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Integrated Watershed Management Practices Adapted In K.Shankaranahalli Village Watershed Area- A Case Study In Arasikere Rural District

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***ABSTRACT*:** *The project was executed by an inter-disciplinary partnership comprising scientists from CRIDA, AP and Karnataka state Agricultural University UAS Bangalore, ICRISAT and NGO, BIRD-K [BAIF] – Karnataka. Practices were need – Based and Developed in consultation with villagers. The project has come up with an Important Institutional Innovation in the formation of Salaha Samithi, Which is an advisory group of villagers, formed by members who are acceptable to the community and willing to work for common good. It is an Informal and Inclusive body in which existing PRIs and SHGs are also represented, besides representatives from women and weaker sections. The SS has helped in smooth Implementation of the project activities with assured people's participation Interventions such as water harvesting structures (farm ponds, check dam, Trench cum bunds soil nutrient management IPM Biomass planting Improved crop varieties Inter crops fodder crops, agri - horticulture and agri-silvi-pastural systems were also taken up to Improve the productivity of CPRs. Improved agricultural implements and machinery such as threshers and shellbarks were introduced to reduce the drudgery for women and to enhance the production entrepreneurial development activities such as nursery raising and backyard poultry for women, sheep raring, beekeeping, vermin compost, Artificial Insemination for livestock etc.*

KEYWORDS: *CHC, Farm pond, ground water, Gully plugs, IPM, INM, Nursery, NRs, PRA, Watershed, SS.*

I. INTRODUCTION

The village has a total geographical area of 711 ha. The Annual Rain fall varies from 600-650 mm. The monsoon commences in May and ends in December with the peak rain full period between September and October. The area has been experiencing continuous drought for the last three years. Natural Resources are the main stay of the life supporting system in rural areas, both human and livestock sustain on this resource base which is rapidly degenerating because of growing population pressure and over exploitation. CPRs such as grazing lands and water bodies are key avenues of Income and livelihood for poor people in the village. But demographic pressures are also talking heavy toll on the CPRs affecting the livelihoods of the poor in addition to the declining quality of NRs in CPRs and private property Resources the evolving socio-economic and demographic patterns in the rural areas are negatively Influencing the ability of poor to access NRs. The project was sponsored by the Natural Resources Systems programme of the U.K. Department for International Development. The central Resources Institute for Dry land Agriculture in partnership with other Institutes in the National Agriculture Research system. The International crop research Institute for the semiarid tropics (ICRISAT) and a non-governmental organisation (NGO) led the project. The project commenced preparatory field work in January 2003, was officially Inaugurated in May 2003 and closed in March 2005. The project was implemented in K.Shankaranahalli village, in Karnataka is part of the central dry zone of Karnataka and has bimodal Rain fall distribution. Soils are mostly sandy loan with high slopes and high altitude, the temperature are relatively low. The cropping pattern is distinct Apart from rain fed crops such as finger millet and ground nut orchards of coconut are a major economic activity in the district. In shankaranahalli village a majority of Families depend on agriculture. The land holdings are small. A significant proportion of families are below poverty line. The proportion of BPL families is more than 50% most the CPRs are privatised. The village face acute water and fodder shortages particularly during summer. The field-based Implementing agency BIRD-K have proven expertise in social Mobilization and also in Issues related to livestock development. The specialist back ground of the project team helped in identifying a range of options for consideration by the village households before they close an appropriate technological or organizational Intervention. The project followed a PRA to develop Interventions with stakeholder farmers in the village. The approach was to take advantage of Indigenous knowledge and the capacity of farmers to experiment and solve their own problems.

It uses many of the principles of participatory rural appraisal, but extends the active participation of farmers well beyond the Initial stage of appraisal to Intervention, planning, Intervention development and evaluation on forms and in the village. In this way former-stake holder in put to Implementation decisions is continuous. The approach begins with in-depth participatory diagnosis by a broad cross section of the community, Including men and women from the different wealth and age groups. This process helps the villagers to define group and prioritise their main development needs opportunities and problems. Then a comprehensive schedule for implementing the Interventions was discussed and finalised in the meetings.

