Chapter - 3B

Programme on Small Ruminants

1. Introduction

1.1 India

Livestock are a vital natural resource of livelihood security for millions of people. India has 199 million cattle, 105 million buffaloes, 71.5 million sheep, 140.5 million goats, 11 million pigs and 649 million poultry (year 2007). Six hundred million rural people rely on livestock related activities for their livelihoods. Livestock not only provide poor people with work, food, income, traction, fertilizer and fuel but also act as catalysts that transform subsistence farming into income-generating enterprises, allowing poor households to join the market economy. Contribution of livestock to agricultural GDP has been rising during last 3 decades (14 percent in 1980-81 to 26 percent in 2010) compared to crop sector, where the annual growth rate for few years during last 3 decades has been negative (35 to 16 percent). Contribution to GDP. The livestock sector over these years has been able to record a steady annual growth of over 4.8 to 6.6 percent. In India 70 to 80 percent of the total livestock produce is contributed by the underprivileged families and livestock are central to their livelihoods and culture.

1.2 Rajasthan

The country occupies 39 million hectares area under arid region of which 32 million hectares is under hot desert and 7 million hectares under cold desert. About 61% hot deserts (20 million hectares) is spread over Rajasthan. The main constraints of the hot arid region are low and erratic rainfall, intense radiations, poor soil fertility and low productivity. Land forms are mostly sandy plains and characterized by dune, inter-dune plains, sandy undulating plains and saline depressions. The vast area of Rajasthan is endowed with number of nutritionally rich and adapted grass species like sawain (lasiurusindicus), anjan and dhaman (Cenchrus species) and multipurpose trees like Prosopis cineraria (khejri) and Acacia nilotica (Babul/kikar). Under these conditions livestock farming becomes a major activity in arid region of Rajasthan. More than 80% rural families keep livestock in Rajasthan. Contribution of animal husbandry sector to the GDP of the state has been estimated to be around 9.16%, much higher than the national figure of 3.92 percent on current price. About 35% of the income to small and marginal farmers comes from dairy and animal husbandry. Planned growth of the sector can prove as a potent tool of sustainable economic and social development of rural households, as the livestock ownership is more equitably distributed than agriculture.

Rajasthan is endowed with some of the finest live-stock breeds of cattle, sheep, goat, camel and horse. Their population (in million) as per livestock census is: cattle- 12.11, buffalo-11.09, sheep – 11.18, goat – 21.50, camel- 0.42 and horse- 0.02 respectively. The state ranks 2nd in sheep and goat population in the country. The animals in this region through natural selection and ecological balance have inherited the capability of maintaining the production even in low plan of nutrition on perennial, hardy and nutritionally rich grasses. Goat has assumed considerable importance as an important livestock species for improving rural income and reducing poverty. The special attributes and value of goats in terms of its ability to make use of low quality roughages and browsing material normally not utilized by other species of ruminant combined with high reproductive efficiency, small size, simple requirement of houses, more resistance to diseases and increase in demand for goat milk and meat over years are favourable points for acceptability of this species by small farmers and agricultural labourers in Rajasthan.

The livestock population trend in Rajasthan during last one decade is changing: buffalo – increasing fast, cattle – almost static, sheep –fluctuating and goat –increasing fast.
Livestock improvement programs associated with large ruminants i.e. cattle and buffalo will be under National Dairy Support Programme, separate programme of World Bank, when it is rolled in the state. Amongst the Small Ruminants (SR) Sheep is migratory & therefore RACP envisions strengthening of the small ruminants mainly goats in order to enhance production, productivity, livelihoods of poor and self-reliance of under privileged sections of the rural society through sustainable development of goatery.

2. **Scope and Dimension of the Project**

The main sources of livelihoods in the arid and semi-arid region of Rajasthan are agro-forestry, agri-horticulture and animal husbandry. The landless and marginal farmers generally rear goats for their livelihoods. The goats in the region are mainly non-descript and different grades of Jakhrana, Sirohi and Marwari. Small flocks, non-descript goats, lack of feed resources, poor productivity, problems of diseases and non-access to market and credit channels are main constraints in goat production in the region. The project is planned to cover RACP Clusters in those districts of Rajasthan (Clusters) which have a significant goat population. It is proposed to organize producer groups of small ruminant women farmers in each Cluster. The selection criteria for SR farmers to become the member of PG would be as follows:-

Farmer should be -

(i) only women farmer

(ii) Preferably though not essentially small or marginal farmer.

(iii) Should possess at least 3 goats.

(iv) Should be willing to participate in the programme.

Three breeds of goats in their native places as per Goat Breeding Policy of the State (viz. Marwari in Osian block of Jodhpur district, Sirohi in Sirohi, Udaipur and Chittorgarh districts and Jakhrana in Alwar district and so on and so forth) depending upon the final selection of clusters will be taken up in the project.

