; Farooq *et al.* 2008; Monteiro *et al.* 2011; Martinez *et al.* 2011; Sharma *et al.* 2012; Offiah *et al.* 2011; Benitez *et al.* 2012; Winter *et al.* 2008). Although livestock production is predominantly vital for the rural population and Odisha's economy (World Bank 2016; Government of Odisha 2020, Government of Odisha 2021; NITI Aayog 2019, Bahta *et al.* 2022a; Bahta *et al.* 2022b), there remain many grass species still unexplored for their potential benefits (Nunes *et al.* 2015). However, their sustainability is increasingly threatened by factors such as overgrazing, land degradation, and climate change. To fulfill the knowledge gap regarding the utilization and selection strategies by local shepherds and farmers towards sustainable utilization and conservation of grassland ecosystem in Mayurbhanj district, this study aims to identify and prioritize fodder species in Mayurbhanj district, examine how socioeconomic factors influence local ethnobotanical knowledge, and rank these species based on animal dietary preferences to classify them into priority categories.

Study Area

Geographical boundary and demography

Mayurbhanj, situated in the northern part of Odisha, spans approximately 10,400 sq. km (Sahoo and Barik 2024; Sahoo *et al.* 2024). The district is bordered by Medinipur (West Bengal) to the northeast, Singhbhum (Jharkhand) to the northwest, and Balasore and Keonjhar (Odisha) to the southeast and southwest, respectively (Mohanty 2020). There are 4 subdivisions, i.e., Sadar subdivision, Bamanghati sub-division, Kaptipada subdivision, and Panchapid subdivision, 26 Tehsils and blocks, 32 police stations, 404-gram panchayats, and 3966 villages functioning in the district (District Portal 2024). Geographically, Sadar subdivision covers the northern part of Mayurbhanj, Odisha, India, within the coordinates 22° 0' 31.3128" N latitude and 86° 25' 7.4316" E longitude. The study was carried out in ten blocks (Baripada, Kuliana, Saraskana, Bangiriposi, Morada, Rasgovindpur, Suliapada, Shyamakhunta, Betonati, and Badasahi) covering nearly 98 villages (Figure 1).

Climate and soil

Mayurbhanj district boasts a unique microclimate characterized by extreme seasonal variation, lush vegetation, and rich diversity. The subtropical climate of the region is marked by significant temperature variation, with April recording the highest temperature (mean max: 45^{0}C, mean min: 35^{0}C) and December the lowest (mean max: 25^{0}C, mean min: 10^{0}C). The region receives an average annual rainfall of 1778.2 mm, with 77.5% of the total rain occurring during the monsoon season (June - October) (Sahoo and Barik 2024). The reserve receives moderate to heavy rainfall, supporting diverse flora, including grassland savannahs and various types of forests such as dry deciduous forests, semi-evergreen forests, and moist deciduous forests (Das and Berera 2012). The region’s geology, moulded by volcanic events, creates a habitat for diverse angiospermic species. Red soil prevails, characterized by a layered profile consisting of an illuvial red layer, a yellowish-brown leached layer and a thin surface layer of organic mineral material (Ramkrishna *et al.* 2006).

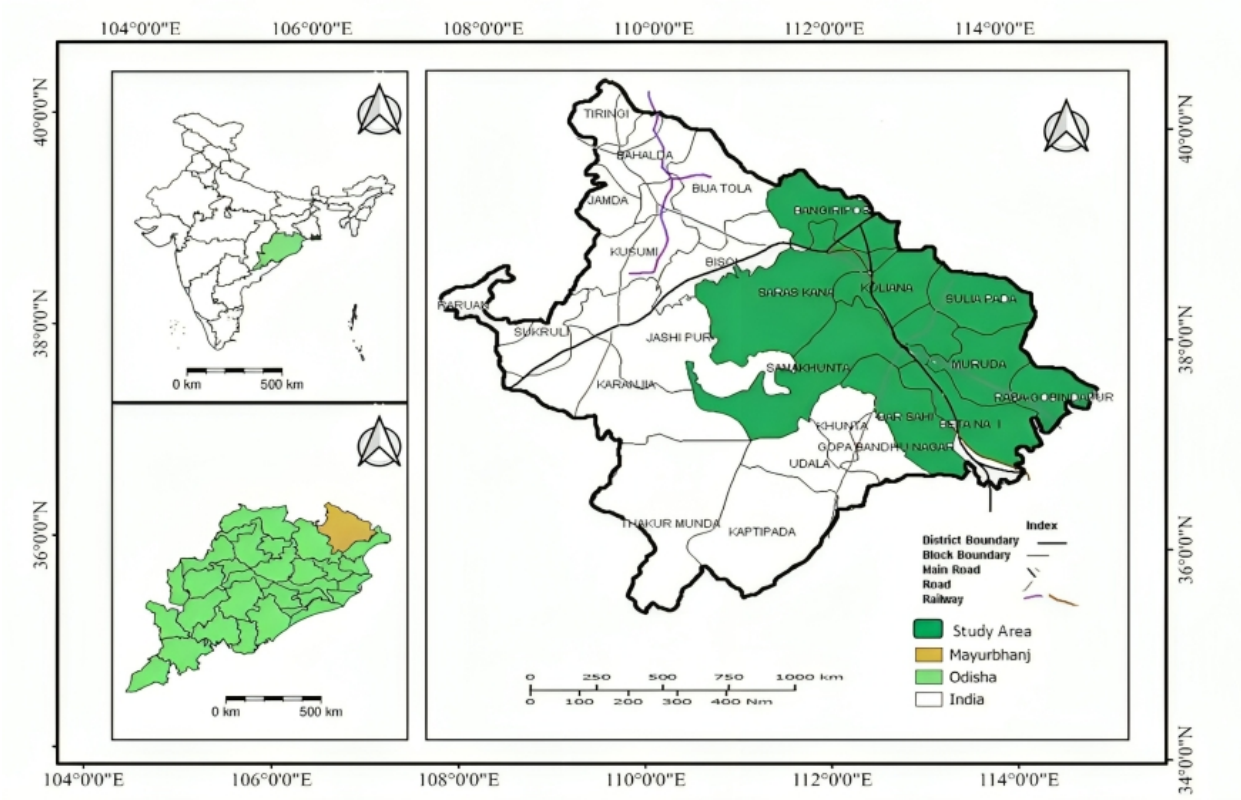

Figure 1. Study area

Materials and Methods

Ecological and Cultural Profile of the Study Area

Mayurbhanj District, located in northern Odisha, is the state's most tribal-dominated district, with approximately 60% tribal population (Behera, 2015). Out of the 62 officially recognized tribal groups in Odisha, Mayurbhanj is primarily inhabited by major tribal communities including the Santals, Ho, Kolha, Munda, Mahali, Khadia, Bhuyan, Bhumija, and Bathudi. The district is ecologically diverse, encompassing a range of forest grassland mosaics and rural agricultural land, which support rich traditional ethnobotanical knowledge, particularly related to livestock feeding and ethno-veterinary practices. These factors contributed to the selection of study blocks such as Baripada, Kuliana, Saraskana, Bangiriposi, Morada, Rasgovindpur, Suliapada, Shyamakhunta, Betonati, and Badasahi, which represent both ecological diversity and cultural richness.

Sampling Framework and Informant Selection

A purposive sampling approach was used to identify ethnobotanically rich sites, followed by snowball sampling (Waters, 2015) to select knowledgeable informants, including village leaders, goatherds, shepherds, ranchers, and livestock caretakers. Informed consent was obtained from all respondents following Free Prior Informed Consent (FPIC) and Mutually Agreed Terms (MAT) protocols. Data was collected over two years (June 2022 to June 2024) through biannual visits, using participant observation, group discussions, and semi-structured interviews in the local language (Odia) to address various aspects of livestock management through Participatory rural appraisal method (PRA) (Zubair *et al.* 2019; Shaheen *et al.* 2017) (Figure 2). To ensure transparency and informed participation, several group discussions and village meetings were conducted at each study site. Informants and village leaders were thoroughly briefed on the research objectives, and assurances were provided that the documented traditional knowledge and local insights would be utilized solely for academic purposes. Furthermore, participants were informed that the study's findings would benefit all the district's residents equally, including those from municipal, rural and tribal areas.The questionnaires are 1. Which grasses are mostly used as fodder for livestock? 2. Which grasses most suit specific animal species such as goats, sheep, ox, bull, buffalo and cows? 3. Palatability rate of different plants used as fodder, 4. Which part of the plant do animals love to eat? 5. How do different animals feed themselves in natural habitats? 6. Are there any traditional veterinary uses for the listed fodder plants among the local communities?

Figure 2. Participatory Rural Appraisal (PRA) session conducted during fieldwork in Mayurbhanj District, Odisha, involving informants from Santal, Kolha, and Ho tribal communities. These sessions provided insights into traditional fodder grass use and livestock feeding practices across different cultural groups.

Plant Specimen Acquisition and Identification

Plant specimens were collected during field visits conducted over two years (June 2022 to June 2024) across selected blocks of Mayurbhanj District. The collections were primarily carried out during fieldwork with local informants, including livestock herders, village elders, and community guides knowledgeable about fodder grasses. The work was conducted in grassland patches, agricultural margins, village commons, and forest edges where livestock commonly graze. Each specimen was photographed in its natural habitat, geo-referenced, and tagged with a field number. Voucher specimens were carefully collected, pressed, and dried following standard herbarium procedures. Taxonomic identification of each plant species was conducted using descriptions and keys from available literature various floras, including Botany of Bihar and Orissa (Haines 1915-21), Flora of Orissa (Saxena and Brahmam 1996), Grasses of Odisha (Chorghe and Prasanna 2021), Grasses of Telangana (Siddabathula and Prasanna 2023), Know your grass genera through hand lens (Nair 2010), Bengal Plants (Prain 1908) and online databases such as Tropicos https://www.tropicos.org, Plant of the World Online https://powo.science.kew.org, and India Flora online https://indiaflora-ces.iisc.ac.in/gallery_family_species.php?name=POACEAE. All specimens were authenticated and confirmed by Prof. Kamal Lochan Barik, Taxonomist and Grassland ecologist, Department of Botany, Maharaja Sriram Chandra Bhanja Deo University (MSCBU), Baripada, Odisha. Voucher specimens were prepared and deposited in the MSCBU Herbarium (Accession numbers are shown in Table 4) for future reference.

