ROSS INSTITUTE UNIT OF
OCCUPATIONAL HEALTH
St. John's Medical College
BANGALORE-560034.

RF_DEV_1.1_SUDHA

17/12

Returned to Dr R.H.
Ramjee 1/7/80

To
DRHSTP

For record in my office
Ra[illegible] 30/7/80

Dear Sir,

This report may be minuted to the Dean/Fr Percy. We have only one copy and therefore it should be returned to the Directorate after perusal by them.

Thanks
Ran.

Gop
Pl could minute up
for sheet to Dean & AO
[illegible] 19/7/80

OUTLINE FOR THE MODEL SCHEME

1. Description of the Projects.
2. Analysis
   - i. Economic viability
   - ii. Self reliance
   - iii. Organisational, financial and political assistance received from outside.
   - iv. Coordination with the existing government infra~~structure~~ structure.
   - v. Spillover into other activities .
   - vi. Whether it was sustained.
3. Conclusion: The technical tasks and organisational tasks if this activity has to become an agent of self-reliant sustained rural development, aiming at the weaker sections.
4. Factors to be considered to create a actual project proposal.
5. Model Schemes for different situations.
   - i. The overall perspective.
   - ii. Despection; Economic viability of the scheme i.e profitability analysis of individual participants and group.
   - iii. Financial contribution Budget of the catalyst agency.
   - iv. Time Budget; The phasing and when the catalytic agency walks out.
   - v. Description of the key person who would be able to execute such a project. Linkage with educational institution in the process.
   - vi. The training dimension- how, ~~how~~ where, who?
6. List of voluntary and government and scientific resource agencies with names of persons and description o of facilities with whom to coordinate at national, state and district levels.
7. Literature & details about the technical and ~~other details~~ other data

Preamble

The Directorate of Rural Health Services and Training Programmes (DRHSTP), St. John's Medical College was requested by the Federation of Indian Chambers of Commerce and Industry (FICCI) to write a Model scheme for Dairying which could be circulated to business houses interested in rural development. Requesting a medical institution to undertake a report on Dairying seemed a most unconventional idea in todays world of highly specialised academic compartmentalization. However, it was made clear to us that this request had stemmed from the fact that (a) the college had been involved in an experiment to transplant a health service function to a Dairy Cooperative since 1973 and hence had some experience of Dairy dynamics;(b) it was felt that such a report should be written by non-dairy professionals who could take an overview of the perspectives gained by different dairy schemes in India even though they may be conflicting at times.

As the request was itself unconventional the procedure of developing the scheme was also unconventional. A group of research workers in Bangalore, interested in rural development (ref. acknowledgement) travelled around Bangalore and also visited Anand, Uruli Kanchan and Kishore Bharati. Having developed a general format of analysis they met and discussed with various workers in these projects and attempted to gain an insight into the perspectives gained by these workers. These perspectives helped to outline the dynamics of dairying as an instrument of development and also helped identify factors to be taken into account when this process is repeated in any area. The process of interacting with persons having grass-root level field experience rather than relying on published reports

and documents from projects has been found to be in our experience a much more satisfactory method in understanding development as an onyoung dynamic process. A report was then written on the basis of the notes made at these meetings.

The most important aspect of this report is that we have come to the conclusion that there cannot really be anything like a 'model scheme'. The idea that a model scheme can be written up to be used by anyone in any part of India is a myth. There are model schemes. There are only projects that have succeeded in certain situations under certai. constraints and therefore those factors of the local socio-economic political and cultural realities which were taken into consideration for the decision making processes by the project teams, to achieve the objectives they had set for themselves have been identified. The report is therefore an attempt to highlight those questions which will have to be asked in any area for formulation of a development project by the development catalyst (team) which will thereby increase the possibilities of development taking place through their efforts Development is too dynamic a process to be put down in strictly quantitative terms. Hence any attempt at quantification in this report must also be taken as a guideline and not as the final work. If this report is read with this perspective I am sure, it will be of some assistance to those who are thinking of embarking on a programme of dairying as an instument of change and rural development.

Ravi Narayan
St. John's Medical College

1st March 1979

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- To Dr. Bharat Jhunjhunwala, Hon. Adviser, Rural Development FICCI for being available all the time for consultation and discussion.
- Finally to my friends and colleagues Mr Shekar Borgaonkar (Indian Institute of Science, Bangalore), Mr Rajadu (Indian Institute of Science, Bangalore), Mr Y. Chandra (Indian Institute of Management for all the help and support in collecting the information for this report.

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INTRODUCTION

The concept of rural development has undergone a major shift in emphasis in the last decade. In the 1950's it was seen as a conglomeration of programmes for increased agricultural production and rural employment through the growth of agriculture, animal husbandry, dairying, forestry and fisheries and infrastructural facilities such as drinking water, roads, schools, hospitals and rural electrification. By the mid 1960s it emerged as a strategy designed to improve the economic and social life of the rural poor in particular and extending the benefits of development to them.

Dairying has always been considered as an important instrument in the development process in India but studies of the benefits of milk cooperatives of the Gujerat pattern to small farmers marginal farmers and landless andthe profiles of social change brought about by dairying has placed it among the best instruments of change that are available today.

The Direct economic benefits of dairying are well known expecially when cross-bred technology is used. The Gujerat experiment of Dairy cooperatives has increased these benefits even further by stabilising the process and controlling of the market. It has been shown that landless and marginal farmers earn as much as 65-70% and small farmers about 25-30% of t their total income in areas where dairy cooperatives have been introduced. The lower half of the social organisation seems to be benefitted by this process and in the last two decades it has been seen that many social groups classed as economically backward have registered marked increase not only in their income but also in their ability to invest

in capital resources. It is this potential for the economic development of the poor through dairying especially when it is a cooperative activity qualified it to be a very important instrument in rural development.

Cooperative dairying has also found to have subtle but important effects on the rm social life of the rural areas. It has been able by its very process of democratic functioning to eliminate the age-old barriers of caste, untouchability and communalism and acted as a great social equalise. By recognising the importance of women in their role of managerosses of dairying in general it has increased their status and their confidence in dealing with business and social life. It has acted as an outpost of rationality within the rural community giving the villagers respect for organisation, technology and efficient functioning. Interestingly enough it was found that in many villages though the panchayats had become an institution for expression of power and status drives of individual the milk cooperatives were kept free of the conflict based on ethnic clearages and allowed to function smoothly as a means of economic development of the whole community.

With increase awareness of correct feeding practices, and regular health check ups and immunization of cattle and the process of controlled Artificial insemination for breeding of better quality cattle it has found to have had an indirect effect on the villagers reactions to health programmes of nutrition, family planning andmedical care.

Finally the villagers have been able through the cooperative endeavour contribute to many other community development activities from the earnings and profits of the dairy

cooperative. One of the Milk Cooperative societies of Gujerat has over the years been able to construct an approach road, lay a water pipeline, donate for flood relief construct water troughs for cattle, plan a library youth cludb, primary school, balwadi, provide benches for public use at the village bus stand, contribute to a TB hospital apart from propoganda and extension work done to increase membership and awareness of the benefits of dairying. There are many such examples which highlight the total effect that dairying can have on the community ability to begin to tackle and solve their own problems

It is these features of dairying that make it stand out as a process worthy of consideration in any planned attempt at social change and development. Four case studies have been presented in this report followed by the identification of technological and organisational tasks that are necessary in use of dairy as a catalysing force in rural development. A process has been described based on the experiences of these projects and the guidelines for a model scheme thereby highlighted.

AMUL (GUJARAT)

The Kaira District Cooperative Milk Producers union Limited, popularly known as AMUL (Meaning 'precious' in Gujarati') was organised at Anand in Gujarat in 1946 with the blessings of the Late Sardar Vallabbbhai Patel. The Anand Union started functioning with a handful of members from two village milk producers cooperative societies and began pasteurising milk for the Bombay Milk Scheme in June 1948. Starting from a collection of 250 litres of milk per day the union gradually developed village societies in practically every village throughout the district and now collects over 450,000 litres of milk from approx 240,000 farmers. The total annual turnover is around 450 million rupees.

The structure of the Anand Milk Cooperatives consists of a two tier system of village Milk producers cooperative Societies at village level and as Distric t cooperative ~~soci~~ milk producers union at district level. The primary village societies are the base-level units shile the district level union is the apex body. This two tiered organisation of milk producers owned and organised solely by themselves is designated as the Anand Pattern.

Primary Cooperative

The milk supply officer or supervisor of the union contact the milk producers of a village who are interesting in forming a cooperative society.Under his guidance each producer becomes a member of the society by paying a membership fees of Rs 5.00 and a

registration fees of Rs.1.00 only. A general body meeting is then held of the members to select managin g committee ~~th~~ representatives by a democratic method. The Committee then selects the employees to perform the day to day work of the society. These include a secretary, a milk collector, fat tester, clerk inseminator, accountant and a helper. The union supervises this society and helps it to run its day to day activity till it comes economically viable in about three to four months.

In every village the surplus milk is collected twice daily - morning and evening. The fat and SNF content of the milk is tested at both tunes and the farmers is paid twide a day accordingly. In some centres a weekly payment is made. The milk is ~~the~~ loaded on a truck (private contractors engaged by the milk unions) and sent to the dairy plant at the union headquarters where it is pasteurised and sold as liquid milk as per local demand. When the distance is quite far to the union headquarters the milk is first taken to a chilling plant and then transported to headquarters.. The surplus milk is converted into an increasing range of milk products. The daily cash payments is the hallmark of the Anand pattern and each and every milk producer received an average of Rs 4-5/- every day from the sale of milk. To many of them especially the marginal farmers, widous and others this forms a very major contribution to their budget.

After the society becomes viable it is recommended for registeration by the union to the State Cooperative department. It then receives constant guidance, support and supervision by the union. There is also a continous and concurrent audit of all the societies on a quarterly basis. The union at the District level is represented by all the registered societies and has a Board of Directors consisting of nineteen members, of Of these, twelve are democratically elected representatives from the village societies and the remaining seven consists of

- a representative of the Funancing institutions,
- a nominee of the district cooperative department
- an expert of the dairy business/organisation
- one representative of the milk marketing federation
- and three from the individual members.

The Board of Directors elects a chairman and a Vice-chairman and frames the general policy of theunion with respect to milk procurement, supply, manufacture of milk products, pricing and pattern of distribution of funds and developmental activities to be undertaken by the surplus funds. It employs a General Manager who is answerable to the Board for the Unions progress. He runs the day to day business of the union and is helped by competent managers, technicians and supportive staff who are employed for the various functions of the union. The Union has three important functions.

i) It develops the marketing facilities for all themilk which its members want to sell.

ii) It sustains the growth of milk cooperatives and initiates new ones and supportively supervises them.

iii) It organises and provides a package of technical inputs to themembers to enhance milk production. This package includes the provision of compounded cattle feed, lucerne seeds,

hybrid napies rootslips, artificial insemination services using seme of high pedigreed or proven siresxxx round the clock emergency visits of the veterinary doctors for treatment of sick animals and various other veterinary services such as x immunization.

These services of feed supply and veterinary facilities are provided through the same system evolved for collection of milk and it has been estimated that the total cost of these programmes amount to about 3 paisa per kilogram of milk. The services are provided on a no profit no loss basis to the farmers in every village.