3. **The main breeds of Goat**

3.1 **Jakhrana**

Name of breed is derived from the name of village "Jakhrana". Jakhrana goats in pure form are concentrated mainly in surrounding areas of Jakhrana village in Behror tehsil of Alwar district in Rajasthan state and are known for their high milk production. Presently approx. 10000 goats are available in the home tract. In the home tract average body weight at birth, 3, 6 and 12 months were 2.54±0.11, 12.28±1.50, 16.47±1.89 and 25.30±3.01 kg respectively. The average milk yield and lactation length were 152.87±2.69 kg and 143.0±3.2 days in semi intensive system and 107.39±2.11 kg and 118.0±2.3 days in extensive system of management. The average age at first kidding, kidding interval and twinning rate were 561.24±9.83 days, 287.78±9.89 days, and 1.54±0.16 days in semi-intensive, and 632.35±7.83 days, 332.86±9.34 days and 1.32±0.16 in extensive management system respectively.

3.2 **Marwari**

The breed derived its name after “Marwar” region which is natural habitat of this dual purpose breed known for meat and milk production. The habitat of the breed is one of the most challenging and difficult area for any life as it falls in desert area of the State. The average age at first kidding and kidding interval is 563 and 375 days. Twinning varies from 10 to 13%. Milk yield is 110 kg in a lactation period of 196 days. The small flocks are stationary but the migration of larger flocks is the routine practice during the lean period.
They start migrating in the month of March-April in many directions through their well-established routes and return back to in the month of July. Most goats are kept on extensive farming system and in open fields. Body weight at birth, 3, 6, 9 and 12 months of age were 3.05±0.05, 11.35±0.17, 14.94±0.21 and 23.19±0.18 kg, respectively. The does maintained under extensive, semi-intensive and intensive systems produced a total of 73.5±5.89, 100.5±7.19 and 88.6±2.90 kg of milk, during the first 150 days of lactation.

3.3 Sirohi

The Sirohi breed is native of Sirohi district of Rajasthan state and has derived its name from its home tract and also known for meat and milk production. The live weight in male and female kids averaged 2.96 and 1.51 kg respectively at birth, 9.59 and 9.12 kg at 3 month, 16.74 and 14.81 kg at 6 m, and 23.92 and 22.49 kg at 12 m. The average 90-day milk yield of 73 females, almost all kidding for the first time under extensive conditions, was 48.22 kg. The kidding percentage was 80.5 and the twinning percentage 4.3. In a study the mean of body weight at birth and at 3, 6, 9 and 12 months of age were 2.16±0.05, 10.84±0.23, 15.24±0.28, 18.33±0.40 and 21.74±0.35 kg, respectively.

The goat improvement program will include Productivity enhancement, institution building and marketing linkages development. Under productivity enhancement focus will be on breed improvement, better feeding & management practices, health coverage (preventive as well as curative) and capacity building. For ensuring the sustainability of the intervention community institutions will be build and their linkages with the market will be formed.

As per the need for providing the quality male goats (bucks) to the farmers possibility to establish Sirohi and Marwari goat breeder farms with Veterinary universities/DAH/NGOs/Private partner will be explored. Multiplier herds of these breeds with progressive farmers will be established in local area.

4. Technical Programme

- Identification of prospective farmers and stakeholders in home tract of all above mentioned breeds. Select and register farmers (covering 10% of total goat population or a minimum of 10,000 populations) and preparation of inventory of goats.
- Create Rural Technology Centre for health care of animals @ one for every 8-10 villages. These centers will also act as overall activity coordination centers in the cluster area to monitor the various activities involved in the project.
- Capacity building of farmers to understand scientific practices of breed improvement, animal healthcare esp. vaccination and collective Marketing.
- Advocating through profitable business options Goat rearers not to sell male kids at early stage of life and/or sell genetically superior animals.
- Provide health care facility and disease prophylaxis to all registered goats through emergency animal health network
- Record the performance of multiplier herd goats for lactation, growth and reproduction traits.
- Plan availability of feed and fodder for expected rise in goat population in the cluster normally or to overcome shortage during natural calamities i.e. drought, flood.
- Explore the possibility for establishment of Sirohi and Marwari breeding Farm with Veterinary University/DAH/NGO/Pvt. Partner for for supply of good quality goats and bucks for distribution in the selected cluster area to small farmers/rearers.
- Promote establishment of Open Nucleus Breeding Herds in Cluster area by selection of approx. 50-100 male kids at 3 months of age from goat-centric areas on the basis of
multiple birth, dam’s milk yield, etc. These goats will then be reared up to 9 months to one year of age for utilization as breeding bucks.

- Stall fed Buck rearing units for meat purpose will be promoted in the cluster to enhance production and farmers income.
- Scoping study of value added goat products, transfer of technology for local value addition and partnership with private entrepreneurs for marketing. Organise goat rearers into producer groups, federate at cluster level and form apex level institution for supporting the entire goat value chain Establishment and management of local Small Ruminant haats through community institutions
- Operationalisation of Feed & Fodder bulk procurement and sale on minimize margin to improve the farmer level profitability
- Promotion of Greed fodder cultivation on common and private land.

5. Role of Rajasthan Veterinary University on Goats

The Veterinary University in the State of Rajasthan will be helping the project in the implementation of technical programme viz. training and capacity building of professionals and goat breeders, animal identification, formulation of breed wise health calendar, performance recording, genetic evaluation of goats and their selection.

5.1 Breed Improvement

Majority of goat population in the state are non-descript and poor in milk and meat production. Existing goat farms are not well organized. Indiscriminate breeding is rampant, as a result of which important goat breeds are getting diluted and few breeds such as Jhakhrana are at the verge of extinction. Non availability of superior bucks appears to be the main constraint.