Data Analysis

Relative Abundance Analysis

The relative abundance of fodder grass species was determined through quadrant sampling conducted across representative grassland habitats in the selected blocks. A total of 60 quadrats (1 m × 1 m) were laid randomly. In each quadrat, the number of individuals of each species was recorded, and relative abundance was calculated using the formula:

Relative Abundance (%) = (Number of individuals of a species / Total number of individuals of all species) × 100

Plots were chosen to reflect diverse grazing conditions and habitat variability in the region, ensuring representation of both frequently grazed and less disturbed areas. Data were compiled for seasonal variation and averaged over two sampling cycles

during the study period (2022–2024). According to distribution, the grasses were grouped into five classes: abundant, common, frequent, infrequent, and rare (Table 1).

Table 1. Classification of Grass Abundance in the Study Area

Abundance Scales	Abundance categories	Coverage of Grasses
	Rare (R)	<7%
1	Occasional (O)	7-10%
2	Frequent (F)	10-25%
3	Common (C)	25-55%
4	Abundant (A)	55-100%

Relative Frequency of Citation (RFC)

The relative frequency of citation (RFC) is a quantitative ethnobotanical analysis method that evaluates the importance of plant species in treating health conditions (EI-Ghazouani *et al.* 2024). The RFC of the plant was calculated using the formula (Tardio and Pardo-de-Santayana 2008).

$$RFC = fc/n \ (0<RFC<1)$$

Here:

fc = Number of participants who mentioned the species used as fodder

n = Total number of participants surveyed

Pairwise Comparison Method (PWC)

To evaluate the priority ranking of the specified species, a Pairwise Comparison (PWC) analysis was conducted. Ten participants were involved, including five key informants known for their ethnoveterinary and fodder-related knowledge, and five individuals randomly selected from the broader informant pool. To ensure cultural representation, informants were selected from major tribal groups in the region, including Santal, Ho, Kolha, and Bhumija. Each informant compared all possible species pairs based on palatability and livestock preference. In each pairwise comparison, the preferred species received a score of 1. The scores were then totalled across all comparisons and all informants, resulting in a maximum possible score of 50 per species. Species with higher cumulative scores were ranked as higher priority. These scores and rankings are presented in Table 2, following the methodology used by Qaseem *et al.* (2019), Nankaya *et al.* (2020), and Tounekti *et al.* (2019).

Table 2. Prioritization of Wild Edible Plants in Mayurbhanj, Odisha: A Pairwise Ranking Analysis

Botanical Name	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
***Cynodon dactylon* (L.) Pers.**	25	33	16	29	18	24	14	16	11	11
Oryza sativa L.	15	18	31	22	26	27	11	14	16	10
***Paspalum scrobiculatum* L.**	19	14	24	29	15	13	17	22	12	24
***Eleusine indica* (L.) Gaertn.**	12	18	14	16	11	14	15	27	22	25
***Setaria flavida* (Retz.) Veldkamp**	23	17	30	11	22	14	11	14	15	13
***Eragrostis uniloides* (Retz.) Nees ex Steud.**	13	18	14	12	18	19	21	11	13	16
***Urochloa ramosa* (L.) T.Q.Nguyen**	9	11	18	17	25	14	15	10	16	13
***Setaria pumila* (Poir.) Roem. & Schult.**	15	14	18	19	17	7	15	13	14	11
***Urochloa distachyos* (L.) T.Q.Nguyen**	20	24	11	9	7	12	19	16	10	13
***Panicum repens* L.**	9	20	16	18	11	7	14	13	16	10

Legend: R Respondent

Cluster Analysis and Graphical Illustration

A correlation analysis was performed on the informant responses, and the resulting Relative Frequency of Citation (RFC) values were used to categorize fodder grasses into higher and lower preference levels through hierarchical cluster analysis. The Squared Euclidean distance method was employed (SPSS version 22) to facilitate clustering. The results were graphically illustrated using Microsoft Excel 2019. A spatial representation of the study area was created utilizing QGIS software (version 3.3.4), a geographic information system (GIS) application.

Result and Discussion

Demographic Characteristics of Participants

A total of 198 informants were selected across all study sites using a combination of purposive and snowball sampling techniques. Initial participants were identified based on their experience with livestock rearing and traditional ecological knowledge, and subsequent informants were recommended by these initial contacts. To ensure diverse representation, efforts were made to include individuals across different occupational categories relevant to fodder use, such as farmers, livestock herders, goatherds, cattle owners, and traditional healers. These occupational roles were considered important for capturing a broad spectrum of ethnobotanical knowledge related to grass usage. Additionally, informants were selected from all major tribal communities and blocks represented in the study area to ensure cultural and geographical diversity in the dataset. The sample consisted of 56% males and 44% females. The female participants were lower due to local cultural norms. The informants' ages spanned 15-80 years and were divided into three main age groups: 35 individuals were between the ages of 15 and 35, 111 informants were between the ages of 36 and 50, and 57 people were between the ages of 51 and 80. Most informants who were engaged in livestock management worked as Goatherds (30%), shepherds (16%), Farmed caretakers (14%), and domestic livestock caretakers (40%). The demographic details of all the informants are provided in Table 3.

. Socio-Demographic Characteristics of Informants.

Type of respondents	Young aged	Middle-aged	Senior aged	Total
	15-35	36-50	51-80	
Local Goatherds (M)	5	12	11	28
Local Goatherds (F)	4	18	9	31
Local Shepherds (M)	6	13	4	13
Local Shepherds (F)	3	7	3	18
Farmed caretaker (M)	4	11	3	18
Farmed caretaker (F)	3	5	2	10
Domestic livestock caretaker (M)	6	29	17	52
Domestic livestock caretaker (F)	4	16	8	28
Total	35	111	57	198

Legend: M: Male, F: Female

Regarding their educational level, most respondents (75%) completed primary education, while 27% had attained middle education. A small percentage (8%) had no formal education, and 3% had incomplete education (Figure 3). Farm owners and animal caretakers had higher educational levels, with 8 years of education and additional training in animal handling and hygiene control. Interestingly, most informants relying on wild grasses for animal feed were from the lower socio-economic class. Therefore, a possible reason for the reliance on these grasses is that they provide a cost-free fodder source for feeding ruminant animals, giving them an option for resource-constrained individuals

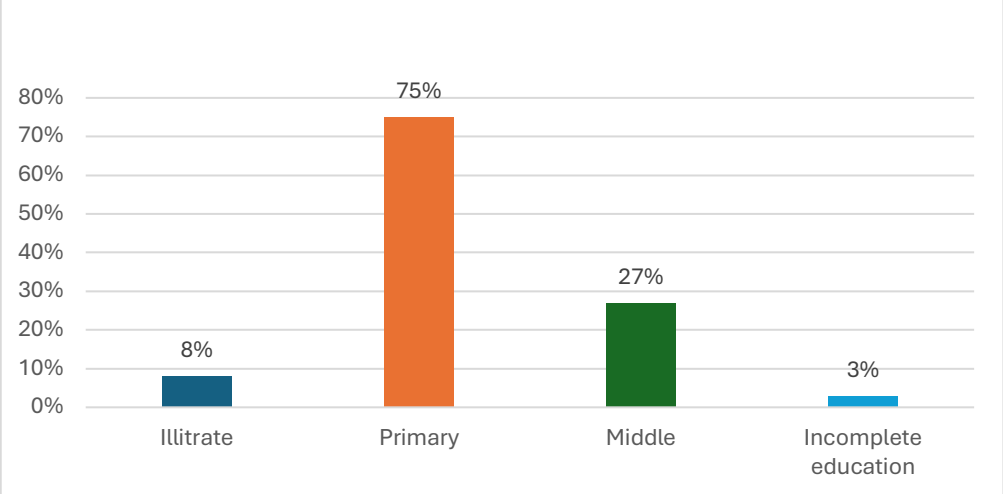

Figure 3. Informant educational profile

Comparative Analysis of Informants

A comparative analysis of the four major informant groups—farmers, livestock herders, goatherds, and traditional healers—demonstrated distinct patterns in ethnobotanical knowledge and species citation. Among the 198 informants, livestock herders exhibited the most extensive knowledge, citing an average of 41.6 species, followed closely by goatherds with an average of 39.5 species. Farmers cited approximately 33.2 species, reflecting their combined engagement with crop and animal husbandry, while traditional healers cited an average of 27.8 species, with a stronger emphasis on grasses used for ethno-veterinary purposes. Highly palatable and frequently cited grasses such as *Cynodon dactylon*, *Oryza sativa*, and *Paspalum scrobiculatum* were consistently mentioned by all groups, but herders and goatherds showed the highest overlap in citing these priority species. Conversely, traditional healers showed greater familiarity with lesser-known species like *Eragrostis pilosa* and *Sporobolus indicus*, often noted for their medicinal or supportive roles in livestock health. These differences underscore the influence of occupational roles on the breadth and depth of traditional knowledge systems, reflecting how community-specific experiences shape resource use and species prioritization.

Taxonomic diversity of fodder grasses

A comprehensive analysis of wild grasses in the Mayurbhanj district reveals a diverse range of species used as fodder for ruminants. This study documents 67 grassland species within the Poaceae family, encompassing 35 genera, of which 47 ethnobotanical grasses from 31 genera receive in-depth review from previous studies (Table S1). Categorization of these taxa revealed that 55% are used as fodder, 26% as forage, and 19% as mixed feed (Figure 4). These findings corroborate the research of Sahoo and Barik (2024), highlighting the importance of wild grasses as a fodder source in the region. Among the 35 genera, *Eragrostis* ranked highest with 9 fodder grass species, followed by *Panicum* and *Digitaria* with 5 species each. *Setraia* and *Urochloa* contributed 4 species each, while 11 genera, including *Chrysopogon*, *Cenchrus*, and *Chloris*, contributed 2 species each as fodder. The remaining 24 genera contributed 1 fodder species each (Table 4). This study categorises some of the species as in other studies (Sahoo and Barik 2024; Dadsena and Jaiswal 2013; Devalaxmi *et al.* 2020; Rout and Barik 2013; Thakur 2015; Dashora and Gosavi 2013). The grassland taxa play a multifaceted role, extending beyond their significance in ethnobotany to hold substantial socio-economic importance. The population derives socio-economic benefits from these taxa, managing livestock, generating income, and supporting their livelihoods (Figure 5).

