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**A comparative study of An Agro-Based
Industry of Tharparkar with Canal
Barrage Areas of Sindh (1988-2000)
Suggested Techniques Leading to an
Industrial Economy**

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5 April 2002

Online at <https://mpra.ub.uni-muenchen.de/16067/>
MPRA Paper No. 16067, posted 06 Jul 2009 10:30 UTC

AGRO-BASED INDUSTRY OF THARPARKAR AND BARRAGE AREA OF SINDH: CONCLUSION REMARKS

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Abstract

This study is concluding the thesis about agro-based industry of Tharparkar and barrage area of Sindh, and ninth chapter of the Ph.D submitted in 2002. Demographic, social and economic conditions are compared and results of hypotheses are given theoretically with reference of primary and secondary data in detail. Purpose of the study was to give the complete picture of results of hypotheses and valuable findings. On the completion of this study it has been observed that both the given hypotheses are accepted. After the detailed study of the thesis it is concluded that: Thar at this time is disadvantaged district of Sindh province. It depends on rain and its reliable source of income is livestock. Agricultural crops are completely failed but Tharies like it. There is need of change crops to non-crops where ever it depends fully on rain. Fencing and reforming some acres of farmland at first time can save the natural vegetation, which is actual stock for fodder for present time and in long run too. It will give the fruits of non-crops and crops too. It also may prove honey farm at some level, if it is looked after and stocked.

Keywords: Conclusion of Agro-Based Industry; Livestock; Rangeland Plantation; Tharparkar; Barrage Area of Sindh

JEL Classification: D13;D18;D24;D31;D33;H24;N30;N50;Q15;P51;R13;R23

CHAPTER-IX

CONCLUSION

I. Hypothesis

A. The Aim of Alleviation of Poverty Can be Achieved, if Local organizations
(Indigenous Leadership), and Live stock are Encouraged by Providing Awareness to People of Thar
(Alleviation of poverty = Local organization + livestock)

When Tharies keep livestock Tharies think that, only those who have livestock are rich. Those who have not any livestock are poor. So, if, we want Tharies to look rich then facilities should be provided to them to regenerate the livestock. If the livestock population will increase then tree plantation is necessary for their survival. Many villagers feel that they could afford to stock, to feed their animals, if there were markets for their animals and dairy products, as well as availability of fodder at cheaper prices. They pointed out that the only saleable dairy product is ghee, which middleman buys from them at half the market price. Alternatively they have to take small quantities of it themselves to urban areas. The general feeling is that fodder prices may come down, if roads are constructed and animals' prices would go up.

Most villagers who owned animals sustained themselves and not agriculture activity. It was pointed out, more than once, that a poor man was one who owned no cattle or goats. (1)

Visit to Thar revealed that during data collection, many villagers pointed out that in addition to ghee (butter oil) they also have other product such as butter wool and milk, which can be sold in markets of urban areas at double rate. And the general feeling is that if roads are constructed, then it could be solved and the prices of their products automatically would rise up and 75 % problem would be solved. After that tree plantation is must according to plan. The electricity provision will further help to solve so many problems. Other problems would be solved step by step and automatically.

If these suggestions are considered, while making policy for uplift of Thar then poverty will gradually alleviate from Tharies and it would lead to an industrial economy. Same practices were done in Denmark and other Scandinavian countries when there was only livestock industry and now they are so advanced in industries, which are based upon livestock. (Chapter-II example of Denmark Somalia, table 7.3, 7.17, 7.18,7.20) All these support that livestock and local organization decreases poverty, in this way hypothesis A is not rejected.

**B. The Progress and Promotion of Agro-Based Industry would Lead Thar to an Industrial
Economy**

(Development of Thar = Local Organization +Livestock + Roads + Electricity)

If Tharies are encouraged and motivated by creating awareness for conservation of rangeland, tree plantation on planed method and by ethno forestry then livestock industry will increase. This work have to be done by Tharies themselves but government and NGOs must be aware of their work and should motivate and train them in using modern methods and technology for plantation, so, that these plants would prove better fodder for livestock, in future. So this work should be done earlier than road and electricity, because both are concerned with government

policies. But plantation is more easily than others are. It is pointed out so many times that young Tharies have lost their interest in agriculture. This also will save their time and money, which is used to cultivate the farmland. The plants, which will grow on their lands, will be the cause of fodder by planting some plants in defined way. The meadows for livestock will increase.

