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Analysis of the Feed and Fodder Development Programmes Implemented During Normal and Drought Years in North Karnataka

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Abstract **– The prime objective of this research is Analysis of the feed and fodder development programmes implemented during normal and drought years in North Karnataka of Belagavi, Baglkot and Gadag district. Fund allocated for ten years period from 2007-2016 was considered for the study. Information on the years declared between 2007-2016 as drought and normal years for Belagavi, Bagalkote and Gadag districts was obtained from Karnataka State Department of Animal Husbandry and Veterinary Services. Further information on feed and fodder development programmes implemented during this period in each of the districts was also collected by consulting same department along with the year wise and program wise allocation of funds. Gadag district with less livestock population is more prone for drought. District often experiences acute shortage of rainfall and categorized as severely drought affected district. So Gadag district with lowest livestock population has received more funds for feed and fodder development programmes compared to other two districts and it was found that difference in fund allocation between normal and drought years for each of the study district when analyzed by applying paired t-test.**

Keywords **– Silage Making, Demonstrations, Fodder Banks, Fodder Minikits.**

I. INTRODUCTION

Crop cultivation, animal husbandry and other allied activities have been the core livelihood for majority of the rural people since time immemorial. Animal husbandry in particular provides productive employment, especially self-employment and the most valuable supplementary income to a vast majority of rural households dominated by small and marginal farmers and landless labourers. Livestock provides increased economic stability to the poor masses. They act as a cash buffer in case of small stock and as captive reserve in case of larger stock. Livestock provides quality animal protein to human population in the form of milk, eggs, meat and value added products. They provide draught power for agricultural operations, organic manure for agriculture and raw materials like skin, hides, blood, bone, hoof, horn, *etc.* for various industries.

India's livestock sector is one of the largest in the world both for livestock numbers and production. The contribution of livestock to agriculture GDP is 15.10 per cent and accounts for 4.11 per cent to total GDP. The productivity of livestock is however low owing to poor feeding practices followed by farmers. Major part (65-70%) of livestock farming cost is attributed to feeding only. India with 2.3 per cent share of global geographical area supports nearly 20 per cent of the livestock population of the world, notably among them are cattle (16 %), buffalo (55 %), goat (20 %) and sheep (5 %). The desired annual growth of agriculture sector at 4 per cent can also be accomplished by enhancing productivity from the livestock sector (Islam *et al*., 2016). Improving productivity in a huge population of low producing animals is one of the major challenges. The average annual milk yield of Indian cattle is 1172 kg which is only about 50 per cent of the global average and much less than in New Zealand (3343 kg), Australia (5600 kg), UK (7101 kg), US (9332 kg) and Israel (10214 kg) (Birthal and

Taneja, 2006). This would require a steady supply of fodder for supporting the livestock population. But in India, the availability of fodder, both dry and green, has not been commensurate with the requirement. Whereas, the projected requirement has showed that 64.21 per cent (728 million tonnes) green fodder and 24.81 per cent (157 million tonnes) dry fodder deficit is estimated (Datta, 2013). It has resulted in a projected shortage of more than 60 per cent in green fodder and nearly 23 per cent in dry fodder by 2020. Converted into absolute terms, this deficit works out to 728 million tons in respect of green fodder and 157 million tons in respect of dry fodder. Scenario in Karnataka is also same. Scenario of feed and fodder requirement & availability in India (Planning commission, 2016) (In million tonnes).

Year	Supply		Demand		Deficit (%)	
	Green	Dry	Green	Dry	Green	Dry
2015	400.6	466	1097	609	63.50	23.56