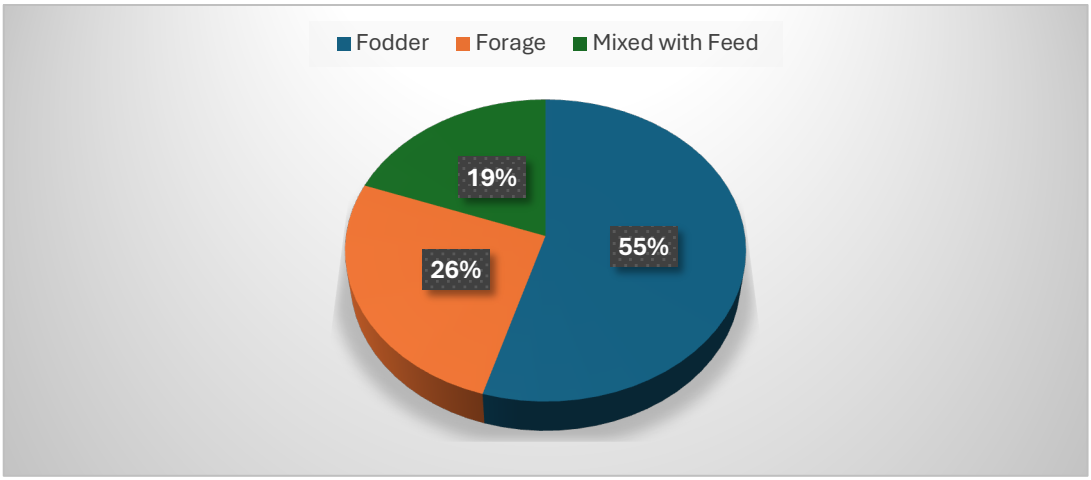

Figure 4**.** Percentage of fodder, forage and mixed with feed grasses in the study area

Pairwise ranking of wild palatable plants

The results of this study reveal a distinct ranking of preferred grass species among local communities. *Cynodon dactylon* emerged as the most favored species, followed closely by *Oryza sativa*, *Paspalum scrobiculatum*, *Eleushine indica,* and *Setaria flavida*, which secured the second, third, fourth, and fifth positions, respectively (Table 4). Conversely, *Panicum repens* received the lowest score, indicating its relative unpopularity among residents. This clear hierarchy of preference underscores the significance of understanding local perspectives and cultural values in the context of traditional grass usage. This study supports the appearance hypothesis, which posits that local communities are more likely to recognize and utilize the most abundant species in each environment. The frequent presence of specific plant species in local ecosystems fosters a deeper understanding of their properties and uses among residents, increasing their incorporation into traditional practices (De Melo *et al.* 2011). This phenomenon is observed in the current study, where the most preferred grass species were also the most abundant in the local environment. The clear hierarchy of preference among local communities highlights the importance of considering the cultural and ecological context in which these species are used.

Table 4. Inventory of Fodder Grasses from Mayurbhanj District, Odisha.

Scientific Name	Local Name	Ecological Status	Accession No. MSCBUB/	Palatable	Fodder part	Feeding Method	Ethno veterinary	RA	FC	RFC
***Alloteropsis cimicina* (L.) Stapf**	-	Naturalized, Wild	01145, 01152	C, G	JS, L	FO	YES	C	121	0.61
***Apluda mutica* L.**	Muger, Dhudhiasouri	Wild	-	C, G, S	AP, S	FO, FOR, MF	YES	IF	34	0.17
***Aristida adscensionis* L.**	Kharangjonik	Naturalized, Wild	01139	C, G	JS, L	FO	YES	A	76	0.38
***Avena sativa* L.**	Jai	Cultivated	-	C	JS, S, L	FO	YES	IF	33	0.17
***Bothriochloa bladhii* (Retz.) S.T.Blake**	Gonda bena	Naturalized, Wild	01150	C, G, S, O	L, S	FO, FOR	YES	R	95	0.48
***Cenchrus ciliaris* L.**	-	Wild, Tolerated	-	C	S	FO	YES	IF	91	0.46
***Cenchrus pedicellatus* (Trin.) Morrone**	-	Wild	01123	C	L	FO	YES	A	128	0.65
***Chloris barbata* Sw.**	-	Naturalized	01116	C, G, O	JS, L	FO, MF, FOR	YES	C	96	0.48
***Chloris virgata* Sw.**	-	Naturalized	-	C, G, O	L	FO, MF, FOR	No	C	97	0.49
***Chrysopogon aciculatus* (Retz.) Trin.**	Gugurchia	Naturalized	01144	C, O	S	FO	YES	A	25	0.13
***Chrysopogon serrulatus* Trin.**	-	Wild	-	G, S	L	FOR	No	IF	34	0.17
***Chrysopogon zizanioides* (L.) Roberty**	-	Naturalized	01122	G, C, S, O, B	L, S	FO, FOR	YES	C	65	0.33
***Cymbopogon citratus* (DC.) Stapf**	Lemon grass	Cultivated	01124	G, C, S, O, B	L, S	FO, FOR, MF	YES	IF	120	0.61
***Cymbopogon martini* (Roxb.) Will.Watson**	Magarlata, Rosa grass, Goelkher	Cultivated, Wild	-	G, C, S, O, B	L, S	FO, FOR, MF	YES	R	132	0.67
***Cynodon dactylon* (L.) Pers.**	Duba, Dhubo, Dubaghas	Naturalized, Wild	01158	C, G, S, O, B	WP	FO, MF, FOR	YES	A	197	0.99
***Dactyloctenium aegyptium* (L.) Willd.**	Kakhuriya, Suntubukrui	Wild	01153	C, G, B, O	L, S	FO, MF, FOR	YES	F	134	0.68
***Desmostachya bipinnata* (L.) Stapf**	Kusa	Wild, Tolerated	-	C, O	L	FO, FOR	YES	IF	71	0.36
***Dichanthium annulatum* (Forssk.) Stapf**	-	Wild	01157	S, G, O	AP, L, S	FO	No	A	114	0.58
***Digitaria abludens* (Roem. & Schult.) Veldkamp**	Chiri-chira	Wild	-	C, G, S	L	FOR, FO, MF	YES	R	29	0.15
***Digitaria bicornis* (Lam.) Roem. & Schult.**	-	Wild	01136	C, G, S	L	FOR, FO, MF	YES	IF	33	0.17

***Digitaria ciliaris* (Retz.) Koeler**	Bada betha	Wild	01134	C, G, S, O, B	L	FO	No	C	81	0.41
***Digitaria longiflora* (Retz.) Pers.**	Kanka jariya	Wild	01143	C, G, S, O, B	JS, L	FO	No	C	57	0.29
***Digitaria sanguinalis* (L.) Scop.**	-	Naturalized	01142	C, G, S, O, B	JS, L	FO	No	IF	47	0.24
***Dinebra chinensis* (L.) P.M.Peterson&N.Snow**	Bhuru	Wild	01148	C, O, B	L	FO	No	R	29	0.15
***Echinochloa colona* (L.) Link**	Jhipa, Swanghas	Wild, Tolerated	-	G, C	JS, L, S	FO, MF, FOR	YES	C	38	0.19
***Eleusine indica* (L.) Gaertn.**	Pernaki, Nandia, Ana mandia	Wild, Tolerated	01154	C, G, S, O, B	WP	FO, MF, FOR	YES	F	174	0.88
***Eragrostis atrovirens* (Desf.) Trin. ex Steud.**	-	Wild	01146	C, G, S, O, B	L, S	FO	No	C	48	0.24
***Eragrostis cilianensis* (All.) Vignolo ex Janch.**	-	Wild		C, G, S, O, B	L, S	FO	No	R	40	0.20
***Eragrostis ciliaris* (L.) R.Br.**	-	Wild	01137	C, G, S, O, B	L, S	FO	YES	C	39	0.20
***Eragrostis coarctata* Stapf**	Kuji jhipa, Ghira nanja, Oita chura, Kuti	Wild	-	C, O, B G	L	FOR, MF	YES	C	91	0.46
***Eragrostis japonica* (Thunb.) Trin.**	-	Wild	-	C	L	FO	YES	C	33	0.17
***Eragrostis minor* Host**	-	Wild	-	C, G, S	WP, AP	FO, FOR	No	F	109	0.55
***Eragrostis pilosa* (L.) P.Beauv.**	-	Wild	-	C, G, S, O, B	WP, AP	FO, FOR	YES	F	110	0.56
***Eragrostis riparia* (Willd.) Nees**	-	Wild	-	C, G, O	L	FO, FOR	No	C	63	0.32
***Eragrostis tenella* (L.) P.Beauv. ex Roem. & Schult.**	Jhusa	Wild	-	C, G, O, S, B	WP	FO, FOR, MF	No	A	111	0.56
***Eragrostis uniloides* (Retz.) Nees ex Steud.**	Phurphuri	Wild	01133	C, G, S, O, B	WP	FO, FOR	No	C	155	0.78
***Eulaliopsis binata* (Retz.) C.E.Hubb.**	Sabai ghas	Wild	-	C	JS	FO, FOR	YES	IF	19	0.10
***Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.**	Sukla, Sinkulia, Sinkola, Dauria	Wild	01135	C, G	L	FO	YES	A	93	0.47
***Imperata cylindrica* (L.) Raeusch.**	Sabbu chana, Chhana ghas	Wild, Tolerated	01159	S, G, O, C	AP, JS, L	FO, MF, FOR	YES	A	120	0.61
***Ischaemum ciliare* Retz.**	-	Wild		C, G	JS, L, S	FO	YES	A	74	0.37
***Megathyrsus maximus* (Jacq.) B.K.Simon&S.W.L.Jacobs**	-	Wild		G, S, C, O	WP, AP	FO MF	No	C	119	0.60

