



Network Project on Sheep Improvement



PROJECT CO-ORDINATOR'S ANNUAL REPORT (01.04.2011 to 31.03.2012)

Compiled by

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PREFACE

The annual report of the Network Project on Sheep Improvement (NWPSI) for the period 01-04-2011 to 31-03-2012 has been compiled using reports obtained from different units. The funds allocated by the Council for the year 2011-12 are presented.

I thank P.I's / Scientist Incharges of all the Units for their valuable contributions to make it possible to compile this report. The staff of Animal Genetics and Breeding Division deserves deep appreciation for their all out devotional help. Special thanks are due to Mr.N.C.Gupta, T-5, AGB Division for his assistance in file maintenance.

My sincere thanks are due to Dr. A. L. Arora, Incharge Project Coordinator (Sheep Breeding) during the period of reporting for his overall monitoring, effective supervision, advice and guidance. My sincere thanks are due to the Dr.S.M.K. Naqvi, Director, CSWRI for his guidance, overall monitoring and providing facilities for the Project Coordinator's Cell.

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Incharge, PC Cell

Avikanagar
Sept, 2012

NETWORK PROJECT ON SHEEP IMPROVEMENT: PROJECT TEAM

(A) COORDINATING UNIT, CSWRI, AVIKANAGAR

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Director & Project Coordinator
CSWRI, Avikanagar

Dr. A. L. Arora
Incharge, Project Coordinator (Sheep Breeding) (up to 11.04.2012)

Dr. L. Leslie Leo Prince
Sr. Scientist (AGB) & Incharge, PC Cell (from 12.04.2012)

Mr. N. C. Gupta
Technical Officer, Animal Genetics & Breeding Division

(B) COOPERATING UNITS

S. No.	Name of the Units	Name of the Unit Incharge
1.	C.S.W.R.I., Avikanagar Chokla Unit	Dr. Ashish Chopra (from 26.05.2012), Scientist (AGB) Dr. L. Leslie Leo Prince (up to 25.05.2012) Sr. Scientist (AGB)
2.	A.R.C. (CSWRI), Bikaner Marwari Unit	Dr. H.K. Narula Sr. Scientist (AGB)
3.	C.I.R.G., Makhdoom Muzzafarnagri Unit	Dr. Gopal Dass Sr. Scientist (AGB)
4.	M.P.K.V., Rahuri Decanni Unit (Farm Based)	Dr. Y. G. Fulpagare (from 01.09.2011) Professor (Animal Science) Dr. P. T. Dhole (up to 31.08.2011) Professor (Dairy Science)
5.	S.V. V. University, LRS Palamner Nellore Unit	Dr. Dr. B. Ekambaram (From 07.03.2012) Professor (AGB)) Dr. P. Thyagaraja Naidu (up to 06.03.2012) Asst. Professor (LPM)
6.	S.D.A.U., Sardarkrushinagar Patanwadi Unit (up to 31.03.12)	Dr. D. P. Pandey Professor (AGB)
7.	R.A. J. U.V.A.S., Bikaner Magra Unit	Dr. C. K. Murdia (from 06.08.2011) Associate Professor (AB&G) Dr S. B.S. Yadav (up to 05.08.2011) Professor (AB&G)
8.	T.A.N.U.V.A.S.,L.R.S, Kattupakkam: Madras Red Unit	Dr. H. Gopi (from 05.04.2012) Professor Dr. D. Balasubramanyam (up to 04.04.2012) Associate Professor (AGB)
9.	O.U.A.&T., Bhubaneswar Ganjam Unit	Dr S. K. Dash (from 20.10.2011) Associate Professor (AGB) Dr N. Barik (up to 19.10.2011) Associate Professor (AGB)
10.	M.P.K.V., Rahuri Decanni Unit (Field based)	Dr. U. Y. Bhoite Associate Professor (AGB)

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SUMMARY

Network Project on Sheep Improvement (NWPSI) was initiated on 1.4.1990 for survey, evaluation and improvement of indigenous sheep breeds under native environment. All the centres of All India Coordinated Research Project on Sheep Breeding (AICRP-SB) were converted into NWPSI Centres. Different breeds of sheep are being improved through selection and inter-se mating for wool and mutton production. The mandate of NWPSI is survey of indigenous sheep, their genetic evaluation and improvement. Presently, there are ten ongoing centres of NWPSI including farm based units at CSWRI, Avikanagar (Chokla, carpet Wool), ARC (CSWRI), Bikaner (Marwari, carpet wool), CIRG, Makhdoom (Muzaffarnagri, Dual type), MPKV, Rahuri (Deccani, Dual type) and SVVU, Palamner (Nellore, Mutton), SDAU, Sardarkrushinagar (Patanwadi, Dual type) and field-based units at RAJUVAS, Bikaner (Magra, Carpet wool) and TANUVAS, Kattupakkam (Madras Red, Mutton), OUAT Bhubaneswar (Ganjam, mutton) and MPKV, Rahuri (Deccani, Dual type) . Field-based unit of Ganjam Sheep at Orissa University of Agricultural Technology, Bhubenshwar started functioning from July 2001. Two new units, Farm Based Unit on Patanwadi sheep at SDAU, Sardarkrushinagar and Field Based Unit on Deccani sheep at MPKV, Rahuri were sanctioned during the XI plan and project sanctioned from 01.04.2009 and actual project work started from September, 2009.

The technical programme aims at improvement of indigenous sheep breeds under farm conditions wherein the male lambs are first ranked using selection index. Index incorporates body weight and wool yield at six months of age. Best lambs are selected and mated with tester ewes by the age of 18 months. Subsequently these rams are again evaluated based on their progeny performance and best 2-3 rams are selected and used for breeding in improver flock. Each field-based unit has four centres including a ram-rearing centre, covering a sheep population of about 1500 sheep per centre. The superior male lambs are selected from the farmers' flocks on the basis of GFY1 and 6-month body weigh in Magra sheep and on six-month body weight basis in Madras Red and Ganjam sheep. Male lambs are initially identified at 3 month of age and are finally selected after first shearing. Selected male lambs from improver flocks are supplied for breeding to base flocks. Unit wise results of the Network Project on Sheep Improvement are summarized below:

Chokla Unit, CSWRI, Avikanagar: The least square means for birth, three, six, nine and twelve months body weights of year 2011 born lambs were 2.73, 12.88, 21.41, 23.76 and 25.74 kg respectively. The greasy fleece yield in first six monthly clips, adult six monthly and adult annual were 1.248, 1.364, and 2.522 kg respectively. *Tupping percent and lambing percent on ewes available basis was 99.13 and 103.74, respectively. 41 breeding rams were sold to various agencies for improvement programme.*

Marwari Unit, Arid Region Campus (CSWRI), Bikaner: *The average birth, 3, 6, 9 and 12- month weights for the year were 3.12, 17.24, 24.37, 27.35 and 30.07 kg respectively.* The overall tupping and lambing on ewes available basis were 96.56 and 94.37 respectively. The average diameter and medullation were 37.01 μ and about 57.90%. The overall survivability was 97.41%. *A total of 161 Marwari ram/ram lambs were sold to various agencies for sheep improvement programme.*

Muzaffarnagar Unit, CIRG, Makhdoom: The least square means for birth, three, six, nine and 12 month body weights of year 2011 born lambs were 3.72, 16.92, 21.63, 26.52 and 31.71 kg respectively. Topping was 103 percent. Lambing percent based on ewes available and topped was 91.0 and 88.2 respectively. *A total of 59 rams were sold to various agencies for sheep improvement programme.*

Deccani Farm based Unit, MPKV, Rahuri: Average body weight at birth, weaning, 6 months, 9 months, and 12 months of age were 3.42, 15.55, 21.84, 23.02 and 24.41 kg respectively. The topping percentage was 93.88 while the lambing based on ewes available was 84.17 %. *Unit supplied 15 breeding rams/ ram lambs to the various agencies for sheep improvement programme.*

Nellore Unit, SVVU, LRS Palamner : The overall means for body weight at birth, three, six, nine and 12 months of age were 3.20, 14.03, 18.56, 23.23 and 24.44 kg respectively. *During the year under report in about 49 rams were sold to different farmers for breed improvement programme*

Magra Unit, R. A. J. U. V. A. S., Bikaner: The average body weights at birth, 6 and 12 months and adult stage were 3.05, 21.71, 30.84 and 39.71 kg respectively. Average greasy fleece weight at 6-month age and adult annual were 1.012 and 2.243 kg, respectively. *A total of 27 rams were distributed to registered farmers at various centres.*

Madras Red Unit, T.A.N.U.V.A.S., LRS Kattupakkam : Overall mean of body weights for lambs born during 2011 for birth, weaning, six, nine and twelve months were 2.83, 11.36, 15.46, 19.28 and 22.31kg, respectively. 86.40 per cent lambing was observed during the year. *A total of 18 ram were distributed to registered farmers at various centres.*

Ganjam Unit, OUAT, Bhubaneswar: Overall mean of body weights for birth, weaning, six and twelve months were 2.70, 11.62, 16.98, 21.51 and 24.64 kg during 2011-12. 84.29 per cent lambing was observed during the year.

Deccani Field based Unit, Mahatma Phule Krishi Vidyapeeth Unit, Rahuri: Survey of Deccani sheep was conducted in the breeding tract for identification and selection of flocks and for collection of baseline data. The overall means of body weights of adopted flock for birth, 3, 6, 9 and 12-months of age were 3.58, 15.82, 23.08, 25.18 and 30.11 kg respectively. *22 selected elite Deccani rams were procured and distributed to registered farmers at various centres*

1. NETWORK PROJECT ON SHEEP IMPROVEMENT

1.1 INTRODUCTION:

The Network Project on Sheep Improvement (NWPSI) came into being on 1.4.1990, when all the centers of All India Coordinated Research Project on Sheep Breeding (AICRP-SB) were transformed into NWPSI Centers. The basic difference between AICRP-SB and NWPSI is that AICRP-SB was mainly focused on crossbreeding of genetically low yielding indigenous sheep breeds with high yielding exotic sheep whereas, in NWPSI emphasis has been given on the survey, evaluation, conservation and improvement of indigenous sheep genetic resources by selective breeding. Under NWPSI different breeds of sheep are being improved through selection and inter-se mating for wool and mutton production.

Presently, there are nine ongoing cooperating centres of NWPSI in the country with its coordinating unit at Central Sheep and Wool Research Institute, Avikanagar, Tonk (Rajasthan). Five of these units are farm-based units while four of them are field-based units.

Two new units, Farm Based Unit on Patanwadi sheep at SDAU, Sardarkrushinagar and Field Based Unit on Deccani sheep at MPKV, Rahuri were sanctioned during the XI plan and project sanctioned from 01.04.2009 and actual project work started from September, 2009. Patanwadi Sheep Unit is discontinued from 31.03.2012 and not included in the XII Plan proposal.