About feed and fodder development programmes. Though feed and fodder is one of the most important contributing factors for the growth of livestock sector, development of this sector has not received the required level of focus in the past. It is estimated that the 60-70 per cent of total cost in livestock production is due to feed and fodder. Any attempt towards enhancing feed availability and economizing the feed cost would result in increased margin of profits to livestock owners. Adequate availability of livestock feed and fodder both quantitatively as well as qualitatively is going to be one of the key inputs in the growth of livestock sector during 12th plan period and beyond. With greater focus being given towards productivity enhancement in the recent years, it becomes all the more essential for ensuring the availability of quality feed and fodder to sustain higher productivity of animals. The schemes so developed by Government has not only to address the issue of green fodder seed production but also encompass other aspects like area expansion of green fodder, fodder conservation, fodder densification, establishment of fodder banks, and nutritional enhancement of crop residues, capacity building, and extension. The ongoing schemes on 'Feed and Fodder Development' are fodder minikits distribution, trainings and demonstrations on feed and fodder, azolla and silage making, chaff cutter distribution, fodder banks and *Goshala*s (*Cow shelters*).The specific objective of the study is as follows

1. Analysis of the feed and fodder development programmes implemented during normal and drought years in North Karnataka.

II. MATERIALS AND METHODS

In north Karnataka, three districts having highest (Belagavi), medium (Gadag) and lowest (Bagalkote) livestock population were selected for the study. So here considered the total fund allotted for feed and fodder development programmes in the above three districts.Fund allocated for ten years period from 2007-2016 was considered for the study. Information on the years declared between 2007-2016 as drought and normal years for Belagavi, Bagalkote and Gadag districts was obtained from Karnataka State Department of Animal Husbandry and Veterinary Services. Further information on feed and fodder development programmes implemented during this period in each of the districts was also collected by consulting same department along with the year wise and program wise allocation of funds. This data was used to calculate per cent of fund allocated for different programmes for normal years and drought years separately for all the three study districts. The difference in fund allocation between normal and drought years for each of the study district was analyzed by applying paired

t-test.

III. Results and Discussion

Table 1: Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Belagavi district: In Belagavi district during 2007-2016, four years were normal rainfall years. They were 2007, 2010, 2011 and 2014. In these four years, for first three years, funds were allocated for trainings and chaff cutter programmes. Among these two programmes nearly three fourth share of fund was allocated mainly for training programmes. The fund allocated was `5 lakhs in the year 2007 and `8 lakhs each in the year 2010 and 2011. Though 2014 witnessed fund allocation for five programmes on feed and fodder development, fund allocated for trainings remained same. But its share reduced in yearly overall allocation to 9.09 per cent. Looking at fund allocation for drought years, almost similar quantity of fund was allocated for trainings though the share reduced from 2013. This indicates that capacity building of livestock farmers on feed and fodder related aspects were given importance every year. Fodder crops especially perennials like Hybrid Napier, Guinea grass, Signal grass, Hamata*etc.* are the names of forages which do not sound familiar to several farmers unlike food crops like paddy, wheat, jowar *etc.* They are not close to and fit in their native vocabulary. Most of these crops are not found to be seen in the vicinity of farmers' habitation. It means that these crops are not cultivated traditionally. Getting farmers see these crops is important to make them familiar with these new set of crops and to the other multiple benefits they bring to these farmers. Few fodder crops when harvested early tend to have higher load of anti-nutritional factors. Though animals have natural built in intelligence not to feed on, but in case of extreme hunger there are cases of feeding leading to complications as fatal as death. Such cases are rear but it is prerogative on the part of extensionist to keep farmers informed that the best way to manage is to harvest fodder crops at right time, about 40 to 45 days schedule for grasses. These are the finer and new messages that need to be conveyed for which effective extension tools like training programmes are to be employed (Biradar and Balamatti, 2017). Because of these unique features training program on fodder and feed might have received importance in fund allocation.

In normal rainfall years, in Belagavi, fund was allocated for chaff cutter distribution on subsidized basis which ranged from `2 lakhs in 2007 to `9 lakhs in 2014. Small land holdings restrict many farmers from taking cultivation of fodder crops. Utilization of available crop residues efficiently, hence gains importance. Chaffing reduces wastage and increases intake by animals, this program thus is of utmost importance. However, considering the large livestock population of Belagavi district this program had not received fund proportionately. The similar situations prevailed even in drought years.