***Mnesithea laevis* (Retz.) Kunth**	Sonatuli	Wild	01141	C, B, O	L	FO, MF, FOR	No	R	72	0.36
***Oplismenus burmanni* (Retz.) P.Beauv.**	Kanguria	Wild	01119	C, G, O	JS, L	FO	YES	C	87	0.44
***Oplismenus compositus* (L.) P.Beauv.**	Mohara	Wild		G, O, B	L	FO	YES	C	74	0.37
***Oryza rufipogon* Griff.**	Balunga	Wild		C, G, S, O, B	WP	FO	YES	R	88	0.44
***Oryza sativa* L.**	Dhanno	Cultivated		C, G, S, O, B	WP	FO, MF	YES	C	190	0.96
***Panicum atrosanguineum* Hochst. ex A.Rich.**	-	Wild		G, S	WP, AP	FO	No	C	18	0.09
***Panicum brevifolium* L.**	-	Wild	01117	C, G, S, B, O	WP	FO, MF, FOR	YES	R	95	0.48
***Panicum miliaceum* L.**	Rala	Cultivated	01156	G, S, C	L	FO	No	IF	29	0.15
***Panicum repens* L.**	Reda, Dal, Sama	Wild, Tolerated		C, G	WP, AP	FO	YES	C	139	0.70
***Panicum sumatrense* Roth**	Gundla, Gundlu, Kosala	Cultivated	01138	G, S, C, O, B	JS	FO MF	YES	C	127	0.64
***Paspalum scrobiculatum* L.**	Kodo, Kodus	Cultivated, Naturalized, Tolerated	01151	C, G, S, O, B	WP, AP	FO, MF, FOR	YES	F	189	0.95
***Perotis indica* (L.) Kuntzz**	-	Wild	01118	C, S, G	L, S	FO	YES	A	119	0.60
***Saccharum officinarum* L.**	Aakhu	Cultivated		G	L	FO	YES	IF	55	0.28
***Saccharum spontaneum* L.**	Kasatandi	Wild, Tolerated		S, G, C	JS	FO, FOR, MF	YES	A	67	0.34
***Sacciolepis indica* (L.) Chase**	Nardula	Wild	01115	C	JS, L	FO	YES	C	49	0.25
***Setaria flavida* (Retz.) Veldkamp**	Bilainangi	Wild	01140	C, G	WP	FO	YES	F	170	0.86
***Setaria intermedia* Roem. & Schult.**	-	Wild		G	L	FO	YES	R	22	0.11
***Setaria italica* (L.) P.Beauv.**	Kangu, Tangun	Cultivated		G	L, S	FO	YES	R	22	0.11
***Setaria pumila* (Poir.) Roem. & Schult.**	Siallenguda, Gunric	Wild, Tolerated	01155	G, C, S	L, S	FO, MF, FOR	No	F	143	0.72
***Setaria verticillata* (L.) P.Beauv.**	Bar Kauni	Wild		C, O, B	L, JS	FO, FOR	YES	R	19	0.10
***Sorghum halepense* (L.) Pers.**	Kala-mucha	Naturalized		C, G	WP	FO, FOR, MF	YES	IF	111	0.56
***Sporobolus indicus* (L.) R.Br.**	Kankrachara	Wild	01161	G	L	FO	YES	C	94	0.47
***Urochloa distachyos* (L.) T.Q.Nguyen**	Nari	Wild	01149	C, G, S, O	WP, AP	FO	No	IF	141	0.71
***Urochloa panicoides* P.Beauv.**	Jalganti	Wild, Tolerated		C	WP	FO	No	C	18	0.09
***Urochloa ramosa* (L.) T.Q.Nguyen**	Banspalli	Wild		C, G, S, O	WP, AP	FO	YES	C	148	0.75

***Urochloa reptans* (L.) Stapf**	-	Wild	C, G, S, O	WP, AP	FO, FOR	YES	R	61	0.31

Legend: List of the collected grasses, ethnoveterinary data, Relative abundance (RA), focal persons count (FC), and relative frequency citation (RFC) of fodder grasses; Palatability: Cow (C), Goat (G), Sheep (S), Ox (O), Buffalo (B); Fodder part: JS (Juvenile Stage), L (Leaves), Arial Part (AP), Stem (S), Whole plant (WP); Feeding method: Fodder (FO), Forage (FOR), Mixed with Feed (MF); Relative Abundance: Common (C), Abundant (A), Rare (R), Frequent (F), Infrequent (IF), Wild – Occurs naturally in the region without direct human intervention; Cultivated – Deliberately planted and managed for agriculture or fodder; Tolerated – Grows spontaneously but not removed from cultivated fields; Naturalized – Non-native species that have adapted and reproduce freely.

Figure 5. Livestock management in Mayurbhanj District by traditional fodder grasses

Pairwise comparison of respondents' data

A pairwise comparison analysis was conducted by using Relative Frequency of Citation (RFC) values to explore the relationship between fodder grasses and respondent knowledge. A subset of 10 respondents with rich indigenous knowledge was selected for this analysis. The results revealed significant correlations between certain respondent pairs, indicating shared knowledge and expertise. Notably, a strong positive correlation was observed between respondents R8 and R10 (RFC = 0.81, $p < 0.01$), suggesting a high degree of consistency in their knowledge. Significant correlations were also found between respondents R3 and R5 (RFC = 0.69, $p < 0.05$) and R3 and R7 (RFC = 0.81, $p < 0.05$), indicating shared understanding and expertise among these respondents. (Table 5). The strong correlation between certain respondent pairs suggests a network of knowledge sharing and collaboration, highlighting the importance of social relationships in the preservation and dissemination of traditional knowledge.

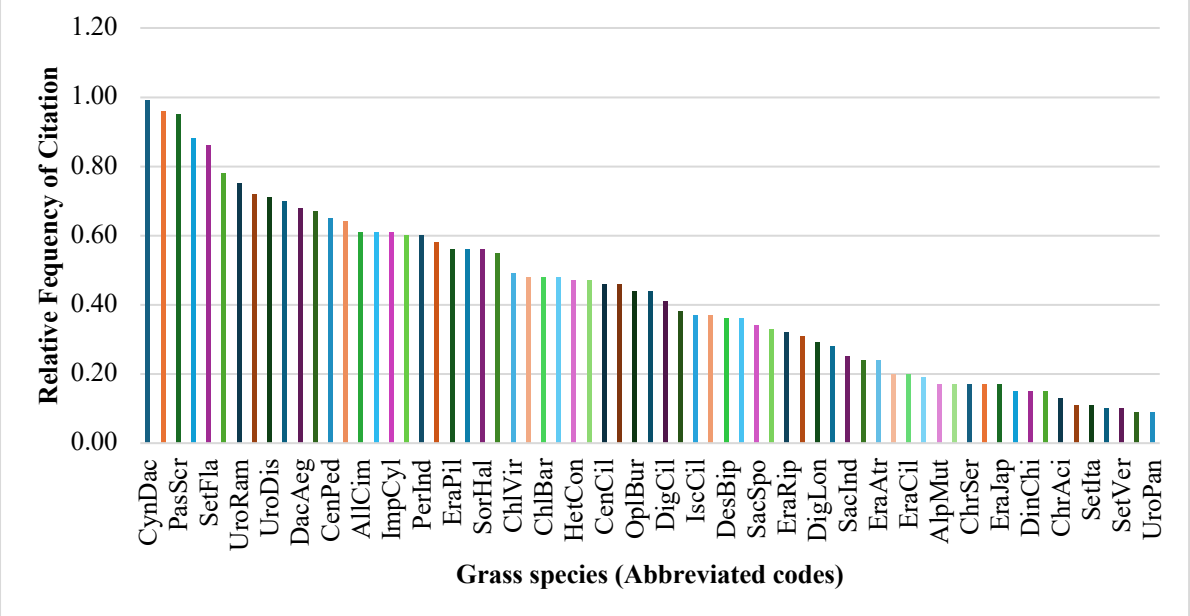

Figure 6. Ranking of Fodder Grasses by Relative Frequency of Citation. The abbreviation of the species was written in Table S1.

Availability and prioritization of fodder grasses by using RFC and PWC data

The analysis revealed that the Relative Frequency of Consumption (RFC) values ranged from 0.99 to 0.09, with a mean value of 0.43. About thirty-four species exhibited RFC values above the mean, whereas thirty-three species had values below the mean (Figure 6, Table 4). Notably, *Cynodon dactylon* and *Oryza sativa* displayed the highest RFC values (0.99 and 0.96, respectively), while *Panicum atrosanguineum* and *Urochloa panicoides* had the lowest RFC value (0.09). Furthermore, the classification of grass species based on their RFC and PC values is presented in Table 6. A hierarchical cluster analysis was conducted using the Relative Frequency of Citation (RFC) values of 67 ethnobotanically documented fodder grass species in the Sadar subdivision of Mayurbhanj District. This statistical approach was employed to classify species based on the similarity of their citation patterns across informants, reflecting perceived importance and usage within the local communities. The dendrogram (Figure 7) was generated using Ward's linkage method and Euclidean distance as the measure of dissimilarity. This clustering method minimizes the variance within each group, thus ensuring that species grouped together are highly similar in terms of their RFC values. The analysis revealed three major clusters, each representing a distinct level of ethnobotanical consensus and fodder use preference:

Cluster I – High-Priority Fodder Species: This cluster, positioned at the lower part of the dendrogram (smallest linkage distances), contains species with the highest RFC values (≥ 0.90), indicating a strong consensus among local informants regarding their importance as fodder. Species in this group include *Cynodon dactylon* (RFC = 0.99), *Oryza sativa* (RFC = 0.96), *Paspalum scrobiculatum* (RFC = 0.95), *Setaria flavida* (RFC = 0.86), *Eleusine indica* (RFC = 0.88). These grasses are frequently encountered, highly palatable, and widely available, making them the primary choices for livestock feeding.

Cluster II – Medium-Priority Fodder Species: Species in this group have moderate RFC values (approximately 0.60–0.86). While not as frequently cited as Cluster I, they are still considered valuable and are used in specific contexts, such as during seasonal shortages or for particular types of livestock. Notable species include *Cymbopogon martini*, *Setaria pumila*, *Urochloa distachyos*, *Panicum sumatrense*, *Cenchrus pedicellatus*, and *Megathyrsus maximus*. The moderate internal linkage distances in this cluster suggest partial consensus, possibly due to regional variation in availability, species-specific feeding traits, or cultural preferences.

Cluster III – Low-Priority or Opportunistic Fodder Species: The upper part of the dendrogram is occupied by species with low RFC values (< 0.50). These include *Sporobolus indicus*, *Heteropogon contortus*, *Chloris barbata*, *Oplismenus burmanni*, *Ischaemum ciliare*, *Desmostachya bipinnata*, *Echinochloa colona*, *Urochloa reptans*, *Aristida adscensionis*, and *Setaria intermedia*. This study reveals a higher number of species in the low-priority category compared to the medium-priority category, in contrast to Harun *et al.* (2017). This discrepancy suggests that the prioritization of fodder species may vary across different regions or communities, highlighting the importance of localized studies in understanding traditional knowledge and practices. The RFC and PWC data from this study showed that *Cynodon dactylon*, *Oryza sativa*, and *Paspalum scrobiculatum* were among the most cited and preferred species, with RFC values of 0.99, 0.96, and 0.95, respectively. These findings align closely with studies conducted in adjoining regions of Jharkhand and Chhattisgarh, where *Cynodon dactylon* and *Paspalum spp.* were also reported as top-ranked fodder species due to their high palatability and year-round availability (Dadsena & Jaiswal, 2013; Harun et al., 2017). Similarly, *Eleusine indica* and *Setaria flavida*, which ranked highly in our PWC analysis, were also identified as significant fodder sources in the ethnobotanical work conducted by Rout and Barik (2013) in eastern Odisha. Notably, our results differ slightly from Geng *et al.* (2017), who found *Panicum maximum* and *Sorghum halepense* as dominant in similar habitat zones, possibly due to ecological and cultural differences in livestock feeding practices. These comparisons underline both the consistency and diversity of ethnobotanical knowledge across regions, reinforcing the need for localized documentation in fodder prioritization.