1. Coordination Cell, NWPSI: PC Cell, CSWRI, Avikanagar

2. Cooperating Units:

Sr. No	Location	Breed	Purpose
A. Farm based Cooperating units			
1	CSWRI, Avikanagar	Chokla sheep	Carpet Wool
2	ARC (CSWRI), Bikaner	Marwari sheep	Carpet Wool
3	CIRG, Makhdoom	Muzaffarnagri sheep	Dual purpose
4	MPKV, Rahuri	Deccani sheep	Dual purpose
5	SVVU, Palamner	Nellore sheep	Mutton
6	SDAU, Sardarkrushinagar*	Patanwadi Sheep	Dual purpose
B. Field-based Cooperating units			
1	RAJUVAS, Bikaner	Magra sheep	Carpet wool
2	TANUVAS, Kattupakkam	Madras Red sheep	Mutton
3	OUAT, Bhubneshwar	Ganjam Sheep	Mutton
4	MPKV, Rahuri	Deccani sheep	Dual purpose

* Patanwadi Unit discontinued from 31.03.2012 and not included in XII Plan Proposal (2012-17)

1.2 OBJECTIVES

The objective of NWPSI is

- Genetic improvement of indigenous sheep breeds by selection.

1.3 TECHNICAL PROGRAMME

The Technical Programme of NWPSI is conceptually based on selection and progeny testing of indigenous sheep breeds with the involvement of institutional and field based flocks. Registered flocks owners in the field, with a specified flock strength (30-40 breedable ewes), are identified and are incorporated in the field-based TP of the project to enhance the efficiency of PT scheme and to obtain superior germ plasm from field, as well. The field-flocks are provided with various incentives and facilities to obtain better cooperation from them towards the project. These incentives provided are:

- i. Adequate health control measures to the flocks (prophylactic and curative, both).
- ii. Essential guidelines and technical knowledge about profitable sheep industry.
- iii. Supply of superior breeding rams.

(a) Farm-based Technical Programme: Under the farm based projects, a base flock of 250 ewes is maintained and after getting the lambing from this flock, preliminary selection of the ram lambs is done at six month of age on the basis of an index incorporating body weight and wool weight at six month of age. Those preliminary selected ram lambs at about 1.5 years of age are mated to the Tester flock. The progenies from these mating are reared and used for evaluating those ram lambs. In this process the ratio of ram: ewes are 1:20. After evaluation of these rams lambs, best 4-6 rams of highest merit are selected for crossing with Improver flock. Now the superior ram lambs produced through these mating are to be used as sires for base flock whereas the female progenies are to be used as replacement for Base Flock. In this way, the cycle is repeated over years to get the desired improvement in the flock. During the whole process flock is kept open to introduce superior genotypes in the flock and vice-versa. Each unit is maintaining 250 breedable ewes. Target is to achieve 500 breedable ewes. Each unit was to develop selection index, for the selection of the rams. Selection indices developed by different units are given in Table 1. Male lambs were selected using selection index and mated with tester ewes by the age of 18 months. These breeding rams are further selected based on their progeny performance and were used for breeding in improver flock.

Table 1. Selection indices developed in farm based units.

Breed	Selection Index
Chokla	0.507 VI wt. + 2.956 GFYI
Marwari	1.26504 VI wt.+ 0.70942 GFYI
Muzaffarnagri	VI wt
Deccani	VI wt.
Nellore	15.102 IIIwt + VIwt

(b) Field-based Technical Programme: In the ongoing, Field based technical programme, each unit will have four centres from which one will be the ram-rearing centre. Each of the other three centres will cover a population of about 1500 sheep. Only those flocks will be included which are having at least 30-40 breedable ewes. The main selection criteria is body size whereas the Tamil Nadu unit is also collecting information on carcass traits and skin quality.

Once these flocks are identified at more than one location, selection of adult males is made by dentition and these males are procured. After procurement, these rams are reared at Ram Rearing Centre, with all infrastructural facilities. During breeding seasons, these males are distributed to the flocks with 30-40 breedable ewes. Preferably, these males are distributed in more than two centres. After breeding season these males are returned back to the Ram Rearing Centre to be used in next breeding season.

Progeny born through these mating are recorded and the breeding value of used rams is evaluated and used extensively for genetic improvement programmes. During each year at least 20 percent of the total rams shall be replaced by selecting superior males from the field and the rams so registered shall be passed on to the base group. The best rams identified in the above programme shall be allotted to certain properly identified flocks and these identified flocks shall always be allotted the best males in each generation. Therefore, the whole population shall have three groups of breedable ewes at a time.

Base group: A group of ewes, to which the rams selected from our own registered breeders, shall be used in each generation.

Test group1: A group of ewes, to which the superior rams (progeny tested), will be allocated.

Test group2: A group of ewes, to which the rest rams will be allocated each year.

This programme will be continued until sufficient information on effectiveness of this programme is collected and attempts will be made to identify methods by which the use of superior rams could be maximised. The possibilities in this direction are -

1. Establishment of a superior ewe flocks (Improver flock) at one of the centres.
2. Extension of breeding season for these rams.
3. Use of synchronized lambing and artificial insemination with liquid chilled semen..

2. UNIT-WISE PERFORMANCE OF NWPSI CENTERS

2.1 CSWRI, AVIKANAGAR (RAJASTHAN) : CHOKLA SHEEP- CARPET WOOL

Project Title: Evaluation and improvement of Chokla sheep for carpet wool.

EXPERIMENTAL RESULTS

Flock Statistics:

The opening and closing balance of the experimental flock of Chokla sheep for the year 2011-2012 was 600 and 627, respectively. Addition was due to lambing (358). Reductions were due to death (93), culling (116), slaughter/predation (7), sale (109) and external transfer (7). At the end of the year, there were 168 males and 459 females in different age groups. Adult ewes replacement rate during the year was 21 per cent. Adult rams were retained in the flock for distribution/sale to the State Govt. Deptt / NGOs. for improvement programmes. 31 rams were sold to Ram rearing project under CWDB project. Population Statistics are presented in Table 1.

Pre-weaning, post weaning (3-6 month, 6-12 month) and adult mortality (death + culling on health ground) was 6.58, 12.72, 2.31 and 6.06 percent, respectively. Percent culling (health ground) in adult stage was 3.98 percent. Results are given in Table 2. Overall mortality during the period was 9.71 percent. Post-mortem finding revealed that pneumonia caused the highest (44%) mortality. A total of 29 sera were collected from susceptible animals and tested for JD, in which 19 animal were found positive. Animals found positive and showed progressive debility were culled from the flock.

Reproduction:

In general the animals were bred in two breeding seasons (spring and autumn) and about 75% percent of the breedable ewes were covered in major breeding season (autumn). But during last year round the year mating was practiced to improve the breeding efficiency. Lambing percentage based on ewe's available basis and tuppéd basis was 103.74 and 104.64 % respectively (Table 3). There is significant improvement in the reproductive performance.

Growth performance:

Data on growth performance generated from the lambs born during the year 2007 to 2011 were subjected to least squares analysis. Least squares means of body weight at various ages are presented in Table 4. The overall least squares means of body weights at birth, three, six, nine and twelve months of age were 2.88, 14.17, 22.47, 24.72 and 28.10 kg, respectively. Corresponding values for the year 2011-2012 were 2.73, 12.88, 21.41, 23.76 and 25.74 Kg respectively. Overall least squares means of average daily body weight gain between 0-3, 3-6, and 6-12 months were 125.2, 89.2 and 26.9 g, respectively. Corresponding values for the 2011 born lambs were 112.3, 91.8 and 13.7 g/day.

Greasy fleece Yield and wool quality:

The least square means for greasy fleece weights (2007-2011) are presented in Table 6. Overall least squares means for 1st six monthly greasy fleece yield (GFY1), adult six monthly and adult annual greasy fleece yields were 1.234, 1.234 and 2.368 kg, respectively. Corresponding values for the year 2011 clips were 1.248, 1.364 and 2.522 kg, respectively. Genetic and non-genetic factors had significant effect on greasy fleece yield. Highest first six monthly GFY was achieved during previous year was maintained during 2011 clips. Average fibre diameter was 35.54 μ , Medullation was 37.34%. Staple length was 7.46cm for adult males and corresponding values for adult females were 34.44 μ , 30.32% and 6.30cm.

Selection of rams:

Selection of rams was based on index combining body weight and wool yield at 6 month of age. ($I = 0.507 \text{ VI wt.} + 2.959 \text{ GFYI}$). Ranking of the selected rams was made based on their index score. Last year top 14 rams were selected for breeding. The selection differential of the rams used during 2011-2012 was 3.54 kg for six-month weight and 331 gm kg for GFYI. 31 rams were sold to Ram rearing project under CWDB project.

Response to selection:

Response to selection was positive for six-month weight and 1st six monthly GFY.

Table 1: Livestock statistics (01.04.2011 to 31.3.2012)

Age group	Opening balance		Closing balance	
	Male	Female	Male	Female
0-3 Months	21	16	28	20
3-6 Months	36	36	42	34
6-12 Months	20	32	62	80
Adult	60	379	36	325
Total	137	463	168	459

Table 2. Annual culling and death percentage for the year 01.04.2011 to 31.03.2012

Age group	Culling % on Health ground			Death %			Overall %		
	M	F	T	M	F	T	M	F	T
0-3M	0.00 (198)	0.51 (197)	0.25 (395)	5.55 (198)	7.11 (197)	6.33 (395)	5.55 (198)	7.61 (197)	6.58 (395)
3-6 M	0.00 (195)	0.00 (198)	0.00 (393)	12.31 (195)	13.13 (198)	12.72 (393)	12.31 (195)	13.13 (198)	12.72 (393)
6-12 M	0.00 (138)	0.61 (165)	0.33 (303)	2.17 (138)	1.82 (165)	1.98 (303)	2.17 (138)	2.42 (165)	2.31 (303)
Adult	3.33 (120)	4.15 (458)	3.98 (578)	2.50 (120)	1.96 (458)	2.08 (578)	5.83 (120)	6.11 (458)	6.06 (578)

Note: 1. Over all mortality percent, irrespective of age group was 9.71 %.