Farmland should be converted into livestock / cattle farms by fencing of plants. Plants of Devi, ber (Zyzyphus rotundifolia) and others plants, which are easily available, should be used for fencing around the farm. Seeds of Devi, ber and other suitable plants should be sown in the row of boundary line of the fence and it is easiest and cheapest way to fence in Thar.

Devi is easily available and grow able, its fruit is good fodder at the same time it grows so early and need no care as much as required for other plants. At the same time khejdi (propos ginerasia) and ber plants should be planted by selecting best seed, which are the fodder for animal, and the singri fruits are vegetable for the people of Tharies. It is described already that livestock itself would lead Thar into industrial economy. So, the above ber (Zyzyphus rotundifolia) and khejdi (propos ginerasia) cultivation should be encouraged for the livestock in Thar. It will fulfill the needs of vegetable and its' surplus preserved dry vegetable could be exportable to earn foreign exchange.

To set up this industry would take some time, but there is immediate need of livestock. After some time when this fence will grow as shelter fence around farm boundary and at the same time so many plants, grasses, herbs and shrubs will be grown in the farmland, which will prove stock of feed for livestock. At the time of cultivation of crops the roots of shrubs, herbs and grasses, which are perennial come out and natural vegetation becomes reduced and due to not raining, crops also do not grow and time and money utilized for crops cultivation gets wasted. At the same time the fodder in shape of uncultivated plants, will also get wasted. In this way there are so many other plants like Sinn, AK (calotropis gigantea), (Salvadora oleoides (Khabar) Acacia Senegal (Kombhat), thuhar (euphorbia caducifolia), phog (calligonum polygonoides), Capparis aphylla (kirur), ber (Zyzyphus rotundifolia) etc will be better stock of fodder if not rained and form is fenced and left un cultivated.

In this way these farms will change into cattle farms or livestock farms. If these farms are further improved then their production will increase. If live stock products are available in large quantity, then they would lead others industries such as wool threading, and fur's tannery, which will lead it into shoes manufacturing industry, which was already in Thar. Milk packing and butter preserving industry will take birth, and in this way; Thar would lead into small industrial area and gradually it would convert into large-scale industry. Some of these industries are already in Thar at small scale. For example:

- i). Blankets made from local wool, which is locally knitted by traditional methods.
- ii). Duries (rugs) made from wool of goats, sheep and camels, which also is locally knitted by traditional methods.
- iii). Tannery by old traditional method which is now finished.
- iv). Shoes' making was already existing so much but now some traditional shoes are stitched with cultural value and now they are in demanded in cities and also are used locally by villagers and laborers.

All these small-scale industries were there due to livestock, which were supplying raw material for these industries. If now Thar will grow livestock in large quantity by making livestock farms, then above industries will grow and Thar will get developed as under:

1. Thar as an Industrial Economy

When livestock industry is established then its products like milk, butter, ghee, furs, bones and wool will be available in abundant quantities for milk packing butter preserving, ghee preserving, shoes making, tannery industry, arts and craft industry. Industries of wool, like wool of goats, sheep and camels will emerge and bone craft industries will come into existence. Then small industries would convert gradually into in large industries.

Livestock industries will help in the establishment of non-crops industries when tree plantation and preserving natural vegetation starts. In this way Thar will look beautiful green & prosperous by tree plantation. The quantity of Thari fruits and vegetables will be saleable commodity for cities. In this way livestock farming and tree plantation will change the fate of Thar and would lead Thar into an industrial economy.

2. Raising of Income Level

As we know that the main source of income of Tharies is only livestock, which is also facing so many natural problems such as rain and drought. Other source of income is agriculture, which itself consume time and is going to be reduced by some people, considerably. (Appendix 21: area of important crops sown 1980 - 92 and table 3 in primary data, which indicates that 39 % people say that it is sustainable as compared to 92 % for livestock.) "The more aware and vocal villages feel that agriculture will not go back to the pre 1987 position as people have found alternative income generating sources and have started considering it as a subsidiary activity. However older generation is strongly attached to the farming". (2) Except for substance livestock farming, there are strictly limited

opportunities for income generating barring a few occupations e.g. handicraft and carpet production that are more beneficial for the middleman than the actual producers.