Assessing the palatability of grasses and feeding methods for optimal livestock nutrition

The dietary feature that can cause a certain reaction in an animal is called palatability (Gherardi and Black 1991; Church 1993). With a cumulative palatability frequency of 68%, statistical analysis shows that the fodder grasses under investigation were preferable for the cow (Table 7). Interestingly, group A members (*Cynodon dactylon* (L.) Pers., *Oryza sativa* L., *Paspalum scrobiculatum* L.) showed excellent palatability to all ruminant species, demonstrating their broad acceptance and significance as favored feed sources (Table 6). This study documented that most of these fodder grasses were used as leaves (26.87%), followed by the entire plant and aerial parts (14.93%) and juvenile stages and leaves (10.45%) (Table 7). Ruminants' innate ability to avoid or detoxify ingested toxic plants likely facilitated their comfort with ad libitum grazing (Khan and Khan 2015; Voeks and Leony 2004). The predominantly herbaceous nature of these grasses, characterized by small stature, shallow roots and non-woody fibrous root systems, made them easily accessible and palatable to animals, which likely contributed to the high reported percentage of leaves used. The availability of grass plays a crucial role in the production of high-quality goat milk, with grass-fed animals producing beef that is not only lower in cholesterol but also richer in polyunsaturated fatty

acids compared to those raised on a high-grain diet (Garcia *et al.* 2008). The relative abundance analysis revealed that 35.82% of the listed fodder grasses were prevalent in the research area (Table 7). A notable correlation was observed between the priority level of fodder grasses and their commonality. The high-priority group A grasses were predominantly classified as common (24 species) or rare (12 species), whereas the medium-priority groups (B, C, D, and E) were frequently (6 species) or infrequently (3 species) encountered. In contrast, the lowest-priority groups (F and G) were typically categorized as common (12 species) or rare (5 species) (Table 7). These findings suggest that the preference for fodder grasses is directly influenced by their commonality, with more prevalent species being given priority over less common ones.

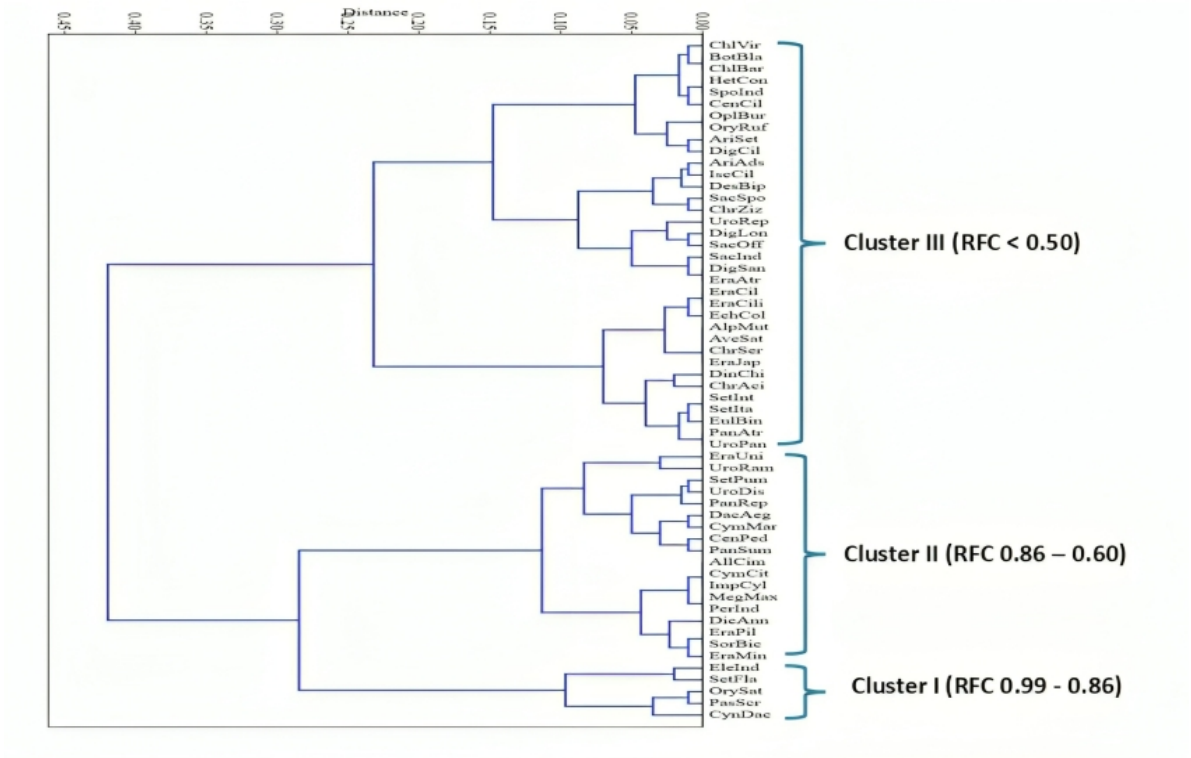

Figure 7. Grouping of Fodder Grasses by Hierarchical Cluster Analysis.

Table 5. Respondent-Based Pairwise Correlation Analysis of Grass Palatability

Correlations										
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
R1	1									
R2	0.578	1								
R3	0.247	0.316	1							
R4	0.216	0.197	0.245	1						
R5	0.013	0.319	.690**	0.202	1					
R6	0.326	0.409	0.341	0.319	0.536	1				
R7	0.139	0.009	.710**	0.252	0.504	0.200	1			
R8	0.165	0.100	0.085	0.260	0.485	0.035	0.012	1		
R9	0.590	0.399	0.105	0.146	0.100	0.092	0.393	0.371	1	
R10	0.058	0.272	0.124	0.116	0.330	0.116	0.343	.816***	0.337	1
***. Correlation is significant at the 0.05 level (2-tailed).**										
****. Correlation is significant at the 0.01 level (2-tailed).**										

Table 6. Pairwise Comparison (PWC) of Fodder Grasses with Similar Relative Frequency Citation (RFC) Values.

Group A	**Total Gained % points**	**RFC= 0.99 - 0.9**	**Rank**
Cynodon dactylon (L.) Pers.	88.6	0.99	1st
Oryza sativa L.	87.4	0.96	2nd
Paspalum scrobiculatum L.	87.1	0.95	3rd
Group B		RFC = 0.89 - 0.80	

Eleusine indica (L.) Gaertn.	72.8	0.88	1st
Setaria flavida (Retz.) Veldkamp	71.5	0.86	2nd
Group C		RFC = 0.79 - 0.70	
Eragrostis uniloides (Retz.) Nees ex Steud.	77.4	0.78	1st
Urochloa ramosa (L.) T.Q.Nguyen	76.3	0.75	2nd
Setaria pumila (Poir.) Roem. & Schult.	74.2	0.72	3rd
Urochloa distachyos (L.) T.Q.Nguyen	71.5	0.71	4th
Panicum repens L.	71	0.70	5th
Group D		RFC = 0.69 - 0.60	
Dactyloctenium aegyptium (L.) Willd.	71.6	0.68	1st
Cymbopogon martini (Roxb.) Will.Watson	67.5	0.67	2nd
Cenchrus pedicellatus (Trin.) Morrone	65.2	0.65	3rd
Panicum sumatrense Roth	60.8	0.64	4th
Alloteropsis cimicina (L.) Stapf	55.3	0.61	5th
Cymbopogon citratus (DC.) Stapf	53.1	0.61	6th
Imperata cylindrica (L.) Raeusch.	49.8	0.61	7th
Megathyrsus maximus (Jacq.) B.K.Simon&S.W.L.Jacobs	49.3	0.60	8th
Perotis indica (L.) Kuntzz	48.5	0.60	9th
Group E		RFC = 0.59 - 0.50	
Dichanthium annulatum (Forssk.) Stapf	71.6	0.58	1st
Eragrostis pilosa (L.) P.Beauv.	68.6	0.56	2nd
Sorghum halepense (L.) Pers.	66.8	0.56	3rd
Eragrostis minor Host	62.1	0.55	4th
Group F		RFC = 0.49- 0.40	
Chloris virgata Sw.	64.2	0.49	1st
Bothriochloa bladhii (Retz.) S.T.Blake	60.9	0.48	2nd
Chloris barbata Sw.	59.9	0.48	3rd
Heteropogon contortus (L.) P.Beauv. ex Roem. & Schult.	58.2	0.47	4th
Sporobolus indicus (L.) R.Br.	55.6	0.47	5th
Cenchrus ciliaris L.	54.9	0.46	6th
Oplismenus burmanni (Retz.) P.Beauv.	52.3	0.44	7th
Oryza rufipogon Griff.	50.6	0.44	8th
Digitaria ciliaris (Retz.) Koeler	49.8	0.41	10th
Group G		RFC = 0.39 - 0.09	
Aristida adscensionis L.	56.8	0.38	1st
Ischaemum ciliare Retz.	55.2	0.37	2nd
Desmostachya bipinnata (L.) Stapf	54.9	0.36	3rd
Saccharum spontaneum L.	52.3	0.34	4th
Chrysopogon zizanioides (L.) Roberty	48.1	0.33	5th
Urochloa reptans (L.) Stapf	47.6	0.31	6th
Digitaria longiflora (Retz.) Pers.	42.9	0.29	7th
Saccharum officinarum L.	41.2	0.28	8th
Sacciolepis indica (L.) Chase	39.4	0.25	9th
Digitaria sanguinalis (L.) Scop.	38.6	0.24	10th
Eragrostis atrovirens (Desf.) Trin. ex Steud.	36.4	0.24	11th
Eragrostis cilianensis (All.) Vignolo ex Janch.	32.9	0.20	12th
Eragrostis ciliaris (L.) R.Br.	31.7	0.20	13th
Echinochloa colona (L.) Link	30.8	0.19	14th
Alpuda Mutica L.	29.7	0.17	15th
Avena sativa L.	28.3	0.17	16th
Chrysopogon serrulatus Trin.	27.9	0.17	17th
Eragrostis japonica (Thunb.) Trin.	26.7	0.17	18th
Dinebra chinensis (L.) P.M.Peterson&N.Snow	25.3	0.15	19th
Chrysopogon aciculatus (Retz.) Trin.	22.5	0.13	20th
Setaria intermedia Roem. & Schult.	20.5	0.11	21st

