International Journal of Science, Environment and Technology, Vol. 5, No 2, 2016, 1737 – 1744

ISSN 2278-3687 (O)
2277-663X (P)

DEMAND AND SUPPLY PROJECTIONS OF INDIAN VETERINARY MANPOWER

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Abstract: The present study was carried out to explore the demand and supply gap in veterinary man power in India. The state-wise projected demand for the trained veterinary manpower was calculated by collecting the data on livestock population for the previous two censuses (1997 and 2003) for the 10 states and future livestock population were projected for the years 2020 and 2025 by calculating point to point annual compound growth rate. The data on inturn and outturn trends of veterinary graduates was collected for the 10 years and annual compound growth rate was calculated. Based on the growth rate and outturn of veterinary graduates, the supply of future veterinary manpower was projected. The demand for veterinary manpower in the year 2020 will be lowest in the Kerala and Himachal Pradesh as the projected population would be at the minimal level. The annual compound growth rate of outturn of students were found positive, which indicated that the out turn of students are increasing over years in all the selected states. The deficit was the highest in the state of Uttar Pradesh (6376 veterinarians), followed by West Bengal (2871), Tamil Nadu (1405) and Gujarat (1434). The outturn growth rate of the veterinary manpower was not proportionate with the growing population of livestock and poultry. Hence, attention might be given to rectify the demand and supply gap in veterinary man power in the supply deficit States to avoid disturbance in livestock production.

Keywords: Veterinary - Manpower - Demand – Supply – Human resource.

INTRODUCTION

Indian livestock industry blessed with a significant amount of world's livestock resources. Both the national economy as well as the socio-economic growth of the country is backed by the livestock sector. The livestock sector is performing well in the manner of production, value addition and export of dairy, fishery, wool, meat, poultry and other products. Keeping in mind of growing human population and shrinkage in cultivable land, the role of livestock products in assuring nutritional security is highly critical. Apart from nutritional security,

*Received Mar 22, 2017 * Published June 2, 2017 * www.ijset.net*

livestock sector extends their arms in terms of year round employment and income to the landless, marginal and small farmers. The achievement of livestock sector not only depends on the farmers but also on services of veterinary man power. Veterinarians are having multi-facet roles especially in breeding in the form of artificial insemination, health care and imparting extension services. Hence, the growth of livestock population and veterinary manpower not only for the present situation but also for future should be in par with each other and any imbalance in the same would have crucial effect in the livestock production and thus leads to drastic consequences like nutritional insecurity, unemployment and poverty. Thus, the present study was carried out to explore the demand and supply gap in veterinary man power in India. The information would help the policy makers in manpower planning in livestock sector in India.

METHODOLOGY

Demand projections of veterinary manpower

The state-wise projected demand for the trained veterinary manpower was calculated by collecting the data on livestock population for the previous two censuses (1997 and 2003) for the 10 states and future livestock population were projected for the years 2020 and 2025 by calculating point to point annual compound growth rate using the formula:

$G = \{e^{[\ln(y_t / y_0)] / t} - 1\} \times 100$ where,

G = Annual compound growth rate

Y_0 = Population of livestock species in base year

Y_t = Population in the t^{th} year (current year)

t = Number of years (current year - base year)

The projected livestock population was converted into cattle units as per the standard livestock conversion units given by Sharma (2003).

Table 1

Livestock Conversion unit

S.No.	Species	Cattle unit
1	Cattle/Buffalo Camels/Horse/ Donkey /Yak	1.00
2	Sheep or Goat	0.20
3	Pig	0.50
4	Poultry	0.01

The demand of veterinary manpower were calculated for the 10 states based on the projected value of cattle units for next 10 years, as per the recommendations of National Commission on Agriculture (1976) of one veterinarian for every 5000 cattle units. Thus based on the animal population in cattle units in future years and demand for veterinary manpower was projected.

Supply projections of veterinary manpower

The supply of veterinary graduates is reflected through intake – outturn trends of veterinary students and it was referred as the number of students admitted and passed out in a particular year. The data on intake and outturn trends of veterinary graduates was collected for last 10 years i.e., from 1999-2000 to 2008-2009. Out of the total 40 veterinary colleges in the country, 37 colleges were started before 1999-2000 thus mailed questionnaire on the prescribed format was sent to obtain data on intake and outturn of students. Sixteen colleges responded and the intake outturn trends were analysed for ten states. Based on the data collected, annual compound growth rate was calculated using the formula given by Rath (1980).