Significant productivity improvement will be achieved hand in hand with a ‘package of practices’ which will include breed Improvement, improved feeding, healthcare & management. Superior bucks of Marwari and Sirohi breeds will be provided through Breeder Farm with the support under the Project to farmers in selected tracts of respective breeds for upgrading indigenous germ plasm of non-descript goats.

Superior bucks in the ratio of 1:15 to 1:20 (male: female) will be provided to producer group members in the project area. The bucks will be provided on 50% cost sharing basis to a PG member who is willing to rear and provide services to other members also (on cost basis) The procurement of bucks and goats for beneficiaries will be done as committee procurement initially by a Committee including local representatives of AHD, PG, NGO and procurement representative as per Bank rules and later on this supply will be made through Breeder Farm after it develops its free supply chain in lieu of backup support from Bank.

It is also proposed to provide 4 pregnant female goats free of cost to widows, handicapped or oppressed in the Cluster for their livelihood, on condition that similar number of goats will be transferred by them in future, free of cost to other similar beneficiaries selected by NGO/DPMU/PG in chain manner. As castration improves quality of meat, improves growth and checks indiscriminate and unwanted breeding, castration of surplus male kids not required for breeding shall be done at appropriate age.

5.2 Feed and Fodder Resources

Goats are mainly reared under extensive system which includes migratory, free range, pasture and control range grazing. Goats are browsers and generally feed on shrubs, twigs and leaves. The common feeds that sustain the goats in arid region of Rajasthan are: Grasses (Dub, Anjana, Saiwan, Kankanwa, Zarga) and Tree leaves, Shrubs, Herbs and
Creepers (Pakad, Bargad, Gular, Peepal, Desi Babool, Jamun, Chhonkara, Ber, Jherberi, Neem, Siras, Karonda, Gheabati, Punarnara, Gokhuru, Subabool etc). The waste land mostly uneven with dense forest having trees, shrubs and bushes, which is unfit for cultivation, neither suitable for fodder production nor for keeping large ruminants like cattle and buffalo can suitably be utilized for feeding of goats. SR largely relies on common property and private pastures which are generally degraded due to poor management and grazing which is largely uncontrolled. Better use of crop residues, fodder banks, feed & mineral supplementation and simple processing are proposed under the project.

Integrating goat farming with agri-silvi-culture, agri-horti-pasture, boundary plantation, wind belts and establishing silvi pasture models with trees and grasses can be established in community wastelands to supplement farm income. Scientific grazing practices like controlled grazing and deferred grazing may increase carrying capacity of the area. There is need for drastic changes to utilize locally available feed and fodder resources efficiently, to reduce wastage of feed and fodder, to improve palatability and feed conversion efficiency, to compute feed ration using locally available feed and fodder resources, to improve feed and fodder availability by developing agri-silvi pasture through introduction of improved variety of fodder seeds, pasture land development and improving waste land in collaboration with Gram Panchayats. Area under cultivated fodder shall be increased. The ideal fodder combination for the project area is hybrid napier grass and Lucerne(legume) that can yield about 100 MT per hectare per year and is enough to raise more than 100 goats. Location specific mineral mixture shall be developed. For that trace mineral mapping in soil, water and plants in the project area is required. Project will support demonstration of fodder cultivation on goat rearers farms for motivating the farmers for adoption of green fodder cultivation practices; this will significantly reduce the cost of production.

Fodder banks (bulk procurement and sale) are proposed to be funded @ one for each RTC area under the project. Establishment of fodder banks(managed by Cluster level institution) with Bank's financial support through a revolving fund, with reasonable storage capacity shall ensure feed and fodder availability especially in scarcity and during natural calamities like severe droughts. The PG/cluster level community institution under the overall supervision & guidance DPM/ AHD will be assisted to construct simple storage structure for storing surplus fodder. The size & capacity of the structure will be worked out for each RTC depending on availability& requirement of fodder by members of PG for their SR. Cluster level institution assessing the requirement of fodder and feed in consultation with members will ensure bulk procurement at minimize cost, ensure proper storage and make available to farmers on cost basis.

5.3 Housing and Management

Goat Management Plan covers goat breeding, goat feeding, disease control, produce and product marketing and proper disposal including farm waste disposal. Salient points are listed below:-

- Proper hygiene of goat habitats (sheds).
- Clean Appliances.
- No overcrowding.
- Leftover feed and fodder including dung disposed off timely.
- Sick animals attended timely and disease control measures like vaccination, deworming and dipping (for ecto-parasites) done as per schedule.
- Kids, pregnant and lactating goats and breeding bucks to be given extra care.
- Males and females kept separately in order to check indiscriminate breeding.
- Cleaning of teats before milking goats.
- Timely disposal of sick and dead animals to check the spread of infection.

It is proposed to provide assistance of 50% of the cost for building sheds/ housing structures and implements like feeding troughs to the beneficiaries. These feeders will be provided @ one for every 15-20 goats. Also similar financial support will be provided to goat rearers for housing structures for goats in order to encourage stall feeding. Providing such basic housing structures and stall feeding will have many advantages like controlled breeding, decreased health risk, energy conservation for meat and milk production, decreased feed waste, overall improved productivity and will also support nutrient recycling/ fertilization of soils.