2. Within parenthesis is the number of sheep available during the period.

Table 3: Ewes reproductive performance

Year	Ewes available (for breeding)	No. of ewes tugged	Tupping %	No. of live lambs born	Lambing % on available basis	Lambing % on tugged basis
2007	244	233	95.5	220	90.20	94.40
2008	252	244	96.8	218	86.51	89.34
2009	289	281	97.2	274	94.81	97.51
2010	289	283	97.92	262	90.66	92.58
2011	348	345	99.13	361	103.74	104.64

Table 4: Least square means of body weight for the period 2008-2012(kg)

Particulars	Birth weight	Weaning weight	6- month weight	9- month weight	12 month weight
Overall mean	2.88±0.01 (1460)	14.17±0.08 (1294)	22.47±0.12 (1007)	24.72±0.17 (786)	28.10±0.17 (733)
Year	*	**	**	**	**
2007-2008	2.87±0.04 (224)	15.55±0.19 (209)	21.98±0.25 (204)	24.49±0.27 (148)	27.86±0.28 (133)
2008-2009	2.87±0.03 (230)	13.23±0.19 (213)	18.82±0.27 (191)	20.70±0.26 (167)	26.60±0.28 (141)
2009-2010	2.94±0.03 (278)	14.64±0.17 (247)	25.19±0.23 (235)	27.44±0.23 (199)	30.90±0.23 (198)
2010-2011	2.98±0.03 (353)	14.56±0.14 (324)	24.96±0.23 (243)	27.21±0.21 (235)	29.40±0.21 (235)
2011-2012	2.73±0.04 (375)	12.88±0.16 (301)	21.41±0.31 (134)	23.76±0.61 (37)	25.74±0.63 (26)

Note: Within parenthesis is the number of observation.

Table 5: Least square means of greasy fleece yield for the period 2008-2011(kg)

Particulars	1 st six monthly GFY	Adult six month GFY	Adult annual GFY
Overall mean	1.234±0.02 (881)	1.234±0.01 (3150)	2.368±0.02 (1317)
Year	**	**	**
2007	1.273±0.04 (172)	1.296±0.01 (581)	2.210±0.04 (208)
2008	0.808±0.04 (172)	1.121±0.01 (583)	2.344±0.04 (291)
2009	1.536±0.04 (190)	1.225±0.01 (564)	2.492±0.04 (241)
2010	1.305±0.03 (205)	1.166±0.01 (653)	2.373±0.03 (274)
2011	1.248±0.04 (138)	1.364±0.01 (769)	2.522±0.03 (303)

Note: Within parenthesis is the number of observation.

2.2 ARC (CSWRI), BIKANER (RAJASTHAN): MARWARI SHEEP FOR CARPET WOOL

Project title: Improvement of Marwari sheep for carpet wool production through selection.

Experimental Results:

Flock Statistics: The opening and closing balance of Marwari flock during the year ending March 2012 was 910 and 829 respectively (Table 1). Additions were due to lambing (401) and deductions were due to mortality (34), culling (220) and sale (228) to Government agencies/ NGO/ Farmers etc.

The overall mortality and culling irrespective of age were 2.59 and 16.78 per cent respectively. Age group wise details of culling, mortality and overall percent are presented in Table 2. A total of 161 adult rams, 3 hogget males and 64 ewes were sold to different agencies for genetic improvement in the animals of farmers flock. The culling and mortality rates were 0.64, 2.60, 23.06 and 8.43 and 4.10, 0.70, 0.73 and 0.79% respectively in lambs, weaners, hoggets and adults, respectively.

Reproduction:

The reproductive performance of Marwari ewes during year 2009-11 has been presented in Table 6. The overall tupping and lambing on available and bred basis were 96.56, 94.37 and 97.73 % respectively during year 2011. The replacement rate was 36.50%.

Growth performance:

The data on growth performance of the lambs born during the year 2009 to 2012 were subjected to least squares analysis and results are presented in the Table 2. Overall least squares means for birth, 3, 6, 9 and 12-month body weight was 3.09, 15.16, 21.92, 26.36 and 30.40 kg respectively. The Corresponding values for the year 2011 were 3.12, 17.24, 24.37, 27.35 and 30.07 kg respectively. The least squares means of birth weight and weaning weight of lambs born during the year 2012 were 3.41 and 16.05 kg, respectively. The overall least squares means for daily body weight gain during 0-3 month, 3-6 month and 6-12 of the lambs born from 2009 to 2011 were 133, 75 and 41 gm., respectively. Corresponding figures for the year 2011 were 156, 77 and 29 g, respectively.

Greasy Fleece Yield:

Wool yield data form 2009-2011 was subjected to least squares analysis and results are presented in table 5. The overall least squares means for adult spring, autumn, annual and lambs first and 2nd clip during 2011 clip were 794, 552, 1388,612 and 740 g, respectively. Wool samples of lambs born during the year 2011 were analysed for various wool quality traits. The least squares means for fibre diameter, Medullation, staple length and crimp were 37.01 μ , 57.90 %, 5.17cm and 0.58 per cm, respectively.

Selection of the Rams:

Selection of rams was made based on index combining body weight and wool yield at 6 month of age ($SI = 1.26504*VIWT+0.70942*IClip$). Ranking of the selected rams was made based on their index score. last year top 21 rams were selected for breeding and surplus were made available for field sheep improvement programs.

Selection differential:

The selection differentials were 4.50 kg and 123g for 6-month body weight and first six monthly clips respectively.

Table 1: Flock statistics for the year 2011-2012

Age group	Opening balance		Closing balance	
	Male	Female	Male	Female
0-3 Months	27	35	46	35
3-6 Months	160	172	63	54
6-12 Months	0	0	71	96
Adult	116	400	37	427
Total	303	607	217	612

Table 2: Annual survivability, culling and sale percentage for the year ending 2011-2012

Age Group	Culling (%)			Mortality (%)			Culling & mortality (%)		
	M	F	Total	M	F	Total	M	F	Total
0-3M	0.44	0.84	0.64	4.86	3.37	4.10	5.30	4.21	4.75
3-6M	3.96	4.12	2.60	0.60	0.82	0.70	4.57	4.94	4.76
6-12M	30.80	16.43	23.06	0.80	0.68	0.73	31.60	17.12	23.80
Adult	7.04	8.97	8.43	0.00	1.09	0.79	7.04	10.07	9.22
Overall	21.11	14.09	16.78	2.98	2.34	2.59	24.10	16.44	19.37

Note: 1. Over all mortality percent, irrespective of age group was 2.60 %.
2. Within parenthesis is the number of sheep available during the period.

Table 3: Reproduction performance for the period from 2008 to 2011

Year	No. Available	No. Topped	No. Lambled	Tupping (%)	Lambing % (available basis)	Lambing % (Topped basis)
2007	306	301	282	98.36	93.06	94.63
2008	366	352	307	96.17	85.04	88.47
2009	381	379	335	99.47	87.92	88.39
2010	419	410	378	97.85	91.08	93.10
2011	320	309	302	96.56	94.37	97.73

Table 4 : Growth performance of Marwari lambs for the year 2008 to 2011 (kg.).

Effect/trait	Birth Wt.	3M Wt.	6M Wt.	9M Wt.	12M Wt.
μ	3.09±0.01 (1409)	15.16±0.06 (1209)	21.92±0.09 (915)	26.36±0.12 (646)	30.40±0.15 (468)
Year	**	**	**	**	**
2008	2.97±0.02 (309)	15.65±0.13 (289)	23.83±0.16 (283)	28.94±0.18 (205)	31.38±0.21 (156)
2009	2.82±0.02 (354)	14.47±0.12 (336)	21.03±0.15 (323)	26.43±0.19 (241)	29.57±0.21 (180)
2010	2.99±0.02 (325)	12.86±0.13 (270)	19.91±0.18 (253)	25.31±0.28 (110)	31.58±0.33 (76)
2010-11	3.12±0.02 (415)	17.24±0.11 (383)	24.37±0.15 (339)	27.35±0.17 (295)	30.07±0.20 (212)
2011-12	3.41±0.02 (315)	16.05±0.15 (220)	-	-	-

Table 5: Greasy fleece weight of Marwari adults and lambs (gm)

Effect	Adult Clip			Lamb Clip	
	Spring	Autumn	Annual	First	Second
μ	778.37±6.24 (1528)	540.50±4.81 (1426)	1354.95±11.76 (1064)	530.07±4.00 (934)	733.15±10.29 (340)
Sex	**	**	**	**	**
Male	926.44±11.84 (154)	655.64±9.00 (173)	1654.66±22.81 (60)	540.19±5.65 (460)	788.00±16.31 (107)
Female	630.29±3.85 (1374)	425.37±3.31 (1253)	1055.25±5.56 (1004)	519.95±5.62 (474)	678.31±11.49 (233)
Year	**	**	**	**	**
2008	821.77±13.40 (305)	582.58±7.80 (395)	1336.18±23.65 (242)	662.30±7.10 (291)	711.10±11.23 (159)
2009	717.49±9.62 (327)	481.73±6.73 (447)	1230.17±14.95 (308)	411.12±6.67 (329)	673.33±12.65 (173)
2010	823.58±8.80 (408)	617.06±5.88 (561)	1475.86±13.44 (384)	566.60±7.64 (251)	785.30±21.23 (59)
2011	794.76±7.66 (453)	552.71±6.96 (418)	1388.82±13.68 (372)	612.49±6.43 (354)	740.83±16.71 (108)
2012	777.64±9.60 (340)				

Note : Within parenthesis is the number of observation.

2.3 CIRG, MAKHDOOM (U.P.): MUZAFFARNAGRI SHEEP FOR MUTTON AND WOOL

Project Title: Genetic evaluation and Improvement of Muzaffarnagri sheep for body weight and wool yield.

Experimental Results:

Progress of work

Flock Statistics:

The flock strength of Muzaffarnagari sheep for the year 2011-12 is presented in Table 1. The opening balance (01. 04. 2012) was 536 sheep while the closing (31. 03. 2012) was 588 sheep. The addition was due to birth of 251 lambs while the reduction was due to death (21), culling (70) and sale (84).

Culling and Mortality:

The overall culling in 0-3 month, 3-6month, 6-12 age group and adults it were 0.53, 1.95, 5.88 and 9.76%. The overall culling in all age groups was 8.89%. The mortality was recorded to be 1.07, 1.30, 1.81 and 1.79% in the 0-3, 3-6, 6-12 age group and adults respectively. The overall culling and mortality was 8.89 and 2.67%. The overall culling on health ground was 1.02%.

Reproductive Performance:

The reproductive performances of ewes in the year 2011 are depicted in Table-3. The annual tupping, lambing on available basis and lambing on bred basis were 103.0, 91.0 and 88.2. Tupping, lambing and twinning significantly improved during this year as compared to previous years.

