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Constraints prioritization in sheep rearing in Mahabubnagar district of Telangana

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Abstract
A study was conducted using the data from 120 sheep farmers in 24 villages of Mahabubnagar district of Telangana state to constraints prioritization in sheep rearing, representing all the four mandals were chosen adopting Simple random sampling method. Delphi technique was adopted to assess and prioritization of constraints faced by sheep farmers in the study area on sheep rearing. 82 constraints on sheep rearing were collected from the published sources and these identified 82 constraints were sent to the identified group of experts to obtain a broad range of opinion on every constraint for further classification through Google forms. After 1st round scrutiny, out of 82 constraints whichever fell ≥2.34 weighted mean were subjected to further scrutiny, thus the authors selected 47 constraints. During 2nd round scrutiny the constraints whichever fell ≥ 2.33 weighted mean were selected and subjected to further scrutiny. Same procedure was used for final selection of the prioritized constraints; whichever fell ≥2.29 weighted mean were included in the final list of constraints. Thus a total of 18 constraints were selected to be redressed through Mobile Extension Advisory Services (MEAS).

Keywords: Prioritization, sheep rearing, constraints, Delphi technique

Introduction
In South Asia, small ruminants contribute enormously towards promotion of livelihoods security and acts as an insurance cover to cope with crop failures particularly for rural landless, small and marginal female farmers (Pasha, 2000 and Misra, 2005). Small ruminants form an important economic and ecological niche in agricultural systems throughout the developing countries.

Agriculture and livestock coexist and go hand in hand. There is a state of interdependence in that livestock contributes manure and draught power to agriculture while crop residues form the major source of feed to the livestock. 12% of the world's population is entirely dependent on livestock production. (Christina and Geerlings, 2001) [2]. India is a country with vast livestock resources and is rich both in numbers and also in variety. India occupies third position in the world with 71.6 million sheep, out of which about 69.64 million and 1.96 million are present in rural and urban areas respectively (GOI, 2010) [4] and their contribution to the economy is immense.

Sheep husbandry is a way of life for many in rural areas of India and landless people who depend on it for their livelihood (Nayak et al., 2008) [6]. Sheep forms an important component of Indian livestock biodiversity. They form lifeline for many marginal farmers and landless labourers surviving in adverse climatic conditions. (Arora et al., 2011) [1].

Although various research and development activities have been carried out in the past, no significant increase in productivity is achieved. Therefore, development programs are necessary to increase productivity per sheep and profits realized from small ruminants in different farming systems of the country. However, such sustainable improvement in sheep and goats will only be achieved when accompanied by a good understanding of the different farming systems and when simultaneously addressing several constraints like: feeding, health control, general management, as well as cost and availability of credit and marketing infrastructure (Gemeda, 2009) [3].

Methodology
The present research study was undertaken in the state of Telangana purposively because it has 5.52 per cent of country's sheep population and was implementing prestigious Sheep Rearing Developing Programme (SRDP) worth of 5000 crores.

Mahabubnagar district was purposively selected by the researcher as the district was having 2nd highest sheep population (2012 census) in Telangana state. Further, the Sheep Rearing Development Programme (SRDP) was also being implemented in this District. Representing all the four mandals was chosen adopting Simple random sampling method. Delphi technique was adopted to assess and prioritization of constraints faced by sheep farmers in the study area on sheep rearing. Constraints in sheep rearing were obtained through analysis of the secondary data like published sources viz: literature and published articles of national and international repute which have significance to the sheep rearing in the state of Telangana. Thus a total of 82 constraints were identified and were subjected to the "Delphi technique" to prioritize them. Delphi technique means is a process mostly used in research and economics, that aims to collects opinions on a particular research questions/specific topic, to gain consensus. The opinions are collected from a group of experts that are not physically assembled, normally through questionnaires.