5.4 Health Coverage

Access to quality health services is crucial to protect livestock against diseases. Animal health services in the State are in public domain and are under-developed. Disadvantaged areas where sheep and goats are main sources of livelihoods hardly have access to facilities under public domain. Identification of disease problems, health status of animals, disease treatment, diagnostic and prophylactic activities, control of ecto- and endo parasites, disease outbreak control measures, disease monitoring and surveillance are important issues to be addressed.

There is a need to improve infrastructures and delivery system and to develop a sustainable disease management program. Strengthening disease surveillance, monitoring and reporting system at all levels and enforcing of preventive and control measures for the diseases prevalent in goats is crucial to bring down the prevalence of disease epidemics. Linkages with University and the Animal Husbandry Department for ensuring timely availability of good quality goats and bucks, low cost vaccines and diagnostic aids that help in protecting animals from disease epidemics will have to be developed, with diversion of adequate financial support from Bank funds, for cross-cutting linkages such as the BP Laboratory, State Disease Diagnostic Laboratory and Nutrition and Soil Analysis Laboratory under the AH Department.

It is also envisaged to organize only need based health and sterility camps periodically through Rural Technology Centre (RTC) in order to cover all health related issues in the project area.

Health camps on regular basis will be organized with Department of Animal Husbandry support (Free Medicine Scheme) in project area. Project will supplement the publicity, extension and some essential medicine (not available in schedule medicine under free medicine Scheme).

An emergency animal health network will be created under the project for providing health services to the goat rearers in time of need. Goat rearers will be registered with RTC on payment of a nominal fee; all the data like no. of animal, vaccination status, breeding etc. related to his/her goats will be available with RTC.

In case of need the goat rearers may contact the GP level Community livestock worke, he will provide the first aid/advisory and will contact the RTC for vet. help. The services of vet. doctor/ Livestock supervisor of RTC will be free, while medicine used during emergency will be on cost basis. The medicine will be procured at cluster level institution in bulk and will be available to the PG members on loss no profit basis. RTC on regular basis will generate information regarding vaccination schedule, prevalent seasonal diseases, date and place of health camps, fodder crops and market prices. These information will be shared with community institutions and goat rearers on regular basis through mobile SMS services.
This will ensure the dovetailing with available government resources and fulfilling utmost need of emergency health and advisory services to the poor goat rearers.

5.5 **Processing and Value Addition**

Value addition of livestock produce is another important aspect of income enhancing. To increase the income it is planned to link up farmers with the market for sale of their surplus livestock wealth through local markets/haats and to convert their produce into value added products to fetch more price. Value addition of goat manure and hair in case of fur animals like Marwari in the project can fetch more prices. Scoping will be done to procure, process and local level value addition of goat milk for improving the profitability. Project seeing the potential, may support pilot for goat milk value chain development through community institution or private entrepreneurs partnership. Community institution may explore networking with private partners for live goat/meat, skin or other parts for local or export markets.

5.6 **Marketing**

Marketing is most crucial activity for producers to realize proper cost of their farm produce. Small ruminant markets are rare and existing ones are not properly managed. No standards are laid down for managing the livestock markets. There is need for developing local markets where sale and purchase deals are done timely and farmers get good price of their produce. Establishment of livestock markets managed by Community institutions with sustainability objectives in mind are supported under the project.

Establishing alternate market outlets at the cluster level may fetch more return and least wastage of the produce and value added products. The approach has triple advantages: 1) farmers have easy access to the market and distress sale is avoided, 2) farmers will get better return for their produce and 3) consumer will be able to get better quality produce at reasonable prices because of minimization of middle channels. Village Panchayat or Govt. may earmark a plot of land for using as sale outlet/haat where producers can sell their produce directly to the consumer/businessman/industrialist. Agri-mart is a new concept that would facilitate forward linkages of farmers and market organizations for creating competitive, open and balanced supply chain. Agri-mart located in rural areas preferably at cluster level shall be managed by PG or producer organizations where middlemen would play the role of facilitator rather than exploiter as he is knowledgeable about the market and marketing modalities.

Thus SR alternate markets will be established one in each cluster at suitable places which will be selected on predefined criteria. The panchayat/community land or govt land will be obtained for the purpose. The infrastructure like compound wall, constructed sheds, shed flooring, loading and unloading platforms, drinking water facility for SR & human beings, electricity provision, gents and ladies toilets, waste disposal arrangements, etc. will be developed. The equipment like weigh bridge to weigh the SR so that it could be sold on weight basis and milk measuring machine for testing the milk yield of milch SR so that these SR can be sold on capacity to give milk, will be provided. It is proposed to provide 100% grant for developing these markets under the project. The management of SR will be vested with cluster level community institution of SR farmers. These SR markets can also be used for organizing health checkup camps, & general body meetings of PG or Producer Company. This activity will be implemented by DPM/AHD with the help of NGO.