Growth Performance:

The data on growth traits generated over the years (2009-2012) were subjected to least squares analysis and results are presented in Table 4. The overall least squares means for body weight at birth, 3, 6, 9 and 12 months of age were 3.64, 15.32, 21.09, 25.42 and 30.45 kg respectively. Corresponding values for the year 2011 were 3.72, 16.92, 21.63, 26.52 and 31.71 kg respectively. The overall average daily weight gain (2011) at pre-weaning (0-3 month) and post-weaning (3-6, 6-12 month) were 111, 83, and 63g respectively. A total of 10 male lambs maintained under semi-intensive feeding management were slaughtered to study various carcass characteristics. The overall mean for carcass traits viz. weight at slaughter, empty body weight, carcass weight, dressing percent (slaughter weight basis), dressing percent (empty body weight basis), fore quarter weight and hind quarter weight were 27.840g, 22.394kg, 11.535kg, 41.64%, 51.88%, 5.179kg and 5.956kg, respectively.

Greasy Fleece Yield:

The least-squares means for fleece yield at different clips are presented in Table 5. The overall least squares means for lambs 1st and 2nd season clip and adult annual clip were 503, 506 and 1175 g, respectively. In year 2011, the means for lambs first, second and adult annual clips were 480, 563 and 1369 g, respectively.

Selection of Rams:

Selection of rams was done on the basis of 6-month body weight.

Selection Differential & Response to selection:

The selection differentials for 6-month body weight was 7.3 kg for year 2011-12. Details about response to selection was not given. The h^2 estimates of birth, 3, 6, 9, 12 month body weight and first six monthly clip were 0.137, 0.091, 0.322, 0.292, 0.295 and 0.530 respectively. A total of 59 breeding rams and 25 ewes were supplied to Animal Husbandry Department, Uttar Pradesh and progressive farmers for genetic improvement of the breed under field conditions.

Table 1: Flock statistics:

Age group	Opening balance as on 1.4.2011		Closing balance as on 31.3.2012	
	Male	Female	Male	Female
0-3 Months	59	64	38	43
3-6 Months	12	08	67	59
6-12 Months	22	28	18	17
Adult	57	286	48	298
Total	150	386	171	417

Table 2: Annual culling and mortality percentage:

Age group	Culling (%)			Death (%)			Total (%)		
	M	F	Total	M	F	Total	M	F	Total
0 – 3M	0.00 (184)	1.05 (190)	0.53 (374)	1.63 (184)	0.53 (190)	1.07 (374)	1.63 (184)	1.58 (190)	1.60 (374)
3 – 6M	0.00 (155)	3.95 (152)	1.95 (307)	1.93 (155)	0.66 (152)	1.30 (307)	1.93 (155)	4.60 (152)	3.26 (307)
6–12M	5.61 (107)	6.14 (114)	5.88 (221)	2.80 (107)	0.88 (114)	1.81 (221)	8.41 (107)	7.02 (114)	7.69 (221)
Adult	3.94 (127)	11.73 (375)	9.76 (502)	2.36 (127)	1.60 (375)	1.79 (502)	6.30 (127)	13.33 (375)	11.55 (502)
Overall	4.00 (275)	11.52 (512)	8.89 (787)	4.36 (275)	1.76 (512)	2.67 (787)	8.36 (275)	13.28 (512)	11.56 (787)

* Culling on health ground = 1.02%

Table 3: Ewes reproductive performance:

Lambing season	No. of ewes available for breeding	No. of ewes tupped	Tupping percentage	Number of Lambing	No. of live lambs born	Lambing percentage on the basis of	
						Ewes available	Ewes tupped
Season 1	206	160	77.7	135	150	69.6	91.2
Season 2	169	148	91.9	119	134	73.9	85.0
Annual	299	308	103.0	254	284	91.0	88.2

Table 4: Growth performance:

Particulars	Birth wt.	3M Wt.	6M Wt.	9M Wt.	12M Wt.
Overall mean	3.64±0.03 (622)	15.32±0.16 (523)	21.09±0.21 (370)	25.42±0.23 (333)	30.45±0.25 (289)
Year	**	**	**	**	**
2009	3.56±0.05 (132)	15.15±0.31 (125)	20.49±0.37 (121)	24.02±0.42 (96)	28.73±0.47 (94)
2010	3.53±0.05 (146)	13.63±0.30 (135)	21.15±0.36 (128)	25.71±0.37 (122)	30.91±0.41 (104)
2011	3.72±0.04 (267)	16.92±0.21 (263)	21.63±0.38 (121)	26.52±0.38 (115)	31.71±0.44 (91)
2012	3.75±0.07 (77)	-	-	-	-

Note : Within parenthesis is the number of observation.

Table 5: Greasy fleece yield (g) of Muzaffarnagari sheep:

Particulars	Lambs Clip		Adult annual
	First season	Second season	
Overall	503.97±06.89 (470)	506.98±07.77 (321)	1175.34±13.01 (668)
Sex	**	**	**
Male	527.36±09.59 (232)	507.08±09.46 (127)	1341.35±23.75 (105)
Female	480.57±09.73 (238)	506.88±11.62 (194)	1009.32±10.43 (563)
Year	**	NS	**
2009	450.77±13.87 (111)	435.79±11.14 (130)	1041.54±20.58 (166)
2010	480.68±11.45 (162)	521.32±11.00 (134)	1115.04±18.30 (241)
2011	480.46±10.35 (197)	563.83±16.82 (057)	1369.43±17.35 (261)

Note : Within parenthesis is the number of observation.

2.4 MPKV RAHURI (MAHARASHTRA): DECCANI SHEEP FOR MUTTON- Farm Based

Project Title: Network Project on Improvement of Deccani Sheep for dual purpose.

Experimental results:

Flock Statistics:

The total population of the Deccani sheep in beginning and at the end of the year (2011-2012) was 493 and 578 respectively. Addition in the flock was due to lambing (231) and reductions were due to death (34), sold/ sold to govt. agencies (15) and culling (103). Details of the population statistics are presented in Table 1. Ewe replacement rate is 30.21 per cent.

Overall mortality and culling on health ground in the flock was 8.48 and 4.44 per cent. Mortality and culling on health ground during the period under report is depicted in Table 2. Mortality statement with post- mortem findings revealed that respiratory system diseases (35.29%) caused the highest mortality followed by alimentary system diseases (25.53%).

Reproductive Performance:

Annual reproductive performance for the year 2011-12 (lambing) is presented in Table 3. Topping percentage was 93.88. Lambing percentage based on ewes available was 84.17. The average age at first lambing and inter lambing period was observed to be 640 and 305 days respectively. Twinning percentage was 1.30.

Growth Performance:

Growth data recorded on the lambs born during the year 2011-2012 is presented in Table 4. Average birth, three, six, nine and twelve months body weights for the year 2011 were 3.42, 15.55, 21.84, 23.03 and 24.41 Kg respectively. Efforts are required to be made to improve the body weight at nine and twelve month. There is no improvement in body weight at different ages over last five years. Number of observation in the growth table is erratic.

Selection of rams:

Preliminary selection of was done on the basis of body weight at six months. The selection differential for six monthly body weights was 3.72 kg.

Response to Selection:

Response to selection of the rams used during 2011-12 was observed to be positive for six months weight.

Sale of breeding stock:

During the year under report in about 15 rams were supplied to different farmers and sold to Govt. Agencies (Deccani Field based unit) for breed improvement programme.

Table 1: Flock statistics:

Age group	Opening balance 1.4.2011		Closing balance 31.3.2012	
	Male	Female	Male	Female
0-3 Months	20	25	46	28
3-6 Months	28	25	37	32
6-12 Months	30	50	27	26
Adult	37	278	64	318
Total	115	378	174	404

Table 2. Annual culling and death percentage for the year 2011 – 2012

Age group	Culling percentage on Health ground			Death percentage			Overall percentage		
	M	F	Total	M	F	Total	M	F	Total
0-3 months	01.39	00.00	00.72	00.69 (144)	03.03 (132)	01.81 (276)	02.08	03.03	02.54
3-6 months	01.67	03.20	02.45	03.33 (120)	01.60 (125)	02.45 (245)	05.00	04.80	04.90
6-12 months	21.49	15.32	18.03	02.80 (107)	04.38 (137)	03.69 (244)	24.30	19.81	21.72
Adult	17.04	09.94	11.33	02.27 (88)	03.31 (362)	03.11 (450)	19.31	13.26	14.44
Total	09.15	08.06	08.48	02.17 (459)	03.17 (756)	04.44 (1215)	11.33	11.24	11.27
Up to 1 Year	07.28	06.34	06.80	02.15 (371)	03.04 (394)	02.61 (765)	09.43	09.39	09.41
Adult	17.04	09.94	11.33	02.27 (88)	03.31 (362)	03.11 (450)	19.31	13.26	14.44

Note: 1) Fig in parenthesis are the number of sheep available during the year.

2) The culling percentage on health ground in flock was 08.48%

3) Overall mortality percentage in flock was 04.44%

Table 3: Reproduction performance:

Traits	Year			
	2008-09	2009-10	2010-11	2011-12
Tupping per cent	94.00 (235)	92.00 (190)	93.39 (245)	93.88 (278)
Lambing percentage on the basis of ewes available	88.00 (221)	88.88 (220)	90.45 (220)	84.17(278)
Age at first lambing (days)	639.58±43.24 (25)	638.13±3 8.42 (25)	642.14±10.31 (28)	640.71±6.38 (44)
Inter-lambing period (days)	333.27 ±31.27 (147)	311.8 ±39.39 (145)	302.17 ± 07.42 (172)	305.08 ± 02.95 (187)
Twinning per cent	2.72	2.50	2.10	1.30

Note: Figures in parenthesis indicates number of observations.

Table 4: Growth performance of Deccani Sheep (Least squares means).

Particulars	Body weight (in kg)				
	Birth	3 Months	6 Months	9 Months	12 Months
Overall mean	3.42±0.02	15.49±0.12	21.64±0.19	22.85±0.21	23.93±0.28
year					
2007-08	3.37±0.03 (195)	15.38±0.19 (173)	22.27 ±0.27 (150)	23.59 ±0.23 (131)	24.65±0.30 (119)
2008-09	3.41±0.03 (200)	15.50±0.21 (158)	21.91 ±0.30 (140)	22.12 ±0.27 (101)	22.84±0.37 (80)
2009-10	3.49 ±0.03 (157)	15.66 ±0.22 (150)	22.63 ±0.32 (127)	23.49 ±0.27 (116)	24.10 ±0.37 (92)
2010-11	3.42±0.02 (202)	15.55±0.18 (194)	21.84±0.25 (180)	23.03±0.21 (163)	24.41±0.27 (139)
2011-12	3.42±0.02 (231)	15.51±0.22 (114)	21.01±0.41 (69)	22.88±0.49 (29)2	--

Note: Within parenthesis is the number of observations

2.5. SVVU, PALAMNER (ANDHRA PRADESH) :NELLORE SHEEP FOR MUTTON

Project Title: Network Project on Nellore sheep improvement.