Setaria italica (L.) P.Beauv.	19.8	0.11	22nd
Eulaliopsis binata (Retz.) C.E.Hubb.	18.6	0.10	23rd
Panicum atrosanguineum Hochst. ex A.Rich.	17.5	0.09	24th
Urochloa panicoides P.Beauv.	16.9	0.09	25th

Table 7. Frequency Analysis of Fodder Grass Attributes: Palatability, Consumption Patterns, and Relative Abundance

Studied Parameter	Frequency	Valid Percentage	Cumulative Percent
Cow	7	10.45	10.45
Cow, Goat	8	11.94	22.39
Cow, Goat, Sheep	8	11.94	23.88
Cow, Goat, Sheep, Ox	6	8.96	20.90
Goat, Sheep	2	2.99	11.94
Cow, Ox	2	2.99	5.97
Sheep, Goat, Ox	1	1.49	4.48
Cow, Ox, Buffalo	3	4.48	5.97
Cow, Goat, Buffalo, Ox	2	2.99	7.46
Cow, Goat, Ox	4	5.97	8.96
Goat	4	5.97	11.94
Goat, Ox, Buffalo	1	1.49	7.46
Cow, Goat, Sheep, Ox, Buffalo	19	28.36	29.85
Total	**67**	**100.00**	
Whole Plant	10	14.93	14.93
Leaves	18	26.87	41.79
Juvenial Stage	3	4.48	31.34
Juvenial Stage, Leaves	7	10.45	14.93
Arial Part, Stem	1	1.49	11.94
Stem	2	2.99	4.48
Leaves, Stem	11	16.42	19.40
Arial Part, Stem, Leaves	1	1.49	17.91
Juvenile Stage, Leaves, Stem	3	4.48	5.97
Arial Part, Juvenile Stage, Leaves	1	1.49	5.97
Whole Plant, Arial Part	10	14.93	16.42
Total	**67**	**100.00**	
Fodder (FO)	33	49.25	49.25
Fodder and Forage (FO, FOR)	10	14.93	64.18
Fodder and Mix with Feed (FO, MF)	3	4.48	19.40
Fodder, Forage and Mixed with Feed (FO, FOR, MF)	20	29.85	34.33
Forage and Mixed with Feed (FOR, MF)	1	1.49	31.34
Total	**67**	**100.00**	
Abundant	11	16.42	16.42
Common	24	35.82	52.24
Frequent	7	10.45	46.27
Infrequent	13	19.40	29.85
Rare	12	17.91	37.31
Total	**67**	**100.00**	

Conclusions

This ethnobotanical investigation reveals a rich tradition of using wild grasses as fodder for livestock. The study documents 67 grassland taxa, spanning 35 genera, used by local communities. *Cynodondactylon*, *Oryza sativa*, and *Paspalum scrobiculatu*m emerged as the most preferred species, highlighting their significance in local livestock management practices. The correlation between the priority level of fodder grasses and their commonality, with more prevalent species being given priority over less common ones, suggests that local communities prioritize species that are readily available and easily accessible. The hierarchical cluster analysis revealed a nuanced classification of fodder species based on their Relative Frequency of Citation (RFC), reflecting the depth of ethnobotanical knowledge and consensus among local informants. Three

distinct clusters emerged, categorizing species into high-priority, medium-priority, and low-priority groups based on their perceived value and utility. High-priority species were widely recognized for their nutritional and cultural significance, while medium-priority species were valued for specific contexts or seasonal use, and low-priority species were known to fewer respondents or used opportunistically. This clustering pattern underscores the complexity and structure of traditional knowledge systems, highlighting the need for livestock development strategies that are informed by community preferences and values. By acknowledging the cultural and ecological relevance of highly cited species, policymakers and practitioners can design more effective, locally adapted fodder resource management programs that not only support rural livelihoods but also reinforce traditional knowledge systems.

While species such as *Cynodon dactylon* and *Urochloa ramosa* are highly valued by local communities for their fodder and ethnoveterinary use, it is important to recognize their potential ecological impact. Some of these grasses, particularly *Cynodon dactylon*, are known to behave aggressively and may act as invasive weeds under certain conditions. Therefore, their large-scale use should be guided by both traditional knowledge and ecological risk assessments to ensure sustainable utilization without compromising native biodiversity or grassland ecosystem health.

Declarations

List of abbreviations: , Relative abundance (RA), focal persons count (FC), and relative frequency citation (RFC), Cow (C), Goat (G), Sheep (S), Ox (O), Buffalo (B), JS (Juvenile Stage), L (Leaves), Arial Part (AP), Stem (S), Whole plant (WP), Fodder (FO), Forage (FOR), Mixed with Feed (MF), Common (C), Abundant (A), Rare (R), Frequent (F), Infrequent (IF), Male (M), Female (F), respondent (R).

Ethics approval and consent to participate: Verbal consent was obtained from all participants before their involvement in the study.

Consent for publication: All persons shown in images gave their consent to have the images published.

Availability of data and materials: All relevant data supporting the findings of this study are embedded within the article itself, with additional supplementary materials provided in the attached appendices.

Competing interests: The authors declare no competing interests

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Author contributions: Akshaya Kumar Sahoo: Conceptualized the study design, conducted ethnobotanical surveys, developed the methodology, wrote and edited the manuscript, analyzed and interpreted the data, and reviewed the final version. Sonali Soren: Ethnobotanical data review, Data collection and field survey. Kamal Lochan Barik: Contributed to the study design and methodology, supervised the research, improved the manuscript, and reviewed the final version.

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Table S1. Ethnobotanical Survey and Documenting Traditional Plant Uses from Literary Sources

Species Name	Aliment	Part Used	Mode of Remedy Preparation	A.	Mode of Use and Dosage	Reference
***Alloteropsis cimicina* (L.) Stapf**	Toothache	Root	Powder	A.	The root paste serves as a remedial agent for alleviating toothache.	Katewa et al. 2001
***Alpuda Mutica* L.**	Mouth sores	Whole Plant	Powder	A.	To treat mouth sores in cattle and to alleviate dysentery.	Shruthi and Kotresha 2024
***Aristida adscensionis* L.**	Mouth and Foot sores	Seed	Powder, Paste	A.	In traditional Santal practice, approximately 10 grams of dried seeds are pulverized into a powder, mixed with castor oil (Ricinus communis) to form a paste, and applied topically to mouth and foot sores in cattle.	Saha et al. 2013
				B.	Additionally, the Lodhas employ a unique method to ward off evil spirits from cattle, wherein inflorescences are tied in bunches and placed in front of cattle shelters.	
***Avena sativa* L.**	Milk production	Arial Part	Powder	A.	To enhance the skeletal system and boost milk production and quality, shoots accompanied by spikelets at the flowering or fruiting stage are fed to lactating cattle.	Mustafa et al. 2015; Suman and Singh 2022
***Bothriochloa bladhii* (Retz.) S.T.Blake**	Digestation	Arial Part	Paste	A.	Improve Digestion	Harun et al. 2017
***Cenchrus ciliaris* L.**	Stomachache	Arial Part	Paste, Powder	A.	A decoction made from the roots is administered to children to treat internal worm infestations.	Katewa et al. 2001; Harun et al. 2017
				B.	Diuretic	
***Cenchrus pedicellatus* (Trin.) Morrone**	-	Stem	Juice	A.	The Lodhas use a natural remedy to alleviate eye irritation, preparing eye drops from the fresh juice extracted by crushing the internode portion of the plant, followed by filtration.	Saha et al. 2013
				B.	The Asurs employ a traditional treatment for piles, involving a paste made from approximately 20 grams of fresh stolon, mixed with around 5 grams of black pepper (Piper nigrum) seeds. This paste is administered for a minimum of 15 days to cure piles.	
***Chloris barbata* Sw.**	Skin Disease	Whole Plant	Juice	A.	The shoots of the plant serve as a nutritious forage, while the plant juice is utilized to treat skin diseases, similar to a medicinal grass.	Suman and Singh 2022

***Chrysopogon aciculatus* (Retz.) Trin.**	Woond, Respiratory and skin disease	Whole plant	Powder, Paste, Juice	A. It is effectively used to treat skin diseases and fever. B. The stems are utilized for crafting baskets, mats, and other handicrafts. C. The entire plant can be ground into a powder and used as a medicinal herb. D. Various preparations can be made from the plant, including liquid extracts, infusions, capsules, and topical oils. E. In addition, the Santals employ a traditional remedy, mixing a fresh rhizome paste with approximately 9 black pepper seeds, and administering it on an empty stomach to alleviate stomachaches and gastric disorders.	Zihad et al. 2018; Islam et al. 2021; Grover et al. 2021; Dangol 2008
***Chrysopogon zizanioides* (L.) Roberty**			Juice	A. Various indigenous communities have employed this plant in traditional remedies. The Lodhas treat dyspepsia by administering a freshly prepared aqueous decoction of the root, approximately 15 ml, twice a day before lunch and dinner. The Mundas use a paste made from fresh roots, about 10 gm, applied to the forehead to alleviate headaches. They also utilize root ash mixed with lukewarm water to cure acidity. B. The Oraons prepare an aqueous decoction by soaking fresh stems from young plants in water overnight, which is then administered in 20 ml doses at regular 3-hour intervals to address urinary problems. The Polias combine a paste made from fresh roots, approximately 25 gm, with black pepper seeds, about 10 gm, and consume it with water or milk to retain vitality and overcome weakness caused by excessive sweating. C. Additionally, the Mundas give root paste, about 10 gm, mixed with honey to children to prevent vomiting. The Polias use fresh root decoction as a mouth freshener and administer root paste to children at bedtime to stop nocturnal enuresis. Furthermore, root paste is taken orally, mixed with water, to address anthelmintic issues.	Saha et al. 2013; Katewa et al. 2001

