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Feeding pattern of livestock owners across the different agro-climatic zones of Karnataka

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Abstract

In developing countries Smallholder dairy farmers face many feed constraints such as inadequate feed quality and quantity, poor storage facilities for feed conservation as well as insufficient water. However, feeding of livestock continues to pose many problems due to lack of information on composition and utilization of locally available feed resources. A study was therefore conducted to know the feeding patterns, socio-economic parameters of livestock farmers, herd size and crops cultivated by livestock farmers in Karnataka covering under 4 agro-climatic zones, 4 districts, 4 taluks, 12 villages and 120 farmers' selected using multistage sampling. More number of the farmers belongs to middle age group with medium farming experience and below half of farmers are belongs to marginal farm size with low annual income and nearly half of the farmer had high school education. Milking animals were more in case of northern dry zone followed by northern transition zone, hilly zone and coastal zone. The mean quantity of feeding dry fodder such as paddy straw, ground nut straw, Hay and dry fodder from morning to evening was comparatively more in coastal zone followed by hilly zone, northern dry zone and northern transition zone. Whereas the mean quantity of feeding green fodder from morning to evening was comparatively more in northern dry zone followed by northern transition zone, hilly zone and coastal zone.

Keywords: Dry fodder. green fodder. feeding patterns. livestock

Introduction

An adequate supply of livestock feed is crucial to the livelihoods of millions of people across the developing world, and not just for smallholders, but also for pastoralists and the large number of landless who depend mainly on common land for grazing (Sanford and Ashly 2008) [16]. Shortages of feeds and forages are especially acute during the dry season. Much research attention has been devoted to feed problems and solutions and optimal feeding practices (Lukuyu *et al* 2009; Lenne and Wood 2004) [9, 8] but there has been relatively little systematic consideration of the constraints smallholders face, the feeding strategies and coping mechanisms they use, and the ways scientific knowledge and indigenous technical knowledge can be combined to help the farmers improve livestock productivity and livelihoods. Feeding practices of animals differ from place to place due to variation in different aspects of feeding such as availability, type of feed, feeding practices on scientific recommendation, etc. Adequate supply of feed and fodder is a critical factor affecting performance of animal (Mattigatti and Jayram. 1993) [10]. So, in order to know the feeding pattern of the farmers from different agro-climatic zones of Karnataka were examined.

Methodology

Study was conducted in northern Karnataka 2018. This part has 7 districts belonging to 4 agro-climatic zones. These zones are northern dry zone (zone 3), northern transition zone (zone 8), hill zone (zone 9) and coastal zone (zone-10). Stratified random sampling was used to select the villages. First stratum was those districts having highest livestock population in each zone. Dharwad (zone 8), Belgaum (zone 9), Bagalkote (zone 3) and Uttar Kannada (zone 10) districts were selected. Second stratum was one taluk (block) from each district again having highest livestock population. Chikkodi (zone-9), Khanapur (zone 8), Badami (zone 3) and Honnavar (zone 10) were the taluks selected. Third stratum was selection of 3 villages from each taluka having highest milk collection by the cooperative milk societies, the data for which were obtained by the respective milk unions of Karnataka Milk Federation. Kerur, Hirekodi, Examba from Chikodi taluk; Itagi, Avarolli, Kodachwad from Khanapur

taluk; Kendura, Mutakanakere, Muttalgere from Badami taluk; and Gunavante, Kerekoan, Gunavante-B from Honnavar taluk, were the villages, together making 12, were sampled for the study. Fourth stratum was respondent's selection in villages based on landholding size. Two each farmers belonging to marginal (below1 ha), small (1-2 ha), semi-medium (2-4 ha), medium (4-10 ha) and large (10ha and above) categories, total 10 farmers from every village were selected. The study thus made use of agro-climatic zone, livestock population, milk procurement and landholding size as the criteria for stratification of study area. It covered 4 agro-climatic zones, 4 districts, 4 taluks, 12 villages and 120 farmers.

Interview schedule was structured by incorporating questions related to different variables to be studied as per the objectives set for the study. This structured interview schedule was pre-tested in non-sample area to identify the ambiguities if any. The necessary corrections were incorporated based on the experiences of pre-testing and interview schedule was then finalized. This standardized interview schedule was used for final data collection which was done through personal interview technique. Collected data were tabulated and analyzed zone wise using frequency and percentages.