Many of the unions own and operate their own stud farm and artificial insemination centre with required number of cross bred and pure bred exotic bulls, mobile veterinary clinics, balanced cattle feed factories fodder development programmes and extension services.

The liquid semen collected at the AI centre of the Union is sent to every milk society, daily in suecially designed containers through the milk trucks which collect milk. Frozen semen available from other institutions in the country are also procured and distributed. One of the employees of the village milk society is trained in the techniques of AI and perfomms the insemination on the animals in heat. The follow up of inseminations is done by trained stock men and veterinary officers coming regularly to the village from union headquarters. Various inventives are given formaintaining the efficiency of the AI system. The inseminator is paid Rs.5 - Rs 10 per corss bred calf born out of the animals inseminated by him. The cattle owner is given Rs 4 - Rs 10 per animal which is inseminated at the centre, calf starve subsidy of 25% of total cost, free vaccination, health coverage and advance

from the union. Prizes are also given to the societies covering the maximum animals under the AI programme.

The milk cooperatives (primary village societies) in close collaboration with the union uses substantial part of their savings towards:

- dividends to themilk producers on their share;
- bonus to the milk producers in proportion with the quantity of milk supplied by them during the year;
- cattle development programme in each village;
- organising of extension activities like compaigns, mobile exhibitions film shows, trips of farmers andtheir wives to their union headquarters andother institutions concerned with dairy development;
- publication of a monthly news letter for the farmers;
- Strengthening of the cooperative movement in the district

Reserve funds are also built up by each society to ensure the financial stability of the union and of the milk societies affiliated to it. In addition, funds are also used for organisation of milk cooperative centres ad a host of rural development activities including schools, libraries, adult education programmes, youth clubs, water and sanitation facilities approach roads, electricity and telephone facilities in the villages and health centres.

Finally the cooperatives also provide benefits to the neighbouring urban population through the regular supply of unadulterated good quality milk at reasonable prices throughout the year.

One of the most important features of the Amul pattern is the district level union which is a sort of cooperative of co-operatives. It is this factor which helps milk-producers to be able to control the fluctuations of the market and have

a bargaining strength like a union. This gives the milk producers a greater control of the market forces and hence is a factor providing stability to their functioning.

The Economics of Milk production of the Amul pattern dairy is shown in Table I. Here the estimated cost of production of Milk is the case of Cross bred Jersey cows under dairy farming system is worked out. These are based on certain assumptions and are calculated for a total stock of 10 milch animals, 2 heifers and a few young stock (14).

Table I

The Economics of the Cooperative may be understood by Table II which shows the accounts of one cooperative which may be considered representative.

TABLE II

Milk Cooperative Societies - 1973-76 ~~Bandhni~~

	Bandhni	Vasna
No. of members	1033	527
Share capital	6025	2715
Reserve Fund	74,989	90,647
Milk purchase in litre	6,15,170	3,89,975
Milk purchase in Rs	6,25,677	5,40,135
Net profit	36,092	59,880
Dividents	9%	
Bonus	2.5% =Rs 15,472	5.2% = Rs 26,831

The pattern of gross profit distributions evolved in the Amul pattern was;

i) Deductions made for interest, working expenses, loan losses, depreciations, land assessment, cess and rent, contribution to staff provident fund, gratuity for staff, staff bonus and income tax deductions;

ii) The Net profit thus remaining is distributed as follows:

a) 25% to reserve fund

b) 9% of the value of paid up share capital as devidend to members

c) To educational fund of state cooperative union as required by State Cooperative Societies Act

iii) The remaining money is then distributed

a) upto 80% towards bonus to members in proportion to commodity sold through union.

b) 10% towards charity fund

c) 2% towards dividend equalisation fund

d) 5% towards cooperative propoganda fund

e) 3% for research work in allied industry

The societies also used their funds for contributions towards community development work which included veterinary dispensary, public health centre, Library, educational institutions Approach road repairing, flood relief and adult education programme.

The Bharatiya Agro Industries Foundation, Uruli.
Kanchar (Maharashtra).

The BAIF is the culmination of the rural development work initiated by Sri Manibhai Desai a disciple of Mahatma Gandhi in 1946 at Uruli Kanchar. Starting as a native-cure ashram, then a modern goshala it finally developed into a foundation of research and extension in the fields of agriculture, horticulture, dairy and animal husbandry. It was formally registered in 1967 as a non-profit, non-government voluntary agency under the Bombay Public Trust Act.

The foundation has developed an integrated package of technological facilities which are availed of by the farmers in surrounding areas at a nominal cost.

The basic schemes are:

i) Cross breeding of cattle.

ii) Agricultural and horticultural extension and seed multiplication units.

These are supported further by schemes for (i) irrigation and water management (ii) animal health care and vaccination programme and (iii) the creation of local financial infrastructure for loans etc.

All these activities are supported by vocational training programme as well as technology and research units which consists of a Bull mother farm, Bull station, genetics section, semen free wing laboratory and semen bank, liquid nitrogen plant, Nutrition laboratory, Disease investigation laboratory, Agriculture and Dairy farm, and research units for economic milk production and animal health. The foundation has a well developed infrastructure of technical manpower to extend,

support, follow up and supervise any of the services availed of by the farmers of the areas. This is the sheet anchor of BAIF model of rural development.

The BAIF has received aid for its many projects through various sources:

i) It got land for most of its activities from the Government of Maharashtra and the Zella parishad.

ii) It received aid from foreign donar agencies like Church of Scotland; Chilmark foundation; Milk Marketing Board UK; Community aid Abroad, Australia; Danida Denmark; Oxfam UK; Corso New Zealand; Christian Aid; Commonwealth, Bureau of Dairy Science and Technology, UK; Canadian Hunger Foundation, Canada and Catholic Relief Society (CRS). This aid was mainly used for importing critical technology inputs for their base-unit.

iii) It sought and received loans laid from the government under various schemes such as SFDA, MFAL, DPAP and TADS.

iv) It has also received loans from commercial banks to cover cost of various construction projects.

The cattle development programme of BAIF consists of inseminating the local, indegenous, non descriptious with semen of proven exotic bulls so that the cross-bred progeny produce will produce higher yields of milk.

Artificial Insemination is made possible by the collection of semen from Jersey and Holstein bulls maintained at the centre, the semen from which are collected regularly and stored in plastic straws in liquid nitrogen freezing units in

which potency is maintained for an unlimited period of time. These straws are sent to the various centres in special containers and then used by a group of trained rets who act as the catalysts in the Dairy extension scheme of BAIF. These rets are trained in AI but in addition they provide a regular and comprehensive health care coverage for the milch animals in the area of their work. This care includes immurizations against the important diseases of cattle, care during illness, care during dystocia (difficult calfing) as well as advise/educate of farmers in caring and feeding of the cross-bred milch cows. The rets are Bachelors in ret sciences who are usually given a six-month orientation programme which consists of approximately 2 months each in the research units of the foundation, one of the organised farm units and replacer or reliever duty in one of the centres already in operation. This training is practical and ensures that the ret is given the proper motivation and skill necessary for technology transfer to the farmer. The training has therefore three components - technical, extension work and motivation.
The BAIF cattle development programme works through the creation of a field centre - usually covering 2000 milch cows as a primary unit. Usually this means about 25 villages. The villagers are contacted by BAIF teams which mx hold group discussions, farmers melas and exibitions and also free clinics for diagnox and treatment of ill animals. Farmers interested in improving their milch animals are then contacted and AI and other facilities are provided at a nominal cost.

One of the village level organizations, a cooperative society a business house, a voluntary agency or a government agency

acts as the sponsor of any centre. It has to put up certain basic capital costs and a service charge to the BAIF for its regular technical inputs and supervision. The inputs from the local village organisation or cooperative consists of a certain basic charge to the centre (Rs 1500 per month) plus office and residential facility for doctor and his assistant, usually running costs for the vehicle and basic cost of postage, stationery and telephone (approximately Rs 2,500.00 per year). A certain basic capital investment for furniture, a vehicle for the doctor usually a motor cycle and some miscellaneous items are also got from the centre (approx. Rs.25,000.00). The Foundation provides the services of a trained vet and his assistant, frozen semen and equipment for AI including semen containers, liquid nitrogen containers, basic laboratory equipment for the centre and vaccines and drugs for animal health care (approx. Rs 15,000 - 16,000).

The economics of the village level centre in the BAIF pattern may be summarised as follows (1975 figures)

Capital (furniture, Vehicle & Miscellaneous) Rs 25,000.00

Recurring Costs

Service charges to BAIF @ Rs 1500/month = Rs 18,000.00

Running charges for vehicle, expenditure on postage, telephone stationary & Residential facility for doctor etc. Rs 3,000.00

Rs 21,000.00

On the assumption of a 10 year life for capital items the annual cost works out to Rs.25.000/year.

Since the centres usually charge Rs 24.00 per AI for a centre to be viable a minimum annual coverage of 1050 cows would be required. This is usually possible if the centre caters to about 2000 milch cows.

From the service charges which it gets from each centre the BAIF provides a trained ret, a village level ~~x~~ assistant, frozen semen and equipment for artificial insemination including 3 semen containers, a liquid nitrogen container, basic laboratory equipment for the centre and travelling and miscellaneous costs which usually works out to Rs 15,000 to 18,000/year. (These figures represent 1975 costs). A regular programme of follow up ensures support to all the farmers who are learning the dynamics of cross-bred cow maintenance and attempts have also been made by BAIF to produce sumple instructional aids for the farmers like the 'calender for disease prevention in cattle' and the 'fodder plan' - which are produced in the local language and are attempts to inform and to some estent demystify diary technology so that the farmers may gain confidence in accepting it. Small notes/ handouts on care and feeding of cattle are also made available for reference by the mambers of the centre.

Table I and II outlines the important differences between indigenous and cross-bred cows and the economic of their maintenance based on the experience of BAIF.

Table I

	Non descript cow	Cross bred cow
Weigh at birth(kg)	15 - 18	30 - 35
Growth rate Gm/day	200 - 300	700 - 1000
Age at puberty	3-4 yrs	12 - 15 months
Age at first catring	4-5 yrs	21 - 24 months
Lactation yields(litres)	200 - 400	2000 - 3500
Lactation days	270	340
Dry periods	150 days	90 days
Intercatring periods	30 - 36 months	12 - 14 mnths
Number of Lactations in life time	5 - 6	10 - 12
Aggregate yield in life time(1000 litres)	1 - 2	25 - 35

Table II

ECONOMICS OF MAINTENANCE (in Rupees)

(A) Cost of Maintenance/yr (Lactating & dry period)	Non-descript cow	Cross-bred cow
Green Fodder	345	490
Dry Fodder	315	313
Concentrates	221	597
Other Feeds	237	419
Total	1118	1819
(B) Average Milk Yield in lactation (income)	2347	4362
(C) Net Profit (B - A)	1229	2543

The economics of keeping local and cross bred cows indicate that the net return (about Rs 2,500/-) from a cross bred cow during an intercatring period was about double the return from a local cow.

Tha BAIF has in recent years coordinated its activities with government schemes such as SFPA and MF MFAL in the area of its operations. It has provided the back up services for these schemes and the spearheading and extension teams. It is expected to get much more involved in the government schemes in Integrated Rural Development, the 6th plan in which it will set up various centres all over the country covering approx 2000 cross breds each and will receive a certain subsidy ~~each-and-will-receive-a-certain~~ to run these centres.

