

Community Action in Integrated and Market Oriented Feed-Livestock Production in Central and South Asia

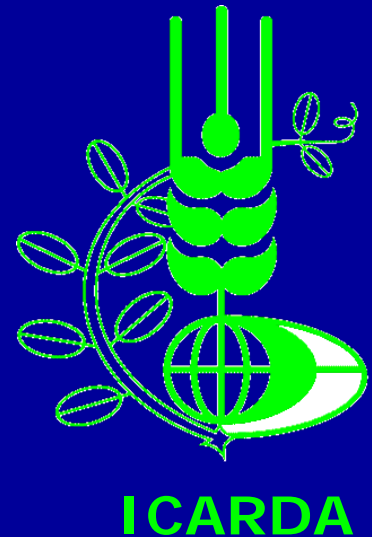
Socio-economic Component Activities

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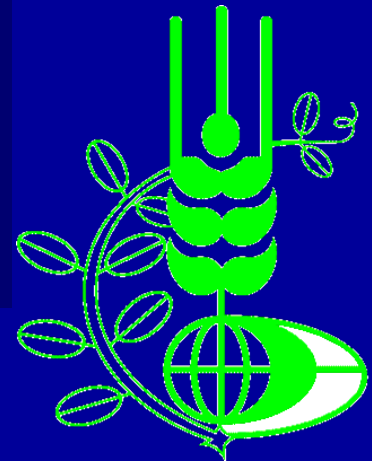
Socio-economic Component Activity

1. Impact Evaluation Framework
2. Baseline Survey Results
3. On-going Technology Evaluation



1

Impact Evaluation Framework



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Project Challenges

- ✿ Optimize participatory research by focusing on essential elements of feed production and livestock product development
- ✿ High quality seed/feed for large numbers of farmers
- ✿ Make feed production costs affordable for large-scale implementation
- ✿ Ensure replicability of technological packages without loss of quality
- ✿ Establish a post-project system of continuous development and adaptation

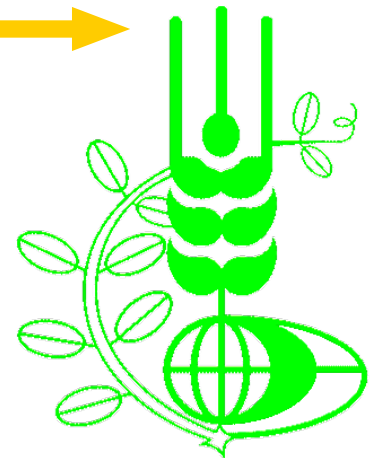
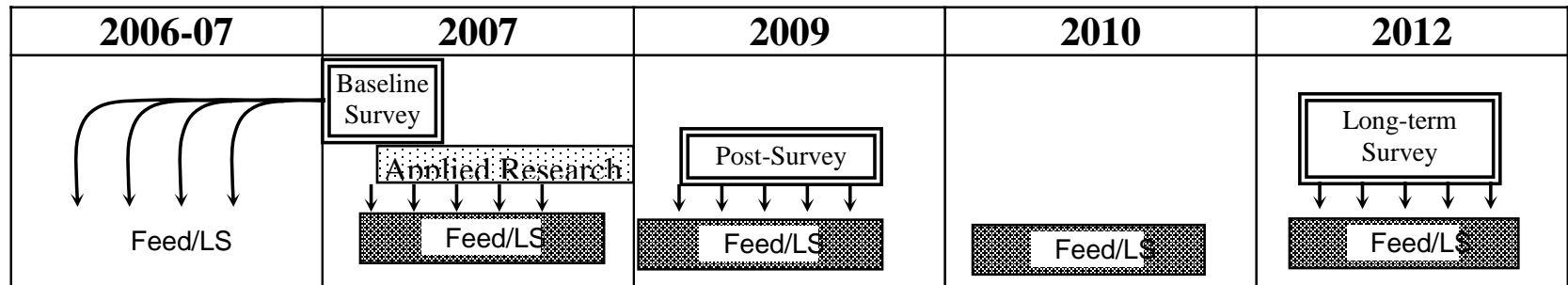


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Feed/Livestock Impact Matrix