Results and Discussion

Socio-economic parameters of livestock farmers

Table 1 shows that the Below half of respondents (40.00%) belonging to middle age group between 46 to 51 years followed by old age (32.50%) above 51 years and (27.50%) of respondents fall under young age group up to the age 45 years and average age of the respondent was 47 years. The average education of respondents is 6 years, of formal schooling i,e. 6th standard. However almost half of the respondents (48.33%) were high school education followed by illiterate (22.33%) middle (14.17%), pre-university (05.83%), graduate and above (5.00%) and primary school education (04.17%). It is clear from the table that more number of respondents (41.67%) had marginal land holdingi. e below one hectorit is because of due to fragmentation of land holding year after year. Followed by small (34.17%)1-2 hectors, semi medium (23.33%) 2-4 hectors, medium (0.83%) 4-10 hectors and none of the farmers from large holding. Average land holding of respondents is 3 hectors. One third of the respondents had medium (42.50%) farming experience of 23 to 31 years followed by high (34.17%) farming experience of more than 31 years and (23.33%) of respondents had low farming experience with less than 23 years. Average farming experience of respondents is 26 years. Nearly half of the respondents had low annual income (44.17%) which below 99868 Rs. followed by more or less equal percentage of respondents belonging to both high (28.33%) and medium (27.50%) annual income.

Table 1: Socio-economic parameters of livestock farmers n=120

Sl. No	Particulars	Categories	Number	Percentage
Age (Yrs)				
1	Young	< 45 yrs	33	27.5
2	Middle	46-51 yrs	48	40.0
3	Old	> 51 yrs	39	32.5
	Mean			47.57
	S.E			0.65
Education (Yrs.)				
1	Illiterate	0	27	22.50
2	Primary	1-4	5	04.17
3	Middle	5-7	17	14.17
4	High school	8-10	58	48.33
5	Pre-university	11-12	7	05.83
6	Graduate & above	>13	6	05.00
	Mean			6.96
	S.E			0.40
Farm size (ha)*				
1	Marginal	<1 ha	50	41.67
2	Small	1-2 ha	41	34.17
3	Semi medium	2-4 ha	28	23.33
4	Medium	4-10 ha	1	0.83
5	Large	> 10ha	0	0.00
	Mean			3.53
	S.E			0.22
Farming experience (yrs)				
1	Low	<23 yrs	28	23.33
2	Medium	23-31	51	42.50
3	High	>31	41	34.17
	Mean			26.89
	S.E			0.78
Annual income (Rs.)				
1	Low	<Rs.99868	53	44.17
2	Medium	Rs.99869-167781	33	27.50
3	High	> Rs.167781	34	28.33
	Mean			133825
	S.E			7293.69

*The average holding in India is tiny and often split into scattered pieces. Five major categories of land holding are: marginal (below 1 ha), small (1-2 ha), semi-medium (2-4 ha), medium (4-10 ha), large (10ha and above).

Livestock holdings

Result reveals that northern dry zone farmers were having more number of cattle's (cow + bullocks) of all the age groups as compare to all three zones and in northern transition zone farmers were having more number of buffalos of all the age groups as compare to all three zones. In case of northern dry zone milking animals were more as compare to reaming zones. Table 2.

Table 2: Livestock holdings (n=120)

Sl. No.	Type of animal	Category	Zone-3*	Zone-8*	Zone-9*	Zone-10*	Total
		Age of animals	Frequency	Frequency	Frequency	Frequency	Frequency
1	Cattles (cow + bullocks)	>2.5 years	111	30	17	30	188
		1.0-2.5 years	25	12	05	17	59
		<1.0 years	93	27	12	28	160
2	Buffalos	>2.5 years	17	64	56	28	165
		1.0-2.5 years	18	18	19	16	71
		<1.0 years	10	59	53	27	149
3	Milking animals	>2.5 years	125	93	65	61	343

*Zone-3=Northern Dry Zone, Zone-8=Northern Transition Zone, Zone-9=Hill Zone, Zone-10=Coastal Zone

Crops cultivated by livestock farmers across different zones

Crop residue forms an important source of fodder for livestock. Hence, it was felt essential to study crops cultivated by farmers across different zones. Results related to this is presented in Table-3. In northern dry zone (zone-3), more than half of the respondents cultivated maize (80.00%), sugarcane (73.33%), fodder crops (60.00%) and groundnut (56.67%). Half of the respondents cultivated rabi sorghum.