The BAIF has had a very comprehensive view of rural development and generation of rural employment. However beyond agricultural activities and animal husbandry and the support services for these there does not seem to have been much headway in tapping the resources of the primary centres or cooperatives for running other developmental activities such as education, health, road building or welfare. Just recently however the farmers have requested the BAIF to organise health programmes for the members of the centre and a plan to have doctors attached to BAIF as under consideration.

The BAIF field centre model has been replicated where the local village level agency has been able to put up the amount through cooperative activity

or get sponsorship through business houses, government schemes or voluntary agencies. However, the dynamics of the technical supervision and inputs is such that it would work more efficiently where there are clusters of centres rather than isolated centres.

The BAIF deals mainly with individual cattle owners and does not see development of co-operative structures or other such organisations as a necessary part of its catalysis of rural development. The concept of provision of marketing facility is also not taken into account since it is expected that the cattle owners will develop these for themselves or use existing available government infrastructures. The BAIF sees it role as a sort of permanent infrastructure of technical expertise that is required to support and supervise cattle breading and development. To the extent that the recurring costs of a centre are not met by the charges for AI by local farmers, the BAIF models will need a sponsoring developing agency to underwrite the running costs. This is one of the reasons why the BAIF has come to a much closer working relationship with government schemes and is beginning to work more and more through the infrastructure produced by these schems.

A very interesting contribution of BAIF has been the research it is undertaking in an important related activity of cattle breading i.e., the development of fodder resources.

1. The first problem it has tackled is the reutilization of agricultural wastes.

Many wastes are easily available in sugarcase growing areas of Maharashtra e.g, sugar cane bagasse, sugarcane tops and sugarcane areas. These have been used by the local cattle owners as fodder. BAIF has carried out experiments on alkali treatment and steam treatment of these wastes to increase the dry matter digestibility. These cannot be done at domestic level by individual farmers but a small plant can be developed at village level which can then produce processed sugarcane waste as cattle feed at approximate cost of Rs 135 per tone (steam treatment) and Rs 150 per ton (Alkali Treatment.) However at present these cannot be used as substitute for cattle feed (approx cost Rs 1100 pe r ton) during the lactating period of the milch animal but can be used to tide overthe dry or drought periods.

Work is also going on into the nutritive value of role (Egyption Miller) and Barbada seed which are used in that area as food by people during the drought season other wastes being studies are tamarind seed warai bran, kasid seed, and Babul seed.

2. Study on Koo Babul Leucaena Leucocephala Koo Babul is a versatile shrub which can easily withstand the vegours of heat and drought and grows well on rocky soils, sleep slops and increased water salinity. It can be used as fodder or as a perennial legune. The tree can be used to obtain

timber for poles and posts and also as fuel. The fodder has high nutritive value being very rich in protein, energy and minerals. (20-25% crude protein) It is also used as a renewable source of green masure. Koobabul trees can be used as wind breakers around the farm lands and provision of shade.

Some spacious produce gum or their trunks which can be used in various industrees - dyes, paper, pulp veruk yeast, alcohol. It also has medicinal properties - for stomach diseases contraception, ans as a abort facient. The economics of Koobabul have been worked out for various uses in BAIF experimental farms

i) For Fodder - Koobabul can be ~~used at Rs 1,100.00~~ produced at a xost of Rs 3.96 per quintal

ii) As green masure - Kochabul can be used at Rs 1,100.0 per hectare (25 tonnes)

iii) As wood it can be produced at Rs 26.32 per tonne of wood.

iv) For seed production it can be produced at Rs 2.86 per Kilogram of seed

3. Studies on Milk replacers A misture of lucenne juice, skin milk, soyabean and tallow has been formulated to produce a milk replacer for feeding of calres. For 90 days feeding cost it was found that whole milk fed to cattle costs Rs 1,142.76 and the animal shows a weight gain of 516 gms perday, whereas the milk replacer costs only Rs 462.25 and the average weight gain was only slightly reduced to 493 grms per day. This product is being further researched since its use could make some impact on the economics of dairying.

This type of research is very meaningful when dairying is being promoted for marginal farmers and landless labourers since marginal lands can be used for fodder generation or reutilisation of available wastes which would greatly reduce maintenance costs.

KISHORE BHARATI (MADHYA PRADESH)

A group of individuals with divorse professional background including field level experience in rural education and development, gathered together in 1970 to evaluate the stratogies for rural development adopted until then and to explore alternatives. The members of this Working Group undertook several field strips to study the work done by Gandhian and non-Gandhian agencies in rural areas. As the ideas became clear, efforts started for financial resources, land and volunteers.

The Madhya Pradesh Government gave 150 acres of land to Kishore Bharati to organize its activities in May 197% in Hoshangabad District. ~~of Madhya Pradesh, allowed~~. The purpose of the Association was to experiment in rural education and to start, promote and assist educational institutions with a view to cultivate free thinking, and an innovative and enterprising spirit among the children of Indian villages.

Whatever is done at Kishore Bharati is guided by the principle that the relationships it builds up with the surrounding population be totally free of any touch of charity, patronage or dependence. Its performance must encourage local initiative and promote grass-roots organisation. The clearest indication of success will be the speed with which the villagers assume responsibility for their own development and thus, render the services of institution superfluous in course of time.

The various activities undertaken by Kishore Bharati are as follows. The ring well system for irrigation was introduced. This technology was found suitable for sandy soil of the area. Under the agricultural extension programme high yealding varieties

were introduced and experiments on composting and pasture were carried out. Science teaching programmes were undertaken to introduce qualitative changes in the formal education system within the constraint of Government administration. Under this programme the discovery approach to learning of science was introduced in 16 schools. A non-formal education programme was carried out with a group of 8 boys. Literacy classes for landless labour were conducted. Studies have been conducted on health services available and special exibitions have been held to make the villagers aware of the link between poverty and malnutrition and health problems.

The cattle development programme is one of the activities of Kishore Bharati. They had the benefit of the experience of Friends Rural Centre, Rasulia, which had been working in the field of cattle improvement for a some time. The Friends Rural Centre had attempted to introduce artificial insemination in the area. They had faced two major problems. The storage of frozen semen was made difficult because liquid nitrogen had to be brought from Bombay every week. This increased the administrative problems and costs. Many inseminations failed because of spoilt semen. The second problem was that a qualified doctor who could properly service the cows was not available. Artificial insemination is a fairly complicated technology. The cow must be in heat, servicing has to be done at the proper place and the equipment has to be handled hygeinically. The cross-bred technology requires regular medical follow-up and vaccinations, whthout which the cattle tend to be very suseptible to diseases. At Kishore Bharati it was therefore decided that instead of the artificial insemination, they would start by keeping cross-bred bull.

A cross-bred bull and a cross bred cow were brought. This dairy evoked considerable interest among the people in the area.

Groups of farmers used to come and watch the cow giving 16 to 18 litres of milk every day. Gradually, people began to bring their cows to the Kishore Bharati for servicing. In the first year, 76 successful impregnations were carried out. The maintenance expenses of the bull worked out to abour Rs 4,000.00 per annum.

It was found, however, that most of the cows serviced belonged to the better-off sections of the village. This was partly because the small cows belonging to the weaker sections were scared of the big bull. Gradually, more of the weaker sections began to bring their cows for servicing.

A group of landless and small farmers were excited by the idea of purchasing cross-bred cattle. They had discussions for months with the members of Kishore Bharati to understand how feasible the proposition was. While these discussions were going on, Kishore Bharati was also involved in designing the selection procedures for the staff of the Regional Rural Bank of the area. The Chairman of the Bank was visiting Kishore Bharati frequently. He was impressed by this highly motivated group of farmers. The Chairman took personal interest and had these people financed under the group guarantee scheme. This group consists of 5 landless and 3 marginal farmers. ~~This group~~ The marginal farmers were financed through their wives and sons who were "landless". The farmers went to Karnal and with the assistance of the National Dairy Research Institute there, they purchased cross-bred cows and brought them to Hoshangabad.

Initially, the farmers were very confident that selling of the milk would not be difficult. However, the cows began to give 16 to 20 litres milk every day and they simply were not

able to sell it. Through the contacts provided by Kishore Bharati to a hotel at Itarsi, they were able to sell about 30 to 40 litres milk per day at Rs 2.00 per litre. While undoubtedly there is a bigger market at Itarsi and Jabalpur, each about 100 km away, they were not able to develop a regular clientle of milk purchasers. The approach of Kishore Bharati was to generate leadership and confidence among them hence they did not take direct responsibility of helping sell themilk. They mainly held discussions and suggested ideas but left it to the farmers to execute them. These illiterate farmers had a great deal of difficulty in recovering money for the milk that they had supplied. Unable to sell milk, they tried to convert milk into khoa. But they were able to sell khoa for only Rs 5.00 per kg, well below the cost ! They ran into heavy losses.

Confronted with this problem of selling milk, the farmers started reducing the feed of the cows so that the milk production was also reduced. The situation as it changed in the second year is given below:

Item	1st Year	2nd year
Straw	Rs 4.00	Rs 2.00
Green Fodder	Rs 5.00	Rs nil
Feed Concentrate	Rs 2.00	nil
Total expenses	Rs11.00	Rs 2.00
Average Income:		
Milk	16 ltrs. @ Rs 1.50 = Rs 24.00	4 ltrs @ Rs 1.70 = Rs 6.80
Net Income	Rs 13.00	Rs.4.80

It can be seen that by starving the cows the farmers brought the production of milk down to about 4 to 5 litres per day and their incomes fell from Rs 13.00 to Rs 5.00 per day. Thus, the farmers today are barely able to meet theinterest and insurance burden of Rs 750.00 per year against the loan of Rs 4,000.00. The income of about Rs 2,000.00 from the heifer would be an additional income for the farmers. It was impossible for the farmers to sell milk in the villages because most of the villagers who were in a position to purchase milk had their own cattle.

The approach of Kishore Bharati has succeeded considerably in inculcating a sense of self-reliance among this group. One example was that they offered a sathyagragha at the railway station because the Station Master was hassassing them in issuing a vendor's pass. Yet their problem of milk disposal remains unsolved.

The farmers' suggestion is: (1) The milk collection van from the government dairy at Hoshangabad should be brought to the area for collecting the milk; (2) The farmers should be given further loans for purchasing a buffalloe. This would allow them to earn from the buffalloe to feed the cow in the dry periods; and (3) A moratorium on interest payments.

It appears viable for landless labourers and small farmers to maintain cross-bred cows, provided a market is available for the milk. It is, however, doubtful whether purchase of high-bred cows would be the correct strategy because this leads to a heavy debt burden. It may be better to improve the local cows by cross-breeding and this burden could be avoided.

It appears that despite the group of farmers having taken considerable initiative in trying to sell milk, they have not been able to become self-reliant in it. The time is perhaps too short to assess their ultimate self-reliance, That, Kishore Bharati is not willing to take the responsibility of selling milk could surely unleash their ~~rec~~ creativity and give them confidence should they be successful. However, it is also possible that continuous failures may "crush" their enthusiasm. It may be a better strategy that the catalysing agency should take greater responsibility in marketing the milk initially and make very concious attempts to devolve the leadership to the villagers in due time. This is an experimentation that has to be carried out.