Results and Discussion
The constraints on sheep rearing collected from the published sources are as presented below:

Table 1: The constraints on scientific sheep rearing from published sources

S. No	Constraint
1	Lack of equipments (feed trough/water trough)
2	High cost of equipments (feed trough/water trough)
3	Lack of farm labourer
4	Lack of extension personnel.
5	Lack of transport facilities.
6	Poor housing will succumb animals to adverse weather conditions.
7	Inadequate space for housing.
8	Poor organised and cooperative marketing infrastructure.
9	Lack of shearing equipments.
10	Lack of awareness on fodder cultivation
11	High cost of concentrate feeds.
12	Inadequate knowledge in preparing balanced feed
13	Shrinkage of grazing lands.
14	Drinking water scarcity
15	Frequent drought attacks
16	Non availability of roughages
17	Non-availability of green fodder
18	High fodder cost
19	Poor grazing management
20	Non-availability of fodder during lean period.
21	Inadequate nutrition is the major reason for stunted growth & low production.
22	Malnutrition leads disease susceptibility.
23	Lack of fodder banks to meet the demand during drought.
24	Lack of knowledge on the right time of crossing
25	Maintenance of undesirable rams for mating.
26	Non availability of exotic breeds for breeding.
27	Low conception rate
28	High cost of parent stock
29	Improper culling of unproductive stock.
30	Inbreeding
31	Poor replacement stock
32	Rearing of low productive animals (poor germplasm)
33	Non-availability of high-yielding breeding stock
34	Negligence in the care of pregnant/dry animals
35	Vaccinations are being undertaken only during the outbreak.
36	Lack of knowledge on weaning of new born lambs.
37	Inadequate availability of Veterinary medicines for ailing sheep.
38	High Cost of veterinary Medicines.
39	Improper Isolation of sick animals
40	Treatment of sick animals by vet seldom happens.
41	Higher rate of mortality in lambs due to worm infestation.
42	Unhygienic maintenance of farm animals.
43	Improper cleaning of sheds.
44	Improper cleaning of the feeding and water troughs.
45	More external parasitic infestation.
46	High incidence of respiratory diseases.
47	Vitamins (A, D) and minerals (Ca, P) deficiency.
48	Frequent disease outbreaks of FMD, Sheep pox, Enterotaxaemia, Pasteurellosis, Bluetongue, etc.
49	Abortions due to feeding with fungus infested feed/grains.
50	Lamb dysentery
51	Mortality due to toxic vegetation & clovers.
52	Deworming the flock at irregular intervals

53	Irregular dipping to protect the animals from external parasites.
54	Non-availability of timely treatment.
55	Rare visits by veterinary staff.
56	Inadequate veterinary service coverage
57	Cold stress on a newborn lambs.
58	Unwillingness to pay for health services.
59	Inadequate supply of vaccines against prevalent diseases (PPR, FMD, ET, BT, Smallpox, Anthrax, Tetanus, HS).
60	High cost of veterinary service.
61	Lack of capital to start a sheep farm
62	Inadequate finance to expand flock size
63	Seasonal demand for mutton.
64	Low market price for small ruminants
65	Unlicensed traders
66	Poor market facilities
67	Involvement of Middle men
68	No incentive market for wool.
69	Lack of market information
70	Lack of extension support on skin handling & marketing
71	Lack of insurance facility
72	Inefficient sheep cooperative sector
73	Lack of technologies/inputs
74	High cost of farm labour
75	Inadequate loan facilities.
76	Timely non-availability of credit facilities
77	Poor knowledge about improved technology
78	Low literacy rate
79	Poor quality skin of local animals
80	Lack of transfer of scientific management information
81	Lack of extension support
82	Natural calamities & Weather vagaries

The 82 constraints were subjected to the Delphi technique of obtaining broad range of opinions in terms of 'Most important', 'Important' and 'Unimportant' and the score were assigned as 3, 2, 1 respectively. For each constraint the mean and weighted mean were calculated.

The above identified constraints were sent to the identified group of experts (30) to obtain a broad range of opinion on every constraint for further classification through Google forms. After 1st round scrutiny, out of 82 constraints whichever fell ≥2.34 weighted mean were subjected to further scrutiny, thus we selected 47 constraints.