OBJECTIVES:

[1] To Increasing the productivity of water through appropriate rain water harvesting utilization and Nutrient management technologies in target areas.
[2] Increasing access to CPRs by the poor by strengthening Social Institutions at the village level.
[3] Strengthening the livestock based farming to address the landless people and marginal farmers.
[4] To Increasing adoption of simple and proven technologies, Interventions Techniques, tools and Implements relating to soil water conservation. Integrated nutrient management is the target areas.
[5] Improving livelihood quality of the rural women by reducing drudgery and hardship in farming operations.
[6]

II. MATERIALS AND METHODS:

2.1. Formation of Salaha Samithi:

Formation of a Salaha Samithi (SS) in the village is an Important Institutional Innovation developed by the communities and the project and put in the village. The SS and advisory group of villagers is formed considering the need expressed by the villagers for an Institution that can facilitate the Implementation of the project staff. The SS is formed by members who are voluntarily willing to work for the common good of the villagers and who are acceptable to the community as a whole. It is an Inclusive body in which existing CBOs (PRIs and SHGs) are also represented to achieve coherence in the activities and to keep the PRI Information of what is going on in the project. Women and Weaker sections (SC/ST) of the society were also Included in the SS.

2.2. Participatory Rural Appraisal (PRA):

Participatory approach is the Importance of understanding the Bio-physical, socio-cultural and economic contexts in which any Interventions will occur. There was characterized using various PRA tools such as social mapping resource mapping, village transact, seasonally and trend Analysis Venn diagram Wealth ranking and focus group discussions involved the PRIs. Women and landless. The steps in the PRA process are shown in Table-(1-5)

2.3. Soil and Water conservation:

2.4. Trench cum bund:

According to the farmers NRs development preferences, Trench cum bunds have been implemented in 105 ha of land in 2003. The Typical trenches are 5m long, 1m wide and 0.3m deep respectively with a storage capacity of 1.5 m^3(1500 litres). Depending on the soil condition, a labour can dig 4-5 trenches per day. Such trenches (55-60 per ha) can harvest 148 m^3 to162 m^3 water.

2.5. Farm Ponds:

Forty five Farm ponds were dug with partial contribution from the farmers. The SS members in consultation with BIRD-K officers selected the site for excavation of Farm ponds. For every 2 ha area, one Farm pond was proposed in lands having 2-3 % slope. When dug out manually, the side slope, boundaries. On an Average the ponds were of 10m long, 10m wide and 3m deep with 1:1 side slope this means creating water storage of 170 m^3. The farm ponds were mainly used for percolation and recharging. Hence the farmers decided not to pump water from farm ponds for irrigation purpose. The water was used some times for manually watering a few plants planted around the farm ponds using pots filled from the pond.

2.6. Farm Pond Mounds:

The dug out soil was used to build a mound of 1-1.5m height around the pond to protect the pond and act as well around protective grasses, forest trees species and vegetables were planted on the Mounds.

2.7. Inlet and Outlet:

Each pond has Inlet and Outlet channels. The Inlet channel has a silt trap and stone pitching was done to protect the inlet from erosion. Due to the farm ponds, the ground water level improved considerably.

2.8. Gully Plugs:

Twenty five gully plugs were constructed with 30 % contribution from the farmers. The total catchment area covered was 8 ha and average gully depth ranged between 1 and 1.5m.

2.9. Check dam:

The land in the watershed area has an average slope of 1-6 %. Considerable run off was flowing from the catchment in to streams. The community and staff decided to construct a check dam to store water in the lower reaches of the farms. On an average the check dam were of 30m long, 1m wide and 1m deep with 1-6 % Slope. The check dam benefited more than 30 families in the village. Its benefit extended over an area of 16 ha of land besides making water available for washer men, animals and household. The check dam also helped in increasing the soil moisture availability to the coconut plants. Mass plantation involving the community was taken up during 2003 and 2004 by creating awareness among the people regarding the potential benefits of planting and growing trees in PPRs and CPRs. The planting was done for two years and 49,000 seedlings were planted 36,000 in PPRs and 13,000 in CPRs. The Nursery units promoted through the project supplied 4200 seedlings of Gliricidia and 1800 seedlings of cassia for the green festival. The plantation process was Institutional by celebrating the planting programme as "Hasiru Habba" (green festival). The species planted were jointly chosen by the village community and the project team and included casuarinas', silver oak pongamia and teak and a diverse group of species each with its own specific utility such as fodder, food, fertilizes, fuel, green manure, aesthetic value etc. Existing SHG's in the villages were active in the plantation and at present they are taking care of the seedlings. Plantation was also taken up in the trenches of trench cum bunds at 100-150 plants per ha of different species. An average of 60 % survived.