The demonstration dairy at Kishore Bharati developed the motivation among the farmers. The financing was done by the Regional Rural Bank under a group guarantee scheme. The Kishore Bharati contacts with a hotel in Itarsi was instrumental in selling whatever milk they are able to sell. A government artificial insemination centre has been opened at Bankhedi some 6 km away. This has now become very popular. A veterinary doctor is also available at Bankhedi.

The government structure provides sufficient facilities for artificial insemination. However, it is some times necessary to pressurise the doctor to take his job seriously. Raising this conciousness among the villagers to prossurise the doctor should be a significant roll of the catalysing agencies.

The experiments at Kishore Bharati has proven that Ku Babul, a hardy fodder crop introduced by the B.A.I.F. can be grown with virtually no water. However, its results are also not very good if not irrigated. There are other groups of grasses which may be more suitable for an area. It was found that most small farmers own very little uncultivated land which could be used for such fodder. Therefore, the usefulness of these crops for small farmers is yet to be established.

Some of the other technological areas which require attention are: technology for storing semen in coconut water or other rurally available media; and low cost chilling techniques to enable distant transportation of milk at low cost.

The training of local youth in veterinary practices relating to cross breeding cows and executing artificial insemination is another component of a successful dairy project.

CONCLUSIONS:

Technological Issues:

1. Feed.

Milk production is a feasible proposition only if sufficient feed is available in the village without causing diversions of productive land which could be utilised for growing foodgrains. The availability of agricultursl wastes like straw, malberry stalks etc. haveto be assessed. Moreover, research of useing agricultural wastes like begasse as feed may bave to be undertaken because they may not be readily useful as feed. A large number of crops are now available from our research institutions which could grow on rocky, sandy and other types of unused lands and under saline water irrigation. It is necessary to bring these various crops into the areas and assess if any of them could be successfully on any marginal land and that catle availability.

It has been shown that grain fodder may not be absolutely necessary for obtaining a high yield of milk provide sufficient amount of straw and other feed consentrates are provided. This is to be kept in mind because green fodder has typically to be grown on irrigated land which could be otherwise used for foodgrain cultivation.

It is very necessary to prevent a shift of cultiviable land from foodgrains to fodder crops because the food made available per acre of foodgrain is about 10 times compared to the foodgrain made available for human consumption through fodder and dairy combination.

2. Cross- breeding-

It is an universal conclusion that it is better to up breed the native cows instead of importing cross-bred cows from other areas. This has various advantages.

(i) The native cows have ~~large~~ much greater resistance to the diseases prevelent in that area. Hence their projing also have a greater disease resistance.

(ii) The cows born in the village itself are more accustomed to the cultural practices of maintaining cows prevalent in the area. It has been found that when cross-bred cows from another area have been brought into the village, their habits of feeding washing calving are quiet different and the villagers find it difficult to adjust to these cultural practices.

(iii) The cost of up-breeding the native cow is only about Rs 25.00 per insemination. If 100 per cent exortic semen is used, in two years, 75 % exortic cows can be produced at a very niminal cost. As shown by the experience at Kishore Bharati, the interest burden comes to about Rs.750.00 per cow and is an unnecessary burden on the farmers.

(iv) Some times the cow is considered sacred in the villages and there is an unwillingness to service them by artificial insemination. In such situations, demonstrations of the high yealds of milk that could be obtained from cross-bred technology reduces the resistance significantly and it may be adviseable to bring a cross-bred Bull into the area initially enable the villagers began to understand the technological motivations of cross-breeding.

(v) It has been established that the percentage of exortic land in the cattle should be increased beyond 60 or 75 per cent. Beyond this, ~~their respon~~ they are responsible to diseases and their needs of medical care and vaccinations are very high.

(vi) Within the exortic blood there are various types like denish, gersey holstein. It has been found that some of them are suitable for an area and ~~thi~~ others are not. Sufficient experimentation has to be done to determine which type would be most suitable for particular area.

The government veterinary services and artificial insemination structure seems to be as ~~efficient~~ effective in terms of technology. The problems of government beurocracy often make their functioning inefficient. Under such circumstances, a pressure group approach which would force the esisting structure to work smoothly may be more appropriate that providing an alternative veterinary structure ~~to work~~ through the capitalising agencies.

It may be that artificial insemination amount to be permenently required. Once the exortic blood in locally available cattle has been raised to 60 to 75 per cent thenseforth it may be acceptedly to develop a bull from the local projeney. The cost of maintenance of a 60 to 75 per cent exortic bull comes to Rs 3000.00 per annum, which is much lower than the infrostructure cost required for an artificial insemination centre. Therefore, one could think in terms of an artificial insemination strategy for the first few years only.

MARKETING:

The entire viability of a dairy scheme depend upon the ability to sell all the milk produced at a rate of not lessthan Rs 1.50 per litre. It has been found that for an individual dairy it helps to have a market within 50 kms and it becomes expensive to cater to a market more than 100 kms away because the transportation times increases more than 4 hours and a chilling plant has to be installed. Selling of the milk requires development of a cliental which would regularly purchase the milk directly and pay the price paid by a sonsumer. The price differencial between supplying milk to the consumer directly and to a government dairy is around 30 paise per litre. The experience of Malur Cooperative indicates that such a cliental could be developed in a city but it requires some business acumen.

It is not practical to them in terms of selling milk within the village because almost every home in the village has a cow and produces sufficient milk for its own consumption. The milk has to be necessarily sold in the urban areas. It has been experience of the Amul co-operative that because there are a large number of widely spread out milk producers and a fewer major milk consumers in any city in the bargaining price, the price tend to be determins more by the purchasers rather than the milk producers. The solution proposed is that various milk supplying cooperatives in the area should be installed so that they could

set and obtain a price collectively for their milk produced.

The experiments of Amul co-operative whereby the milk products ~~projects~~ produced in a couple of districts are virtually meeting the needs of the whole country is very significant. It implies that as this stand presently there may not be sufficient market for selling milk products ~~projects~~ produced in various areas. It is therefore, wiser to them of only as at milk production as could be sold in that area itself. It would be wise to ascertain whether any other major milk production schemes are likely to be initiated in the area before initiating this work.

Although it may not be possible to sell milk products on a national market, however, if milk processing and preservation techniques are developed, which could be used to convert and retain milk products, then, it could be useful to convert the surplus milk in a serplus seasons and sell those milk products i n a lean season. Most of the milk processing techniques presently in vogue, are highly centralised and capital intensive. Research at decentralised labour intensive milk processing techniques would be very useful.

ORGANISATIONAL ISSUES.

The main crucial organisational consideration that mostly dairy has to be come an activity utilised by the already well off sections of the village. The better off sections have plentiful availability

of agricultural wastes like straw and malburry stalks they have marginal land at their disposal to be able to grow fodder, they are more educated and aware of modern ~~techniques~~ technology and are more easily pursuaded to ~~attach~~ adopt newer techniques, they have a financial strength to both invest in new technology and also to bear any risk that may be involved. Therefore, it is in the industrial process that the first financials of any milk co-operative are the well off sections in the village.

Technologically, it has been shown that greater individual attention to cows can increast their milk yield by up to 2 litres per day. Therefore, should the infrostructure be made available to the landless and marginal farmers, they have an advantage over the better off sections in that they can provid much greater attention to the cattle.

It is therefore, essential that the catalysing agency intervening conciously on behalf of the poor. This implies that the emphasis has to be not on mear expansion of production but on generating a self-reliant economic activity among weakersections even if it takes longer time. A co-operative society can provide the basic structure for undertaking this work. The kind of facilities that it may have to provide could include the following:

1. Arranging for artificial insemination or a cross-bred bull and maintain it.

2. Providing a cash or material encentive per insemination to the farmer to initially encourage them to accept cross-bred technology. This has been found successful in Anand.

3. Agricultural extention facility to providing cities and technology for growing fodder crops in dry and marginal lands.

4. Supplying feed ~~cent~~ concenters regularly.

5. Giving loans during dry periods of the cattle to enable landless and marginal farmers to feed them.

6. Providing loans during periods when straw is plentifully available at cheap price to enable landless and marginal farmers to purchase and stock it for their use throughout the year.

7. Marketing and processing of the milk

It has to be a conc~~i~~ous effort on the part of the capitalising agency to solicit the participation of a large number of weaker sections. While the facility should also be expanded to the better off sections, it has been seen that in any case they are more animable to expecting newer approaches.

The experience of Kishore Bharati is extremely significant in the demonstration of a cross-bred dairy technology motivated a group of landless and marginal farmers to adopt cross-breed technology. This indicates that the weaker sections can be benefited. However, it has also been the experience of Kishore Bharati that unless the weaker sections were separated in organising marketing, they were not able to cope up with the development of a regular urban clients. These, it may be necessary for the capitalising agency to provide this organisational assistance for some time until the leadership from among the weaker section is generated which can handle these tasks.

The other roll of the capitalising agency is to inter-weave the dairying activity with other rural development activities. Most important perhaps is a healthy and nutrition education programme. Some doubts have been expressed whether commercialisation of milk does not increase mal-nutrition among the children of the village. Under the traditional system, the native cows are feed nominal agricultural wastes and produce from small quantity of milk which is consumed within the village. When with the introduction of cross-breed technology, milk becomes the commercial commodity, there may be a tendency of part of the weaker sections to sell the entire milk and deprive their own children of that vital nutrition that they were obtaining from the native cows previously Therefore, a programme for health and nutritional education should be simaltaneously undertaken.

It has been found that the introduction of cross-breed technology also makes the villagers more open towards family planning.

The health programme was effectively appointed with a milk co-operative on Malur and similar process is on way at BAIF and Anand. At Kishore Bharati, various activities like agriculture extention, science education etc are already being simultaneously under-taken.

As a rural development agency, one has to aim at integrated development of the village which may that alongwith starting a dairy activity focused at the weaker sections. Such health education and other economic activities could also be under-taken and a dairy co-operative makes it more convenient to do so.

ECONOMIC CONSIDERATIONS:

A dairy activity appears feasible in a village under if the following factors are suitably met:

MODEL SCHEME

The scheme presented here is only by the way of suggestions and general guidelines to be suitably modified for the local situation. A Cooperative milk society should be initiated in the village. The focus of the society would be to obtain the participation of the landless and marginal farmers in particular. It is essential to form an indipendent cooperative society which alone can make the villagers self-relient and generate a feeling of self-confidence in them. It is strongle advised that mear introduction of cross-bred technology and other such social structure is not adviseable. The mear growth to collection is not rural development.

In the initial phases, the society can undertake demonstration of dry forming for fodder crops and introduction of cross-bred technology. The reason involved can be under written by the agency. In th e initial period some insentives of some Rs 25 per artificial insemination may be introduced for assisting acdeptability. While it is advised that this demonstration may be carried out on the lands and cows of small farmers themselves, however, under certain conditions it may be necessary for the catalysing agency to initially undertake these demonstrations itself.

Once, the milk marketing structure is stipulised, the cooperative society can expand its activities in various ways like provision of feed consentrates provision of loans, milk processing etc. It is assumed that the government structure would

provide the artificial insemination and veterinary facilities. If these are not available, it is suggested that the agency pressurises the government to make this facility available. The basic strategy proposed is to improve the breed of native cows rather than import cross-bred cows into the area.