Farm Household Impact Survey



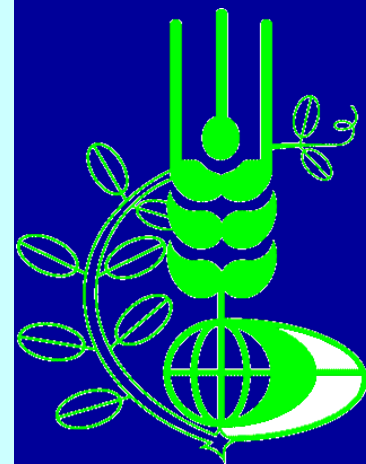
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Sampling Method

- ✱ Total 198 farmers surveyed for Impact Evaluation
- ✱ 58 participating (30 from irrig. Chak No. 74/SB and 105/SB And 28 from rainfed sites of Lodhay village)
- ✱ 71 non participating (40 irrig. And 31 rainfed)
- ✱ 69 farmers from control villages (40 irrig. And 29 rainfed)

2

Baseline Survey Results



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Baseline Survey Results at irrigated Sites of Sargodha District

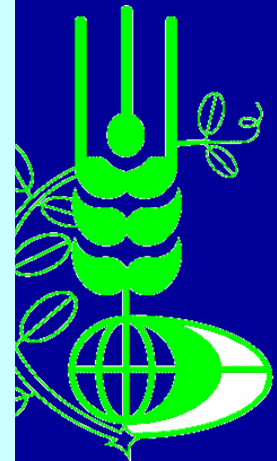
M.Sc Students

Irfan Mehmood

M. Ahsin Javed

Abdul Rehman

1. Comparative economics of diff dairy
production systems
2. Comparative profitability of Surplus vs non-
surplus dairy producers
3. Profitability of peri-urban vs rural dairy farmers



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Baseline Survey at rainfed Site of Gujakkhan

Abid Hussain

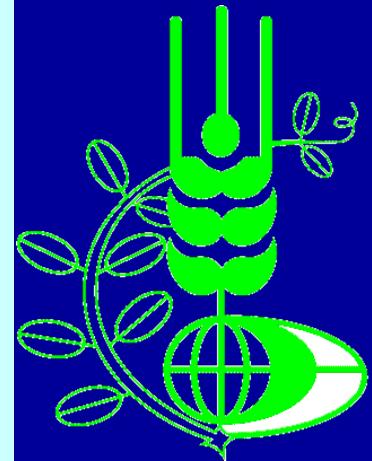
Zubair Anwar

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1. Comparative economics of diff dairy
production systems at Rainfed site



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Analysis of the Development Options to improve the income Situation of Dairying Households in Punjab



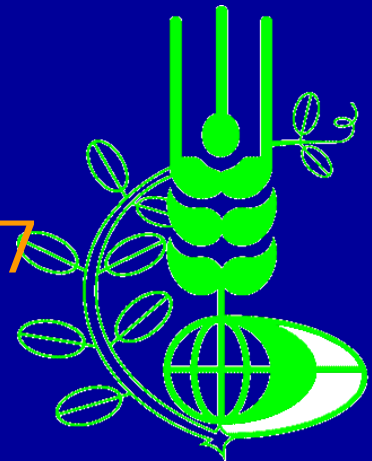
Dissertation

Submitted in fulfillment of the Requirements of the
Degree of Doctor of Agricultural Sciences to the Faculty
of Agricultural Sciences

Georg-August-Universität Göttingen

Khalid Mahmood

Braunschweig, November 2007

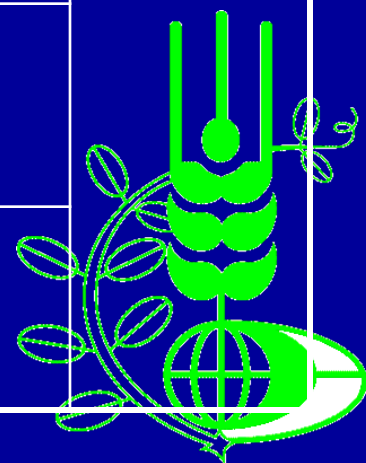


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Farm Sizes at Irrigated Sites



	Participating	Non Participating	Control	All	Sig.
< than 2 ha	13	25	55	33	0.000
2-4 ha	40	55	27	41	
> 4 ha	47	20	18	26	