2.10. Vermicompost:

As per the suggestion of the Salaha Samiti (SS), only small and marginal farmers were selected for the Interventions. Nine units of vermicompost were initiated and all the participating farmers successfully produced a total of 1650 kg of vermicompost. The farmers applied the vermicompost to Horticulture and commercial crops in their farms and were unwilling to sell the compost to others although the price of vermicompost in the market was Rs-3 per kg.

2.10.1. Diversified cropping system:

2.10.2. Improved Varieties:

Most of the farmers were found growing local varieties of crops such as finger millet, sorghum and Red grams. Observation plots were planted by farmers with improved varieties of these crops. The yields obtained and presented in the table. Show on an average 30-50 % increase.

2.10.3. Nursery Rising:

Nursery raising and maintenance in K.Shankaranahalli village is a new Intervention being carried out in the village. In this village most of the people are small, marginal farmers and landless people. To improve the livelihoods of the landless poor, landless poor persons including women were identified for nursery training 10 women's in shankaranahalli were trained. During the training at lakkihalli farm, the participants were thought grafting techniques, prorogation methods and the techniques of nursery rising.

2.10.4: Beekeeping:

Beekeeping was introduced in shankaranahalli village to 10 farmers. However, the yield from the honey comb was poor due to frequent migration of bee colonies, which was thought to be due to intensive pesticide application for gherkin cultivation. Therefore

Bee keeping may be a potential livelihood option under the circumstances of Non-pesticide Intensive farming.

2.10.5. Sheep Rearing:

Sheep rearing was offered as a livelihood diversification option for the landless poor.

2.10.6. Improved livestock production:

The approach takes advantage of Indigenous knowledge and the capacity of farmers to experiment and solve their own livestock feeding problems. It used many of the principles of participatory rural appraisal. Predominantly local Buffalo and cattle were largely kept for production of milk for direct consumption and occasional sales in rural areas.

2.10.7. Sheep Rearing:

Sheep rearing was offered as a livelihood diversification option for the poor and landless people.

2.10.8. Integrated Animal health camp:

An animal health camp was organised during January 2004 at K.Shankaranahalli village, in which more than 500 animals were treated. Irrespective of the species, all the animals were de-wormed. About 165 sheep and goats and 30 poultry birds were vaccinated and about 100 crossbreed cows' fifty local cows and fifty buffaloes were given gynaecological treatment and supplementary feed (mineral mixture). Further farmers reported immediate recovery of animals from recurrent attacks of gastro-Intestinal parasite Infection.

2.10.9. Ethno – veterinary training:

From K.Shankaranahalli village 3-4 persons who are already Involved in the livestock treatment of diseases were identified and were trained at BIRD-K lakkihalli in order to their skills and capacity. All the trained persons render good services as Para veterinarians in their village. They help the farmers in Identifying the health problems, providing Information on husbandry practices and treating the sick animals.

2.10.10. Multi crop thresher for ragi (finger millet):

Ragi (finger millet) is a major food crop of this village and covers about 30-40% of the cultivated area. Traditionally, threshing of the ragi is done by manually beating and cleaning. This requires a large number of labourers, mostly women. Owing to large hectare under coconut and other plantation crops, most of the labour force was diverted to the irrigated areas and therefore was not available for ragi harvesting and threshing. The ragi thresher was introduced as requested and as agreed during PRA. It was made available through the CHC to predominantly small farmers @ 15/quintal. There was a good acceptance of this machine.

2.11.1. Manual weedier, manual chaff cutter coconut de husker:

There implements were relevant for the K.Shankaranahalli farming operations and were supplied to the custom hire. Manual weedier did not perform well on stony soils and needed modifications while the chaff cutter handle was found to be too short for easy operation. Both these problems were rectified by local blacksmiths. However there was little demand for either the weedier or chaff cutter, since they were low cost Items and hence are affordable to farmers. The coconut dehusker was introduced to growers to assess its usefulness in saving drudgery and cost. Many farmers could buy this tool.

2.11.2. Custom hire centre:

Custom hire centre (CHCs) is centre in the communities, where agricultural Implements are kept for by villagers.