Demonstrations on silage making and azolla were the programmes added to the existing feed and fodder programmes of the district from 2013 onwards. Support from central government for promotion of fodder lead to overall increase in fund allocation. It was increased by three times in 2013 and in subsequent years, there is a steady increase ranging from eight times in 2014 to ten times in 2016. This increase in fund allocation might have helped district administration to increase number of programmes on feed and fodder development. Therefore addition of above two programmes might have become possible. While silage making facilitates to conserve the green fodder, azolla helps to supplement livestock with nutritionally rich feed.

In 2016, a drought year, fund was allocated to the extent of `5 lakhs for fodder banks. This particular year witnessed severe drought and through such program some of the livestock might have been saved by providing f-

-odder to meet out their basic feed requirement.

Support from central government from 2013 onwards not only increased fund allocation many folds, but also altered the number of programmes and percentage allocation for different programmes.

Table. 2 Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Bagalkote district: Bagalkote district was selected as it had medium livestock population among the districts of North Karnataka. In 2007 and 2009, both normal rainfall years, minikits, trainings and chaff cutter distribution were the three programmes implemented. In 2007, more than half of the fund was allotted for trainings. As mentioned in the discussion of previous table the same reasons are applicable for present finding. In 2009, among three programmes, more fund (44.44 %) was allotted for minikits distribution. Production of fodder seed as well as distribution is the major responsibility of public sector in India. Private sector owing to tiny size of the seeds, large volume, less germination percentage and poor demand is not very active in selling seed of fodder crops. In such situation, fodder seed distribution through minikits is the only option, but requires more expenditure for procurement and distribution. This could be the reason for getting relatively higher allotment for minikits. Surprisingly 2011 though declared as drought year received exactly same allotment as in 2009, a normal rainfall year for the programmes. Minikit programmes was dropped in 2010 (normal rainfall year) and three drought years (2008, 2012 and 2013). The reasons could be lack of planning as seed production is a season based activity and/or non-availability of fodder seeds in large quantity elsewhere.

When total fund allotted for feed and fodder development programmes was considered from 2013, fund allocated increased many folds irrespective of normal or drought years. The similar trend was also observed in Belagavi district, main reason for massive increase in fund allocation as mentioned earlier is support from central government to the state.

Increase in fund allocation resulted in addition of programmes on silage making, azolla cultivation and fodder banks. Among these three new programmes more funds was allotted to silage making. Probably to ensure the preservation and enrichment of maize, which is widely cultivated in this district. Fodder banks though is important program especially in drought years did not witnessed allocation of relatively large amount. Reason could be less availability of dry fodder to purchase as Bagalkote district being a command area has large area under commercial crop mainly sugarcane.

Table 3 Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Gadag district: Gadag district with less livestock population is more prone for drought. District often experiences acute shortage of rainfall and categorized as severely drought affected district. Karnataka State Government is making continuous effort to promote livestock rearing to sustain the income of the farmers of this district. This could be the main reason for the district receiving more fund as compared to other two districts of the study from 2013 onwards, the year from which state started receiving central assistance for fodder and feed development. Year 2016, a drought year for all the three study districts, Gadag district received highest amount (`233 lakhs, while Belagavi district received `110 lakhs and Bagalkote district received `82 lakhs). Higher allocated fund for this district however, was utilized as special assistance for *Goshala* (cow-shelter), the program which is absent in other two districts. Special assistance for *Goshala* is continuous program in Gadag district since 2013, the year from which central support began, irrespective of amount of rainfall received in the district. Maximum per cent of fund, thus allocated for this particular program ranged from 64.3 per cent in 2016 to 80.21 per cent in 2013.

From 2007 to 2012 fund allocation for feed and fodder development for this district was relatively less as compared to other two districts. Initial years (2007 and 2008) witnessed only training programmes and chaff cutter distribution, in subsequent year's programmes on minikits, silage making, azolla cultivation and fodder banks were added.