Along with the expansion in the nature of activity undertaken by the cooperative society the second line of approach would be to multiply such societies in our surrounding villages. It has been found that as the number of milk supplying co-operative societies increases, they find it difficult to maintain prices in the urban markets. Hence, unionization of these cooperative societies would have to be undertaken in due course.

Along with dairy activity, it is necessary to undertake health and educational activities in the village. Details of these activities have not been given as a part of this report. In the initial period these activities could assume the form of welfare to gain acceptability.

Simaltaneously, the technical research wing is also proposed. In the initial periods, the research would be of adoptive type. The two major areas would be, utilising uncultiviable land for fodder crops and introduction of suitable crops for the same and ascertaining the exact type of

exortic breed that would be suitable for the local conditions. These research could be undertaken in colloboration with some scientific institutions.

LOCAL FACTORS TO BE CONSIDERED

1. An area where there is some tradition of cattle breeding and hopefully some marketable surplus of milk is already existing, may be more suitable because the agricultural practice relating to maintenance of cows are already existent. This is important because the beginning of cross-breeding has to be done from the native breed of cattle.

2. Feed should be available either from agricultural waste or from any marginal lands not otherwise utilisable for food crop cultivation.

3. Sufficient water should be available for the cattle.

4. Veterinary services are available at nominat costs. It seems that the government infrastructure may be sufficient to provide this facility and the task of the rural development agency is not to undertake this expenditure itself. This should be done more by coordination with the government structure. Where government cannot proive this veterinary service, then this has to be either financed by the co-operative itself or by the rural development agency.

5. A critical mass of atleast about 50 cows should be possible to be introduced. Mere introduction of a few cross bred milk cattle to 20-25 villagers may be unwise because the marketing training and veterinary services may be difficult to provide.

From the cross breeding point of view, 50 cows is still a small number, however, 50 cows would be the barest minimum to make a marketing activity feasible at about 250 litres per day.

6. A market should be available preferable within 50 miles of the area so that a chilling plant and its expenses are not necessary. Transport facilities should be available.

7. Contact with some training institutions to train some village people into the practice of cross breed cows shouls be available.

INITIATION OF THE PROJECT

The point of initiation would depend upon the local conditions.

a) If cattle breeding is already existing in the area and there is some marketable surplus, perhaps the organisation of a milk marketing cooperative would be the proper starting point. This would immediately give some benefits to the participants and establish credibility.

b) The second approach would be to start with the demonstration of feed production on marginal land and to start along with it, a small cross-breed diary of say 4 to 10 cattle, which serves as a demonstration only. This could have confidence to the villagers in this technology. This demonstration could be done by fully financing some small farmer of the village and subsidising their capital and underwriting their risk. Even this group of small farmers who are part of the demonstration should be formed into a cooperative at this stage itself. Any time taken and delays caused in the process of cooperation should not be considered. Time wasted since this lays the foundation for their self reliance. It should be noted that such a demonstration may not be economically viable and initially because of its small size and may require some assistance. If some of the landless and marginal farmers do not even have native cows to initiate the cross breeding process but are willing to join such an endeavour they should be assisted to obtain small loans to buy native cows and initiate the process of cross-breedin therefrom.

If the agency has no background of developmental activities in the village concerned it could initiate its work by some small welfare activity like repairing of school building health centre and wells. This given the agency a certain ~~xx~~ creditability and helps it in obtaining acceptability.

THE BENEFIT:

The benefit accruing to the cross-bred cattle owners in the project area will vary greatly depending on local conditions particularly with reference to availability of feed and market as has been shown in the four case-studies. However the following may be taken as a reference point for expected benefits to a landless former who already owns a native cow

Expenditure:

1.	Feed - Straw	300	
	Green fodder	400	
	Concentrates	750	
		1,450	
2.	Interest (on 2,000 rupees @ 10%)		200
3.	Depreciation on Rs.2,000 @ 15%		300
			1,950

Income:

1.	Milk Yield - 2000 litres @ 1.65 per litre	3,300.00
2.	Sale of calves	500.00
		3,800.00

Nit income = 18.50

Note:

a) It is assumed that no capital expenditure is actually incurred and cross-bred cow has been developed from AI of native breed.

b) The price of milk varies considerably from 1.20 per litre to Rs 2.10 per litre. We have taken a typical price of Rs 1.65 per litre.

c) For a landless farmer who can provide green fodder from his labour by mulberry stalks, sugar cane tops etc the Rs 400 provided for green fodder would be an additional income.

THE BUDGET:

The budget suggested below is for a project area where the government infrastructure for provision of artificial insemination and veterinary services is easily available.

Where this is not so the rural development agency may try to pressurise the government structure to extend these facilities to their area or it may incur the expenditure of providing a cross-bred bull or AI and veterinary services. Items 1,2 and 4 of the budget below will be required mainly for the first year. However, it is assumed that other developmental activities will be undertaken in subscequent years and hence the total ~~expxxx~~ expenditure per year may remain the same.

The Budget

1. Subsidy or under writing risk for demonstration of fodder crops and cross-breading or the lands & cows already existing with the small farmers	10,000
2. Initial welfare activities and long term Health education programmes	10,000
3. Salaries	
a) Project officer Rs 1,500/month	18,000
b) Two field assistants at Rs 250 per month	6,000
4. Training of staff	5,000
5. Literature, audio visual aids	5,000
Farmers visits and other extension work	
6. Adaptive Research	10,000
7. Travel and contingencies	6,000
	70,000

PHASING

The first six months are suggested to be used for a detailed survey of the area, ascertaining whether dairy would be a feasible proposition and initiation of their welfare activities for giving acceptability.

The next 18 months are suggested to be used for demonstration of the cross-bred technology and expansion work in agriculture and the initiation of a milk marketing cooperative society.

The next 24 months are suggested to be used for horizontal expansion of the cooperative society in activities like organisation of food supply, provisions loan, milk processing ect. The unionisation of cooperative society should also be under taken.

This covers 4 years of the scheme. Next one year may be planned for phasing out of the involvement of the guidelining agency and initiating new projects in other villages.

KEY PERSON

For the purpose of any development work in a area the experience all over the country has shown the need to identify a good catalyst who can initiate the project and work towards self reliance by the local community Experience has also shown that such a person should be about 25-35 years of age, preferably married (more acceptable to villagers) ready to live in the village. It is not necessary that he should be by professional training a vet or Agricultural scientist though this would be an added qualification. He should however have demonstrated professional competence in his own field and have a managerial flow.

Since the project work is not merely the running of a milk cooperative but will need further expansion into other development activities and generation of self-reliance and also an ability to see rural development and processes of social change in a totality, It requires high professional competence and motivation and hence the need to identify such catalysts. A certain freedom to interact actively with local realities and plan, innovate and be creatively involved with the development activity will be a precondition for such a key person to initiate self reliant development process and must be kept in mind while employing such a person.

TRAINING

Technical competence and understanding of Dairy Development methods can be acquired by allowing the key person a certain period of 3-6 months to visit NDDB, BAIK, Kishore Bharati and other agencies to understand key issues and undergo basic training and observe existing projects. This type of non-formal training will be of greater help to prepare the individual for the project development. Ad hoc arrangements are possible with all the above agencies where such training can be obtained.

Wherever courses for village level workers are also available as in BAIF, NDDB and NDRI, the village level assistants may also be sent for training to provide primary facilities for the beneficiaries of the project.

Dairy Project

Case Studies

1. Anand
2. Uruli Kanchan
3. Kishore Bharathi
4. Vishwaneedham
5. Magadi road

Additional

1. Mallur Cooperative.

Points to be considered

1. Description of Project.
2. Analysis i) Economic viability,
   ii) Self Reliance.
   iii) Organisational,
   iv) Financial/Political assistance received from outside
   v) Coordination ~~c~~ existing govt

3. Spillover into other activities

4. Conclusion

Technical and organizational tasks if model is to become self-sustained, self reliant rural development agency.

1. When was it started
2. Initial investment and size
3. What should have been the starting point in terms of investment and size, seen in the light of present knowledge and experience.
4. What was the basis on which the
(i) animal was (were) selected
(i) Cows, buffalos, goats (ii) The particular breed & the animal
5. What was the present state

~~5~~. Inventory
Size
expenditure < direct / indirect

Feed requirements

income
Milk output
6. Technical expertise < Feed / Insemination / Health / Milk process

7. Political assistance
8. Organisational requirements at various stages
(i) Feed
(ii) Marketing
(iii) Health
(iv) Insurance
9. Spill over into other activities due to this
10. Whether sustained
11. Multiplication
12. Gober Gas
13. General opinions about being

~~14. Go~~

Some details of Broad questions

1) Cost (expected in 1979
2) Availability
3) Building requirements
4) Manpower requirement
   a) Technical
   b) Non Technical
5) Breeding facilities
6) Adaptability to climatic conditions and its effect on yield
7) Resistance to diseases -
   Medical cost
   Premature mortality
8) Feed requirement; (incl water)
9) Average yield — Milk
10) Multiplicity - Average over 5 years
11) Average children / delivery
12) Mean period between deliveries
13) Average life span
14) use of male
15) Side products
16) Acceptability of milk fat content
17) waste period
18) Any other information

1. Animals
2: Feed — Land / Fodder Production / Concentrate Production
3. Water
4. Power — For Housing & for water pumping
5. Housing — 1. For Pumphouse
2. For keeping cart & implements of the farm
3. Animals
4. calves
5. Dispensary
6. chaff cutting & Storage of Green fodder for lean season
7. utensils
8. Labour quarters
9.

Farming
1) Land
2) water — Table 8
3) Farm Implement
4) Fertiliser ← Gobar Gas / Manure conservation
5) Seeds
6) Labour
7) Housing area required for Storage
8) Power

Implements for cattle

Table 9

Buckets

Sanitary Milking Pails & Strainers

Wheelbarrows

hose, pipe, Rope, chain, udder cloth, shovel etc

Milk cans for Storage

Medicines

CASE STUDY : MALLUR MILK COOPERATIVE

The Mallur Milk Cooperative was established in 1968 in the village of Mallur in Siddlaghata Taluk, near Devanahalli, Kolar district of Karnataka.
It was set up with the initiative of the Government Dairy, Bangalore and the Kolar District Bank which came forward with loans given initially to 50 members (mostly medium to large landowners) from three villages of Mallur, Muthur and Kachahalli.
Over a few years with availability of more loans the membership increased to 450.
Most of the members own 3-40 acres of the land.
The Cooperative is under the management of 8-10 directors mostly the large landowners and 1 full time clerk and 7 part time workers All these workers are paid.
The cooperative runs a milk collection centre ~~from~~ where the milk is collected every day after each sample is tested by a lactometer. The milk is then pooled into containers and transported to Bangalore where it is sold to Bangalore Dairy or private parties (over the years there has been a shift from one to the other).
The cooperative retains 5-10p per litre of milk for cooperative administration and transport service.
Additional facilities provided to the members are.

i) Loans for further purchase of cattle
ii) Cattle Feed.
iii) Tractor facilities (the cooperative has purchased a tractor out of its collections)

iv) Taxi facility?
v) Purchase of pumpsets and digging of tube wells

The rest of the money after the deductions is made is deposited in the bank in the name of the individual farmer.
In 1973-74 the average daily output of milk was 3000-4000 litres in the peak season

The rules of membership require that some milk is put into common pool every day

Politics - Majority of the cooperative members belong to Congress party (I)

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The

MALLUR - Evaluation

Group I - Social - Political - Cultural

Mallur 40km.
Siddalghata Taluka.
Kolar Dist
P - 2600

No intermarriage

Harijans — Adi karnataka / Adi Dravida] 150 — not yet integrated (Telugu speaking)

3 Brahmin Families

Vokkaligas, Kusuvas.