Experimental Results:

Flock Statistics:

The opening and closing balance for the period under report was 650 and 673 respectively. Additions were due to lambing (292) and reductions were due to death (110), sale of breeding rams/ram lambs to farmers (49), emergency auction (61) and public auction (48) and missing(1). Ewes replacement rate was 26.13 per cent. The details of population statistics have been presented in the table 1.

The overall mortality and culling percentage in 0-3 months, 3-6 months, 6-12 months and adult groups are 6.63, 8.95, 6.39 and 16.75 % respectively (table 2).

Reproduction:

The reproductive performance during the period under report is presented in table 3. Overall tupping percentage was 96.15. During this year a total of 292 lambs were born. The overall lambing percentage was 86.39 % based on the breedable ewes available and 89.84 % based on the ewes tupped basis.

Growth Performance:

Results are presented in Table 6. Least square mean (2011born) body weight at birth, weaning, six months, nine months and 12 months of age were 3.20, 14.03, 18.56, 23.23 and 24.44 kg respectively. Least square mean (2012 born) body weight at birth and weaning were 3.09 and 11.22 kg respectively. Body weights at different ages are not up to the expected mark. Reasons need to be explained.

Selection of rams:

Preliminary selection was done on the basis of index incorporating body weight at weaning and six months of age.

Selection Differential:

Selection differential of rams used during the year 2011-12 was 4.22 kg for three-month weight and 6.24 kg for six-month weight. Response to selection is not given.

Sale of breeding stock:

During the year under report in about 49 adults rams were sold to different farmers for breed improvement programme.

Table 1: Flock strength

Age group	Opening Balance		Closing Balance	
	Male	Female	Male	Female
0-3 Months	52	48	44	42
3-6 Months	65	57	67	89
6-12 Months	2	7	0	0
Adults	44	375	75	356
Total	163	487	186	487

Table 2 : Annual Culling and Death Percentage for the year 2011-2012.

Age group	Culling % (Health Ground)			Death%			Overall%		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-3 Months	0	0	0	6.7 (194)	6.57 (198)	6.63 (392)	6.7 (194)	6.57 (198)	6.63 (392)
3-6 Months	0	0	0	13.37 (202)	4.5 (200)	8.95 (402)	13.37 (202)	4.5 (200)	8.95 (402)
6-12 Months	2.73 (110)	0.92 (109)	1.82 (219)	5.45 (110)	3.67 (109)	4.57 (219)	8.18 (110)	4.59 (109)	6.39 (219)
Adult	7.04 (142)	11.63 (473)	10.57 (615)	2.11 (142)	7.40 (473)	6.18 (615)	9.15 (142)	19.02 (473)	16.75 (615)

Note: Within parenthesis is the number of observations

Table 3: Reproductive Performance:

Lambing season	Ewes available for breeding	No. of ewes tupped	Tupping %	No. of Live lambs born	Lambing % based on	
					Breedable Ewes available	Ewes tupped
Season I (Off season)	287	196	68.29	190	66.20	96.93
Season II (Main season)	145	129	88.96	102	70.34	79.06
Annual	335	325	96.15	292	86.39	89.84

Table 4: Least Square Means of body weights.

Effect	Birth Weight	Weaning Weight	6 Months Weight	9 Months Weight	Yearly Weights
Year Effect	**	**	**		
2008 - 09	3.15 ± 0.029 (224)	13.90 ± 0.19 (213)	16.49 ± 0.23 (198)	21.84 ± 0.32 (139)	24.82 ± 0.46 (96)
2009 - 10	2.95±0.031 (243)	11.92±0.19 (220)	15.56±0.26 (212)	18.52±0.32 (201)	23.11±0.32 (200)
2010- 11	3.2±0.030 (248)	14.03±0.18 (238)	18.56±0.25 (217)	23.23±0.31 (209)	24.44±0.31 (196)
2011-12	3.09±0.028 (292)	11.22±0.16 (180)	-	-	-

Note: Within parenthesis is the number of observations

2.6 SDAU, SARDARKRUSHINAGAR (GUJ) : PATANWADI SHEEP FOR CARPET WOOL

Project Title: Evaluation and improvement of Patanwadi sheep.

EXPERIMENTAL RESULTS:

Flock Statistics:

Evaluation and improvement of Patanwadi sheep project was started from September, 2009. The opening and closing balance of the experimental flock of Patanwadi sheep for the period April, 2011 to March, 2012 was 109 and 134, respectively. Addition was due to lambing (47). Reductions were due to death (22). At the end of the year, there were 37 adult males and 59 adult females. Population Statistics are presented in Table 1. Sex and age group-wise mortality and culling were not reported. Flock size is very small and proper genetic selection cannot be done in this flock.

Reproduction:

During the period of report, 47 lambs born and overall lambing percentage about 100.00 percent. Topping percentage was 92.16. The other reproductive traits viz. age at first mating, age at first lambing, weight at first mating, weight at first lambing and gestation period were reported as 454 days, 605 days, 28.12 kg, 29.81 kg and 151 days, respectively (Table 2).

Growth performance:

The overall means of body weights at birth, three, six, nine and twelve months of age were 3.01, 13.56, 18.72, 24.55 and 27.68 kg, respectively for the year 2011-2012. Pre weaning (0-3 M) and post weaning (3-6 M, 6-12 M) average daily gains were 118, 47 and 33 g (table 3). There is lack of infrastructure facilities and lack to proper grazing area and hence performance is affected.

Greasy fleece Yield:

The average march clip and October clip wool yield were 0.442 and 0.425 kg, respectively. Whereas, overall annual wool yield per animal was recorded as 0.872 kg. (Table 4). Wool quality evaluation was not done.

Selection of Rams, Selection Differential and Response to selection

Details were not given and annual report is not as per the format.

There is lack of infrastructure facilities and lack to proper grazing area and hence performance is affected. This Unit was discontinued from 31.03.2012 and not included in the Draft EFC Proposal for XII Plan.

Table 1: Livestock statistics (01.04.2011 to 31.3.2012)

Age group	Opening balance		Closing balance	
	Male	Female	Male	Female
0-3 Months	1	-	-	-
3-6 Months	14	11	6	2
6-12 Months	6	4	20	10
Adult	22	51	37	59
Total	43	66	63	71

Table 2: Reproductive Performance of Patanwadi Sheep

Traits	Mean
Age at First Mating (days)	454.39 ± 30.68 (18)
Age at First Lambing (days)	605.83 ± 30.74 (18)
Weight at First Mating (kg.)	28.12 ± 1.45 (5)
Weight at First Lambing (kg.)	29.81 ± 0.79 (16)
Weight at Lambing in adult ewes (kg.)	31.88 ± 0.44 (48)
Gestation Period (days)	151.49 ± 0.24 (47)
Lambing Interval (days)	319.16 ± 12.00 (25)
Service Period (days)	167.64 ± 11.95 (25)
Tupping Percentage	92.16
Lambing Percentage	100.00

Table 3: Least square means of body weight for the period 2009-10 to 2011-12 (kg)

Particulars	Birth weight	Weaning weight	6- month weight	9- month weight	12 month weight
2009-2010	3.33 ± 0.08 (40)	15.58 ± 0.34 (53)	22.46 ± 0.62 (25)	25.64 ± 1.39 (05)	30.10 ± 1.13 (15)
2010-2011	3.06 ± 0.05 (39)	15.60 ± 0.48 (37)	20.99 ± 0.47 (42)	24.49±0.41 (35)	27.91±0.45 (35)
2011-2012	3.01± 0.06 (47)	13.56 ± 0.43 (44)	18.72 ± 0.48 (58)	24.55 ± 0.58 (34)	27.68 ± 0.59 (33)

Note : Within parenthesis is the number of observation.

Table 4: Least square means of greasy fleece yield for the period 2011-12 (kg)

Greasy Fleece Yield	Male	Female	Overall
March clip	0.475 ± 0.02 (43)	0.420 ± 0.02 (65)	0.442 ± 0.01 (108)
October clip	0.464 ± 0.02 (41)	0.400 ± 0.01 (63)	0.425 ± 0.01 (104)
Annual	0.947 ± 0.03 (41)	0.824 ± 0.02 (63)	0.872 ± 0.02 (104)

Note: Within parenthesis is the number of observations

2.7 RAJUVAS, BIKANER (RAJASTHAN): MAGRA SHEEP FOR CARPET WOOL

Project Title: Evaluation and genetic improvement of Magra sheep for carpet wool production in farmers' flock.

Experimental Results:

As envisaged in the technical programme, four centres of project were established at Norangdesar, Gadhwala, Kilchu and Kodemdesar. The Kodemdesar centre was identified as ram rearing centre. The technical inputs were given in the form of treatment of diseased animals and advisory services for management and breeding of animals at each of the centre.

Flock Statistics:

The centre-wise flock statistics as on 31.03.2012 is given in Table 4. The opening and closing balance of Magra sheep at three centres during the year was 8035 and 8126. There were 4098 lambing (82.36%), considering 60% breedable population of total stock. A total of 327 animals (4.07%) died. A total of 3660 sheep were sold at different centres during the year 2011-12.

Health Control Programme and Disease Incidence:

The health control programme was taken up during the year 2011-12 as one of the major inputs in the form of deworming, control of ecto-parasites and vaccination against infectious disease like sheep pox and enterotoxaemia. The total number of cases handled as prophylactic measures for deworming, dipping/spraying and vaccination were 18089, 19047 and 5235 respectively.

A total of 10444 cases were treated for various ailments at three centres. The frequency of alimentary tract disease were highest (34.91%). Followed by respiratory disorder (32.36%). A total of 327 animals died during the reporting year amounting to 4.07% mortality.

Reproduction:

Highest lambing percentage (82.69) was found during Season – II (July to December, 2011) at Norangdesar followed by Kilchu (81.45) and Gadhwala (80.90) centre (table 2). The overall lambing percentage was 82.36 in the registered sheep flocks under the Unit. No twinning was reported at any of the centre during the year.

Growth Performance:

Overall least squares means for body weight at birth, six & 12 months and adult stage was observed as 3.05, 21.71, 30.84 and 39.71 kg, respectively. Body weight at 12 months age was found to be significantly affected by sire groups. The body weights of progenies of superior sires were found to be high at all ages as compared to the progenies of local sires available with the farmers.

Greasy Fleece Yield:

Least- squares means for annual and six monthly greasy fleece weights are presented in Table 4. The results for wool production indicated that the Greasy fleece weight was 1.012kg at 6-months age. The overall annual wool yield was found to be 2.243 kg. The wool yield of progeny of Superior sires was heavier than the progeny of local sire in all the clips. Wool quality parameters were not analysed.