***Cymbopogon citratus* (DC.) Stapf**	Digestion, Headache, Immunity Power boost, Mosquito repellent	Whole Plant	Powder, Paste, Juice	A. In Egypt, dried leaves were boiled and orally administered as a renal anti-spasmodic and diuretic. Leaves and essential oil (EO) showed significant results in treating cough, fever, vomiting, headache and even insomnia and depression. B. In Indonesia and Malaysia, the whole plant is boiled, and the liquid obtained is administered orally for its emmenagogue effect (stimulation of the pelvic blood flow and uterine region). In the United States of America, the boiled liquid is used as an external lotion to heal wounds and bone fractures, especially in the Minnesota region. C. In South America, precisely in Brazil, tea obtained from the leaves of *C. citratus* is drunk for its antispasmodic, anti-inflammatory and analgesic effects. D. In India, the plant itself of *C. citratus* is grown in gardens to ward off snakes. Indians also give children lemongrass tea with slices of lemon to heal stomatitis. A few drops of the EO diluted in warm water are administered orally to treat gastrointestinal problems. E. In Africa, it is used as an antitussive, antiseptic, sudorific, and to treat back pain. Lemongrass leaves are also brought to a boil with the leaves of bamboo (Bambusa vulgaris) and ginger to reduce fever. F. In Nigeria and Ghana, decoctions of C. citratus leaves with Cassia occidentalis and/or key lime (Citrus aurantifolia) are used to treat malaria, especially for pregnant women. Patients take one cup per day until complete healing. G. Chinese treat colds and oral bleeding with C. citratus essential oil . H. Studies have also shown that lemongrass has allelopathic properties, which means it can be used as a herbicide I. Lemongrass essential oil concentrated at 10% in an aqueous suspension has a total herbicidal effect	Oloyede 2009; Spring 1989; Fransisco et al. 2013; Negrelle et al. 2007; Tchoumbougnang et al. 2005; Dudai et al. 1999; Valarini et al.1996; Lachman-Asase et al. 2010; Ritter et al. 2012; Machraoui et al. 2018; Nadaf et al. 2019

				on many weed species such as *Digitaria horizontalis*, *Sorghum halepense*, *Bidens pilosa*, *Euphorbia heterophylla* and *Raphanus raphanistrum.* Even animals are treated with C. citratus. J. In Brazil, the tea made out of leaves and roots is given as a remedy for colic. The oil showed its efficiency against body odors. K. Macerate leaves reduce swelling, mosquito bites, wounds and eczema. L. Moreover, C. citratus is known for its domestic use. In aerosols, deodorants, C. citratus is used as an insect repellent. Roots extracts are added to perfumes, shampoo, soaps and cosmetics. It is also used as a household detergent.	
***Cymbopogon martini* (Roxb.) Will.Watson**	Digestion, Headache, Immunity Power boost, Mosquito repellent	Whole Plant	Powder, Paste, Jiuce	A. The leaves of this plant have various traditional uses. A warmed paste made from the leaves, mixed with Rhoido mustard oil (*Brassica compestris*) and water, is used for massage to alleviate rheumatic pain. B. The extracted oil from the leaves is utilized to treat skin diseases. C. A decoction of the leaves is administered to relieve cold and fever. The smoke from the plant serves as a repellent for rodents and mosquitoes. D. Additionally, crushed leaves and stems are given to children to treat stomachaches. The decoction of leaves is also employed as a diuretic. Leaf extract is used to remove insects from the ear, and the leaf oil is taken internally by the Totos to cure biliousness, although medicine men advise against consuming pork and country liquor during treatment. E. The Santals use leaf extract as nasal drops to cure headaches. Furthermore, the entire plant is used for thatching purposes.	Katewa et al. 2001; Saha et al. 2013

***Cynodon dactylon* (L.) Pers.**	Anticoagulant, Eye irritation, Constipation	Whole Plant	Powder, Paste	A. The plant has various traditional uses. The Totos crush fresh plants and apply the juice to fresh cuts to stop bleeding. The Nepalese use a paste made from the whole plant, combined with seeds of 'Dhatura' (*Datura stramonium*), *Boehmeria nevia*, and *Pteridium aquilinum*, to reduce the risk of hydrophobia after a dog bite. B. The Mundas apply fresh leaf extract to the external eyelid to alleviate redness and irritation caused by summer heat. C. This plant holds cultural significance, being considered sacred and used in deity worship by local people. Its leaves are crushed and applied to cuts to stop bleeding, while leaf juice is used to treat eye infections. The shoots serve as excellent forage and are used to treat various health issues, including anemia, constipation, indigestion, menstrual disorders, and nasal bleeding. The shoot paste is applied to cuts and wounds to promote healing. D. The root decoction is used as a diuretic. In Hindu traditions, the plant plays a significant role in religious ceremonies. Additionally, it is used as forage for cows and yaks.	Saha et al. 2013; Kumari and Sagoo 2015; Bhatia et al. 2014; Suman and Singh 2022
***Dactyloctenium aegyptium* (L.) Willd.**	stomachache	Inflorescence	Paste	A. The plant has various traditional uses, particularly among the tribal communities in the Purulia district of West Bengal. The Lodhas prepare a paste from the plant's grains, mixed with limewater, to treat stomachaches in children. B. The Santals use a similar paste, combined with Handia (country liquor), to cure kidney stones. C. The Asurs utilize the plant paste as a fish stabilizer. D. Additionally, the grains are used by many tribal communities in the region to prepare country liquor. A simple remedy for a stomachache involves mixing grain powder with water.	Saha et al. 2013; Katewa 2001

***Desmostachya bipinnata* (L.) Stapf**	Cut and Wounds, Asthama and Jundice	Whole plant	Paste	A. B.	The Lodhas take a paste of the whole plant orally to cure dysentery. Leaf paste is applied to treat cuts and wounds, while root paste is used to alleviate asthma and jaundice. A specific contraceptive remedy involves mixing root paste with the root paste of *Piper betel* and decoction of *Dendrophthoe falcata*, grown on Vitex negundo, in a 3:2:1 ratio. The Santals use root juice combined with a decoction of long peppers (Piper longum) to treat jaundice. They also administer a decoction of the fresh plant, mixed with black pepper paste, to address constitutional disorders. Additionally, the plant has practical uses, such as making ropes and mats. Its root paste is also used with milk to treat rheumatism.	Katewa et al. 2001; Saha et al. 2013; Ahmad et al. 2009
***Digitaria abludens* (Roem. & Schult.) Veldkamp**	Stomach worm	Leaves	Juice	A.	Leaves juice is used to kill the stomach worm	Sinha et al. 2023
***Digitaria bicornis* (Lam.) Roem. & Schult.**	Food poisoning	Root	Juice	A.	Root juice is taken thrice to treat food poisoning.	Sinha et al. 2023
***Echinochloa colona* (L.) Link**	Indigestion, Pain relief	Seed, Whole plant	Juice	A. B. C.	The seeds are roasted and mixed with roasted wheat and bhang seeds, then consumed. The stems are utilized in weaving mats, showcasing the plant's practical applications. In terms of medicinal uses, the Lodhas administer fresh plant juice, approximately 10 ml, mixed with a pinch of common salt, to treat indigestion. The Santals apply fresh root paste to alleviate acute burning pain on the soles of the feet. These traditional remedies highlight the plant's significance in local healthcare practices.	Kumari and sagoo 2015; Saha et al. 2013
***Eleusine indica* (L.) Gaertn.**	Snake bite, Fever	Root	Paste	A. B. C.	The Oraons employ a specific antidote for snake bites, consisting of fresh root paste, approximately 15 gm, mixed with rhizome paste of *Zingiber officinale* and 9 black pepper seeds. The Rabhas use fresh root paste, about 10 g, to facilitate easy delivery. Additionally, a paste made from the whole plant, mixed with water, is taken orally to treat fever. A	Saha et al. 2013; Katewa et al. 2001; Kumari and sagoo 2015

					decoction of the fresh plant is used to address dysentery and constipation. The plant also has practical applications, such as making ropes and mats, highlighting its versatility in traditional practices.	
***Eragrostis ciliaris* (L.) R.Br.**	Digestive Problems, Food	Root, Seed	Powder	A.	The root powder is utilized to alleviate digestive problems, providing a natural remedy for gastrointestinal issues. Additionally, the seeds of this plant serve as a valuable food source, highlighting its importance in supporting local nutrition and sustenance.	Kokwaro 1976
***Eragrostis coarctata* Stapf**	Tonic	Root	Juice	A.	Root juice is used as a tonic.	Sinha et al. 2023
***Eragrostis japonica* (Thunb.) Trin.**	Digestive, Respiratory & Skin Disease	Whole plant	Powder, Paste, Juice	A. B. C.	The leaf powder is used to prepare teas, infusions, or decoctions that alleviate digestive issues, respiratory problems, and skin conditions. The seeds are utilized to produce medicinal oils and powder, which are effective in treating arthritis, rheumatism, and menstrual disorders. The root juice is a natural remedy for fever, cough, and sore throat. Additionally, the stem of the plant is used to prepare medicinal infusions or teas that address digestive issues and respiratory problems. The various parts of this plant offer a range of health benefits, making it a valuable resource in traditional medicine	Kadir et al. 2012; Gebru et al 2021
***Eragrostis pilosa* (L.) P.Beauv.**	Digestive Problems, Food	Root, Seed	Powder	A.	The root powder is used to cure digestive problems. The Seed of this plant is used as a food source	Sujatha et al. 2022; Mani et al. 2024; Kokwaro 1976; National research council 2002
***Eulaliopsis binata* (Retz.) C.E.Hubb.**	Fever, bronchiti	Whole Plant	Paste, Juice	A. B. C.	The Lodhas administer a root decoction, approximately 10 ml, mixed with long pepper paste, to treat fever. The Santals use a combination of whole plant paste, about 5 gm, honey, and leaf juice of *Adhatoda zeylanica* to cure bronchitis, taking this mixture three times a day. The Oraons employ an aqueous decoction of the root, about 10 ml, mixed with black pepper seed powder, approximately 5 gm, to reduce body temperature caused by summer heat. These	Saha et al. 2013