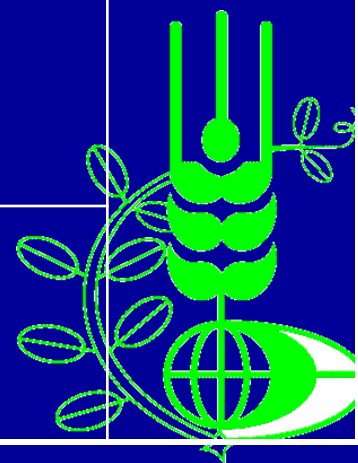


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Farm Sizes at Rainfed Site



	Participating	Non Participating	Control	All	Sig.
< than 2 ha	17	28	71	36	0.008
2-4 ha	39	39	24	24	
> 4 ha	43	33	6	29	



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Milk Marketing at Irrig. Sites

	Participating	Non Participating	Control	All	Sig.
No sales	27	45	10	27	0.002
Nestle	0	8	0	3	
Dodhi	37	8	35	25	
Village Shopkeeper + Consumer	33	37	50	41	
Dodhi + Village consumer	3	2	5	4	

Milk Marketing at Rainfed Site

Agency	Participating	Non Participating	Control	All	Sig.
No Sale	22	44	12	26	0.185
Milkmen (Dohdi)	69	45	64	60	
Others (Village Shopkeepers/ Consumers)	9	11	24	14	

Dairy Animal Ownership at Irrig. Sites

	Participating	Non Participating	Control	All	Sig.
High Milking Buffalo (no)	1.4 (52)	1.3 (52)	1.7 (50)	1.4 (51)	0.386
Average Milking Buffalo (no)	1.3	1.2	1.7	1.4	0.108
High Milking Cow (no)	0.4 (57)	0.3 (37)	0.3 (43)	0.3 (43)	0.371
Average Milking Cow (no)	0.3	0.5	0.4	0.4	0.311

Dairy Animal Ownership at Rainfed Site

	Participating	Non Participating	Control	All	Sig.
High Milking Buffalo	2.6 (53)	1.2 (37)	1.4 (52)	1.9 (55)	0.549
Average Milking Buffalo	2.3	2.0	1.3	1.9	0.666
High Milking Cow	1.9 (52)	1.4 (53)	1.1 (44)	1.5 (50)	0.673
Average Milking Cow	1.7	1.2	1.4	1.5	0.420

Animal Specific Milk Productivity at Irrig. Site(liters)

	Participating	Non Participating	Control	All	Sig.
High Milking Buffalo	2405 (1050.1)	2180 (705.3)	2329 (332.0)	2294 (793.9)	0.316
Average Milking Buffalo	1719 (665.4)	1934 (830.9)	1722 (451.3)	1784 (646.6)	0.229
High Milking Cow	3068 (1511.5)	3948 (3973.5)	2500 (564.8)	3095 (2399)	0.441
Average Milking Cow	2580 (950.0)	2109 (1170.1)	1753 (581.1)	2252 (1224)	0.427

Animal Specific Milk Productivity at Rainfed Site (Liters)

	Participating	Non Participating	Control	All	Sig.
High Milking Buffalo	3623 (425.7)	3376 (617.6)	3898 (878.6)	3616 (632.7)	0.139
Average Milking Buffalo	2995 (153.4)	2623 (285.3)	2663 (500.1)	2833 (355.1)	0.529
High Milking Cow	4285 (2667.7)	3763 (1405.3)	3236 (1585.7)	3998 (2219.6)	0.378
Average Milking Cow	3328 (858.5)	2059 (597.9)	1901 (0)	2684 (904.9)	0.354

Animal Production Cost at Irrig. Sites (% Share)

	Concentrates	Fodder & Forages	Labour	Veterinar y & Breeding	Total Cost/ Lactation
Buffalo High Yielding	25.1 (6874)	39.1 (10707)	34.9 (9552)	0.9 (245)	100 (26878)
Buffalo Average Milk Yielding	21.2 (5089)	41.9 (10067)	36.4 (8739)	0.5 (112)	100 (24006)
Cow High Milk Yielding	29.4 (7967)	45.6 (12364)	24.3 (6583)	0.7 (197)	100 (27111)
Cow Average Milk Yielding	21.2 (4862)	44.7 (10245)	33.6 (7697)	0.5 (113)	100 (22917)