Majority of the respondents of northern transition zone (zone-8) cultivated sugarcane (93.33%), maize (83.33%) and fodder crops (80.00%). Some of them cultivated rabi sorghum (36.67%), bengalgram (30.00%) and kharif sorghum (16.67%). Paddy (90.00%), sugarcane (70.00%), chilli (66.67%), fodder crops (50.00%) and rabi sorghum (46.67%) were the crops cultivated majorly by the respondents of hilly zone (zone-9).

Sugarcane, maize and rabi sorghum however emerged as dominant crops in three zones (3, 8 and 9). Sugarcane is considered as commercial crop. It demands less labour and has assured market. Because of these reasons farmers with irrigation facilities prefer this crop. Maize being photo insensitive crop can be taken up during any time of the year. With unassuming rainfall pattern in recent years farmers prefer to take up this crop as unlike many crops rains during maturity stage will not affect it much, as cobs are well protected by sheath. Rabi sorghum comes up very well in residual moisture. Besides, it is essential as the crop residue from this crop is the only and the best source of dry fodder for livestock. Both grains and stover of this crop have good marketability. Coconut and arecanut are two important crops cultivated in coastal areas (zone-10) as the prevailing climatic factors favour these crops besides good market facilities created in the region by coconut and areacnut boards.

Table 3: Crops cultivated by livestock farmers across different zones (n=120)

S. No	Crops	Zone-3		Zone-8		Zone-9		Zone-10	
		F	%	F	%	F	%	F	%
1	Sugarcane	22	73.33	28	93.33	21	70	0	0
2	Maize	24	80.00	25	83.33	4	13.33	0	0
3	Paddy	0	0.00	0	0.00	27	90.00	27	90
4	Kharif sorghum	3	10.00	5	16.67	1	3.33	1	3.33
5	Rabi sorghum	15	50.00	11	36.67	14	46.67	0	0.00
6	Sunflower	7	23.33	0	0.00	0	0.00	0	0.00
7	Horsegram	0	0.00	2	6.67	3	10.00	0	0.00
8	Bengal gram	2	6.67	9	30.00	2	6.67	0	0.00
9	Ground nut	17	56.67	0	0.00	0	0.00	0	0.00
10	Chilli	0	0.00	1	3.33	20	66.67	0	0.00
11	Banana	1	3.33	0	0.00	1	3.33	19	63.33
12	Mango	1	3.33	1	3.33	4	13.33	0	0.00
13	Sapota	5	16.67	2	6.67	6	20.00	2	6.67
14	Coconut	1	3.33	0	0.00	0	0.00	27	90.00
15	Areca nut	0	0.00	0	0.00	0	0.00	19	63.33
16	Betel nut	1	3.33	0	0.00	0	0.00	10	33.33
17	Black pepper	0	0.00	0	0.00	0	0.00	7	23.33
18	Fodder crops	18	60.00	24	80.00	15	50.00	3	10.00
19	Others	4	13.33	1	3.33	6	20.00	26	86.67

Mean values of different socio economic characters of livestock farmers

The average age of livestock farmers was 48.43±1.9 years in northern transition zone (zone-8), 48.3±1.0 years in coastal zone (zone-10) and 46.87±1.1 years in hilly zone (zone-9) where as in northern dry zone (zone-3) mean age of livestock farmers was 46.70±0.9 years (Table 4). From the above results it can be inferred that, majority of the respondents were in middle age group (between 46 to 48 years of age) in all the agro climatic zones. Reasons for this could be as age increases, experience in agriculture also increases which might have lead them to understand importance of livestock rearing. So, they might be more eager and interested to know about green fodder production. The results were in line with the findings of the studies reported by Rabbani *et al.* (2004) [11], Rahman and Gupta (2015) [12].

The average education of respondents was 7.43±0.8 years of formal schooling in hilly zone (zone-9), 7.1±0.7 years in northern dry zone (zone-3), 6.4±0.9 years in northern transition zone (zone-8) and 6±0.9 years in coastal zone (zone-10). So probable reasons for this could be lack of access to higher level of formal education and/or lack of motivation to continue their schooling. The formal schooling helps the farmers to gather new information required for fodder production which in turn might create positive outlook to manage their livestock. The above results are in conformity with the findings of Kashappa (2013) [5] and Rahman and Gupta (2015) [12].

The average farming experience of livestock owners was 24.33±1.2 years to 29.5±2.2 years in all the agro climatic zones. Probable reason for this was, most of the respondents were in medium age category and they might have started farming at a young age. Similar results were reported by Sowjanya (2014) [18] and Rahman and Gupta (2015) [12].