Feast - End of Jan
(Dhanur masa)
everyone participates

Harijans - have access to — shops, hotels, place of worship, cannot initiate puja

Status better than other harijans in neighbouring village

Economic

Land distribution — 30 acres - 1
3-6 acres

600 members.

3 Harijans

1 Harijan has some business (Shop)
previously working in Consumers Coop
also working in P.O.

attempted adult education - discouraged & response

Labour

Sufficient work during season
- Out of season - coolie work in neighbouring villages
- Wages 3-4 Rs/day & food
& food - unduly long hrs of w.r.

- Std of life slightly ↑
- Panchayat has electrified Harijan colony and given a common well.
- Better health facilities (since last yr)

Mania catalyst in Harijan welfar

Occupation
- Dairy alone not profitable / cost of fodder & feed
  Good insemination centre.

Politically
Panchayat - not functioning.
Majority (Congress R.)
Few for Communists

Panchayat income poor - only House tax.
One member from Harijan colony
6 members from village specially for harijan problems

Summary
1. Economically better off.
2. Social - no apparent conflict
3. Culturally - common access to everyone facilities
4. Politically - ↓ (No panchayat)

Group-II Health Coop

- 600 families - 3 villages
- Membership pattern
- Services free
- Medicine - NM charged
- Admn pattern
-

1. Lack of Personnel.
2. Lack of Participation
3. Authoritarian attitude to ~~training~~ take decisions for the benefit of the trainees
4. Reason: May loose area??

4. Lack of education - participation

+ve

1. Incentive to have coun
2. Cooperation ē Govt agencies

~~To~~

Possibilities - In case Coop fails other possibilities exist.

MCH

- Priorities are right ← immunisation
  worm infestation
- Environmental sanitation
  (difference between two groups)

Nutrition — Problem ≈ Harijan
& economic backwardness

Group III

MC - 1965

- 50 members - Mallur, Mathur, Kakhol
- Idea from Bangalore Dairy & local Bani
  Increased membership to 450
- = 9 Directors - 1 F T, 7 P T workers
- = 5p/litre - H·C
  3p/litre - admin
  2p/litre - TPR

rest in bank in member name

Other services

- Supply of feed
- Tractor - Leased to members

- Crisis - High prices of feed

Initiative - from land owners
Ranging 3-40 acres

Cooperative also helps
2 wells + pump-sets

- Give loans 12% interest
- for buying cows

- None of the landless provided by it.
- Free Health Services.

M. Coop - Caste + Class differences not so prominent
- Coop members has almost taken over work of Panchayat

Congress - Coop members
Communist - Landless

M/NM Point to be clarify

- Members & liberal view
- Landless remain unorganised

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Group IV

Peoples Participation

(1) Project of milk producers not of community

(2) Harijans not represented in community project

(3) Increasing conflict in unfairness of Coop idea

(4) Peoples participation in meeting - St. Johns dominated for its term programm

(5) More village volunteer in programme.

Mallur Project

Report on Milk Co-operative

It was started in 1965. It was the first project in that village, in the begning with 50 members from three villages Muthur, Mallur and Kachahalli. They started under the inspiration of Banglore, diary and the Kolar district Bank also came to their assistance; With this loans they helped to increase the number of people in the Milk Co-operative. the number became up to 450. this Cop. is under mangement of 9 directors 4 Per time workers, 1 full time work as clerk: all the workers are Paid. they Collect 5 Rs for per litter of milk, for Health Co-operative and 3 Rs for milk Co-operative administration. and 2 Rs for transport service, and rest of the money from daily saving is deposited in the Bank. also supplying feed to the members. they have purchased a tractor out of this profit for agricultural purpose. the preference given to milk Co-operative members. they received 4 shield cups from Bangalore diary for their Best performance. Due to the high prices of feeds the society is facing crisis.

The inciative of the Co-operative came from the land owners who could ~~afford~~ afford to keep the cows. except one Harrijan member all the members are land owners. ~~Ha~~ Raging from 3-40 acrs; the Cop. has helped them in Economic stages, with their additional they have well and buy Pump sets and now they are having two crops for per year.

though they have the permission of giving loans to anyone deserving to own a cow + get membership in the co-operative, it seems that none of the landless profited by it the member of the milk Coop. geting free treatment, and the non members have to pay for medical cure; as far as milk society is concerned Cast system and class difference are not so strong. the Political body Panchyat is not functioning, and the Coop. managing body took up almost all its function.

Marjority of the Coop. members are Congress Party, the Communist party also have some influence in the locality among the landless

The relation of the Coop. members to the non members:

1 The Harrijans + the landless are working as labourers wages 2.50 for woman and 4 Rs for men.

2. they are unemployed for half of the month - their economic state is very poor.

3. Most of the children of the Coop. members are school going, but the non members children cannot go to school because of the financial difficulties, the Coop. is not coming forward to help these children.

Our general observation: there are some members with liberal views! but since number is small they cannot do anything landless remain unorganised.

Magadi scheme and Individual Cattle holders

The Magadi is a ~~village~~ town about 50 kms west of Bangalore. The Bangalore Dairy at its inception gave loans around 1965 to Mallur and this place. The extent of the loan was about Rs 30000 to various individuals. The Scheme unlike Mallur, however did not catch up and ended up in a financially lossy venture. At present there is no organised ~~cattle~~ Dairy activity in Magadi. However few farmers succeeded and the analysis of the failure for the ~~Magadi~~ catching up of cattle breeding activity is due to one of them. This farmer left Magadi and settled in Bangalore, he had a number of relatives in Magadi whom he observed. According to him the financial assistance alone is not sufficient for Cattle development. There must be a strong backup of Technical assistance. The technology of breeding and rearing exotic breeds is entirely different from that of local breeds. For instance it was simply very difficult for the villagers to understand why the cows needed to be fed so much. Why they were not to be grazed and why they were to be regular vaccinated against a number of diseases. Unlike Mr Paparna of Mallur there was no person in Magadi whose example could be emulated by other farmers. If this was done the farmer felt there was no reason why individual cattle owners could use dairy as a profitable economic activity.

Analysis: Individual Cattle owners have found that Cattle rearing is a profitable activity earning them as much as Rs 250 P.M per cattle head. This assumes ready market which is available only in some places otherwise he will be forced to close down his business.

Self reliance The individual farmer is not self reliant in the sense he has to depend on a number of agencies ~~which~~ like artificial insemination, vaccines and medical help etc. These facilities are available only in moderate sized towns and cities. In a village these things are usually not available.

Conclusion: Individual farmers can start economically viable cattle activity only if a ~~proper~~ infrastructure for cattle rearing is already present. Hence if both the infrastructure as well as financial assistance is given at any place sustained activity can take place. ~~Hence~~ This is just what has happened in Mallur village. However this activity usually confines itself to the upper class of the village. It has taken about 15 years for the activity to mildly percolate among the weaker sections. With the same order of input a much better and far fetched results can be obtained as suggested in the Model scheme.

To check with Mallur

Hesaraghata

SCHEMES FOR STARTING SMALL SCALE DAIRY FARMS

INTRODUCTION:-

Dairying as a part of the agricultural operations has been practised by farmers since ancient times. Due to factors, such as low yielding capacity of animals, non-availability of feeding materials and lack of marketing facilities, higherto dairying had a low priority in the agricultural economy. Many farmers have come forward for a starting small dairy farms, due to changing pattern of agricultural economy.

Beginning with a he-ar-d of high milk yielding cross-bred animals alongwith good management practices, dairying is a profitable enterprise. The need for some basic information on costs of this operation has been felt. To fulfil such a need, the schemes have been prepared.

In presenting, there is, following certain points are assumed. These should be understood by any person who is wishing to take up this profession.

1) Only high milk yielding cross bred cows will be maintained.
2) Sound management practices such as, balanced feeding, timely breeding and culling are followed.
3) That there is adequate source of water supply.
4) That measures will be taken to protect the animals from diseases.
5) That there is a regular market for the disposal of milk so produced. — Regular Vet Service Cooperative
6) Suitable land and equipment are acquired.
7) Money for capital and recurring expenditure is forthcoming.
8) a) In the case of schemes with smaller numbers of animals housing for calves, store, labour charges (asit is expected to be put in by the farmer and his family) has not been included;
   b) These schemes have been presented for the benefit of small farmers and landless agricultural labourers to provide work throughout the year and more than economically sound.

Farms requiring large capital and bigger herd strength, it would be desirable to have a trained person to manage or the farmer may himself get training needed to run the farm .

The schemes prepared to not purport to give any detailed information on the actual running of the farm for which one should refer to published/printed materials.

It is mentioned that it is always better to start with a small herd and develop the herd to bigger sizes by suitable culling and selection. The farmer also develops experience and skill by this and gains confidence in herd management. Though, this may be found to be a slow process, it would be economical, as heavy initial capital for purchase of the animals is reduced.

The figures give for the costs for construction of buildings, equipment, animals, feeds and rate of sale of milk, etc, are only approximate and may vary from place to place and time to time.

.....2/-

For Mallur

From Uruli Kanchan

SMALL SCALE DAIRY FARMER WITH TWO CROSS BRED COWS:

A. Capital Expenditure :-

Existing Infrastructure

i. Livestock:
Adult milch animals 2 x Rs.3000/- Rs.6000 5000

ii. Building: 2500
Cow byres 8' x 10' (0.8 Sq) x Rs.1500 per sq. Rs.1200

iii. Equipment:
Milk pails, buckets, chairs etc. Rs. 100

Rs.7300

B. Recurring Expenditure:

Milk production
10 Lits/day x 8/12
5 Lits/day x 2/12
or
6 Lits/day

i. Feeds & Fodders

Green Fodder	Rs. 1150	- (Surplus Labour) 1000
Dry Fodder	Rs. 500	
Concentrates	Rs. 2170	2160
Milk for calves	Rs. 190	
		Rs.4010

ii. Misc.items of expenditure:

a) Interest on Capital 10% on Rs.7300	Rs. 730	
b) Dep. on animals at 15% on Rs.6000	Rs. 900	
c) Dep. on Buildings 5% on Rs.1200	Rs. 60	
d) Vety.Charges, Water & Elec.Charges etc.	Rs. 150	
		Rs. 1840
Total:		Rs. 5850

C. Income:

i. Milk Sales 2 x 19 Kgs.x300 - Rs.1.26	Rs. 7200
ii. Return from manure. 2x2 Tons x Rs.10	Rs. 40
iii. Appreciation of young stock females	Rs. 1000
iv. Sale of male calf 3 days old 1 x Rs.10	Rs. 10
Total:	Rs. 8250
Net profit over expenditure Rs.8550-Rs.5850	Rs. 2300
Percentage income over fixed investment of Rs. 7300	Rs. 33.0%

Feed Requirements:

a) Green fodder:

Adult cows	2x25x370	- 18,500 Kgs.
Calves	1x15x300	- 4,500 Kgs
		23,000 x 5 paise per Kg. Rs.1150

b) Concentrates:

Adult cows in milk 2 yield 10 Kgs of milk - 2x4x300 - 2400 Kgs
Dry cows: 2x65x1 / 180 Kgs.
Calves at 0.5 Kg per day - x 365 days - 183 Kgs. Rs. 2174

../-

c) Dry Fodder:

Adult cows	- 2x4x370 days	- 2960 kgs
Calf cows	- 1x1x270 days	- 270 kgs
		3260 x 15 p. / kg
		489-00 OR Rs.500

d) Milk:

One calf upto 2½ months at 2½ kgs/day
1 x 2 - 5x75xRs.1/- Rs.187-50 OR ---------- Rs.190

GRAND TOTAL: Rs.4010

Land Requirements:- For fodder production of 23,000 Kgs P.A.

a) If the entire area is under any guinea, para, hybnapier 1/2 acre or 33 at 60.75 tons/acre/annum.

b) If maize 4 crops/year at total of 40 tons/acre/annum, 2/3 acre or 65 cents or 30 guntas

c) If maize 50% and lucerne 50% at total yield of 40 tons/acre/annum, 1/3 acre maize 1/3 acre lucerne 2/3 acre or 65 cents of 30 guntas. Among all the above croopingprogrammes, the one shown at C is most suitable.