Animal Specific per Litter Milk Production Costs at Irrig. Sites

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	12.0 (3.6)	12.0 (5.6)	12.4 (3.9)	12.7 (4.5)	0.343
Buffalo Average Milk Yielding	15.13 (4.6)	12.8 (5.3)	13.6 (3.2)	13.8 (4.2)	0.333
Cow High Milk Yielding	9.5 (2.6)	10.8 (4.7)	7.7 (0.85)	9.5 (3.4)	0.464
Cow Average Milk Yielding	12.5 (4.5)	14.1 (7.4)	10.2 (3.3)	12.0 (5.4)	0.481

Animal Specific per litter Milk Gross Margins at Irrig. Sites

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	9.8 (3.1)	9.5 (2.4)	8.6 (3.9)	9.4 (3.1)	0.361
Buffalo Average Milk Yielding	7.4 (3.8)	8.2 (5.3)	7.4 (3.2)	7.6 (3.0)	0.343
Cow High Milk Yielding	9.5 (2.6)	8.2 (4.7)	11.3 (0.9)	9.5 (3.4)	0.464
Cow Average Milk Yielding	6.5 (4.5)	4.9 (7.4)	8.8 (3.3)	7.0 (5.4)	0.481

Household Income Share

% Share

	Participating	Non Participating	Control	All
Young-stock	7	9	13	10
Milk	24	30	29	28
Off Farm	25	25	19	23
Crops	44	36	39	39

Incidence of Poverty

% below poverty line

	Participating	Non Participating	Control	All	Sig.
Below poverty	10(3)	15(6)	20(8)	15(17)	0.157
Above poverty	90(27)	85(34)	80(32)	85(93)	

Animal Production Cost at Rainfed Site (% Share)

	Concentrates	Fodder & Forages	Labour	Veterinary & Breeding	Total Cost/ Lactation
Buffalo High Yielding	48.4 (17941)	22.5 (8365)	27.2 (10085)	1.9 (713)	100 (37104)
Buffalo Average Milk Yielding	47.3 (12265)	22.3 (5780)	27.5 (7130)	3.0 (776)	100 (25951)
Cow High Milk Yielding	61.4 (21283)	21.6 (7506)	15.9 (5522)	1.0 (363)	100 (34674)
Cow Average Milk Yielding	51.2 (12774)	26.3 (6573)	19.2 (4792)	3.3 (810)	100 ()

Site

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	11.3 (3.8)	14.6 (5.8)	13.6 (5.8)	12.9 (5.0)	0.406
Buffalo Average Milk Yielding	9.8 (3.1)	14.1 (4.9)	12.4 (1.2)	11.0 (2.9)	0.353
Cow High Milk Yielding	14.0 (8.8)	12.9 (3.4)	17.9 (6.8)	14.9 (7.4)	0.375
Cow Average Milk Yielding	10.4 (3.5)	17.7 (4.9)	14.8 (4.3)	13.1 (4.9)	0.353

Animal Specific per litter Milk Gross Margins at Rainfed Site

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	13.8 (4.3)	10.1 (5.6)	10.7 (6.3)	11.9 (5.4)	0.406
Buffalo Average Milk Yielding	15.1 (4.4)	9.9 (3.4)	11.1 (1.2)	13.5 (4.1)	0.353
Cow High Milk Yielding	11.9 (9.4)	11.1 (4.6)	6.0 (6.9)	10.4 (7.8)	0.375
Cow Average Milk Yielding	14.9 (3.7)	7.3 (4.9)	9.9 (4.9)	12.0 (5.1)	0.353

Farmers' Perception on Feed Livestock Management

(Value of score near 4 shows highest level of acceptance;
Rank I = acceptance by more than 75% farmers and Rank
II = acceptance by more than 50% farmers)

A. Livestock Keeping

Statement	Evaluation Score	Rank
Having more number of animals is economically rewarding	3.42	I
Having more number of animals is socially prestigious	3.34	I
Livestock is more profitable than annual crops	3.20	I
Young stock raising as dairy enterprise is more economical	3.09	I
Cross breed cows are more profitable as dairy animals	2.96	II
Young stock raising as meat enterprise is more economical	2.88	II