The average farm size of respondents was 3.58±0.3 acres to 4.75±0.5 acres in all three zones, where as in case of coastal zone (zone-10) average farm size of farmers was 1.26±0.1 acres. Land fragmentation might be the main reason for small holdings in three zones. In coastal zone marginal size of land holdings could be attributed to topography of the area where much of the land is covered under forest and

very less cultivable land is available. Similar results were reported by Chaudhari (2006) [2] and Kashappa (2013) [5].

The average herd size of respondents was between 2.7±0.ACU to 5.3±0.5 ACUs in all the agro climatic zones. Reasons could be requirement of more manpower to take care of more animals, high cost to purchase animals, restricting herd size in accordance with the estimated production of fodder and selling of animals to meet the expenditure of the family. Results were in line with the results of Satish (2010) [17], Akshata (2014) [1] and Rajni (2015) [13].

Table 4: Zone wise mean values of different socio economic characters of livestock farmers (n=120)

Sl. No	Variable	Zone3	Zone8	Zone9	Zone10
1	Age (yr.)	46.70 ± 0.9	48.43 ± 1.9	46.87 ± 1.1	48.3 ± 1.0
2	Education (yr)	7.1 ± 0.7	6.4 ± 0.9	7.43 ± 0.8	6 ± 0.9
3	Farming Experience (yr)	24.33 ± 1.2	29.5 ± 2.2	27.63 ± 1.4	26.1 ± 1.1
4	Farm size (ac)	4.54 ± 0.4	4.75 ± 0.5	3.58 ± 0.3	1.26 ± 0.1
5	Herd Size (ACU)	5.3 ± 0.5	4.3 ± 0.6	3.7 ± 0.5	2.7 ± 0.2
6	Annul income from crops (Rs.)	85166.6 ± 4694.6	85333.3 ± 6423.4	86064.52 ± 5712.93	61000 ± 4049.97
7	Annual income from livestock (Rs.)	11575 ± 563.13	8200 ± 791.96	8588.71 ± 643.61	6175 ± 557.36
8	Total Annual income (Rs.)	98408.33 ± 5124.23	96033.33 ± 7178.01	96104.84 ± 5690.75	67175 ± 4208.94
9	Daily milk production (l/household)	11.33 ± 0.84	9.13 ± 0.74	5.32 ± 0.59	3.11 ± 0.33
10	Daily milk sale (l/household)	10.16 ± 0.82	7.78 ± 0.63	5.25 ± 0.25	2.96 ± 0.33

*Zone-3=Northern Dry Zone, Zone-8=Northern Transition Zone, Zone-9=Hill Zone, Zone-10=Coastal Zone.

The average annual income of respondents from crops was Rs. 85166.6±4694.6 in northern dry zone (zone-3), Rs. 85333.3±6423.4 in northern transition zone (zone-8), Rs. 86064.52±5712.93 in hilly zone (zone-9) and Rs. 61000±4049.97 in coastal zone (zone-10). Income from crops is mainly influenced by factors like prevailing cropping pattern and intensity, cost of production, soil fertility and the market price. The results were in line with the results of Kumar (2013) [7].

The average annual income of respondents from livestock was Rs.11575±563.13 in northern dry zone (zone-3), Rs.8200±791.96 in northern transition zone (zone-8), Rs. 8588.71±643.61 in hilly zone (zone-9) and Rs. 6175±557.36 in coastal zone (zone-10). Reason for less income from livestock was due to small herd size possessed by the respondents and treating livestock rearing as a subsidiary activity where in livestock is kept mainly for draft or Farm Yard Manure. The results are in line with the findings of Desai (2009) [3], and Suresh *et al.* (2009) [19].

Total average annual income of respondents ranged from Rs.96033.33±7178.01 to Rs. 98408.33±5124.23 in three zones except coastal zone. In coastal zone (zone-10) it was Rs. 67175±4208.94. Very small landholdings and herd size in coastal zone could be the reasons for this finding. The results were in line with the results of Khin Mar Oo (2005) [6] and Chaudhari (2006) [2].

The average daily milk production (liters/household) and daily milk sale (l/household) of respondents was 11.33±0.84 and 10.16±0.82, respectively in northern dry zone (zone-3), followed by 9.13±0.74 and 7.78±0.63 liters/household respectively in northern transition zone (zone-8), 5.32±0.59 and 5.25±0.25 liters/household respectively in hilly zone (zone-9) where as in coastal zone (zone-10) mean average daily milk production and daily milk sale (liters/household) of farmers was 3.11±0.33 and 2.96±0.33 liters/household, respectively. Lack of adequate fodder and cultivation of plantation crops, residue of which can't be fed to livestock could be the main reasons for less milk production in coastal zone. The results were in line with the findings of the studies reported by Kannan (2002) [4] and Sah (2005) [15].