Table 2: The constraints subjected to 1st round analysis by Delphi technique

S. No	1st round constraints	Mean= Sum / No. of respondents	W. mean= Sum. Mean / no. of constraints (191.78/82)
1	Lack of equipment's (feed trough/water trough)	2.266	2.3338
2	High cost of equipment's (feed trough/water trough)	2.433*	2.3338
3	Lack of farm labourer	2.3	2.3338
4	Lack of extension personnel.	2.7*	2.3338
5	Lack of transport facilities.	2.16	2.3338
6	Poor housing will succumb animals to adverse weather conditions.	2.3	2.3338
7	Inadequate space for housing.	2.23	2.3338
8	Poor organised and cooperative marketing infrastructure.	2.2	2.3338
9	Lack of shearing equipment's.	2.16	2.3338
10	Lack of awareness on fodder cultivation	2.36*	2.3338
11	High cost of concentrate feeds.	2.36*	2.3338
12	Inadequate knowledge in preparing balanced feed	2.66*	2.3338
13	Shrinkage of grazing lands.	2.56*	2.3338
14	Drinking water scarcity	2.56*	2.3338
15	Frequent drought attacks	2.06	2.3338
S. No	1st round constraints	Mean = Sum / No. of respondents	W. mean = Sum. Mean / No. of constraints (191.78/82)
16	Non availability of roughages	2.26	2.3338
17	Non-availability of green fodder	2.26	2.3338
18	High fodder cost	2.33*	2.3338
19	Poor grazing management	2.4*	2.3338
20	Non-availability of fodder during lean period.	2.3	2.3338
21	Inadequate nutrition is the major reason for stunted growth & low production.	2.4*	2.3338
22	Malnutrition leads disease susceptibility.	2.4*	2.3338
23	Lack of fodder banks to meet the demand during drought.	2.23	2.3338
24	Lack of knowledge on the right time of crossing	2.46*	2.3338

25	Maintenance of undesirable rams for mating.	2.56*	2.3338
26	Non availability of exotic breeds for breeding.	2.23	2.3338
27	Low conception rate	2.26	2.3338
28	High cost of parent stock	2.3	2.3338
29	Improper culling of unproductive stock.	2.26	2.3338
30	Inbreeding	2.4*	2.3338
31	Poor replacement stock	2.46*	2.3338
32	Rearing of low productive animals (poor germplasm)	2.26	2.3338
33	Non-availability of high-yielding breeding stock	2.5*	2.3338
34	Negligence in the care of pregnant/dry animals	2.6*	2.3338
35	Vaccinations are being undertaken only during the outbreak.	2.63*	2.3338
36	Lack of knowledge on weaning of new born lambs.	2.33*	2.3338
37	Inadequate availability of Veterinary medicines for ailing sheep.	2.43*	2.3338
38	High Cost of veterinary Medicines.	1.96	2.3338
39	Improper Isolation of sick animals	2.56*	2.3338
40	Treatment of sick animals by vet seldom happens.	2.6*	2.3338
41	Higher rate of mortality in lambs due to worm infestation.	2.33*	2.3338
42	Unhygienic maintenance of farm animals.	2.43*	2.3338
43	Improper cleaning of sheds.	2.43*	2.3338
44	Improper cleaning of the feeding and water troughs.	2.43*	2.3338
45	More external parasitic infestation.	2.43*	2.3338
46	High incidence of respiratory diseases.	2.63*	2.3338
47	Vitamins (A, D) and minerals (Ca, P) deficiency.	2.5*	2.3338
48	Frequent disease outbreaks of FMD, Sheep pox, Enterotaxaemia, Pasteurellosis, Bluetongue, etc.	2.8*	2.3338
49	Abortions due to feeding with fungus infested feed/grains.	2.36*	2.3338
50	Lamb dysentery	1.9	2.3338
51	Mortality due to toxic vegetation & clovers.	1.6	2.3338
52	Deworming the flock at irregular intervals	2.33*	2.3338
53	Irregular dipping to protect the animals from external parasites.	2.46*	2.3338
54	Non-availability of timely treatment.	2.46*	2.3338
55	Rare visits by veterinary staff.	1.66	2.3338
56	Inadequate veterinary service coverage	1.83	2.3338
57	Cold stress on a newborn lambs.	2.06	2.3338
58	Unwillingness to pay for health services.	1.63	2.3338
59	Inadequate supply of vaccines against prevalent diseases (PPR, FMD, ET, BT, Smallpox, Anthrax, Tetanus, HS).	2.46*	2.3338
60	High cost of veterinary service.	1.73	2.3338
61	Lack of capital to start a sheep farm	2.33*	2.3338
62	Inadequate finance to expand flock size	2.16	2.3338
63	Seasonal demand for mutton.	1.96	2.3338
64	Low market price for small ruminants	2.53*	2.3338
65	Unlicensed traders	2.43*	2.3338
66	Poor market facilities	2.33*	2.3338
S. No	1st round constraints	Mean = Sum/No. of respondents	W. mean = Sum. Mean/no. of constraints(191.78/82)
67	Involvement of Middle men	2.46*	2.3338
68	No incentive market for wool	2.16	2.3338
69	Lack of market information	2.46*	2.3338
70	Lack of extension support on skin handling & marketing	2.46*	2.3338
71	Lack of insurance facility	2.6*	2.3338
72	Inefficient sheep cooperative sector	2.36*	2.3338
73	Lack of technologies/inputs	2.26	2.3338
74	High cost of farm labour	2.3	2.3338
75	Inadequate loan facilities.	2.2	2.3338
76	Timely non-availability of credit facilities	2.16	2.3338
77	Poor knowledge about improved technology	2.53*	2.3338
78	Low literacy rate	2.33*	2.3338
79	Poor quality skin of local animals	2.03	2.3338
80	Lack of transfer of scientific management information	2.53*	2.3338
81	Lack of extension support	2.3	2.3338
82	Natural calamities & Weather vagaries	1.43	2.3338