5.7 **Establishment of Commercial Goat Farms**

There is a common belief that rearing goats in large number is not possible. The situation has now changed. The rich and progressive farmers have started taking interest in commercial goat farming. There are now commercial goat farms in the country mostly
maintained on semi-intensive system (both grazing and stall feeding). In this system supplementary feed (fodder and concentrates) is provided under stall feeding conditions. Scientific approach of breeding, feeding, management and disease control is strictly followed in this system to make it economically viable. Traditional system of rearing goats by marginal and landless farmers is mainly extensive and based on zero input with little supplementation by kitchen waste. The sources of income are mostly through sale of milk, surplus and culled animals and kids at slaughter age. As goats are reared mainly on zero input system by family members like children and women, whatever income generated through sale of milk, surplus and culled animals and kids at slaughter age including manure becomes the net income of the farmer.

Under commercial goat farming where investment towards infrastructure, feeding, labor charges, health coverage is involved, the economic return per goat is almost same as additional expenditure incurred towards establishment of commercial goat farming is neutralized by enhanced income through sale of milk, animal, meat, skin, manure etc. The net income, however in absolute terms will be much higher. Two large indigenous goat farms for identified breeds (Marwari and Sirohi) are proposed to establish with Vet. university/NGO/DAH/Private partner. The main aim to establish these large commercial goat farms is to provide superior /proven bucks to the farmers covered under the project. Alternatively, two small commercial goat farms within each RTC area under the project are planned to be established with locally continued sustenance of this activity in mind.

5.8 Facilitating Factors

5.8.1 Microcredit

Microfinance will be promoted. Members of SHG/PG can save and contribute to a common fund from which small loans may be given to needy members as per decision of the group executive. Increasing microcredit to villagers will help eliminate money lenders in phases. Small, landless and marginal farmers preferably women associated with the goatary will be given priority for credit. There is a need to set up credit cooperatives at village level. Self-help group-bank linkage system, suited to Indian rural sector may be developed as a supplementary mechanism for bringing the rural poor into formal banking system, thereby improving bank’s outreach and the credit flow to the poor in an effective and sustainable manner.

5.8.2 Empowering Women

Forty per cent of the total rural work forces in the country are women and they are mainly attached to agriculture and allied activities. To exploit their full potential, the women should be empowered through 1) making them economically self-sufficient, 2) improving their social status, 3) educating and training them to become self-reliant, 4) increasing their awareness and knowledge relating to skills in advanced rural based technologies, 5) increasing their participation in decision making and farm management and 6) creating proper entrepreneurial opportunities for them in the AH sector.

5.8.3 Sustainability Fund

New innovative concept to have continuation of project activities even after the project gets completed. The experience so far indicates that in almost all projects, the project activities stop after end of project. SF created by the contribution of the beneficiaries will allow financial support for continued technological back stopping. The farmer share for buck purchase, vaccine service charges, balance of revolving fund at the end of project will contribute as sustainability fund. This fund will be at the disposal of producer organization or farmer's groups.
5.8.4 Cross-cutting activities

In addition to PIU and District Level Committee under cross cutting, services from University for training will also be provided. Breeder farm establish under project would be the key source for supply of improved bucks to farmer beneficiaries in the Cluster. A provision for 50% of Bucks cost as farmer’s share to be recovered and deposited in the Sustainability Fund for the Cluster would be inbuilt in the project.

A feasibility study will also be undertaken related to other possible cross-cutting support including enhancing the State’ vaccine development facility, the soil and feed testing laboratory and state disease diagnostics facility, all of which are centrally located in Jaipur.

5.8.5 Regional Technology Centers

**Description** - Each RTC will service about 8-10 villages depending on the Cluster and distribution of the farmers. Thus each RTC will support about 200-250 farmers and about 3000 to 4000 goats. The RTC will be located within an estimated 10-15 km radius of the farmers/beneficiaries it supports. Each RTC will be staffed by a livestock assistant. Further 1 veterinarian will provide advisory and animal health support for each of 4-6 RTCs. The RTC will be managed by the DPM/AHD/ Cluster level community institution and will be the property of AHD/ Community institution after the end of the project. The staff at the RTC will be hired and trained by the DPM/AHD as well as the NGO. The RTC will provide support for other livestock activities and other project activities in the cluster beyond livestock. Activities would include:

- Advisory support provided to farmers by RTC staff.
- Animal health services, like AI and castration in Cattle and Buffalo.
- Emergencies that cannot be supported during the camps. Each RTC will have its own emergency animal health network. Location of training on all activities for farmers of the Cluster. The fact that RTC will be located locally is important to support knowledge empowerment of women farmers who cannot travel and stay away from home.
- Organization support for farmer exposure visits.
- Farmer selection and buck distribution.
- Concentrate and mineral mixture distribution.
- Fodder minikit distribution and fodder banking.
- Market information availability to farmers.
- Mobile feed block equipment made available for use.
- Chaffing machines and mangers made available for use.
- Storehouse for camp medicines and vaccines.
- Central meeting place for producer organization.