B. Fodder Production Constraints

Statement	Evaluation Score	Rank
Major bottle neck to livestock production is fodder/feed problems	2.63	I
Improved fodder technology is difficult to adopt	2.58	I
Fodder production for selling is not profitable enterprise	2.51	II
Low milk price is disincentive toward adopting improved fodder production technologies	2.55	II
Fodder seed selling is very difficult at village level	2.50	II
Increase in productivity of fodder crop is critical for low cost livestock and livestock products production	2.45	II
Fodder seed production is very difficult as an enterprise	2.33	II
Fodder requirements can only be meet through allocating more area to fodder crops	2.26	II
Low fodder availability mainly limiting breed improvement at farms	2.12	II



C. Milk Marketing

Statement	Evaluation Score	Rank
Female folk training in milk processing can enhance livestock profitability	2.89	I
Milk production for selling to conventional dhodi is more economical as an enterprise	2.81	I
There is no potential for the marketing of other milk products (yogurt, cheese)	2.30	II

D. Breed Improvement and Health

Breed improvement in buffalo is more easy with AI than natural breeding	2.75	I
Major bottle neck to livestock production is health problem	2.30	II

3

On-going Assessments

Objectives of On-Going Assessments

1. To understand farmers' perceptions of the adoption of project interventions.
2. To provide feed back to the scientists and development agencies

Assessment Matrix

Intervention	Knowledge	Participation level	Fellow farmer interest	Yield/GM Increase	Suggestion/problems
Oat+Vetch	50%	75 %	High	35%	Oat Sole
Oat Hay	100%	100 %	High	Less wastage	High Labor
Oat seed enterprise	50%	75%	Partial	CBR: 1:3	
Balanced feed for dairy animals	75%	100%	35% positive	15% increase	Selection of animals
Feed lot fattening	100%	100%	25% satisfied	Not clear	repeat

Thank You

Attributes of Dairy Producers at Irrigated Site

	Participating	Non Participating	Control	All	Sig.
Percent Farms	28 (30)	36 (40)	36 (40)	100 (110)	
Education (years)	8	5	5	6	0.287
Family Size (no)	9	6	6	7	0.102
Farm Size (ac)	11.0 (6.3)	7.4 (4.1)	5.7 (3.4)	7.8 (5.2)	0.083
Males Working on Farm (no)	1.6 (0.8)	1.5 (0.5)	1.5 (0.6)	1.5 (0.6)	0.026
Females Working on Farm (no)	0.6 (0.9)	0.5 (0.5)	0.0 (0.0)	0.3 (0.6)	0.000
On Farm Permanent Hired Labor (no)	0.4 (0.7)	0.4 (0.6)	0.3 (0.5)	0.3 (0.6)	0.815

Attributes of Dairy Producers at Rainfed Site

	Participating	Non Participating	Control	All	Sig.
Percent Farmers	40 (23)	31 (18)	29 (17)	100 (58)	
Education (years)	9	8	7	8	0.030
Age (years)	36	51	40	42	0.531
Experience (years)	16	28	19	21	0.043
Family Size (No)	7	7	8	7	0.200
Farm Size (ac)	12.4 (10.3)	8.6 (5.7)	3.7 (2.3)	8.7 (8.0)	0.465
Males Working on Farm (no)	1.3 (0.6)	1.0 (0)	0 (0)	1.1 (0.5)	0.058
Females Working on Farm (no)	1.3 (1.0)	1.0 (0)	1 (0)	1.1 (0.6)	0.600
On Farm Permanent Hired Labor (no)	0.6 (1.1)	0.2 (0.5)	0 (0)	0.3 (0.8)	0.110

Buffalo Attributes at irrig. (%)

	Participating	Non Participating	Control	All
<u>Breeding Practices</u>				
AI	9	8	13	9
Natural	91	92	87	91
<u>Breeding Objective</u>				
Quality Calves	14	38	15	32
Indiscriminate	86	62	85	68
<u>Breed Preference</u>				
Cross	23	8	12	14
Desi	23	15	3	13
Nili Ravi	6	-	-	2
Ravi	-	3	-	1
None	48	74	85	70

Cow Attributes (%)

	Participating	Non Participating	Control	All
<u>Breeding Practices</u>				
AI	10	8	8	8
Natural	90	92	92	92
<u>Breeding Objective</u>				
Quality Calves	23	15	13	16
Indiscriminate	77	85	87	84
<u>Breed Preference</u>				
Cross	13	3	4	8
Frisian	3	5	-	3
New Jersei	3	-	-	1
Desi	7	3	-	3
Sahiwal	-	5	-	2
None	74	84	96	83