Table 4. Average fund allotted in normal and drought years for feed and fodder development programmes: Among all the programmes minikit distribution received higher share of fund both in normal and drought years, based on ten years average fund allocation, except in Gadag district. Production, procurement and distribution of fodder seeds is cost demanding activity. This could be the reason for allocating more funds for this. In normal years, trainings on feed and fodder received next higher fund allocation in both the districts, but in drought years silage making received more share. Reason could be that in drought years conservation of green fodder is more crucial than capacity building of livestock farmers. Chaff cutter distribution program in fund allocation stands at number four in both the districts (Belagavi and Gadag) for normal as well as drought years. By using chaff cutter, wastage of the fodder could be reduced (up to 30 %) substantially (Misra *et al.,* 2006). Chaffing of fodder will increase the digestibility. Particle size of fodder is reduced in chaffing. The surface area available for microbial action in digestive system is increased. Plant enzymes released while chaffing will increase the palatability and juiciness of fodder. Voluntary intake of fodder will increase (Sujatha *et al.*, 2016). In study area crop residues meet nearly 70 per cent of fodder requirement of livestock. Efficient use of crop residues can be well addressed by promotion of usage of chaff cutter. This could be the reason for relatively better fund allocation to chaff cutter as compared to programmes on silage and azolla.

In Gadag district, as mentioned earlier, the average of ten years data also reflects similar trend, where maximum share of fund was allotted for *Goshala*. In drought years, the next share of fund was utilized for minikits (11.38 %) and fodder banks (10.17 %). But in normal years, these two programmes received negligible share. Training program on feed and fodder development was given relatively more fund (next to *Goshala*) in normal years as capacity building is one of the important activity which could be best conducted in normal years.

Table 5. Difference between average fund allocation in normal rainfall years and drought years: It shows difference between average fund allocated in normal and drought years in all three districts. Paired t-test calculated for fund allocation in normal rainfall years and drought years was 2.39 in Belagavi district, 2.43 in Bagalkote district and 2.82 in Gadag district. All these t-values showed significant difference at 5 per cent level of probability.

Paired t-test computed for fund allocated for feed and fodder development programmes in normal rainfall year and drought year showed significant difference at 5 per cent level of probability in all the districts. Two reasons could be attributed to this finding. One reason could be more drought years prevailed in all the study districts from 2013 onwards. The year 2013 is the starting year of receiving funds from central government. Second reason is during drought years, apart from regular feed and fodder development programmes, fodder banks and minikits received more funds when compared to normal rainfall years. These two reasons might have resulted in significant difference.

Table 4.1. Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Belagavi district.

Programmes	Normal years						Drought years							
	2007	2010	2011	2014	Total	Ave	2008	2009	2012	2013	2015	2016	Total	Ave
1] Minikits				50 (56.81)	50 (42.74)	12.5 (42.74)		8 (44.44)			60 (63.16)	65 (59.09)	133 (47.25)	22.17 (47.25)
2] Trainings	5 (71.43)	8 (72.73)	8 (72.73)	8 (9.09)	29 (24.79)	7.25 (24.79)	6 (75.00)	7 (38.89)	8 (53.33)	8 (22.54)	8 (8.42)	10 (9.09)	47 (16.70)	7.83 (16.70)
3] Chaff cutter	2 (28.57)	3 (27.27)	3 (27.27)	9 (10.23)	17 (14.52)	4.25 (14.53)	2 (25.00)	3 (16.67)	3 (20.00)	8 (22.54)	9 (9.47)	10 (9.09)	35 (12.43)	5.83 (12.43)
4] Silage making demonstration and finance				15 (17.05)	15 (12.82)	3.75 (12.80)				15 (42.25)	18 (18.95)	20 (18.19)	53 (18.83)	8.83 (18.83)
5] Azolla cultivation, demonstration and finance				6 (6.82)	6 (5.13)	1.5 (5.14)			4 (26.67)	4.5 (12.67)			8.5 (3.01)	1.42 (3.01)
6] Fodder banks												5 (4.54)	5 (1.77)	0.83 (1.77)
Total fund	**7 (100)**	**11 (100)**	**11 (100)**	**88 (100)**	**117 (100)**	**29.25 (100)**	**8 (100)**	**18 (100)**	**15 (100)**	**35.5 (100)**	**95 (100)**	**110 (100)**	**281.5 (100)**	**46.92 (100)**

Number indicates ` in lakhs and values in brackets indicates per

Table 4.1.2. Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Bagalkote district.