5.8.6 Capacity Building, HRD and Technology Delivery System

Capacity building, human resource development and an effective technology delivery system are key points for long term sustainability. Salient areas and action points are given below:-

5.8.6.1 Capacity Building

- Supply of superior germ plasm in project area for breed improvement.
• Developing a mechanism to link farmers with credit and insurance agencies.
• Linking farmers with market.
• Equipping project area with feed pelleting/chaffing machines.
• Establishment of rural haats.
• Formation of farmers interest groups or self-help groups (SHGs), women self-help groups and animal breeders groups.
• Establishment of Rural Technology Centers (RTCs).
• Establishment of goat farms (commercial goat farms) and goat nucleus farms.
• Capacity building of the goat rearers in Goat management practices
• Training of the community livestock worker in commercial goat rearing
• Capacity development of the DAH staff for Goat farming economics and value addition
• Capacity Building of DPMU and NGO staff

5.8.6.2 Human Resource Development

• Organizing training for field veterinarians, paravets, goat farmers including women farmers and youths in various aspects of goat husbandry and goat health.
• Short term practical courses on various aspects of goat production including entrepreneurship development by Partner agency.
• Organizing demonstrations to a group of farmers at village/cluster level on hygienic milk production, feed pelleting machine, feed processing, rearing of kids, basic knowledge about health, milk processing and value addition.
• Organizing awareness and motivation camps on goat production.
• Organizing exposure visits of village level workers and other stake holders involved in goat rearing.
• Organizing exhibitions on different aspects of goat production.
• Various interventions for improving extension, information & HR under the sub component of SR Livestock strengthening & Management.

5.8.6.3 Technology Delivery System

Dissemination of technologies will be done through DPMU/AHD/NGO managed RTC in project area under the supervision of AHD staff at cluster level. AHD/NGO shall provide one Veterinarian for every 4-6 RTCs, one Livestock assistant for conducting animal husbandry activities at each RTC and one centre assistant with computer knowledge for collecting and disseminating information of all kinds relating to the project including market information through touch screens.
6. **Issues, Interventions and Expected Impact**

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<tr>
<th>Issues</th>
<th>Interventions</th>
<th>Expected Impact</th>
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<tbody>
<tr>
<td>Infrastructure development</td>
<td>Establishment of one Regional Technology Center (RTC) for every 8-10 villages in the Cluster as center of activity for goat development and other animal healthcare, people's capacity building and producer group activities.</td>
<td>Fast and progressive rural development with special focus on goat-centric animal husbandry activities aimed at increasing profitability.</td>
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<tr>
<td>Villages in the cluster area do not have a common place to undertake rural development and training activities to improve livelihood of the farmers.</td>
<td>RTC with minor addition could serve the purpose of storing fodder and fodder seeds in addition to medicines and vaccines. The facility can be shared for other storage needs like cereal and horticultural crops also.</td>
<td>Safe storage and easy availability at appropriate time and reasonable cost.</td>
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<tr>
<td>No suitable place for storing medicines, vaccines, fodder and fodder seeds, etc.</td>
<td>Establishment of &quot;Haats&quot; and farm outlets.</td>
<td>Will facilitate the sale of their produce at reasonable price and increase profits.</td>
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<td>Farmers lack access to market and market information.</td>
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<tr>
<td>Knowledge empowerment of all stakeholders</td>
<td>Organizing training of veterinary officers, paravets, village level workers, goat keepers and other stakeholders on different aspects of goat rearing, goat management, goat feeding, processing and value addition, art of marketing and linking with credit agencies.</td>
<td>Knowledge empowered in goatery will help in improving goat productivity and marketing leading to improved profit margins of farmers.</td>
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<tr>
<td>Animal rearers do not have scientific knowledge of goat rearing, goat management, goat breeding, goat diseases, processing and value addition of goat products and market information.</td>
<td>Organizing awareness and motivation camps to promote goat rearing.</td>
<td>Will create interest in large number of marginal and landless farmers to take up goatery as primary or subsidiary sources of income.</td>
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<tr>
<th>Organizing demonstration for groups of farmers at cluster or village level on hygienic milk production, feed block making or pelleting through machine, fodder production and processing, rearing of kids, practical knowledge about health, milk processing and value addition.</th>
<th>Demonstration develops confidence and imparts practical knowledge on goat production and management.</th>
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<tbody>
<tr>
<td>Organizing exposure visits of village level workers and other stakeholders involved with goat rearing.</td>
<td>Exposure visits to the institutes/organizations working on goats will enrich their knowledge and develop confidence in scientific goatary management.</td>
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<tr>
<td>Organizing exhibitions covering different aspects of goat rearing by displaying pamphlets, posters, leaflets, films etc.</td>
<td>This approach of delivery system will leave long term impact on farmer's memory.</td>
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### Local capacity building for Goatary