Feeding schedule of livestock farmers across the different zones

Table 5 shows that feeding patterns of livestock farmers across the deferent zones of Karnataka. In northern dry zone (zone-3), Majority (86.67%) of the farmers feed only green fodders to their animals in the morning, night (86.67%), afternoon (76.67%), and evening (43.33%). More than half of the respondents feed dry fodders like paddy straw and ground nut straw to their animals in the afternoon (93.33%), morning (86.67%), night (83.33%) and evening (56.67%). Both green and dry fodder in combination fed by (73.33%) of the farmers to their animals in the morning, afternoon (70.00%), night (70.00%). and evening (33.33%). More than fifty percent of the farmers feed both green and dry fodder in combination with Karnataka milk federation (KMF) feed to their animals in the morning (73.33%), night (70.00%), afternoon (66.67%), and evening (33.33%).

The annual rainfall ranges from 464.5 to 785.7 mm and about 52% of the annual rainfall is received during rabi season. The elevation is between 450 and 900 m. The soils are shallow to deep black clay in major areas. The important crops grown here are rabijowar, maize, bajra, groundnut, cotton wheat, sugar cane and tobacco. Hence green fodder will available sufficiently to feed the animal's whole day with green fodderresiduescould be the reason for this result. Ramachandra *et al*. (2004) [14].

In northern transition zone(zone-8), majority (83.33%) of the farmers feed only green fodders to their animals in the morning, night (76.67%), afternoon (26.67%), and evening (6.67%).More than half of the respondents feed dry fodders like paddy straw and ground nut straw to their animals in the afternoon (66.67%), less than fifty in the morning (36.67%), night (26.67%) and evening (23.33%).Both green and dry fodder in combination fed by only (20.00%) of the farmers to their animals in the morning, afternoon (13.33%), night (10.00%), and Nan of the farmers feed fodders in combination in the evening. Only few of the farmers feed both green and dry fodder in combination with (KMF) feed to their animals in the morning (3.33%), night (3.33%), afternoon (3.33%), and no one of the farmer feed fodders in combination with KMF feed in the evening.

The annual rainfall ranges from 619.4 to 1303.2 mm. About 61% of rainfall is received in Kharif season. The elevation is 450-900 m and the soils are shallow to medium black clay and red sandy loam in equal proportions. The main crops grown are rice, jowar, groundnut, pulses, sugar cane and tobacco. Due to less availability of green fodder residues from the crop farmers could not feed sufficiently whole day to the animals this could be the reason for this result. Ramachandra *et al*. (2004) [14].

In hilly zone(zone-9), majority (73.33%) of the farmers feed only green fodders to their animals in the night, morning (70.00%), afternoon (43.33%), and evening (10.00%). More than half of the respondents feed dry fodders like paddy straw and ground nut straw to their animals in the night (90.00%), morning (86.67%), afternoon (73.33%), and evening (36.67%).Both green and dry fodder in combination fed by only (66.67%) of the farmers to their animals in the night, morning (60.00%), afternoon (40.00%), and evening (10.00%).More than fifty percent of the farmers feed both green and dry fodder in combination with (KMF) feed to their animals in the night (53.33%), less than fifty in the morning (43.33%), afternoon (33.33%), and only (6.67%) of farmer feed fodder in combination with KMF feed in the evening.

The annual rainfall received ranges from 904.4 and 3695.1 mm. About 75% of it is received in Kharif season. The soils are red sandy loam in major areas. The principal crops are rice and pulses. Farmers store paddy straw as hay and fed to the animal's whole day.Ramachandra *et al*. (2004) [14].