During 2nd round scrutiny the constraints whichever fell ≥ 2.33 weighted mean were selected and subjected to further scrutiny. Same procedure was used for final selection of the prioritized constraints; whichever fell ≥2.29 weighted mean were included in the final list of constraints. Thus a total of 18 constraints were selected.

Table 3: The constraints subjected to 2nd round analysis by Delphi technique

S. No	2nd round constraints	Sum / No. of respondents	W. mean / no. of constraints (109.383/47)
1	High cost of equipment's (feed trough/water trough)	1.733	2.327
2	Lack of extension personnel.	2.300	2.327
3	Lack of awareness on fodder cultivation	2.400*	2.327
4	High cost of concentrate feeds.	2.266	2.327
5	Inadequate knowledge in preparing balanced feed	2.533*	2.327
6	Shrinkage of grazing lands.	2.466*	2.327
7	Drinking water scarcity	2.366*	2.327
8	High fodder cost	2.166	2.327
9	Poor grazing management	2.433*	2.327
10	Inadequate nutrition is the major reason for stunted growth & low production.	2.500*	2.327
11	Malnutrition leads disease susceptibility.	2.333*	2.327
12	Lack of knowledge on the right time of crossing	2.333*	2.327
13	Maintenance of undesirable rams for mating.	2.533*	2.327
14	Inbreeding	2.366*	2.327
15	Poor replacement stock	2.333*	2.327
16	Non-availability of high-yielding breeding stock	2.333*	2.327
17	Negligence in the care of pregnant/dry animals	2.366*	2.327
18	Vaccinations are being undertaken only during the outbreak.	2.500*	2.327
19	Lack of knowledge on weaning of new born lambs.	2.266	2.327
20	Inadequate availability of Veterinary medicines for ailing sheep.	2.133	2.327
21	Improper Isolation of sick animals	2.366*	2.327
22	Treatment of sick animals by vet seldom happens.	2.333*	2.327
23	Higher rate of mortality in lambs due to worm infestation.	2.466*	2.327
24	Unhygienic maintenance of farm animals.	2.566*	2.327
25	Improper cleaning of sheds.	2.433*	2.327
26	Improper cleaning of the feeding and water troughs.	2.366*	2.327
27	More external parasitic infestation.	2.466*	2.327
28	High incidence of respiratory diseases.	2.533*	2.327
29	Vitamins (A, D) and minerals (Ca, P) deficiency.	2.366*	2.327
30	Frequent disease outbreaks of FMD, Sheep pox, Enterotaxaemia, Pasteurellosis, Bluetongue, etc.	2.500*	2.327
31	Abortions due to feeding with fungus infested feed/grains.	1.800	2.327
32	Deworming the flock at irregular intervals	2.333*	2.327
33	Irregular dipping to protect the animals from external parasites.	2.333*	2.327
34	Non-availability of timely treatment.	2.233	2.327
35	Inadequate supply of vaccines against prevalent diseases (PPR, FMD, ET, BT, Smallpox, Anthrax, Tetanus, HS).	2.300	2.327
36	Lack of capital to start a sheep farm	2.233	2.327
37	Low market price for small ruminants	2.200	2.327
38	Unlicensed traders	2.200	2.327
39	Poor market facilities	2.366*	2.327
40	Involvement of Middle men	2.400*	2.327
41	Lack of market information	2.366*	2.327
42	Lack of extension support on skin handling & marketing	2.133	2.327
43	Lack of insurance facility	2.133	2.327
44	Inefficient sheep cooperative sector	2.100	2.327
45	Poor knowledge about improved technology	2.266	2.327
46	Low literacy rate	2.266	2.327
47	Lack of transfer of scientific management information	2.500*	2.327