<p>| Non-availability of superior bucks with goat rearers in the area. | Superior bucks of identified breed in the ratio of one male to 15-20 females will be provided to interested goat rearers. | 20-30 percent improvement in milk and meat production envisaged. |
| Widows or disadvantaged women and handicapped persons in the project area who have no source of secured livelihood. | Four pregnant females goats will be provided free of cost to each beneficiary. | Secure livelihood will be ensured. |
| Wastage of surplus feed and fodder resources for want of processing and storage facilities. | Providing chaffing machine, feed pelleting machine on nominal rent at cluster level will bring down wastage, enrich and improve palatability of locally available feed and fodder resources. | Computing complete and enriched feed pellets using locally available feed and fodder resources will be a cost-effective strategy to overcome feed scarcity and mineral deficiency. |
| Lack of access to market to sell surplus goats and kids at slaughter age and their produce. | Establishment of one rural haat (animal market) in cluster area and entrustment of its day to day management to local producer organization. | Goat keepers will get reasonable price of surplus and culled goats including kids. |</p>
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<tr>
<th>Programme on Small Ruminants</th>
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<tr>
<td><strong>Formation of PG /animal breeder group</strong> (that would mature into producer group) at cluster level with few representatives from each village. The association will develop linkages with market to sell live animals, milk and milk products like Cheese/paneer. The group may also take care of other livestock related activities such as pasture development and fodder bank management.</td>
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<tr>
<td>Sale of livestock, milk and milk products at reasonable prices will be ensured. Also, sufficient fodder availability for expected increase in fodder demand in the cluster can be suitably managed.</td>
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<tr>
<td><strong>Lack of commercial goat farms for buck supply within the cluster.</strong></td>
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<tr>
<td><strong>Establishment of commercial goat breeding farms in each cluster through private participation with the objective of making the cluster self-reliant in buck availability for future.</strong></td>
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<td>Will make the cluster self-reliant in the area and encourage many other farmers/entrepreneurs to take up commercial goat farming.</td>
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<tr>
<td><strong>Housing and management</strong></td>
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<td>Houses used for goats are mostly kaccha, non-hygienic and unsafe.</td>
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<td>Provision of pucca shelters/sheds and proper cleaning of these, use of lime and periodic replacement of soil if floor is kaccha.</td>
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<td>Incidence of diseases including parasite diseases reduced significantly.</td>
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<tr>
<td>Use of appliances and stall feeding practice for goat rearing is minimum or nil. Kaccha mangers for feed and fodder are sometimes used.</td>
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<tr>
<td>Promoting use of hay racks cum feeders for providing feed and fodder. Initially 1 or 2 hay racks may be provided in each village for demonstration purpose.</td>
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<td>Prevents feed contamination, reduces wastage and also cost effective in long run.</td>
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<td>Kids are left loose with mothers resulting in overfeeding that leads to diarrhea and wastage of milk.</td>
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<tr>
<td>Kids till weaning time should be kept separate from the mother.</td>
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<tr>
<td>The practice restricts kids from over feeding, protects from diarrhea and also saves milk.</td>
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<td>Adult males (bucks) accompanying the females during grazing lead to stray mating. The practice is common by farmers having large flocks.</td>
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<tr>
<td>Males should not be allowed to accompany the females during grazing.</td>
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<tr>
<td>Avoids stray mating and also maintains purity of breed.</td>
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<tr>
<td><strong>Goat breed improvement</strong></td>
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113
| No planned breeding programmes for goats. | Formation of FIG/Animal Breeder's Organizations in respective native places. | Control of unwanted breeding and breed improvement through public participation / motivation. |
| Dilution of breeds (Marwari, Sirohi and Jakharna) identified under the project. | Improvements in goat breed in their home tract (Cluster) by selective breeding. Selective breeding by introducing superior bucks of respective breed will be adopted. | Improvement in production performance and control on breed dilution. |
| Population/percentage of non-descript goats is increasing over the years. | Non-descript goats in the cluster area will be upgraded using superior bucks of selected breed. | No further dilution of native breeds and also improvement in performance. |
| Non-availability of superior bucks in the area. | Superior bucks of identified breed in the ratio of one are to 15-20 (male & female) will be provided in each village. | At least 20-30 percent improvement in milk and meat production. |
| Widows, handicapped and oppressed in the project area who have no source of secured livelihood. | Four female goats will be provided free of cost to each family falling in this category. | Ensuring permanent source of livelihood to poorest of poor. |
| Castration of male kids in order to improve quality of meat is not practiced. | Compulsory castration of surplus male kids not required for breeding. | Fattening and Quality of meat is improved. |

**Feed and fodder resources**

| Very less area under fodder crops. | Increasing area under fodder production using improved variety of fodder crops. | Increase in fodder production of superior quality. |
| Underutilization of common property resources for pasture development. | Silvi-pasture development, reclamation of waste land and enriching the pasture/ improved grass variety. | Increase in area of good quality pasture development. |
| Unplanned browsing and lopping of shrubs and fodder trees. | Regularizing browsing and introduction of stall feeding as an alternative. | Increase in bio-mass availability, shrubs and tree damage is also minimized. |
| No processing and value addition of huge bio-mass particularly available during rainy season. | Converting surplus biomass into hay/silage for lean period. Computation of complete feed blocks/ pellets using locally available bio-mass and feed grains using feed block making / pelleting machine. | Improvement in palatability and nutritive value of crop residues like bhusa and surplus green fodder. |
No efforts are made to control normal wastage of feed and fodder. | Chaffing of fodder and lopping’s and introduction of low cost hay racks-cum-feeders. | Significant improvement in feed and fodder wastage.  

Mineral deficiency affecting productivity and reproductive efficiency of animals is major problem in the area. | Mineral mixture supplementation preferably homemade. Mapping of soil, water, plants for mineral status for developing location specific mineral mixture. | Significant improvement in production and reproductively efficiency by supplementation of feed enriched with mineral mixture.  

**Total animal health coverage**

Health coverage is poor and treatment of sick goats using public facility alone is difficult. | Connecting with health care centres (RTC) esp. for emergency health coverage | Improvement in health and reduction in mortality.  