Programmes	Normal years						Drought years							
	2007	2009	2010	2014	Total	Ave	2008	2011	2012	2013	2015	2016	Total	Ave
1] Minikits	0.5 (14.29)	8 (44.44)		40 (55.56)	48.5 (46.41)	12.13 (46.42)		8 (44.44)			40 (57.14)	50 (60.97)	98 (45.58)	16.33 (45.58)
2] Trainings	2 (57.14)	7 (38.89)	8 (72.73)	6 (8.33)	23 (22.01)	5.75 (22.01)	5 (83.33)	7 (38.89)	5 (50.00)	7 (24.13)	5 (7.14)	6 (7.33)	35 (16.28)	5.83 (16.28)
3] Chaff cutter	1 (28.57)	3 (16.67)	3 (27.27)	5 (6.94)	12 (11.48)	3 (11.48)	1 (16.67)	3 (16.67)	3 (30.00)	6 (20.69)	6 (8.57)	5 (6.09)	24 (11.16)	4 (11.16)
4] Silage making demonstration and finance				13 (18.06)	13 (12.45)	3.25 (12.44)				13 (44.84)	14 (20.00)	15 (18.29)	42 (19.54)	7 (19.54)
5] Azolla cultivation, demonstration and finance				3 (4.17)	3 (2.87)	0.75 (2.87)			2 (20.00)	3 (10.34)			5 (2.32)	0.83 (2.32)
6] Fodder banks				5 (6.94)	5 (4.78)	1.25 (4.78)					5 (7.15)	6 (7.32)	11 (5.12)	1.83 (5.12)
Total fund	**3.5 (100)**	**18 (100)**	**11 (100)**	**72 (100)**	**104.5 (100)**	**26.13 (100)**	**6 (100)**	**18 (100)**	**10 (100)**	**29 (100)**	**70 (100)**	**82 (100)**	**215 (100)**	**35.83 (100)**

Number indicates ` in lakhs and values in brackets indicates per cents

Table 4.1.3: Fund allocation for different feed and fodder development programmes from 2007 to 2016 in Gadag district

Programmes	Normal years						Drought years							
	2007	2009	2010	2014	Total	Ave	2008	2011	2012	2013	2015	2016	Total	Ave
1] Minikits		2 (28.57)			2 (0.95)	0.5 (0.95)					35 (15.63)	40 (17.17)	75 (11.38)	12.5 (11.38)
2] Trainings	1 (50.00)	3 (42.86)	4 (66.67)	30 (15.42)	38 (18.14)	9.5 (18.14)	2 (50.00)	3 (75.00)	4 (57.14)	5 (2.67)	4 (1.79)	4 (1.72)	22 (3.34)	3.67 (3.34)
3] Chaff cutter	1 (50.00)	2 (28.57)	2 (33.33)	4 (2.06)	9 (4.30)	2.25 (4.30)	2 (50.00)	1 (25.00)	2 (28.57)	4 (2.14)	5 (2.23)	4 (1.72)	18 (2.73)	3 (2.73)
4] Silage making demonstration and finance				8 (4.11)	8 (3.82)	2 (3.82)				6 (3.21)	8 (3.57)	10 (4.29)	24 (3.64)	4 (3.64)
5] Azolla cultivation, demonstration and finance				1.5 (0.77)	1.5 (0.72)	0.37 (0.71)			1 (14.29)	2 (1.07)			3 (0.45)	0.5 (0.46)
6] Fodder banks				1 (0.51)	1 (0.48)	0.25 (0.67)				20 (10.70)	22 (9.82)	25 (10.73)	67 (10.17)	11.17 (10.17)
Total fund	**2 (100)**	**7**	**6 (100)**	**44.5 (22.88)**	**59.5 (28.40)**	**14.88 (28.40)**	**4 (100)**	**4 (100)**	**7 (100)**	**37 (19.79)**	**74 (33.04)**	**83 (35.63)**	**209 (31.71)**	**34.83 (31.72)**