"Since time immemorial Tharies have migrated along with their animals to the barrage area in the dry season, or in periods of drought, to work on farmlands and other job. This migration was primarily for feeding and watering their animals, selling their dairy products, and surviving drought conditions. However, between 1987 and 1992, and ever increasing number of Tharies are migrating to the urban areas outside Thar to work as masons, tailors masters, in garments factories, domestic servants, labour in sugar factories and as employee in government departments. They earn any thing between 1,000 to 4,000 per month, villagers claim that facility who receive remittance money from cities let out their land to others rather than cultivate it themselves". (3) This is the evaluation of TRDP in 1993, at the same time we have also observed by attitude and opinions by poll questions, that each and every Thari want to do agriculture by attitude, intently or unintentionally, by confirm belief in God that it will rain properly by grace of God. If there will be no crops, then at least some fodder they will get from farms. Out of 100, 90 percent Tharies keep the livestock and 20 percent Tharies have more than 50. (4) These fact shows that 90 % percent people want to keep the animals; tables 18 of primary data shows that 93 % people have got livestock and 23 % fully depend upon it. If awareness is given then they will keep more livestock and they will continue agriculture and other jobs, which will be available in Thar.

From above review it is clear that young Tharies do not have interest in cultivation of land. They go out of Thar to earn for their livelihood whenever they have drought problems in Thar. They also take their livestock to barrage areas. It is fact that every body wants to work in there own areas, when compelled then they go out of Thar in search of work. Another problem is that the labour is cheap as compared to work rate in cities. When these sources of income generation are made available in Thar, for example, tailoring, small industry, tannery, textile, weaving looms, bone factories, glass factories, wool weaving looms, wool knitting factories and other such as ghee, milk and meat preserving industries at small scale, then they would lead it automatically in large scale industrial economy.

To achieve concrete result first step should be the improvement of livestock industry. When it will progress a lot of livestock would be there, and Tharies will get much milk, which will lead it to milk pack preserving, butter preserving and dry milk industry, cush and Paneer making industry etc. When livestock would increase, furs will increase it would lead Thar into tannery industry, which is very old and traditional in Thar and its origin is proved from Moen jo daro (mount of dead) culture but it has decreased due to its' bad smell. And people hated the workers who were working in this industry. If tannery industry will be introduced and encouraged on scientific method then it will improve and lead to shoes industry, which was already remaining on traditional methods. This will improve into first small scale and then in large-scale industry. When leather will be there then so many crafts will come into existence automatically, consuming the raw material available in Thar. Rugs and carpet similar to in Blochistan could be manufactured in Thar because of easy availability of wool and locally made thread. In this way the livestock progress will lead Thar into an industrial economy, as it happened in Denmark and other Scandinavian countries and they rise automatically.

In this way hypothesis B is not rejected.

Following results to be achieved:

1. Land reforms for eliminating rural poverty, being a prime instrument for the development of agro-based industries. (Tables: 7.20, 7.22, 7.23, 7.24)
2. Land reforms for eliminating rural poverty, being a prime instrument for the development of agro-based industries. (Tables: 7.20, 7.22, 7.23, 7.24)
3. Land reforms for eliminating rural poverty, being a prime instrument for the development of agro-based industries. (Tables: 7.20, 7.22, 7.23, 7.24)
4. Creation of awareness among Tharies to use duly fenced farmlands for the purpose of fodder for livestock. (Table: 7.21, 7.22)
5. Introduction of micro-financing system for safety nets. (Table: 7.21, 7.22)
6. Bringing up livestock (animals within species; race, lineage; sort and kind) by producing fissile material and introducing short-term loans, on experimental basis. (Table: 7.13,7.14)
7. Steps for conservation of rangeland by planting indigenous and exotic plants and grasses. (Appendix-Ethno forestry, Table: 7.20, 7.21, 7.22, Refrence-15 Chapter-II Drought Presentation)
8. Training to understand the benefits of non-crops (un-sowed natural vegetation) and mathematical calculations. (Chapter-II Drought Presentation)
9. Thar as an industrial economy. (Example of Denmark Chapter-II)
10. Raising of income level of people. (Example of Denmark Chapter-II)
11. Encouragement of Local indigenous skills and know-how. (NGOs Working in Thar Chapter-II)
12. Benefit to poor at grass root level. (Result of AKRSP Chapter-II)
13. Vision of a bright future. (Example of Denmark Chapter-II))
14. To provide real assets possession (land, and livestock) to the poor Tharies.