Disease control measures in respect of infectious diseases prevalent in goat area are sparsely adopted. | Developing vaccination schedule for diseases prevalent in the area like PPR, ET and Sheep pox. | Control of disease epidemic, reducing morbidity and mortality. Improvement in overall productivity.  

Prevalence of Parasitic infection, both ecto-parasites and endo-parasites. | Developing schedule for periodic de-worming and dipping for ecto-parasites prevalent in the area. | Significant improvement in growth, productivity and reproductively efficiency of animals.  

Rare provision for veterinary health camp organization in the area. | Periodic health camps to provide better health care facilities in the area. | Periodic health camps provide an opportunity at farmer’s door. Other animals like cattle, buffalo, sheep and camel may also be benefitted.  

**Processing and value addition**

Processing of milk at producer’s level is rare. | Adopting hygienic approach in milking goats like washing of teats cleaning utensils and standard method of milking. | May improve shelf-life of milk.  

Cheese/Paneer from goat milk is delicacy and can be easily prepared by farmers. | Converting milk into paneer may fetch more prices.  

Slaughter of goats at household level is not common in Rajasthan. Nevertheless, technique used in about 10-15 percent cases slaughtered at household level is non-hygienic and unscientific. | Hygienic condition of animal before slaughter, scientific approach of bleeding and deskinning and body cuts under hygienic conditions are crucial. | Scientific approach of animal slaughtering may fetch more prices to the farmers.
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<tr>
<th>Issue</th>
<th>Solution</th>
<th>Outcome</th>
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<tr>
<td>Little or no knowledge of slaughtering age and condition of the kids sold to middlemen or butchers.</td>
<td>Optimum age of slaughter in goat breeds for optimum return to be identified and built into common practice.</td>
<td>More body weight at slaughter age results in more profit.</td>
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<td>Goat dung, a rich source of manure is not fully utilized.</td>
<td>Making compost and vermi-compost using goat dung and feed waste and residues.</td>
<td>Sale of good quality manure may fetch higher prices.</td>
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<tr>
<td>Hairs in Marwari goats are unutilized.</td>
<td>Timely collection and sorting may improve yield and quality of hairs.</td>
<td>Additional income may be earned by sale of hairs.</td>
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Programme on Small Ruminants

PERT CHART FOR LIVESTOCK ACTIVITIES DURING PROJECT PERIOD

(A) Establishment of Regional Technology Center (RTC)
   (i) Building Construction and Equipment purchase
   (ii) Selection of Animal Husbandry Team
   (iii) Procurement of Medicines and vaccines
   (iv) Mineral mixture supplementation

(B) Deployment Manpower (Veterinarian, Livestock Assistant, Center assistant cum computer operator, Contractual staff and labour)
   (i) Training and Exposure visit

(C) Health control activities
   (i) Medicines for General Treatment, Deworming and vaccination for organizing camps with Goshti
   (ii) Purchase and deployment of vehicle for Ambulatory Clinic cum disease surveillance at district level

(D) FIG Formation
   (i) Goat breeders Association Formation
   (ii) Leadership Training
   (iii) Members Training/ Capacity building of Goat

(E) Breed improvement
   a i Identification of farmers for breed improvement
   a ii Training and exposure of farmers
   a iii Procurement of Bucks
   a iv Distribution of Bucks to farmers
   b i Identification of progressive farmers for establishing or strengthening of commercial farms.
   b ii Training and exposure of farmers
   b iii Distribution of Bucks for nucleus herds / commercial herds
   c i Identification of widows and oppressed
   c ii Training and exposure of above beneficiaries.
   c iii Distribution of goats for above beneficiaries.
**Programme on Small Ruminants**

**ACTIVITIES**

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
<th>6th Year</th>
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<tbody>
<tr>
<td>(F) Feed fodder efficiency development and distribution</td>
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<td>i Mini Kit Distribution for fodder development to the farmers-procurement and distribution</td>
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<td>ii Chaff cutter procurement and distribution</td>
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<td>iii Feeding troughs procurement and distribution</td>
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<td>iv Free fodder Tree plantation -procurement/nursery raising and distribution</td>
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<td>v Cultivation of green fodder- Silvi pasture</td>
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<td>vi Mobile fodder block making machine procurement and deployment for hiring basis.</td>
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<td>vii Fodder development, Grazing land development on common lands for three years</td>
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<td>(G) Marketing</td>
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<td>(i) Establishment of Rural Haat</td>
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<td>(ii) Deployment of Community Extension Worker for extension and marketing with FIGs</td>
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<td>(H) Production and productivity Enhancement Promotion</td>
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<td>(v) Establishing Feed and mineral mixture store</td>
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<td>(ii) Stall fed Buck rearing for meat purpose</td>
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<td>(iii) Promotion of Castration/castration kit distribution</td>
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<td>(iv) Promotion of hygienic Housing and disposal systems</td>
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<td>(i) Organization of Goat Exhibitions cum seminars</td>
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<td>(I) Social and financial security</td>
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<td>(i) Establishing Fodder bank</td>
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<td>(ii) Goat Insurance (Aprox 8% premium of maximum cost of Rs 5000)</td>
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<td>(iii) Insurance of goat breeders</td>
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<td>(J) Vehicle on rent for Monitoring at District level</td>
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**PERT CHART FOR LIVESTOCK ACTIVITIES DURING PROJECT PERIOD**