Distribution of Rams:

A total of 27 rams were purchased and distributed to the registered breeders at Kilchu, Gadhawala and Norangdesar centres. The selection differential was 2.893 kg for 12 months body weight and 0.239 kg for annual wool yield. Number of ram available with breeders at Centre I, II and III were 62, 49, and 66 respectively.

Table1: Flock statistics:

S.No.	Name of the centre	Age group	Opening Balance as on 1.4.2011		Closing balance as on 31.3.2012	
			Male	Female	Male	Female
1.	Norangdesar	Young	205	985	106	543
		Adult	51	1234	109	1589
2.	Gadhawala	Young	454	1405	332	658
		Adult	78	1498	313	1720
3.	Kilchu	Young	286	781	239	664
		Adult	56	999	179	1674
Total		Young	945	3171	677	1865
		Adult	188	3731	601	4983
Overall			8035		8126	

Table 2: Reproductive performance for the year ending 31.03.2012.

Centre	Lambing Season	Ewes available for breeding	Total Live Lambs born	Lambing (%)
Norangdesar	Season - I	1836	312	16.99
	Season- II	1190	984	82.69
Gadhawala	Season - I	2010	397	19.75
	Season - II	1246	1009	80.98
Kilchu	Season - I	1894	342	18.06
	Season - II	1294	1054	81.45
Season-wise	Season – I	5742	1051	18.30
Overall	Season - II	3730	3047	81.69
Overall		4976	4098	82.36

Season - I = January 2012 to March 2012 & April 2011 to June 2011

Season - II = July 2011 to December 2011

Table 3: Growth performance:

Particulars	Birth Weight (Kg.)	Six Months Weight (Kg.)	Twelve Months Weight (Kg.)
Overall	3.051± 0.008 (4078)	21.710± 0.356 (3824)	30.843± 0.021 (5747)
Centres			
Norangdesar	3.064 ± 0.007 (1276)	21.126± 0.448 (1213)	30.677 ± 0.032 (1451)
Gadhwal	3.121 ± 0.005 (1406)	21.723 ± 0.425 (1605)	30.753 ± 0.033 (2107)
Kilchu	2.941 ± 0.007 (1396)	21.755 ± 0.532 (1006)	30.825± 0.040 (1889)
Sex			
Male	3.143 ± 0.007 (1900)	22.172 ± 0.351 (1778)	31.654 ± 0.037 (1674)
Female	2.915 ± 0.009 (2178)	21.163± 0.487 (2046)	30.121 ± 0.032 (4073)
Sire group			
Sire Group-I	3.192 ± 0.006 (2458)	23.237± 0.419 (2428)	33.865 ± 0.038 (3751)
Sire Group-II	2.714 ± 0.006 (1620)	20.106± 0.434 (1396)	28.023± 0.031 (1996)

sire group-i = progeny of superior sires supplied by the centre

sire group-ii = progeny of local sires available in the flocks

Table 4: Least-squares means for greasy fleece weight.

Particulars	Greasy Fleece Weight (kg)	
	Six monthly yield	Annual yield
Overall	1.012 ± 0.005 (4725)	2.243 ± 0.003
Seasons		
Season – I	1.007 ± 0.006 (1283)	2.016 ± 0.005
Season – II	1.135 ± 0.003 (1485)	2.103 ± 0.004
Season – III	1.112 ± 0.003 (1957)	2.159 ± 0.006
Sex		
Male	1.153 ± 0.005 (2039)	2.179 ± 0.005
Female	0.912 ± 0.003 (2686)	2.106 ± 0.004
Sire group		
Sire Group– I	1.113 ± 0.004 (2719)	2.236 ± 0.005
Sire Group–II	0.961 ± 0.003 (2006)	2.002 ± 0.004

S - I = March – April 11 (Holi); S - II = July – August 11 (Rakhi); S – III = Nov. – Dec.11 (Diwali)

sire group-1 = progeny of superior sires supplied by the centre

sire group-ii = progeny of local sires available in the flocks

2.8 TANUVAS, KATTUPAKKAM (TAMIL NADU): MADRAS RED SHEEP FOR MUTTON

Project Title: Evaluation and genetic improvement of Madras Red sheep for mutton production in farmers' flocks.

Experimental Results

Madras Red Sheep is one of the important meat breeds of Tamil Nadu. Sheep skins are preferred in tanning due to better grains in fine sheep leather. This is a field based Unit. As envisaged in the technical programme four centres of Project were established as below. Livestock Research Station, Kattupakkam identified as ram rearing Centre.

Centre I	: Rayamangalam, Sirukundram, Otteri, Sastrampakkam and Annoor
Centre II	: Veerapuram, Mevalooruppam, Vayalur and Pazhaiyanur
Centre III	: Kayarampedu, Ponmar and Maduraipakkam
Centre IV	: Kondamangalam, Periyavaiyavur, Andavakkam and PGRIAS

The work of registration of flocks in the villages, identification of breedable ewes by tattooing, performance recording of rams, sheep were protected from various disease by adopting preventive measures against parasites, contagious diseases and nutritional deficiencies at all the Centres was continued during the year.

Flock Statistics:

The population of sheep covered under this scheme during the year 2011-2012 was 7639, of which 1978 were young and 5661 were adult. The population of sheep were 2328, 1610, 1903 and 1798 for centre I, II, III and IV. The centre-wise flock statistics is given in Table 1.

Health Control Programme and Disease Incidence

Sheep were vaccinated against foot and mouth (biannually) and sheep pox (annually). The sheep were dewormed quarterly with Albendazole/Praziquantel/Fenbendazole against round worms and also with Triclabendazole/Oxyclozanide/Closantel annually against fluke infestation. The lambs were dipped periodically for external parasitic infestations. Drenching and dipping as preventive measures and clinical treatment was also provided. A total of 17904 vaccinations were given against Foot and Mouth disease, Sheep Pox and Anthrax. 23440 sheep were drenched for control of internal parasites. 2464 animals were detected for non specific diseases during the period. The incidence of alimentary system was higher when compared to respiratory, general systemic disease and skin/subcutaneous system infections.

Reproduction:

Centre wise & village wise reproductive performance for the year 2011-2012 is given in Table 2. A total of 4660 ewes were available during the year and gave birth to 4032 lambs. 86.40 per cent lambing was observed during the year.

Growth Performance:

Body weights at birth, three, six, nine and twelve months and are given Table 3. Overall mean of body weights for lambs born during 2010-11 for birth, weaning, six, nine and twelve months were 2.83, 11.36, 15.46, 19.28 and 22.31 kg, respectively. Body weights for the year 2011-12 for birth and weaning were 2.89 and 11.54 kg respectively. Body weights for 6, 9 and 12 months are in process of recording. ADG of 0-3 months, 3-6 months, 6-9 months and 9-12 months were 95, 45, 42 and 34 gm, respectively for 2010-2011 and pre-weaning ADG for year 2011-12 was 97g.

Distribution of rams:

During 2011-12, a total of 18 rams were purchased for distribution to various centres. Number of ram available with breeders at Centre I, II, III and IV were 44, 36, 41 and 62 respectively.

Selection Differential

Not Given

Table1: Flock statistics for the year 2011-12.

Name of the Centre	Young	Adult	Total
I	616	1712	2328
II	394	1216	1610
III	540	1363	1903
IV	428	1370	1798
Grand Total	1978	5661	7639

Table2: Ewes reproductive performance for the year 2011- 2012.

Centre	Number of ewes available for breeding	Mean body wt. of ewes at breeding	No. of ewes lambed single	Total No. of live lambs born	No. of ewes lambed twins	Lambing %
I	1047	27.02 ± 1.47	993	993	-	94.81
II	1422	27.82 ± 0.89	1253	1253	-	88.08
III	1189	24.71 ± 1.46	1048	1048	-	88.08
IV	1002	29.32 ± 1.52	738	738	-	73.58
Overall	4660	27.22 ± 1.29	4032	4032	-	86.40

Table 3: Growth Performance (2007-2008 to 2011-2012)

Effects under study	Birth wt. (kg)	3 months wt. (Kg)	6 months wt. (kg)	9 months wt. (kg)	12 months wt. (kg)
<i>Overall Mean value</i>					
2007-08	2.82 ± 0.004 (2446)	10.96 ± 0.023 (2420)	15.24 ± 0.022 (2403)	19.36 ± 0.070 (1307)	22.48 ± 0.131 (1279)
2008-09	2.86 ± 0.005 (2631)	11.35 ± 0.019 (2558)	15.32 ± 0.018 (2354)	19.35 ± 0.019 (1949)	22.86 ± 0.064 (1084)
2009-10	2.85 ± 0.005 (3068)	11.37 ± 0.014 (2954)	15.46 ± 0.10 (2396)	19.28 ± 0.016 (1450)	22.22 ± 0.065 (986)
2010-11	2.83 ± 0.005 (3831)	11.36 ± 0.017 (3675)	15.46 ± 0.010 (2839)	19.28 ± 0.016 (1903)	22.31 ± 0.041 (1198)
2011-12	2.89 ± 0.003 (4032)	11.54 ± 0.011 (3870)	-	-	-

2.9 OUAT, BHUBANESWAR (ORISSA) : GANJAM UNIT FOR MUTTON

Project Title: Evaluation and Genetic improvement of Ganjam Sheep for mutton production in farmers flocks.

Experimental Results:

Altogether eight villages have been identified under three centres in Ganjam district. The details of centres with identified villages are given below:

Centre	Name of Centre	Village(s)
I	Kalikote	Purnachandrapur, Fasid, Gorapalli
II	Rambha	Minahipatna, Ramachandrapur, Gendapalli
III	Chatrapur:	Ghadghadapalli, Tellapalli, Sundarapalli,

Flock statistics:

The centre wise flock statistics for the year 2011-2012 is presented in table 1. The opening balance was 9037 on 01.04.2011 and decreased to 8004 on 31.03.2012. There were 3745 lambing. A total of 333 animals died. A total of 4413 sheep were sold at different centres during this year.

Health Control Programme and Disease Incidence:

The health control programme was taken up during the year 2011-12 as one of the major inputs in the form of deworming, dipping and control of ectoparasites. Clinical treatment to sick animals was also provided. Deworming through drenching was carried out twice for all the registered flocks during the period. Ectoparasites were controlled by dipping. A total of 25752 drenching were done for control of internal parasites. 2072 sheep were protected against ectoparasites by dipping/dusting /spraying. In addition to prophylactic measures, 6065 sheep were given curative treatment for non-specific diseases. It was observed that the incidence of alimentary system disease were higher than other system diseases.

Reproduction:

Centre wise reproductive performance for the year ending 31.03.2012 is given in Table 2. Altogether 4443 ewes were available during the year and they gave birth to 3745 lambs. 84.29 per cent lambing was observed during the year.