					traditional remedies highlight the plant's significance in local healthcare practices.	
***Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.**	Snake bite, Dog bite	Root	Paste	A.	Root paste is taken orally in snake and Lapidary dog bites. A poultice of root paste is also tied on the bite portion for early cure	Katewa et al. 2001
***Imperata cylindrica* (L.) Raeusch.**	Indigestion, Scorpion bite	Whole Plant	Juice	A. B. C. D. E.	The Lodhas use fresh plant juice, approximately 10 ml, mixed with a pinch of common salt, to treat indigestion. The Santals apply fresh root paste to alleviate acute burning pain on the soles of the feet and also use it to treat scorpion bites. Additionally, the Santals burn the rhizomes to ash and apply it to cure piles. The Mundas prepare a paste from the fresh root, about 5 gm, and mix it with rice beer, "Pachai", to treat enlarged spleen and liver problems in children. The Lepchas apply root paste to treat leprotic wounds. Beyond its medicinal uses, the plant also serves practical purposes. Green leaves are used as cattle fodder, mixed with sword grass and straw. Dried leaves are used for thatching the roofs of huts, demonstrating the plant's versatility in traditional practices.	Saha et al. 2013; Katewa et al. 2001; Suman and Singh 2022
***Ischaemum ciliare* Retz.**	Diarrhea	Whole Plant	Juice	A.	Freshly prepared plant juice (ca. 35 ml) mixed with 'Ada' (rhizome of *Zingiber officinale*) paste (ca. 15 gm) is given to cattle to cure diarrhea by the Lodhas.	Saha et al. 2013
***Oplismenus burmanni* (Retz.) P.Beauv.**	Galactagogue	Whole Plant	Paste	A.	Whole plant chopped into small pieces, mixed with molasses, is given to the cattle as a galactagogue by the Asurs.	Saha et al. 2013
***Oplismenus compositus* (L.) P.Beauv.**	Insect Bites	Root	Paste	A.	Root paste is used to treat insect bites.	Sinha et al. 2023
***Oryza rufipogon* Griff.**	Wound healing, Piles and Liquor preparation	Root	Paste	A. B.	The plant has various traditional medicinal uses among different communities. The Lodhas mix chopped fresh root stocks with marcha, a substance used in country liquor preparation. The Mundas prepare a paste from the fresh root, approximately 5 gm, and mix it with rice beer,	Saha et al. 2013

				"Pachai", to treat enlarged spleen and liver problems in children. C. The Santals burn the rhizomes to ash and apply them to cure piles. D. Additionally, the Lepchas use root paste to treat leprotic wounds.	
***Oryza sativa* L.**	Tonsillitis	Inflorescence	Paste	A. Uncooked ground rice is made into a paste and applied externally to cure tonsillitis. B. Uncooked rice is fed to animals to facilitate the expulsion of the placenta	Acuna et al. 2002; Agra et al. 2007; Bhatia et al. 2014
***Panicum brevifolium* L.**	Stomach Infection	Leaves	Juice	A. Leaves juice is used to treat stomach infections due to food poisoning	Sinha et al. 2023
***Panicum repens* L.**	Eye irritation, Orchitis	Internode, Root	Juice	A. The Lodhas use an aqueous extract of the fresh internodes as an eye drop to cure eye irritation caused by conjunctivitis infection. They also use a fresh juice prepared from the internode portion of the plant as an eye drop to treat eye irritation. B. The Santals apply a paste made from the fresh root mixed with *Zingiber officinale* rhizome paste to cure orchitis. Additionally, they use a mixture of seed powder and black pepper paste as a diuretic agent. C. The plant also has practical uses. The grains are edible and can be used as a substitute for rice. D. The Asurs use a paste made from the fresh stolon, approximately 20 gm, mixed with black pepper seeds, about 5 gm, to cure piles. This treatment is continued for at least 15 days, highlighting the plant's significance in traditional healthcare practices.	Saha et al. 2013
***Panicum sumatrense* Roth**	Infections and Ailments	Root	Juice	A. The Lodhas administer fresh juice, approximately 10 ml, mixed with a pinch of common salt, three times a day for three days, as a refrigerant to alleviate symptoms during smallpox. B. The Asurs use a paste made from fresh root, about 50 gm, mixed with black pepper, approximately 5 gm, to treat scalp infections. C. The Polias apply a warmed root paste to carbuncles to reduce pain, showcasing the plant's versatility in traditional medicine. These remedies	Saha et al. 2013

				highlight the plant's significance in local healthcare practices, particularly in treating various infections and ailments.	
***Paspalum scrobiculatum* L.**	Typhoid, Fever	Root	Juice	A. The Rabhas administer an aqueous decoction of grains, approximately 15 ml, mixed with freshly prepared root paste of Hemidesmus indicus, about 8 gm, as a tonic to help women regain their health after childbirth. B. The Santals use a freshly prepared root decoction, about 10 ml, mixed with black pepper paste, approximately 5 gm, and a pinch of common salt, as a tonic during typhoid fever, taking it twice a day before lunch and dinner. C. Beyond its medicinal uses, the plant also serves practical purposes. The grains are used as a fermenting agent in the preparation of country liquor. D. Additionally, a paste made from the whole plant is used to treat skin diseases, boils, and sores, highlighting the plant's versatility in traditional practices.	Saha et al. 2013; Katewa et al. 2001
***Perotis indica* (L.) Kuntze**	Digestive and Wound Healing	Root, leaves	Paste,	A. Roots are used to clear digestive problems, and leaves are used to heal wounds. B. Decoction of dried inflorescence is taken orally to stop bleeding after childbirth.	Kokwaro 1976; Katewa et al. 2001
***Saccharum officinarum* L.**	Jaundice	Stem	Juice	A. The Lodhas use the stem juice as a cooling agent. B. The Mundas administer a mixture of stem juice, a pinch of table salt, and a few drops of citrus juice ("nimbupani") as a health drink to patients suffering from jaundice. C. The Santals use a combination of stem juice and black pepper paste to treat constitutional disorders, highlighting the plant's significance in local healthcare practices. These traditional remedies showcase the plant's versatility in addressing various health issues.	Saha et al. 2013
***Saccharum spontaneum* L.**	allergic eruptions, pox	Root, Stem	Paste	A. The Lodhas administer a root decoction, approximately 20 ml, mixed with lukewarm goat milk as a diuretic.	Saha et al. 2013; Katewa et al. 2001; Suman and Singh 2022

				B. The Santals apply a root paste mixed with camphor to treat allergic eruptions. C. The Polias use ash obtained from burning the inflorescence, mixed with mustard oil, to treat septic wounds in cattle. D. The Mundas use the root decoction to cure skin irritation caused by excessive consumption of country liquor. E. The stem is used for rough thatching work by many tribal communities and is also used by the Rabha tribes to treat pox. F. Various parts of the plant are used for practical purposes, such as thatching roofs, preparing fiber, weaving mats and carpets, and making brooms. G. Additionally, the plant is used to treat various health issues, including cuts and wounds, for which a leaf paste is applied to prevent pus formation. H. The Gangotas consume loose jaggery prepared from the plant's sap to cure piles, highlighting the plant's significance in traditional medicine and everyday practices.	
***Sacciolepis indica* (L.) Chase**	Stone cure	Whole Plant	-	A. The Lodhas use a plant decoction mixed with common salt to treat gallstones.	Saha et al. 2013
***Setaria flavida* (Retz.) Veldkamp**	Tonic	Whole Plant		A. The grains are consumed at a time of scarcity. Root juice is used as a tonic	Sinha et al. 2023
***Setaria italica* (L.) P.Beauv.**	Chicken pox	Arial Part	Paste	A. Its flour is used to make a sweet dish called "kangni halwa", which is given to patients suffering from chickenpox. B. The Lodhas administer a freshly prepared root decoction, approximately 10 ml, mixed with a pinch of table salt, about 2 gm, to cure dyspepsia, taking it on an empty stomach in the early morning. C. The Santals use the tender stem as fodder to increase lactation in cattle. D. The Oraons prepare a root paste, about 5 gm, mixed with the root paste of *Paederia scandens* and *Sida cordata*, approximately 3 gm and 2 gm respectively, to cure blood dysentery, taking it twice a day.	Ahmad et al. 2010; Saha et al. 2013

				E. These traditional remedies highlight the plant's significance in local healthcare and agricultural practices.	
***Setaria pumila* (Poir.) Roem. & Schult.**	Neck sores, Rheumatic pain	Root	Paste	A. The Lodhas use the plant to treat various ailments. A freshly prepared root paste is warmed gently and applied to reduce rheumatic pain. Additionally, they boil the grains, pound them into a paste, and mix them with black pepper seeds in a 3:2 ratio. B. This paste is then applied to neck sores on bulls, showcasing the plant's versatility in traditional medicine and veterinary care.	Saha et al. 2013
***Setaria verticillata* (L.) P.Beauv.**	Wound healing	Root, Inflorescence	Paste	A. The Santals apply root paste to septic wounds on cattle to promote early healing. B. The inflorescence portion, without grains, is used to prepare mats that serve as flooring in granaries. Interestingly, these mats are believed to function as rodent repellents by the Santals, Lodhas, and Mundas. C. In terms of healthcare, the Lodhas administer a freshly prepared root decoction, approximately 10 ml, mixed with a pinch of table salt, about 2 gm, to cure dyspepsia, taking it on an empty stomach in the early morning. D. The Santals use the tender stem as fodder to increase lactation in cattle. E. The Oraons prepare a root paste, about 5 gm, mixed with the root paste of *Paederia scandens* and *Sida cordata*, approximately 3 gm and 2 gm respectively, to cure blood dysentery, taking it twice a day.	Saha et al. 2013
***Sorghum halepense* (L.) Pers.**	Tonic, Fever	Root	Juice	A. The Lodhas administer a mixture of root juice, approximately 15 ml, and long pepper paste, about 5 g, to treat gonorrhoea. B. The Santals use a mixture of root juice and a pinch of table salt as a tonic to treat fever. C. The Rabhas boil the grains and administer them to patients to cure dysentery. Many tribes in the state mix the root juice with rice beer, "Pachai", to increase its potency.	Saha et al. 2013; Harun et al. 2017

				D.	Additionally, a root decoction is used to reduce swelling of the mammary gland, highlighting the plant's significance in traditional medicine and healthcare practices.	
***Sporobolus diandrus* (Retz.) P.Beauv**	Fodder	Stem	Paste	A. B.	The Santals chop the stem into small pieces and use it as fodder for cattle to promote lactation. Additionally, many tribal communities in the state utilize the plant for broom-making, highlighting its versatility in everyday practices.	Saha et al. 2013
***Urochloa ramosa* (L.) T.Q.Nguyen**	Antiseptic	Leaves	Paste	A.	Leaves act as antiseptic	Harun et al. 2017
***Urochloa reptans* (L.) Stapf**	Anemia	Leaves	Juice	A.	Leaves juice help to cure anemia also used as laxatives	Harun et al. 2017