2.11.3. **CHC Performance and outcome**:

Interventions of tools and Implements are expected to enhance the Income of the farmers through reduction of the cost of the different crop operations and enhanced yield due to better utilization of nutrients and moisture. The utilization and Income generation for the farmers through hire of the CHC Implements in K.Shnakaranahalli village the predominantly small holdings and conventional hand tools discouraged the youth to pursue agriculture. Implements such as multi-crop thresher for ragi, chaff cutter, coconut de-husker and manual weedier Improved the Income of the farmers by 15-20% removed the drudgery of women in weeding, threshing and coconut de-husking operation and made agriculture more attractive to the youth.

III. INDENTATIONS AND EQUATIONS

The dimensions of the farm ponds are designed based on the area

Total catchment area (land holding) area = 2.0 ha
Effective rain fall received =600m =0.6m
Total volume of rain fall received =2x10000x0.6m
From 2 ha's =12000 cu. M
Expected run off in to farm pond =40% of effective rainfall or8000x40/100
=0.4x12000=4800 cu m
No. of expected fillings = 2
Storage volume required in farm pond=4800/2=2400cu m
Depth of farm pond proposed =3m
Mean area of pond will be 2400/3=800 sq m
Mean length =10m
Mean bread =10m
Side slope of the pond = 1:1
Top length of farm pond =10=3=13m
Top breadth of farm pond =10=3=13m

Bottom length of farm pond =10-3=7m
Bottom breadth of pond =10-3=7m
Land area that will be lost for cultivation =13x13 =169m^2 or 0.845m^2
Net cultivable area =2x10000-169
=19831 sq m
Net storage available in pond after allowing for evaporation =2400x75/100
Losses at 25 % of storage =1800 cu m per filling
Net storage available in farm pond after allowing for evaporation =1800x2
=3600 cu m
3600x45 no .of ponds excavated=162000 cu m
162000x100=16200000 liters

IV. FIGURES AND TABLES:

FIG.1. PRA MEETING IN SHANKARANAHALLI VILLAGE

FIG.2. VILLAGERS ACTIVELY PARTICIPATED INPRA MAPING

Fig.3.Excavation of farm pond

FIG. 4.ARASIKERE TALUK VILLAGE MAP

Table: 1 Socio-Economic and demographic profile of the village

Parameter	Village
	K.Shankaranahalli
A. Population Male Female	835 285(49)% 295(51)%
B. No. of families No. of SC families No. of SC families Literacy %	235 54 (23)% 6 (3)% 72.5
C. Form households Small (< 1ha) Medium (1-2ha) Large (2-4ha) Very large (> 4ha)	68 (29%) 68 (29%) 66 (28%) 33 (14%)
D. Land less families Wage employment Self employment Services: Govt/Pvt	20 79 44
E. Wealth ranking Rich Middle Clan BPL/Poor	26 (11%) 130 (55%) 79 (34%)

Figures in Parenthesis are Percentages.

Table.2. Infrastructure and service facilities available in the village.

Particulars	K.Shankaranahalli
Primary school (No)	1
High school	1
Post office	─-
Grama panchayathi office	1
Veterinary Clinic	-
Hospital	-
Anganavadi	1
Milk production centre	1
SHG's	5

Table.3. Existing Agro climatic situations in the village

Particulars	K.Shankaranahalli
Rain fall mm Soil	600 Red, Sandy, Loamy, Small pebbles, Saline Soil, depth, 20-50 mm Moderate in nutrient
Land use Forest (ha) Fallow land & waste lands (ha) Net cultivable area (ha)	 Nil 272 517
Major crops: Kharief Rabi	 Finger millet, sorghum, pulses, groundnut, castor, sesame, Niger, coconut paddy mango, banana. Sorghum
Irrigation Sources Tanks (No) Dug well & Bore wells (No) Check dam (No) Percolation tank (No) Farm pond (No)	 7 65 1 - 32

Table.4. Issues Identified in the village K.Shankaranahalli

1	Lack of appropriate Institutions (VI) to support the NRs- based livelihood activities.
2	A poor crop yield because of local varies.
3	Lack of crop diversification.
4	Lack of vegetation, soil erosion, low fertility.
5	Lack of diversified enterprises.
6	Lack of Improved agricultural tools and Implements.
7	Lack of CPR land due to encroachment.
8	Landless labour less do not have livelihoods options.