A SCHEME FOR TEN CROSS BRED COWS DAIRY FARM:

A. Capital Expenditure:-

i Livestock:

Adult milch animals 8xRs. 2500	Rs. 20000	
Dry cows 2 x Rs.2000	Rs. 4000	
One pair of bullocks - Rs.1500	Rs. 1500	
		Rs.25500

ii. Buildings:

i. Cow byres 40x10(4.0 Sq) x Rs.1500	Rs. 6000	
ii. Calfshed/bullocks (1.0 Sq) x 10 x 10	Rs. 1500	
iii. Pump-house 10x8(.8 sq) Rs. 2000	Rs.16000	
iv. Servants quarters 10x20(2 sq) x Rs.1500	Rs. 3000	
v. Office/Store/Pharmacy 20x15(.. sq) x Rs.1500	Rs. 4500	
		Rs. 31000

iii. Well:- i) Well 20 dia x 30 Deep Rs.8000
ii) Pump, water, accessories Rs.5000 Rs. 13000

iv. Implements & Equipments:-

i. Agricultural equipments, bullock cart	Rs. 1500)	
ii. Milk pails, chaffcutter power/hand	Rs. 500)	Rs. 2000
GRAND TOTAL CAPITAL INVESTMENTS:		Rs. 71500

B. Recurring Expenditure:-

i)	i. Cost of feeds 122100 Kgs x 5 ps/kg	Rs. 6105	
	ii. Dry fodder 22200 Kgs x 15 ps/kg	Rs. 3330	
	iii. Concentrates 14235 Kgsx 75 ps/kg	Rs. 10676	
	iv. Milk for calves 1125 x Re.1/kg	Rs. 1125	
			Rs. 21235
ii)	i. Labour charges at Rs.120 p.m. per person/ labourer		Rs. 1500

....4/-

ii. Misc.expenses like, Vety Charges, water, electricity, etc. Rs. 635/-

iii. Dep. on animals at 15%(25500) Rs. 3825
---do--- Buildings at % (16600) Rs. 840
Interest on 57100 - at 1 (Rs. 5710) Rs.11000
Rs. 1500
---------- Rs. 17165

Returns: -(A) Sale of milk - average number of animals in which 8x365x1 - 2 OR 200.0 Kgx1.25 Rs. 36150

(B) Income from manure 2 tons per animal per annum(2x12) 24 x 10 Rs. 240

(C) Value of appreciation of female calves at the age of one year 6 x 700 Rs. 4200

Sale of young stock male at birth 4 x 10 Rs. 40

Rs.74780

Net income on necessity expenditure per annum Rs. 74780 Rs. 2830
Rs.34150

Feed requirements:-

i. Green Fodder:

No. of adults 10x20x370 (Cow) 74000 Kgs
Bullocks 2x20x370 14800 Kgs } 122400 Kgs
Calves 8x14x300 33600 Kgs

ii. Dry fodder(probably ragi/straw & Hariyali Hay)
No. of adult cows 10x4 Kgs/dayx370 Kg 14800 Kgs
No. of bullocks 2x7 Kgs per dayx370 Kgs 5180 Kgs
No. of Y.S.below 1 year 370x1x6 - 22200 Kgsx15 ps 2220 Kgs

22200 Kgs
==========

iii. Concentrates: Rs.3330

Average milk per day 10 Kgs/Animal 8x4x365 11740 Kgs
Average animals dry 2x1kg/day x 365 730 "
Bullocks 2x1kg/day x 365 1730 "
Youngstock 6 at x 0.50 kgs/day x 365 1095 "

10676 Kgs
==========

iv. Milk:

Milk for 6 calves upto 2½ months @ 2.25 kgs/head/day @ Re.1 per kg of milk 6x2.5xRe.1 Rs. 1125

Land requirement for fodder production(Any of the following cropping sequencies could be made use of preferable than one suggested at (f)

....5/-

Total green fodder requirement, p.a. 122100 Kgs

a) If the entire area is under perennial guinea grass yielding at 60 tons per acre per annum 2.25 x 60 - 135000 Kgs. 2.25

b) If the entire one is under Lucerne perennial yielding at 40 tons per acre - 3.20 x 40-128000 Kgs 3.20

c) If the area is under maize, 4 crops p.a. @ 10 tons per acre per crop acres. 3.20x10x4 @ 10 3.20

d) If the area under Lucerne half and the other half under guinea grass 50,000

Lucerne 40 x 1.25 acre
Guinea 60 x 1.25 acre
2.50 75,000 125000-2.50

1,25000

e) If the one is under maize, 50% lucerne 50% acres - 3.20 x 40 - 128000 Kgs 3.20

f) If 1 acre under lucerne 40,000
1 acre under lucerne 60,000
1 acre under guinea
0.75 acre under maize
2.75 (4 acres/year) 30,000

1,30,000

SCHEME FOR TWENTYFIVE CROSS BRED COWS DAIRY FARM:

A. Capital Expenditure:

i. Liv tock :

Adult milch cows	18 x 2000	36,000	Rs.48000
Dry cows	7 x 1500	10,500	
One pair bullocks	1500	1,500	

ii. Building: -

i.	Cow by res 52 x 20(10.5 Sq.) 1500 Sq.	15,750	
ii.	Bullocks calf shed 20x20(4 Sq)1250 Sq.	5,000	
iii.	Pumphouse 10x8 (8 sq) 2000/Sq.	1,600	
iv.	Servants quarters 10x10(4 Sq.) 1500 Sq.	6,000	
v.	Office/s/Store/Pharmacy 10x20(2 Sq) 1500/Sq.	3,000	Rs. 31000

iii. Well:

i. Well 40 wide 30 deep 10000.0 or bore-well
ii. Pump, Motor accessories 5 HP 5,000.0 electrical charges, pipe line. 700 x 2" Rs.15,000

iv. Imolements & Equipment :

i.	Agric.equipment, bullock cart	Rs.1500
ii.	Milk pails, tubes, buckets, and weighing balance	Rs.1000
iii.	Chaff cutter power/hand. Total	Rs. 500
	Capital Investment:	Rs. 300
		Rs.97350

....6/-

B. Recurring expenditure :

I. Cost of feeds :

i. Grasses	10360	
ii. Dry Fodder	6771	
iii. Concentrates	23270	
iv. Milk	1500	Rs. 41901

II. Labour:
Farm labour at 120/- month - 5765 Rs. 6000

III. Misc.expenses :

i. Int. on Cap. 9% on 97350	Rs.8761-50	
ii. Dep. on Animals: 15% on 8000	Rs. 7200-00	
iii. Dep. on Bldngs: 5% on 31350	Rs. 1567-50	
iv. Vety.Expenses, elecl.charges	Rs. 471-00	Rs. 18000
		Rs.65901

RETURNS/INCOME :

I. Sale of milk: Daily/head 10x365x20xRe.1/10Kgs/Animal/20 Animals	Rs. 73000
II. Sale of manure/30 adult animals x 2 tons x Rs.10	Rs. 600
III. Appreciation of young stock 8 years at Rs.800 at the end of 1 year	Rs. 6400
IV. Sale of 12 years meat 1 wk age Rs.10 animal	Rs. 120
	Rs.80120

Net income on recurring expenses: Rs.65901-80,120 Rs.14,221/-
Per centage return on fixed capital of Rs.97,350/- Rs.14.6%

I. Feed Requirements :

i. Green Fodder :

No. of adult cows 25 daily requirements 20 Kgs.
370 x 20 x 25 - 18,5000 Kgs.
Bullocks No. 2 daily requirement 10 Kgs.
370 x 10 x 2 - 7400 Kgs.
Followers 8 below 1 year at 1: Adult: Young stock daily.
Intake 5 Kgs. - 5 x 8 x 370 - 14,800 Kgs. Rs.10360

ii. Dry Fodder (Ragi straw, hariyali hay):
Cows: 25 x 4 Kgs x 370 - 37,000 Kgs
Bullocks: 2 x 7 Kgs x 370 x 5180
7 x 8 x 1 x 370 2960
Total: Dry: 45, 140 Kgs x 15 Paise/Kg Rs. 6771

II. Concentrates :

Adults: in milk 17 yld 10 Kgs/day milk:
1 : 2 : 5 Milk 18 x 4 x 365 - 26250 Kgs

Av. dry animals 7 at 1 Kg cow/day 7x1x365 - 2555 Kgs
Bullocks 2 at 1 Kg/Dry x 365 - 730 Kgs
Young stock No. 8 at 0.5 Kg/Dry x 365 - 1460 Kgs
Total concentrates: 31, 025 Kgs x 0.75 paise per Kg Rs.23, 270

III. Milk:-

Milk for 8 calves upto 2.5 at 2.5 Kg/Head/Daily at Rs.1/- per kg of milk 8 x 2.5 x 75 x 1 - Rs. 1,500

Land requirement for fodder production (Any one of the following cropping sequencies could be made use of preferebly the one suggested at (a).

a) Entire area is under guinea grass at 60 tons/acre/4 acres Annum: 5.5 acre - x 60 - 21,00,000 Kgs - actual

b) Entire area under lucerne at 40 acre/tons/annum 5.25 acres
acre/x/40/-21,00,000 Kgs actual 5.25 acres

c) Of entire area under lucerne at 40 ton acre.
Half (hf) under guinea at 60 tons/acre
Lucerne 2.25 x 40 tons - 90,000 Kgs
Guinea - 35,000 Kgs } 4.5 acres
- 25,000 Kgs

d) Area under lucerne 1 acre x 40 40,000
Guinea 2 Acres - x 40 1,20,000
Maize 4 - 1.5 acre x 40 60,000
Total: 4.5 acres 2,20,000 4.5 acres