Table 4: The constraints subjected to 3rd round analysis by Delphi technique

S. No.	3rd round constraints	Sum / No. of respondents	W. mean / no. of constraints (68.72/30)
1.	Lack of awareness on fodder cultivation	2.233	2.29
2	Inadequate knowledge in preparing balanced feed	2.300*	2.29
3.	Shrinkage of grazing lands	2.166	2.29
4.	Drinking water scarcity	1.933	2.29
5.	Poor grazing management	1.800	2.29
6.	Inadequate nutrition is the major reason for stunted growth & low production.	2.400*	2.29
7.	Malnutrition leads disease susceptibility.	2.533*	2.29
8.	Lack of knowledge on the right time of crossing	2.333*	2.29
9.	Maintenance of undesirable rams for mating.	2.333*	2.29
10.	Inbreeding	1.933	2.29
11.	Poor replacement stock	1.933	2.29
12.	Non-availability of high-yielding breeding stock	2.000	2.29
13.	Negligence in the care of pregnant/dry animals	2.433*	2.29
14.	Vaccinations are being undertaken only during the outbreak.	2.400*	2.29
15.	Improper Isolation of sick animals	2.466*	2.29
16.	Treatment of sick animals by vet seldom happens	2.333*	2.29
17.	Higher rate of mortality in lambs due to worm infestation	2.366*	2.29
18.	Unhygienic maintenance of farm animals	2.366*	2.29
19.	Improper cleaning of sheds	2.566*	2.29
20.	Improper cleaning of the feeding and water troughs	2.566*	2.29
21.	More external parasitic infestation	2.233	2.29
22.	High incidence of respiratory diseases	2.566*	2.29
23.	Vitamins (A, D) and minerals (Ca, P) deficiency	2.233	2.29
24.	Deworming the flock at irregular intervals	2.500*	2.29
25.	Frequent disease outbreaks of FMD, Sheep pox, Enterotaxaemia, Pasteurellosis, Bluetongue, etc	2.466*	2.29
26.	Irregular dipping to protect the animals from external parasites	2.166	2.29
27.	Poor market facilities	2.266	2.29
28.	Involvement of Middle men	2.433*	2.29
29.	Lack of market information	2.300*	2.29
30.	Lack of transfer of scientific management information	2.200	2.29

*Indicate selected constraint by Delphi technique

Table 5: Final list of constraints identified through Delphi technique

S. No.	Final constraints
1.	Inadequate knowledge in preparing balanced feed
2.	Inadequate nutrition is the major reason for stunted growth & low production.
3.	Malnutrition leads disease susceptibility.
4.	Lack of knowledge on the right time of crossing
5.	Maintenance of undesirable rams for mating.
6.	Negligence in the care of pregnant/dry animals
7.	Vaccinations are being undertaken only during the outbreak.
8.	Improper Isolation of sick animals
9.	Treatment of sick animals by vet seldom happens
10.	Higher rate of mortality in lambs due to worm infestation
11.	Unhygienic maintenance of farm animals
12.	Improper cleaning of sheds
13.	Improper cleaning of the feeding and water troughs
14.	High incidence of respiratory diseases
15.	Deworming the flock at irregular intervals
16.	Frequent disease outbreaks of FMD, Sheep pox, Enterotaxaemia, Pasteurellosis, Bluetongue, etc
17.	Involvement of Middle men
18.	Lack of market information

Eighteen identified constraints posed threat to scientific sheep rearing and were found to be very important to reap more benefits in sheep rearing. Emphasizing tackling of these constraints was of utmost importance to realize the set objective of the SRDP.

Conclusion
It can be concluded from the above results that the final list of constraints (18) were identified through Delphi technique.

Prioritized constraints can be of great use for the researchers and policy makers to plan and modify the research and extension programmes and for the officials of the state Animal Husbandry department to address these constraints to promote scientific rearing practices and make sheep rearing a profitable one.

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