Buffalo Attributes (Raifed)

	Participating	Non Participating	Control	All
<u>Breeding Practices</u>				
AI	0	10	9	5
Natural	100	90	91	95
<u>Breeding Objective</u>				
Quality Calves	46	33	44	41
Indiscriminate	54	67	56	59
<u>Breed Preference</u>				
Cross	4	3	6	4
Nili Ravi	37	33	35	34
Kundi	8	0	6	5
None	51	64	53	57

Cow Attributes (Rainfed)

	Participating	Non Participating	Control	All
<u>Breeding Practices</u>				
AI	30	0	41	24
Natural	70	100	59	76
<u>Breeding Objective</u>				
Quality Calves	48	28	41	40
Indiscriminate	52	72	59	60
<u>Breed Preference</u>				
Cross	9	11	10	10
Frisian	4	11	10	10
Desi	9	-	5	5
Sahiwal	9	-	3	3
New Jersi	9	-	3	3
None	60	78	69	69

Animal Concentrate Feeding Cost (Rs./lactation)

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	8206 (5283)	6081 (6566)	6063 (1754)	6874 (5394)	0.319
Buffalo Average Milk Yielding	6381 (4273)	4398 (3565)	4613 (3535)	5089 (3822)	0.304
Cow High Milk Yielding	8444 (7194)	9959 (15248)	5014 (1658)	7967 (9534)	0.409
Cow Average Milk Yielding	7285 (3497)	5641 (8152)	2792 (3576)	4862 (6025)	0.456

Animal Fodder and Forage Feeding Cost

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	10808 (2526)	11943 (2602)	9208 (1416)	10707 (2556)	0.350
Buffalo Average Milk Yielding	10588 (3039)	11082 (3366)	8700 (1093)	10067 (2439)	0.350
Cow High Milk Yielding	11592 (3059)	14388 (5992)	9815 (2491)	12364 (4394)	0.472
Cow Average Milk Yielding	10666 (2948)	10514 (3030)	8125 (2664)	10245 (2991)	0.481

Animal Concentrate Feeding Cost (Rainfed)

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	17605 (10035)	18067 (12255)	18362 (9481)	17941 (10275)	0.409
Buffalo Average Milk Yielding	11882 (7112)	10664 (6128)	16122 (4494)	12625 (6113)	0.371
Cow High Milk Yielding	23811 (13330)	20126 (5828)	18385 (10785)	21283 (11353)	0.752
Cow Average Milk Yielding	15464 (11634)	9797 (5254)	12047 (7331)	12774 (9066)	0.375

Animal Fodder and Forage Feeding Cost (Rainfed)

	Participating	Non Participating	Control	All	Sig.
Buffalo High Yielding	7653 (1818)	8243 2776	9687 (3643)	8365 (2726)	0.662
Buffalo Average Milk Yielding	5768 (2790)	7208 (4240)	5262 (1269)	5780 (2520)	0.503
Cow High Milk Yielding	6243 (2033)	7297 (2546)	9461 (4179)	7506 (3169)	0.388
Cow Average Milk Yielding	6135 (592)	7054 (221)	6824 (482)	6573 (590)	0.341

(A) On-Going Assessments of Winter Fodder Trials

☀ Winter Fodder Mix	Oat+vetch
☀ No of Exp. Farmers	16
☀ No of Farmers Interviewed	12
☀ Trial Condition	100% Rainfed
☀ Farmer selection	By Community
☀ Trial sowing Time	Timely
☀ Knowledge about seed rate	100%
☀ Knowledge about fert. Type & doses	100%
☀ Knowledge about variety	0%
☀ Involvement in trial sowing	100%
☀ Interest of fallow farmers	High
☀ Yield difference (Con. Vs imp)	35% Increase
☀ Area allocated for seed prod	2 Kanals

On-Going Assessments of Winter Fodder Trials

- ☀ Would you like change in trial 60% yes
- ☀ Type of changes suggested sole oat
- ☀ Reason vetch is harvested

Vetch

seed availability

- ☀ View about Trial Results Satisfactory
- ☀ Views about continuity 80% high 20% less interest
- ☀ Previous involvement in R & D projects 65% yes
- ☀ **HAY**
- ☀ Views about oat + vetch hay very positive
- ☀ Adoption possibility of hay technique 85%