		(100)												
Special assistance for *Goshala*				150 (77.12)	150 (71.60)	37.5 (71.60)				150 80.21)	150 66.96)	150 (64.37)	450 (68.29)	75 (68.28)
Total fund	**2 (100)**	**7 (100)**	**6 (100)**	**194.5 (100)**	**209.5 (100)**	**52.37 (100)**	**4 (100)**	**4 (100)**	**7 (100)**	**187 (100)**	**224 (100)**	**233 (100)**	**659 (100)**	**109.83 (100)**

Number indicates ` in lakhs and values in brackets indicates per cent

Table 4.1.4: Average fund allotted in normal and drought years for feed and fodder development programmes

Programmes	**Belagavi**		**Bagalkote**		**Gadag**	
	Normal years	**Drought years**	**Normal years**	**Drought years**	**Normal years**	**Drought years**
1] Minikits	12.5 (42.74)	22.17 (47.26)	12.13 (46.42)	16.33 (45.58)	0.5 (0.95)	12.5 (11.38)
2] Trainings	7.25 (24.79)	7.83 (16.69)	5.75 (22.01)	5.83 (16.28)	9.5 (18.14)	3.67 (3.34)
3] Chaff cutter	4.25 (14.53)	5.83 (12.44)	3 (11.48)	4 (11.16)	2.25 (4.30)	3 (2.73)
4] Silage making demonstration and finance	3.75 (12.80)	8.83 (18.82)	3.25 (12.44)	7 (19.54)	2 (3.82)	4 (3.64)
5] Azolla cultivation, demonstration and finance	1.5 (5.14)	1.42 (3.03)	0.75 (2.87)	0.83 (2.32)	0.37 (0.71)	0.5 (0.46)
6] Fodder banks		0.83 (1.76)	1.25 (4.78)	1.83 (5.12)	0.25 (0.67)	11.17 (10.17)
Special assistance for *Goshala*					37.5 (71.60)	75 (68.28)
Total fund	**29.25 (100)**	**46.92 (100)**	**26.13 (100)**	**35.83 (100)**	**52.37 (100)**	**109.83 (100)**

Number indicates ` in lakhs and values in brackets indi

Table 4.1.5: Difference between average fund allocation in normal rainfall years and drought years

District	**Fund allocated in (` in lakhs)**		**'t' test**
	Normal year	**Drought year**	
Belagavi	29.50	46.92	2.39*
Bagalkote	26.13	35.83	2.43*
Gadag	52.37	109.83	2.82*

* - Significant at 5 % level.

REFERENCES

[1] Biradar, N. and Balamatti, A., 2017, Innovative Extension Tools for promotion of fodder technologies. In: Ghosh, P. K., Mahanta, S. K., Singh, J. B., Vijay, D., Kumar, R. V., Yadav, V. K. and Kumar, Sunil (eds.). *Approaches Towards Fodder Security in India.* Studera Press, New Delhi. Pp. 583-596.

[2] Birthal, P.S. and Taneja, V.K. 2006. Livestock sector in India: Opportunities and challenges for smallholders. In: Proceedings of an ICAR-ILRI International Workshop, National Centre for Agricultural Economics and Policy Research, New Delhi and International Livestock Research Institute, Nairobi.

[3] Misra, A. K., Rama Rao, C. A., Subrahmanyam, K. V., Vijay Sankar Babu, M., Shivarudrappa, B. and Ramakrishna, Y. S., 2006, Experiences on participatory action research for enhancing productivity of dairy animals in rain fed agro-ecosystem of India. *SAT eJournal.* 2 (1): 1-14.

[4] Sujatha, V., Suresh, C. and Lawrence, C., 2016, Effect of training the farmers in usage of fodder production technology implements. *Int. J. Sci. Environ. Technol.,* 5 (4): 2071 – 2075.