Growth Performance:

Centre wise body weights at birth, three, six and twelve months are given Table 5. Overall mean of body weights for birth, weaning, six, nine and twelve months were 2.70, 11.62, 16.98, 21.51 and 24.61 kg during 2011-2012. Slight increasing trend in body weight in all ages were observed over the years.

Distribution of rams:

During 2011-2012 ram were not distributed. Reasons need to be explained. Number of ram available with breeders at Centre I, II and III were 65, 49 and 35 respectively.

Selection differential:

The selection differential for body weight for 6 months and 12 months of age were not reported.

Table 1: Flock Statistics

Name of the Centre	Opening Balance (As on 01.04.2011)			Closing Balance (As on 31.3.2012)		
	Young	Adult	Total	Young	Adult	Total
I. Khallikote	1475	2150	3625 (30)	1249	2037	3286(30)
II. Rambha	1163	1601	2764 (26)	1123	1328	2451(26)
III. Chatrapur	1116	1532	2648 (24)	1008	1259	2267(24)
Grand Total	3754	5283	9037 (80)	3380	4624	8004(80)

Figures in parenthesis indicate the number of breeders.

Table 2: Reproductive performance:

Name of the Centre	Number of ewes available for breeding	Number of ewes lambed	Lambing % on the basis of ewes available
I. Khalikote	1750	1369	78.23
II. Rambha	1380	1228	88.99
III. Chatrapur	1313	1148	87.44
Overall	4443	3745	84.29

Table 3: Growth performance:

Year	Birth Wt.	3M Wt.	6 M Wt.	9 M Wt.	12 M. Wt.
2009-10	2.702±0.008	11.852 ±0.038	16.950±0.051	21.353±0.064	24.551±0.088
2010-11	2.734±0.010	11.880±0.031	16.982±0.042	21.454±0.058	24.604±0.082
2011-12	2.70±0.01 (812)	11.62±0.04 (797)	16.98±0.05 (786)	21.51±0.06 (664)	24.64±0.12 (460)
Centre (2011-12)					
Khallikote	2.71 ±0.02 (308)	11.72±0.05 (302)	16.97±0.06 (300)	21.56±0.08 (252)	24.51 ±0.14 (189)
Rambha	2.72±0.02 (297)	11.61±0.06 (296)	16.93±0.07 (296)	21.41±0.09 (230)	24.80±0.16 (155)
Chatrapur	2.67±0.02 (207)	11.52±0.07 (199)	17.04±0.09 (190)	21.56 ±0.10 (182)	24.59±0.18 (116)
Sex (2011-12)					
Male	2.80±0.01 (398)	11.92±0.05 (391)	17.21±0.06 (399)	21.76±0.08 (380)	24.92±0.19 (381)
Female	2.60±0.02 (414)	11.32±0.05 (406)	16.75±0.06 (387)	21.26±0.07 (284)	24.35±0.11 (89)

Note: Within parenthesis is the number of observations

2.10 MPKV RAHURI (MAHARASHTRA): DECCANI SHEEP FOR MUTTON- Field Based

Project Title: Network Project on Improvement of Deccani Sheep for dual purpose

Experimental Results:

Flock statistics:

The centre wise flock statistics for the year 2011-2012 is presented in table 1. The opening balance was 2974 on 01.04.2011 and decreased to 2240 on 31.03.2012. There were 1641 lambing. A total of 224 animals died. A total of 2151 sheep were sold at different flocks during this year.

Baseline Survey:

Deccani sheep field based unit was started from September, 2009. During last annual review meeting it is recommended to do fresh base line survey. Unit reported that 120 flocks were surveyed and recorded the body weights (kg) at birth, 3, 6, 9 and 12 months of age were reported as 3.27, 14.35, 20.66, 22.93 and 26.67, respectively. basis of grouping the animals in to different age groups was not clearly mentioned.

Health Control Programme and Disease Incidence:

The health control programme was taken up during the year 2011-12 as one of the major inputs in the form of vaccination. deworming, dipping and control of ectoparasites. Clinical treatment to sick animals was also provided. A total of 4564 drenching were done for control of internal parasites. Vaccination was given to 4708 sheep against FMD, HS, BQ and PPR. In addition to prophylactic measures, 226 sheep were given curative treatment for non-specific diseases.

Reproduction:

The Reproduction performance of sheep under field condition for the year 2011-12 is given in Table 2. A total of 2207 ewes were available for breeding. Out of these sheep 1974 ewes were tupped and tupping was 89.44 percent. Lambing percent on ewes available basis is not reported and calculated as 72.32%. Very low lambing are reported in Panodi Centre. Reasons need to be explained.

Growth Performance:

Centre wise body weights at birth, three, six and twelve months are given Table 3. Overall least squares means of body weight of Progeny performance were given for birth, six, nine and twelve month at 3.58, 15.82, 23.08, 25.18 and 30.11 kg. Less number of animal were recorded in Panodi centre.

Selection differential: Details not given.

Distribution of rams:

During 2011-2012 a total of 22 young rams were selected, purchased and distributed to the breeders. 13 rams were distributed at Ambi centre and 9 rams were distributed in Panodi centres, respectively. Number of ram available with breeders at Centre I, II and ram rearing were 38, 14 and 27 respectively.

Table 1: Flock Statistics:

Name of the Centre	Opening Balance (As on 01.04.2011)			Closing Balance (As on 31.3.2012)		
	Young	Adult	Total	Young	Adult	Total
I. Ambi	367	1573	1940	373	1239	1612
II. Panodi	335	699	1034	120	508	628
Grand Total	702	2272	2974	493	1747	2240

Table 2: Reproductive performance:

Name of the Centre	Number of ewes available for breeding	Number of ewes lambed	Lambing % on the basis of ewes available
I. Ambi	1531	1378	90.00
II. Panodi	676	218	32.25
Overall	2207	1551	72.32

Table 2: Growth performance of Progenies born:

Details	Birth Wt.	3M Wt.	6 M Wt.	9 M Wt.	12 M. Wt.
overall	3.58±0.12 (1641)	15.82±0.17 (1307)	23.08±0.29 (401)	25.18±0.37 (170)	30.11± 0.61 (40)
Centre (2011-12)					
Ambi	3.57±0.14 (1417)	15.00±0.18 (1170)	21.89±0.31 (391)	25.18±0.37 (170)	30.11± 0.61 (40)
Panodi	3.58±0.10 (224)	15.56±0.14 (137)	24.27±0.25 (15)	-	-

3. INFRASTRUCTURAL SETUP OF NWPSI UNITS

3.1 STAFF POSITION: The staff position is given as on 31.3.2012

3.1.1. Project Coordination Cell, CSWRI, Avikanagar :

Work is managed by internal arrangement (by staff of PC Cell/ AGB Division)

Dr. S. M. K. Naqvi,
Director & Project Coordinator
CSWRI, Avikanagar

Dr. A. L. Arora
Incharge, Project Coordinator (Sheep Breeding) (up to 11.04.2012)

Dr. L. Leslie Leo Prince
Incharge, PC Cell (from 12.04.2012)

Mr. N. C. Gupta
Technical Officer, Animal Genetics & Breeding Division

3.1.2 Cooperating Units located at SAU's (as on 31.03.2012)

S. No	Unit	Number of Posts																	
		Rahauri (Farm Based)			Palammer			Kattupak kam			Bikaner			Bhubaneshwar			Rahauri (Field Based)		
Name of Posts	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V	
1.	Professor (AG&B)	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-
2.	Assistant Professor / Farm Manager	1	1	-	1	1	-	1	1	-	1	1	-	1	-	1	1	1	-
3.	Technical Assistant / Livestock Assistant	1	1	-	1	-	1	1	-	1	1	-	1	1	-	1	1	-	
4.	L.D.C	1	1	-	1	1	-	1	1	-	1	-	1	1	1	-	1	1	-
5.	RA / SRF (Temporary)	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-
	Total	5	5	0	5	4	1	5	4	1	5	4	1	5	4	1	5	5	-

S = Sanctioned, F = Filled and V = Vacant.

3.2 Budgetary Proposal (as per SFC of XI Plan (2007-2012))

3.2.1 Plan Outlay (2007-08 to 2011-12) ICAR Sharge (75%) (Rs. in lakhs)

S.No.	Centre	Pay & All	T.A.	Rec. Cont.	Training	Non-Rec. Cont.	Total
1.	SVVU, Palamner	80.25	1.53	65.03	1.13	6.75	154.69
2.	MPKV, Rahuri (Farm based)	80.25	1.53	65.03	1.13	6.75	154.69
3.	R.A.U., Bikaner	78.90	1.88	64.28	1.12	17.25	163.43
4.	TANUVAS, Kattupakkam	78.90	1.88	64.28	1.12	17.25	163.43
5.	OUAT, Bhubaneswar	78.90	1.88	64.28	1.12	17.25	163.43
6.	SDAU, Sardarkrushinagar	80.28	1.50	65.03	1.13	6.75	154.69
7.	MPKV, Rahuri (Field based)	78.90	1.88	64.28	1.12	17.25	163.43
Total ICAR Share		556.38	12.08	452.21	7.87	89.25	1117.79

3.2.2 Revised Allocation (as per RE) for the year 2011-12 (ICAR Share 75%)

(Rs. in lakhs)

Head	MPKV Rahuri (Deccani Farm based)	SVVU Palamner	RAJUV AS Bikaner	TANUVAS Chennai	OUAT Bhub.	MPKV Rahuri (Deccani Field based)	SDAU Gujarat	Overall Total
A. Recurring								
Pay and Allowances	16.05	10.00	15.78	15.78	15.78	15.78	8.00	97.17
T.A.	0.20	0.20	0.25	0.25	0.25	0.25	0.20	1.60
Rec contingency	5.24	5.24	5.21	5.24	5.24	5.24	4.00	35.41
HRD (Training)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total A	21.49	15.44	21.24	21.27	21.27	21.27	12.20	134.18
B. Non-recurring								
Equipment	0.35	0.35	0.35	0.35	0.35	0.35	0.35	2.45
Livestock	0.15	0.15	1.55	1.55	1.55	1.55	0.15	6.65
Works	0.30	0.30	0.30	0.30	0.30	0.30	0.30	2.10
Total B	0.80	0.80	2.20	2.20	2.20	2.20	0.80	11.20
Total (A + B)	22.29	16.24	23.44	23.47	23.47	23.47	13.00	145.38

4. Action Taken Report (ATR) on the Recommendations made in the Annual Review Meeting (NWPSI) held on 4th August, 2011 at ARC, Bikaner