Table 5: Feeding schedule of livestock farmers across the different zones (n=120)

	Morning			After Noon			Evening			Night		
ZONE-3	**F**	**%**	**Mean quantity**	**F**	**%**	**Mean quantity**	**F**	**%**	**Mean quantity**	**F**	**%**	**Mean quantity**
GF	26	86.67	3.5±0.3	23	76.67	2.6± 0.3	13	43.33	1.2± 0.3	26	86.67	3.0± 0.3
DF(PS,GN,H,DF)	26	86.67	3±0.4	28	93.33	2.6± 0.3	17	56.67	1.5± 0.3	25	83.33	2.8± 0.3
GF+DF	22	73.33	3.2±0.3	21	70.00	2.6± 0.3	10	33.33	1.3± 0.3	21	70.00	2.9± 0.3
GF+DF+CF(CF+KMF)	22	73.33	2.9±0.3	20	66.67	2.4± 0.3	10	33.33	1.2± 0.3	21	70.00	2.7± 0.3
ZONE-8												
GF	25	83.33	2.8±0.3	8	26.67	0.6± 0.2	2	6.67	0.1± 0.1	23	76.67	2.5± 0.3
DF(PS,GN,H,DF)	11	36.67	1± 0.3	20	66.67	1.6± 0.3	7	23.33	0.5± 0.2	8	26.67	0.7± 0.3
GF+DF	6	20.00	1.9±0.3	4	13.33	1.1± 0.2	0	0.00	0.3± 0.1	3	10.00	1.6± 0.3
GF+DF+CF(CF+KMF)	1	3.33	1.8±0.3	1	3.33	1± 0.2	0	0.00	0.2± 0.1	1	3.33	1.7± 0.3
ZONE-9												
GF	21	70.00	2.3±0.4	13	43.33	1.1± 0.3	3	10.00	0.2± 0.1	22	73.33	2.2± 0.3
DF(PS,GN,H,DF)	26	86.67	3.5±0.4	22	73.33	2.7± 0.4	11	36.67	1.3± 0.4	27	90.00	3.6± 0.4
GF+DF	18	60.00	2.9±0.4	12	40.00	1.9± 0.3	3	10.00	0.8± 0.3	20	66.67	2.9± 0.4
GF+DF+CF(CF+KMF)	13	43.33	2.6±0.3	10	33.33	1.6± 0.3	2	6.67	0.5± 0.2	16	53.33	2.5± 0.3
ZONE-10												
GF	5	16.67	0.4±0.2	3	10.00	0.1± 0.1	2	6.67	0.1± 0.1	4	13.33	0.3± 0.2
DF(PS,GN,H,DF)	29	96.67	5.2±0.4	20	66.67	3.3± 0.5	16	53.33	1.9± 0.5	29	96.67	4.9± 0.3
GF+DF	4	13.33	2.8±0.3	3	10.00	1.7± 0.3	2	6.67	1.0± 0.3	3	10.00	2.6± 0.2
GF+DF+CF(CF+KMF)	4	13.33	2.3±0.2	3	10.00	1.3± 0.2	2	6.67	0.8± 0.2	3	10.00	2.2± 0.2

**Note: ***GF-Green fodder, DF-Dry fodder, CF-Cattel feed, PS-Paddy straw, GN-Ground nut straw, H-Hay, KMF-Karnataka milk federation feed, F-Frequency,%-Percentage. (*Zone-3=Northern Dry Zone, Zone-8=Northern Transition Zone, Zone-9=Hill Zone, Zone-10=Coastal Zone

In coastal zone (zone-10), very few of the farmers feed only green fodders to their animals in the morning (16.67%),night (13.33%), afternoon (10.00%), and evening (6.67%).Majority of the respondents feed dry fodders like paddy straw and ground nut straw to their animals in the night (96.67%), morning (96.67%), afternoon (66.67%), and evening (53.33%).Both green and dry fodder in combination fed by only (13.33%) of the farmers to their animals in the morning, night (10.00%), afternoon (10.00%), and evening (6.67%).Only few of the farmers feed both green and dry fodder in combination with (KMF) feed to their animals in the morning (13.33%), night (10.00%), afternoon (10.00%), and only (6.67%) of the farmer in the evening.

The annual rainfall ranges from 3010.9 to 4694.4 mm, of which 80% falls in the monsoon season. The elevation is less than 300-800 m and the soils are red lateritic and coastal alluvial. The crops grown are rice, pulses and sugar cane. As compare to other zones this zone receives high rainfall and due to high rainfall couldn't able to maintain fodder crops by the farmers. Hence majorly feed the dry fodders to the animals. Ramachandra *et al*. (2004) [14].

Conclusion

Eating pattern of cattle can be influenced by a simple fodder management resources- feed the feeding resources according to the availability of feed resources. An eating patterns and the feeding schedule may lead to improve cattle performances. Overall farm owners fed their animals daily 4 times but comparatively more in the morning and afternoon in some zones feeding the resources according to the availability feed materials.

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