SCHEME FOR FORTY CROSS BRED COWS DAIRY FARM

A. Capital Expenditure :

i. Live-stock:

a) Adult milch cows 32 x Rs.2500		Rs.80,000
b) Dry cows: 8 x Rs.2000		Rs.16,000
c) Bullocks 2 pairs - 2 x Rs.1500		Rs. 3,000
		Rs.99,000

ii. Buildings :

a) Cow Hydres 40 x 10 x 4/16 sq. x 1500	24,000	
calfsheds) 20x20 - 4 Sq. x 1500		
bullocks	6,000	
b) Pump House 10 x 8 (8.9 sq) Rs.2,000	16,000	
c) Servants quarters 10x20x3x5qx1500	12,000	
d) Office/stories/pharmacy.		
20x15x2(6 Sq.x1500)	9,000	
		Rs. 62,600

iii. Well : either open or borewell, pump water, accessories 15,000 Rs.115,000

iv. Implements & Equipments :

a) Agri imple., bullocks carts	2,500	
b) Milk pails, buckets, feeding etc.	1,000	
c) Chaff Cutter Power	1,500	
		Rs. 4,500

Capital Expenditure on fixed items: Rs.1,81,100

....8/-

Recurring Expenditure :

a) Green feeds	20,500	
b) Dry fodder	11,700	
c) Concentrates	41,100	
d) Milk	3,750	
		Rs. 77,050
Labour: Farm Labour: 8 x 120 x 12	11,520	Rs. 11,520

Misc. Items expenditure :

a) Interest on Capital: 9% on 151100	16,300	
b) Dep. on animals: 15% on 99000/-	14,850	
c) Dep. on Buildings: 5% on Rs.62600	3,130	
d) Vety. expenses, electrical charges	1,520	
		Rs. 35,800
		Rs.1,24,370

INCOME :

a) Milk sales : 32x1-0x35 - 116800 Kgs x 1.25	Rs.1,56,000
b) Returns from manure: 40-4-20/3 - 50x2-100x	Rs.1,01,000
c) Appreciation of 20 youngstock at end of Rs.80/-	Rs. 1,600
d) Sale of 20 male youngstock at year 3 days Rs.10/-	Rs. 200
	Rs.1,63,200

Net profit: Rs.1,63,200 - Rs. 1,24,370 - Rs.38,830
Percentage income fixed capital invest of - 21.4% . Rs.1,81,100

Feed requirements :

1) Green Fodder :

a) Adult cows: 40 daily requirements: 25 Kgs/cow 50 x 370 x 25 Kgs	3,70,000 Kg
b) Bullocks: 4 x 370 x 20 Kgs	29,600 "
c) Calves: 20 x 300 x 15 Kgs	9,000 "
Total Green Fodder:	4,08,600 "
4,08,600 Kgs x 4 paise/Kg	Rs. 20,403

2) Dry fodder: (Maize/Jower/Kadbi/Harihalli-hay):

a) Adult cows 40 x 4 Kgs x 370	59,200 Kgs
b) Bullocks - 4 x 7 Kgs x 370	10,360 "
c) Calves : 20 x 300 x 15 Kgs	7,200 "
Total Green Fodder:	77,960 "

Rs. 11,694 OR Rs.11,700 (77,960 Kgs x 15 Ps/Kg)

...9/-

3) Concentrates :

a) Average adults in milk yield 10 kg of milk/day (1 : 2 : 5 milk) 32 x 4 x 365 –	46,720 Kg
b) Average dry animals: 8.1 kg/per day per cow 8 x 1 x 365	2,920 "
c) Bullocks 4 at 1 kg per day x 365	1,460 "
d) Youngstock 20 at 0.5 kgs/per day per head x 365	3,650 "
Total concentrates: 54,750 Kgs	54,750 "

54,750 x 0.75 ps per Kg – Rs.4,063-50

4) Milk for 20 calves upto 2½ months at the rate of 2.5 Kgs/head per day @ Re.1/- per kg of milk
20 x 2.5 x 75 1 Re. Rs. 3, 750

Green Requirements: 4,08,600 Kgs OR 408 x 6 tonnes

Area under guinea grass 4 acres x 60 tonnes	240
Area under maize 4 acres 2 acres x 40 (10 tonnes x 4 x 2 acres)	80
Area under lucerne 2 acres x 40	80
Jowar, Bajra, Cowpea– 1 acre x 2 crops – x 10 tons	20
	420

11 Acres for crop growing
2 acres for roads, buildings, etc.

Total area of the farm 13 acres and if expansion is envisaged, atleast of 15 acres would be required.

Common fodder crop rotations and their package practices for Southern Regions:

(Yield per hectare Quintals)

	Sowing :	Green	Dry	D.C.P:	T.D.N.:
a) Maize/cowpea	1.2	300	69.0	4.8	41.1
maize cowpea	21.4	300	69.0	4.8	41.1
(two cuts on 15,9,15.11)	3.7	750	1632	11.7	109.2
Maize/cowpea	10.11	300	369.0	4.8	41.1
		1650	370.2	26.1	232.5
b) Hyb Napier/Guinea (6 cuts 15.5, 1.7, 15.8, 1.10, 1.12, 1.2 cowpea)	1/3 15/3	1500	250	13.5	175.0
c) Parasgrass Controcema pubescence(8 cuts 30-45 days integal)	1.6	1600	320.0	24.0	185.0
d) Lucerne 10/12 cuts at 30 days at Co-op: 1	1.9	1000	200.0	32.5	125.0

1) Maize Cowpea, 2) Maize cowpea 3) Maize cow pea teosintee Jower(2 cuts), 4) Maize cowpea seed rate (1) Maize 40 Kg cowpea, 15 Kg (2) Maize 40 Kgs cowpea 15 kgs. (3) Maize 20 Kgs cow pea 15 Kg Teorinto 10 Kgs Jowar 20 Kgs (4) Maize 40 Kgs cowpea 15 Kgs.

...10

Fertilizer/Manure:

1. Crop 40 tons FYM/60 Kg. N2/30 Kg P205/("40 Kg K 20)
2. & (4) Crops 60 Kg N2/ 30 Kg P205/20 Kg K20
3. Crop 60 Kg N2/40 Kg P203/ = 30 Kg K2 followed by 60 Kg N2 as top dress after first cut.

Crop rotation II. Hyb.Napier or Guinea inter planted with cowpeas.
Seed rate - Hyb. Napier/Guinea rootslips - 12,500, Cowpea - 30 Kgs
fertilizer/manure - Hyb. 50 tons FyN.60 Kg N2/

Napier.

Guinea 30 Kg N after every two cuts
Cowpea 30 Kg P2 65/- 15 K2 K20

Crop rotation III para grass/centrocem pubsscense.
Seed Rate: Paragrass 8-10 Sq(Stem cuttings)
Centrocema Pubsscense - '8' Kgs

Fertilizer/manure 50 tons/40 Kg K20/ 30 K2 0 10 Kg N after each cut

Crop IV Lucerne

Seed rate 25 Kgs - Lucerne Seeds - V 50 Perennial

Fertilizer/Manure - 25 tons FYM 20 Kg N2/60 Kg K2 05 Kg K20

2 tons applied every year in November.

CROPPING PROGRAMME FOR TWENTYFIVE ACRE IRRIGATED FODDER FARM

Area	5 Acres	5 Acres	5 Acres	5 Acres	5 Acres	
	Lucerne () per acre sowing Sep.Oct., seed rate 8.10 kgs fertilizers FYM.30 tonnes K205 60 Kg. K20 20 Kg once a year)	Guinea grass plant/ Feb. to Nov. (/acre seed rate 5,000 rootslips ferti:FYM30 to 40 ton. N 40-50 Kg)	Maize (/' acre) seed rate 15/20 Kg.FYM.10-20 tons N. 16-20 (split. 2) F205 10.0 Kg. K2 06-10 Kg		Maize/Cowpea seed rate - 10/ 5 FYM.10-20 tons. N.16 (Split P 205 10.0 Kg. K208.10 Kg)	
January	17	14	40	40	1 Pla.	71 Ton.
February	17	15	1 Planting		---	72 "
March	16	17	---	1 Plant	40	73 "
April	16	17	40	---	2 Plan.	73 "
May	16	18	2 Plantings.	40	---	74 "
June	17	19	2 Plantings	40		75 "
July	17	20 plantings	40	---	3 Pla.	77 "
August	17	20	3 plantings	40	-----	77 "
September	17	19	------	3 plant	40	75 "
October	17	14	40	---	4 pla.	71 "
November	17	14	4 plantings	40	-----	71 "
December	17	13	-----	4 plant	40	70 "

....11/-

Respected No. of animals to be maintained 75 Adult Stock: about 50 in milk 16 dry bullocks. 12 Calves(Adults Unit).

HOUSING :

For maximum labour saying, a system of loose house is recommended. In this system, the animals are always free within the enclosed area and they have the option to feed at the mangers, rest under the shade or room in the open block of pad. For a herd of 20 cows and 2 buffalos, the loose housing system shall consist of a shed 40 x 15'. Along the 40 feet length on one side, shall be wide feed manger with 5 feet wall on the outside which acts as one of the boundaries. The remaining 12' . 10' of the 15' wide shall be paved with Brick/B.S.S./ Cement Slocing away from the manager. There shall be an open paved are 40 x35 feet surrounded by 5 ft walls, with one gate for the animals. The room of the dovered shed can be put on brick pillars holding wooden asbestos roof sheets.

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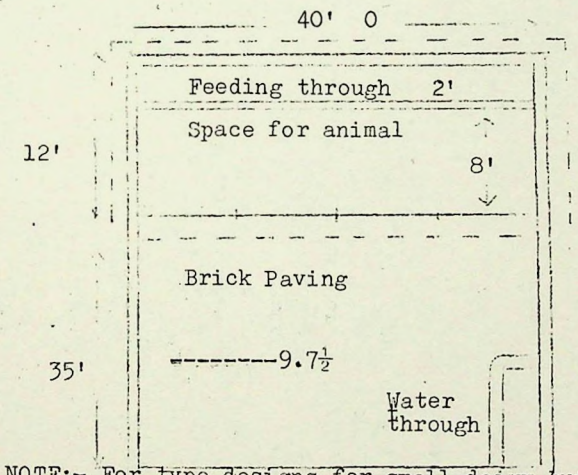
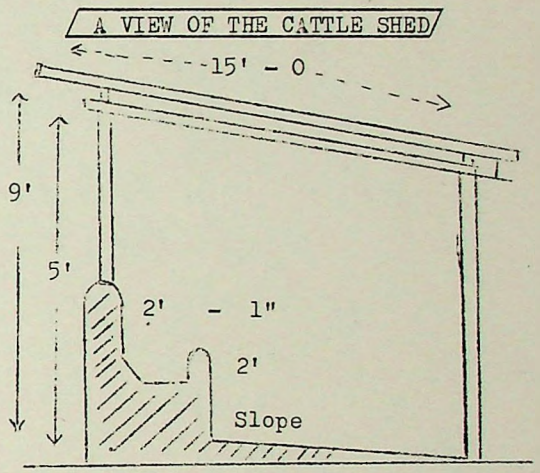
PLAN



A VIEW OF THE CATTLE SHED



NOTE:- For ~~type designs for small dairy~~ buildings and cattle sheds, please refer to the "RECOMMENDATIONS FOR FARM CATTLE HOUSING FOR PLAN AREAS WITH MEDIUM RAINFALL PART-I & II, NEW DELHI"

I.S.: 4466(P & I) - 1967 and IS: (Pt-II) - 1968.