TABLE. 5. Training programmes in K.Shankaranahalli village.

SL.No	Training on	Places visited
1	Soil & Water conservation methods	Lakkihalli Farm (BIRD–K)
2	Bee-keeping	K.Shankaranahalli
3	Ethno veterinary	K.Shankaranahalli
4	Nutrition programme	Lakkihalli (BIRD-K)
5	Kitchen herbal Garden	Lakkihalli (BIRD-K)
6	IPM INM	Shankaranahalli
7	I G A	Shankaranahalli
8	Post harvest technology	Lakkihalli (BIRD-K)
9	Fertility Management on coconut	K.Shankaranahalli
10	Nursery Raising Techniques exposure visits:	Lakkihalli Krishimela UAS Bangalore

.

Table .6. Costs benefit analysis of water harvesting structures:

Sl. No	Structure	Cost (INR)	Benefits
1	Farm ponds	Rs 6000-15000	1) Ground water recharge. 2) Supplementary irrigation. 3) Raising vegetables & horticulture plants. 4) Rearing fish.
2	Check dams	1,00,000	1) Prevent wastage % Runoff water. 2) Prolonged availability of water. 3) Available water for drinking for cattle, household & washing clothes etc.
3	Trench cum Bunds	Rs.2000/ha	1) Prevent soil loss. 2) Better establishment of folder & agro-forestry trees on the Bunds/trenches. 3) Increased soil Moisture availability in the surrounding area.

Table.7.EXISTING LOCAL CULTIVARS AND IMPROVED CULTIVARS YIELD COMPARISONS OF DIFFERENT CROPS IN K.SHANKARANAHALLI.

Crop	**Existing cultivars**		**Improved variety**		
	Name	**Yield (kg/ha)**	**Name**	**Yields (kg/ha)**	**%increase in yield**
Finger millet	Local	600	MR - 1(5) GPU - 28(9)	1000	67
Sorghum	Local	800	CSH - 14(33)	1250	56
Pigeon pea	Local	700	TTB – 7(5) Hy – 3c(5)	950	36

(Figures in parentheses are no. of farmers planted improved cultivars)

Table.8. Cost and Returns of Nursery Rising in K.Shankaranahalli:

	Total No. Of Plants : 10,000	
A	Costs :	Rs
	1) labour for filling the polythene bags with soil 20 women labour @ Rs.35/day	= 700.00
	2) cost of material (FYM,soil and sand)	= 3500.00
	3) cost of polythene bags (10,000 @ 0.30/bag)	= 3000.00
	4) cost of seed	= 700.00
	Total	7900.0
B	Gross Returns : 10,000 plants @ 3/plant	= 30,000.00
C	Returns for family labour	= 22,100.00

Watering and shading by SHG's in their own.

Table.9. the livestock population of K.Shankaranahalli

Sl. No	**Particulars**	**Shankaranahalli**
1	Cows	550 (58%)
2	Buffaloes	25 (3%)
3	Bullocks Large Ruminant	210 (22%)
4	Sheep	80 (8%)
5	Goat	85 (9%)
6	Poultry	65

Table.10. Implements distribution to CHC's and hires charges:

Implements requested & provided	**No. Of Items**	**Cost of machine Rs**	**Charges cost saved in Rs**	**operation**
1) Multi crop thresher	1	30000	15/quintal	20/quintal
2) Manual weeder	5	550		
3) Manual chaff cutter	5	250		
4) Coconut de husker	5	850		