$\ln Y_t = a + b_t$

Y_t = Intake or outturn of students

a = Constant

t = time; 1,2,3…. n where n is number of years

b = parameter to be estimated

Compound Growth rate, $G = (1/Y_t) * (dY_t/dt) *100$

Based on the growth rate and outturn of veterinary graduates in the base year, future veterinary manpower outturn i.e. the supply of veterinary manpower was projected.

Demand and supply gap in veterinary manpower in India

Based on the demand and supply projections in veterinary manpower in future, the gap between the same was calculated and discussed.

RESULTS AND DISCUSSION

Demand projections of veterinary manpower in India

The growth rate of livestock and poultry population was calculated based on the livestock census 1997 and 2003. Based on the growth rate of livestock and poultry population, the future livestock and poultry population was projected for the year 2020 and 2025. As per the recommendations of National Commission on Agriculture (1976) of one veterinarian for

every 5000 cattle units, the demand for veterinary manpower was calculated and presented in Table 2.

From the table, it is evident that the demand for veterinary manpower in the year 2020 will be lowest in the Kerala and Himachal Pradesh as the projected population would be at the minimal level. This situation will persist for the year 2025 also. Thus more number of veterinarians would be in demand for the Uttar Pradesh, West Bangal, Tamil Nadu and Gujarat with respect to the animal population.

Supply projection of veterinary manpower in India

For projecting the supply of veterinary man power in India, annual compound growth rate of intake and outturn of veterinary students was worked out and presented in Table 3. The results showed that annual compound growth rate of intake of students was found to be positive in Tamil Nadu (0.94 per cent), Kerala (0.08 per cent), Andhra Pradesh (1.18 per cent), Karnataka (0.43 per cent), Jammu and Kashmir (0.89 per cent), Himachal Pradesh (0.23 per cent) and Gujarat (3.49 per cent). Almost in all states, the intake trend was found to less than one per cent and the reason could be that the parents and students are not aware about the prospects of veterinary and animal science education as well as the restricted number of seats as a policy decision of the Veterinary Council of India (VCI). School education at primary and secondary levels might not endow the students with broad knowledge and significance of veterinary and animal science for future selection of this degree for their higher education. The negative intake trend in West Bengal (-0.42 per cent), Haryana (-2.07 per cent), Punjab (-1.02 per cent) and Uttar Pradesh (-2.27 per cent) indicated that students passing out from school education in the above states might be attracted towards other professional degree courses for their higher education. Hence, the veterinary educators should plan to reduce the cost of education and provision of stipend/awards during the course work might attract the students to opt for admission in veterinary and animal science.

The table also depicts that in all the states the annual compound growth rate of outturn of students were found positive, which indicated that the out turn of students are increasing over years. Although in Kerala (0.23 per cent), the rate is less than one per cent, it remained positive value indicating slight increase in outturn of students over the mentioned period. The positive outturn trend indicated the improvement success rate of students every year in the mentioned states, which might be due to ascend in quality of education, proper training and increase in knowledge level of students. It concurs with the findings that 76 per cent

success rate in the degree in agriculture and allied sciences Anonymous (1995) and Heath (1998), who found 90 per cent success rate in veterinary students in Australia. Similarly, Rush *et al.* (2005) reported 84.7 per cent success rate of veterinary students in Kansas State University, USA. The outturn trend over years revealed that the supply of veterinary manpower is likely to be increased in the coming years. However the adequacy of the veterinary professionals in future depends upon the future animal population in the concerned state.

With this, the supply in veterinary manpower for the next 10 years was calculated based on the growth rate of out turn trends (Table 4). Overall, in all the states positive growth rate of out turn trends favoured for increase in supply of veterinary manpower over the years. In Uttar Pradesh, the supply of veterinarians increased from 4979 (2020) to 5763 (2025) with 5.14 per cent as growth rate of out turn trends in veterinary graduates. Lowest growth rate of out turn in Karnataka (0.23 %) and Himachal Pradesh (0.92%) also resulted in increased supply of veterinary manpower over the years might be due to higher number of passed out students. In Gujarat with the highest growth rate of out turn (9.57 %) in veterinary graduates, the supply of veterinarians would be 2842 and 3099 in the year 2020 and 2025, respectively.