General recommendations (NWPSI)	
Recommendations	Action Taken
1. Report presentation should be in common format for all units.	Recommendation Implemented. All P.Is have been instructed to follow the common format.
2. Uniform feeding practices should be followed at all farm based units under NWPSI.	P.Is assured that all farm based units will follow the uniform feeding management as per the guidelines. Approved recommendations of the Committee were circulated to all farm based units for implementation.
3. Field based unit under NWPSI should explore the possibilities of AI with freshly diluted liquid semen combined with estrus synchronization to accelerate superior germplasm dissemination.	Magra Unit: P.I. Informed that the flocks usually remain either on grazing in distant places or on migration so it is very difficult to identify the animal in heat to perform AI in field flocks. However, suitable modus operandi shall be found out to implement AI in field units. Madras Red Unit: Possibilities for AI combined with Estrous Synchronisation will be explored. Ganjam Unit: P.I informed that efforts will be made with one/two non-migratory flocks for AI with synchronization of estrous. Deccani Unit: possibilities of AI with freshly diluted liquid semen will be initiated with collaboration with facilities available at semen laboratory, MPKV.
4. Unit Incharges should pursue with the University authority for timely submission of Audit Utilization Certificate (AUC) i.e. before 30 th September, so that second instalment can be released in time.	P.I.'s have been instructed accordingly. Recommendation implemented.
5. Queries made by the Coordinating Cell/ Council should be responded/answered at the earliest.	P.I.'s have been instructed accordingly. Recommendation implemented
6. D.D.G (AS) constituted a committee to recommend and suggest suitable uniform management and feeding practices for farm based units under Network project. The committee consists of Dr.P.C.Patnayak, former Director, CSWRI, Dr C. Nimbkar, Dr. S. C. Gupta, ADG (AP&B) and Dr. A.Sahoo, Head, AN Division, CSWRI. Dr.A.L.Arora will function as Member Secretary and will coordinate the meeting.	Recommendation implemented. Committee Meeting was held on 18 th June, 2012 and approved recommendations for suitable uniform management and feeding practices for farm based units were circulated to all farm based units for implementation.

Specific recommendations:	
Farm Based Units under NWPSI	
Chokla Unit:	
Effort should be made to disseminate the superior breeding rams in the native tract. Collaboration with state animal husbandry department, NGOs is to be developed for effective dissemination.	During 2010-11, forty three breeding rams were sold to Rajasthan State Animal Husbandry / CWDB ram rearing project for ram distribution in the native tract. During 2011-12, 41 rams were sold to A.H. Dept / CWDB ram rearing Project for distribution in the native tract.
Effort should be made to control J.D. problem.	Screening of flock using ELISA and Fecal smear is a routine activity by the Health Scientists and affected animals and animals showing clinical symptoms are culled from the flock at regular interval. Animal Health Division is having a project in control and eradication of the JD in the institute flock.
Marwari Unit:	
Efforts should be made to improve Greasy Fleece Weight.	P.I. informed that all efforts are being made to improve the greasy fleece yield and as per earlier recommendations, adult rams with higher wool yield were also purchased from the field two times and introduced to increase genetic variability. A survey was also made in native tract to identify the rams with higher wool yield. GFY of 204 animals were recorded in different flocks. The average GFY of March clip of 29 rams and 175 ewes was 803.45 and 551.0 gm respectively. The average GFY of Marwari animals in field is 15-20 percent lesser than the Marwari at ARC Farm. The rams with higher wool yield (>2 Kg) are not available in field. So, the targets of GFY may be revised accordingly.
Muzaffarnagari Unit:	
Survey of field flock performance and to compare the performance of farm animals with field animals	Survey was conducted by the Muzaffarnagari unit and performance of the field flock is attached as Annexure-I.
Deccani Unit:	
Appointment of PI from AGB/Animal Production	Dr. Y. G. Fulpagare, Professor joined as Scientist Incharge and he is having Ph. D. in Animal Nutrition
The lower post weaning gain should be improved by appropriate management.	Feeding schedule for post weaning lambs is modified. The additional concentrate is provided and the results are encouraging.

Nellore Unit:	
Appointment of PI from AGB /Animal Production	Dr.B.Ekambaram, Professor (AGB) appointed as P.I from 07.03.2012
Overall performance should be improved.	P.I. assured that there is improvement in growth performance compared to previous year.
Patanwadi Unit:	
Closure of the centre during 12 th plan	P.I. informed that he informed the University authorities about the closure of the unit. This unit is not considered in the XII Plan proposal document.
Field Based Units under NWPSI	
Magra Unit:	
Animal identification of both superior sires and local sires and performance recording of progenies for effective comparison	P.I. informed that identification will be strictly followed as suggested
Madras Red Unit:	
Compare the performance of progenies born from superior rams with lambs born from local rams available with farmers	Performance recording is in progress and P.I. assured that it will be presented in the review meeting.
Ganjam Unit:	
To strictly follow the sanctioned staffing pattern.	Sanction staffing pattern is in force since 01.04.2011.
Revise and submit the AUC for the years 2008-09, 2009-10 and 2010-11 keeping in view and restricting the pay and allowance as per the sanctioned staffing pattern.	Revised AUCs were received and admitted AUCs were informed to the University.
Revise and submit the pay arrear requirement keeping in view and restricting the pay and allowance as per the sanctioned staffing pattern.	Revised arrear statements are received. Requisition for additional funds requirement for arrear payment was send to Council.
Deccani Unit :	
Fresh survey should be done to have proper base line information. Animal identification and recording of growth at different ages on these lambs is required.	P.I informed that fresh survey and collection of baseline data of Deccani sheep in various Tehsils of Ahmednagar and Pune districts was undertaken. About 120 flocks were covered.
More number of flocks should be covered.	P.I. informed that additional new shepherd's flocks have been registered.
Animal identification of both superior sires and local sires and performance recording of progenies for effective comparison.	P.I. informed that ear tagging affixed to all the Deccani rams distributed in field and identification of progenies are also done. Performance recording is in progress and detailed report will be presented in review meeting.

Muzaffarnagari sheep Unit

Recommendation: Survey of field flock performance and to compare the performance of farm animals with field animals

Action Taken Report submitted by the P.I., Muzaffarnagari sheep Unit:

Field performance:

Survey was conducted consecutively for three years (2008-2010) in Muzaffarnagari breeding tract to record management practices and growth performance of the breed in the field. The field data on growth compared with the farm data for similar attributes in same period of time.

In field, the animals were maintained on extensive production system in which animals were grazed for 6-8 hours on common grazing land or on the road and canal sides with zero supplementary feeding. The animals were taken for grazing at 10.00-11.00 AM and returned from grazing with sunset. In some cases, animals also got opportunity to graze on Parti land to consume post-harvest crop residues.

The overall least squares mean of body weights of lambs under field were 2.83 ± 0.04 , 11.93 ± 0.20 , 19.45 ± 0.21 , 22.86 ± 0.43 and 25.63 ± 0.41 kg respectively at birth, 3, 6, 9 and 12 month age (Table 11). On comparison, it was observed that the performance under field was 0.780, 5.780, 2.00, 1.990 and 3.210 kg. lower than farm animals at respective age. These results suggest that more number of breeding rams produced at farm should be utilized under field for overall improvement of farmers flocks.

Table Body weights of Muzaffarnagari lambs under farm and field condition (kg).

Particulars	Birth Wt.	3M Wt.	6M Wt.	9M Wt.	12M Wt.
Overall mean	3.22 ± 0.02 (631)	13.32 ± 0.12 (609)	20.40 ± 0.18 (591)	23.85 ± 0.25 (421)	27.23 ± 0.24 (370)
Location	**	**	**	**	**
Farm	3.61 ± 0.03 (431)	14.71 ± 0.14 (409)	21.45 ± 0.21 (391)	24.85 ± 0.25 (314)	28.84 ± 0.26 (263)
Field	2.83 ± 0.04 (200)	11.93 ± 0.20 (200)	19.45 ± 0.21 (200)	22.86 ± 0.43 (107)	25.63 ± 0.41 (107)
Sex	**	**	**	**	**
Male	3.30 ± 0.03 (336)	13.77 ± 0.17 (325)	21.95 ± 0.25 (313)	25.61 ± 0.33 (209)	29.21 ± 0.32 (180)
Female	3.14 ± 0.03 (295)	12.87 ± 0.17 (284)	18.84 ± 0.26 (278)	22.10 ± 0.34 (212)	25.26 ± 0.33 (190)
Year	*	**	**	*	*
2008	3.30 ± 0.04 (205)	13.80 ± 0.21 (200)	21.03 ± 0.31 (193)	24.20 ± 0.41 (138)	28.41 ± 0.32 (132)
2009	3.14 ± 0.04 (198)	13.57 ± 0.21 (191)	19.41 ± 0.31 (187)	23.04 ± 0.40 (136)	25.95 ± 0.42 (113)
2010	3.22 ± 0.04 (228)	12.60 ± 0.20 (218)	20.75 ± 0.29 (211)	24.32 ± 0.39 (147)	27.32 ± 0.39 (125)

** Significant (P<0.01), * Significant (P<0.05), Figures in parentheses are number of observation.

5. OBSERVATIONS OF PROJECT COORDINATOR

Chokla Unit:

Growth performance at six month body weight and adult annual wool yield were satisfactory. Annual lambing of above 100% was achieved. Ewe replacement rate is on lower side. Overall performance is satisfactory. Shifting of flock to ARC, Bikaner is in progress.

Marwari Unit:

Body weight at six and twelve month weight were satisfactory. Annual lambing of above 90% was achieved. General condition of flock is satisfactory. Overall performance was satisfactory.

Muzaffarnagari Unit:

Growth performance at six month and twelve month was satisfactory. Observed and Expected Response to selection need to be compared. Overall performance was satisfactory.

Deccani Unit (Farm Based):

Efforts are required to be made to improve the body weight at twelve months of age. Number of observation in the growth table is erratic. Needs rechecking and reanalysis of data.

Nellore Unit:

Growth performance was slightly improved compared to the previous year. Efforts are required to be made to improve the body weight at six and twelve months of age. Details about response to selection were not given.

Magra Unit:

Activities related to Health Coverage and ram distribution were satisfactory. Twenty seven rams were distributed and needs improvement. Identification of progenies and performance recording needs improvement. Overall performance was satisfactory

Madras Red Unit:

Overall performance was satisfactory. Activities related to health coverage were observed satisfactory. Eighteen rams were distributed and needs improvement.

Ganjam Unit:

Activities related to health coverage were observed satisfactory. Rams were not distributed.

Deccani Unit (Field Based):

Overall performance was satisfactory. Criteria used to classify the animals in different age group (3,6 & 9M) during base line survey was not mentioned. Animal identification, performance recording in reasonably large numbers and health coverage work should be started on priority. Twenty two rams were distributed and needs improvement.