TABLE.11.VILLAGE INSTITUTION

Sl. No	Name	sex		Age	Caste (ST/SC/OBC)	**Present Position in Village Institution**	Village
		male	Female				
1	SR.MARULAPPA	M		57	OBC	**President**	S.K Halli
2	SH. VISHWANATHAPPA	M		57	OBC	**Vice President**	S.K Halli
3	SM GURUMARULA SIDDAPPA	M		43	OBC	**Secretary**	S.K Halli
4	SV.MALLIKARJUNA	M		48	OBC	**Member**	S.K Halli
5	SM JAY NANDA MURTHY	M		43	OBC	**Member**	S.K Halli
6	MRUTUNJAYAPPA	M		57	OBC	**Member**	H.M Kaval
7	MAYASHETTY	M		58	OBC	**Member**	S.K Halli
8	GOVINDANAIK	M		40	SC	**Member**	S.K Halli
9	HALAPPA	M		50	OBC	**Member**	S.K Halli
10	MARULASIDDANAIKA	M		45	ST	**SHG Members**	S.K Halli
11	SS BASAVARAJ	M		38	OBC	**SHG Members**	S.K Halli
12	SB.BASAVARAJ	M		43	OBC	**SHG Members**	S.K Halli
13	SHASIDHARA	M		30	OBC	**SHG Members**	S.K Halli
14	SC.MALLIKARJUNA	M		30	OBC	**SHG Members**	S.K Halli
15	SC.MARULASIDDAPPA	M		30	OBC	**SHG Members**	H.M Kaval
16	GANESHAPPA	M		50	OBC	**SHG Members**	H.M Kaval
17	Susheelamma		F	33	OBC	**SHG Members**	S.K Halli
18	Leelavathi		F	23	OBC	**SHG Members**	S.K Halli
19	Maheswaramma		F	40	OBC	**Member**	S.K Halli

V. DISCUSSTION AND CONCLUSSION

Conflict minimization and peoples participation the SS contributed to smoother Implementation of Project and faster diffusion of Interventions. That the SS could create assets and development plans to continue even after the project ends is a testimony to the effectiveness and utility of such Institutional Interventions. The social capitals build through forming these Institutions and the human. Capital strengthened through exposure visits, training programs and regular intervention with the project staff also contributed to the success of the project in Improving Natural Resources based livelihoods of the rural poor. In fact transparency is the single most important reason for why the decisions of the SS were accepted. As all the Interventions were identified in consultation with the villagers and SS, there was enough flexibility to choose the options that responded to their needs. This maximized the chances of adoption of technologies thus gives short duration of the project through which there Interventions could be tested it could be concluded that the Interventions such as SS could be highly useful opportunities. Integrated watershed management with a farming systems approach is key to natural resources management and benefits both landed and landless Crop Interventions were effective in creating awareness about Improvements regarding seed, seed source and practices. Nursery Raising, buy-back arrangements with local commercial nurseries would make it more successful as a livelihood for the landless. Seed Interventions are self replicating but farmers should be encouraged to replenish the old seed with pure seed to avoid genetic degradation after every 3-4 years. Alternate land use Interventions are slow to demonstrate their benefits and need a long gestation – further they should be Introduced as a package that Includes arrangements for water availability during the day months and for some appropriate fencing even if it is from local materials.

The adoption of Improved livestock technologies (AI centre, sheep rearing, poultry etc) requires Medium to long term Investment. A researcher – NGO – extension workers farmer partnership is possible for research to test develop and promote technologies under a participatory mode. Interventions of Improved tools and Implements have improved the efficiency and economics of crop operations. Small tools and particularly the manual weeder plough, chaff cutter proved to be significant contributions in reduction of the drudgery of farm women. The concept of a CHC for Implements proved to be a boon to all categories of farmers, landless or poor people. CHCs will sustain in the post – project period due to their economic feasibility and benefit to users. Biomass plantation was promoted in K.Shankaranahalli village and participants were encouraged to plant multi-purpose biomass yielding plants in both private and common lands. Biomass yielded more success in K.Shankaranahalli. Bunds and Biomass plantations have a functional and Interdependent relationship the formation and bunds creates the scope for Biomass plantation and the plants strengthen and stabilize the bund. The two should be promoted together. Vermi compost is not always an appropriate livelihood opportunity for the rural poor. It is likely to be more successful in locations where large areas are planted to fruits, vegetables, flowers other commercial crops. The Rain water harvesting structures were capital Intensive and need external funding for their adoption through Government programmes and others forms of support.

Major Learning's:

a) The ragi thresher overcomes the crisis of labour shortage during the threshing season.
b) If removed the drudgery of women.
C) If was cheaper than manual threshing.
d) Most small farmers benefited due to its availability in a customs hiring basis.
e) The CHC generates self-employment opportunities and is economically feasible.
f) Manual weedier is not useful in soil with pebbles.
g) The Implements reduce drudgery for women and saves time and energy.
h) The chaff cutter minimizes fodder wastage.
I) Local modification to the chaff cutter handle is needed for comfortable operation and is done locally

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