15. Reduction in migration of indigenous leaders, experts, and skilled people having know-how of the work.
16. Boost promotion of agro-based industry.

II. Future Vision of Thar

In Thar so many social changes are taking place, which are irreversible. Livestock and dairy products are reliable sources of their daily earning. Agriculture (Means crops cultivation) cannot meet the economic needs of the Tharies, because of recurring drought and famine conditions, demise of traditional social order, and low income. Timber and non-crops manufacturing may be reliable and assured source of earnings, arts work, trade work, trade related activities employment and remittance are assured source of earning. If livestock and dairy products are increased and the skill related to these changes and attitude are developed then Thar will prosper and survive. Promotion and progress of these would lead Thar into an industrial economy in long run. If these are not done then they will be exploited and fall further into debit at least for the time being.

There is a need of physical and institutional infrastructure development to create a more equitable relationship between the market economy and the Tharies. Other essential things are tree plantation, electricity, technical support mechanism, appropriate and sufficient credit, easily accessible animal husbandry and marketing facilities for their production. Product of livestock like skins, furs, hairs bones meat, milk, butter and ghee need promotion and progress of small-scale industry at this time and introduction of new technical mechanism. At the same time there is a need of market. In coming time, large-scale industry will take birth, when small-scale industry will be in full swing. In this way it is concluded that there should be involvement of the local organization and faith full and active NGOs, then future of Thar is bright and industrial.

III. Types of Agro-Based Industry

A. Crops

Crops are not reliable source of income generation for Tharies. It consumes time and results in wastage of money. In spite of that Tharies like it, so, there is need to alter it in some ways and convert the farmland into livestock farms. Main product from land should be non-crops and fodder.

B. Non-Crops

A agriculture (Crops) are not reliable sources of income generating in all parts of Thar except some areas of Nagarparkar and Vat, and can not meet the longer needs of Tharies due to drought recurring. But non-crops like uncultivated plants and grasses are including in it may be reliable source of income generating all over Thar. They are at the same time fulfilling the requirements, one for livestock as a fodder and sustainable factors, second fulfilling the requirements of fruits and vegetables as a green fresh and dry. It may be sold at markets of cities by introducing and advertising. Third it fulfills the requirement of environment, which is a great issue now days.

The fruits and vegetables are singri, Pilo, kirur, which are in large quantity. There are so many other things like pipoon, Kunder and beer. Pipoon and Kunder are useful for health according to medical research. The Kunder reduces the fatness of persons. There are so, many herbs and shrubs, which are used as medical treatment at home by traditional methods and by hakims (herbal doctors). The vegetables of the leaves of golaro are used for the purpose of night blindness. In this way non-crops may be reliable source of income generating.

At this time one thing new is in process that is feasibility of Thar canal, if, it is constructed then it will help in fodder of livestock and for drinking too, for some areas of Thar. (5)

C. Livestock

1. Domestic livestock farming

"Thar depends on" animals" not on crops." In The conditions of drought people of country side and small villages who depends upon rain and cattle migrate to barrage area in search of source of income generating where they work and make both ends meet." (6)

Tharies depend on livestock. For the sake of livestock they migrate from one place to another place. In this way they look walking along with tents that is their symptom. They fit their tent, where, there is best rain (Vaskaro) and a lot of grasses. After rain all sandy dunes, flat soil, sloppy soil and all surface of soil is filled with rainy water that is why there is much grass and water. Tharies stay near the sandy dunes making homes of straw (Jhopri/hut).