Gap in demand and supply projection of veterinary manpower in India

The gap in demand and supply of veterinary manpower for future years is shown in Table 5. The demand and supply projections in year 2020 implied that the situation of Kerala improved with excess of veterinary manpower to the tune of 1427, where they could be placed in nearby states or might opt of research and higher education. All the other states had negative gap indicating the demand exceeding the supply of veterinary manpower. The projections for the year 2025 implied that the status of veterinary manpower were improved in the States of Kerala (+1607), Karnataka (+1208), Punjab (+260) and Himachal Pradesh (+200). However, the situation worsened in other states with the veterinary manpower supply deficit viz., Uttar Pradesh (-7025), West Bengal (-4140), Tamil Nadu (-3549) and Gujarat (-1896). Haryana state was in deficit of about 1000 Veterinarians and Jammu and Kashmir with about 500 veterinarians in the year 2025.

CONCLUSIONS

The annual compound growth rate of intake and outturn trend of students was found to be positive, however, negative growth rate was noticed in intake trends in few states. The outturn growth rate of the veterinary manpower was not proportionate with the growing population of livestock and poultry. This demands for more number of veterinarians in

coming years to fulfill the manpower needs for academics and also for livestock health and extension services in our country. Hence, attention might be given to rectify the demand and supply gap in veterinary man power in the supply deficit States to avoid disturbance in livestock production. In addition, necessary steps may be taken to regularly project the demand and supply scenario of veterinary manpower and to formulate policies accordingly to improve livestock production through regular supply of veterinary manpower. Further, a link between the educational institutions (manpower generators) and the industry (manpower users) should be established for mutual benefits to meet the demand of veterinarians in diverse industrial institutions, In addition, more number of veterinary colleges may be opened with increased number of seats subject to the fulfillment of regulation of Veterinary Council of India.

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Table 2
Statewise projected livestock population (in lakh cattle units) and demand of veterinary manpower in India

State	Year			
	2020		2025	
	Livestock population	Demand for veterinarians	Livestock population	Demand for veterinarian
Tamil Nadu	246.90	4938	362.10	7242
West Bengal	356.05	7121	410.90	8218
Karnataka	120.20	2404	110.55	2211
Uttar Pradesh	581.65	11633	639.40	12788
Haryana	122.80	2456	146.25	2925
Jammu and Kashmir	70.80	1416	79.40	1588
Punjab	66.50	1330	63.20	1264
Kerala	15.40	308	13.30	266
Himachal Pradesh	37.15	743	38.05	761
Gujarat	224.55	4491	249.75	4995

* Based on livestock census, 1997 and 2003.

Table 3
State-wise annual compound growth rate of intake and outturn of students in veterinary colleges from 1999-2000 to 2008-09
(in per cent)

Sl.No	State	Intake	Outturn
1	Tamil Nadu	0.94	3.19
2	West Bengal	-0.42	1.62
3	Kerala	0.08	0.23
4	Haryana	-2.07	5.14
5	Punjab	-1.02	2.94
6	Karnataka	0.43	4.41
7	Jammu and Kashmir	0.89	1.84
8	Uttar Pradesh	-2.27	5.24
9	Himachal Pradesh	0.23	9.57
10	Gujarat	3.49	3.26

Table 4
Statewise Projected Supply of Trained Veterinary Manpower

State	Growth rate of out turn (%)	Projected supply of veterinary manpower	
		2020	2025
Tamil Nadu	3.19	2984	3693
West Bengal	1.62	3768	4078
Karnataka	0.23	2764	3419
Uttar Pradesh	5.14	4979	5763
Haryana	2.94	1490	1927
Jammu and Kashmir	4.41	959	1127
Punjab	1.84	1396	1524
Kerala	5.24	1735	1873
Himachal Pradesh	0.92	678	961
Gujarat	9.57	2842	3099

Table 5
State-Wise Projected Demand and Supply of Veterinary Manpower in India
(in numbers)

State	Year					
	2020			2025		
	Supply	Demand	Gap	Supply	Demand	Gap
Tamil Nadu	2984	4938	-1954	3693	7242	-3549
West Bengal	3768	7121	-3353	4078	8218	-4140
Karnataka	2764	2404	360	3419	2211	1208
Uttar Pradesh	4979	11633	-6654	5763	12788	-7025
Haryana	1490	2456	-966	1927	2925	-998
Jammu and Kashmir	959	1416	-457	1127	1588	-461
Punjab	1396	1330	66	1524	1264	260
Kerala	1735	308	1427	1873	266	1607
Himachal Pradesh	678	743	-65	961	761	200
Gujarat	2842	4491	-1694	3099	4995	-1896