On-Going Assessments of Winter Fodder Trials

☀ Price Comparison (Hay Vs Wheat Straw)

- ☀ Avg. GF production O+V/ kanal 87.5 Mds
- ☀ Dry matter production @ 33%/kanal 29 Mds
- ☀ GF farm gate price/ Kanal Rs. 5000
- ☀ Price of 1 Mds Dry matter Rs. 172/Mds
- ☀ Cost of Substitute (wheat straws) Rs. 200/Mds
- ☀ Financial benefit with Hay Rs. 28/ Mds
- ☀ Also improved nutrition of the animals

(B) On-Going Assessments of Fodder Seed Enterprise

☀ Seed enterp. crop	Oat
☀ No exp. farmers	04
☀ No of farmers interviewed	04
☀ Farmer selection	By Community
☀ Previous experience (seed business)	50% Yes
☀ Crop stand	75% good
☀ Seed produced	24 mds
☀ Avg. seed wasted (Harvesting and cleaning) mds	2.5
☀ Seed saved for self use 5.5Mds	
☀ Knowledge about proper storage	100% Yes
☀ Storage cost	Rs. 80/bag
☀ Seed selling months	September
☀ Price charged 35/kg	Rs

On-Going Assessments of Fodder See Enterprise

- ✱ Seed marketing problem No
- ✱ Continuity 50%
- ✱ Reasons of discontinuation
 - ✱ No crop security (free grazing)
 - ✱ Labor extensive
 - ✱ Water shortage
- ✱ Previous involvement in R&D activities 75% Yes
- ✱ Cost per (Acre) Rs. 13416
- ✱ Gross Income/ Acre 38400
- ✱ Cost benefit ratio 1: 2.86

(C) On-Going Assessments of Feeding Lactating Buffalos

☀ Purpose of trial Improve Milk Productivity

☀ Exp farmers No	07
☀ Farmers interviewed	07 (100%)
☀ Trial duration (Days)	60
☀ Avg. Qty used per day	13.8 kg
☀ Regularity in the use of FS ration	Very regular

Current Status of feed use

☀ Temp. Stopped
71.4%

☀ Reasons of Stoppage

i) Ration finished (S+G HAY)

On-Going Assessments of Feeding Lactating Buffalos

- ☀ View about Labor problem

☀ No

85.7

- ☀ Gender involved in trial

Male

- ☀ Other farmers views

35% positive

- ☀ Previous involvement R&D activities

☀ No

56.7%

- ☀ Increase in milk yield

15%

- ☀ Increase in cost

11%

- ☀ Continuity

Still evaluating

- ☀ Problems with trial

- Selected farmers' conventional feeding regime is good

- Some farmers used same feed for control group

- Most of the selected animals were high yielding (avg. lact. No

(D) On-Going Assessments of Feedlot Fattening Trial

☀ Purpose of trial	Dissemination of improved fattening feed
☀ Exp. Farmers Nos.	06
☀ Farmers Interviewed	06 (100%)
☀ Trial duration (Days)	60
☀ Consistency in Feed use	regular use
☀ Knowledge about ingredients	100 yes
☀ Equivalent feed available	70% yes
☀ Labor problem	75% yes
☀ How you manage extra labor	By hiring
☀ Type of labor involved	Male & Female
☀ Previous involvement in R&D	75% yes

On-Going Assessments of Feedlot Fattening Trial

Avg. Weight Increase (buff. calf)

- Experimental 30.55
- Control 30.79

Avg. Weight Increase (cow calf)

- Experimental 31.38
- Control 31.75

☀ Farmers Own View about trial 25% Satisfied
75% No clear conclusion

Fallow farmers interest Low

☀ Advantages of the trial: i) Can produce more flocks ii) less diseases & good health

☀ Continuity 75% No

☀ Reasons of discontinuation

Suggestion for future R& D

- ☀ Scaling up mechanism of hay making technique needs to be worked out
- ☀ Previously feeding trials were mainly conducted with large farmers. In the next plan, small and medium (not involved in milk business) categories of farmers should also be included in the feeding trial of lactating animals.
- ☀ Animal vaccination against seasonal diseases is important. Farmers are bearing heavy economic losses due to these diseases. In this context, awareness sessions and vaccination training program needs to be included in the future R & D plan. (Baseline data ranked diseases as no 1 problem)