From appendix 20 (livestock in Thar), the increase in population of animals in Thar is clear. In between 1989 and 1992 increase percentage is shown. According to it sheep have increased in major in both tables

(Animal Population in TRDP PA between 1989-92) and animal population by Taluka, 1980-1983-84). From this it is clear that growth rate has increased, more in later case "The villagers feel that since 1987 the rate of growth has been increased much more than before, during the drought period realized that animal were the only reliable source of income."(7) According to census report 1998 total livestock population is 3.66 millions and it is decrease with annual growth rate 0.188 % and projected population in 2001 is between 3.00 millions to 3.44 millions it is due to 2000 drought, it has decreased due to sell and mortality. **(See chapter-I & VIII Livestock).**

People also feel that agriculture is not confirm income generating source but it is time wasting in spite of that they want to do it .Its alternate is livestock which Tharies think better for them for income generating. If the Tharies will increase the animal population then they have to stock feed and many more trees will need to be planted. For the sustain of livestock following steps should be taken:

a). Livestock Sustainability

For the sustainability of livestock, three things are essential: First fodder and second husbandry and third market. Animal husbandry problems can be resolved by facilities given by government. But if, farmland owners are motivated and trained then it easily can be solved.

First problem is fodder for this purpose, which can be resolved by tree plantation. It will fulfill due requirement and will supply fodder and it will protect natural environment also, that is a main issue now a day. For this purpose there is need of involvement of local Tharies by making local organization. Environmental department, TRDP, VPDP, Baanh-belli and forest department can help Tharies, if they will demand the plants and suggestions, the details of these are given as under:

(1). Stock of Livestock Fodder

As livestock is agro-based industry and from the definition of agro-based industry, it is known that, agro based industries are those industries, which have background linkages with the agriculture. When it is linkage with agriculture, which is also their feed. Therefore detailed study of agriculture and natural environmental vegetation should be done.

For the better growth of livestock fodder is must. From this it is clear that crops agriculture is necessary for livestock. But only crops-agriculture is not successful that is why natural environmental conditions are to be improved by tree plantation method by planting plants only those, which are recommended. Their detailed study is only in next suggestion chapter. Livestock depends on only plants. In Thar it mostly depends upon plants, which are naturally grown e.g. natural grasses, herbs, shrub and trees. "In the monsoonal season after rain uncountable grasses and creepers, are grown which include: golaro, tooh, gigantea, jandeer, gunn, lump, lular, lani, sinn, kharo, maguni, lonak, marero, saun and other"(8). And herbs, shrubs and trees, which are available in Thar are, source of fodder for livestock and useful to people too. They are Acacia Senegal (Kombhat), *Salvadora oleoides* (Khabar, in which *Salvadora oleoides* fruit pilo are produced), chibhar, kandi (propos ginerasia), *Capparis aphylla* (kirur, which produce, paka & pusi), AK (*calotropis gigantea*), *Aeura tomentosa* (boh), *Leptadnia spartium* (khip), ber (*Zyzyphus rotundifolia*) and rohiro (tree which gives red flowers). It means after good rain, everywhere is greenery and there is festival of aid for Tharies.

In this area if, it is rained than the production of crops like bajra, guar, til, mong, castor oil seed, etc are very nice. These commodities now a-days are included in cash crops. These all are source of fodder for livestock and are stocked in the homes and farm for two three years. There is no irrigation system now a day except the well from, which drinking water is got with difficulty. In Nagarparkar there are some little dams, which help in irrigation.

In Thar when there is no rain at that time birds, insects, animals and helpless Tharies human beings look helpless and worried. From everywhere dry and hot winds are started. Trees, herbs, and grasses get semi-dry. Dry and cruel climate dominants every life and every body gets helpless. Cows, bulls and other livestock die during walking. Due to scarcity of water the sandy dunes which are spread in hundred of miles throw flames of fire. It is felt that the superior power (nature has planed to destroy the life).

From above all it is clear that in Thar agriculture is not successful due to rain. Tharies depends upon livestock but livestock itself depends upon agriculture too. Now matter is that what solution that we can suggest for betterment of livestock and for the best future of Tharies, that solution is only to save natural environment and vegetable by planting more plants with well planed system.

(2). Tree Plantation

Tree plantation is must for Thar's beauty and for livestock as a fodder, for non-crops as a timber wood, vegetables and fruits, which may be reliable source in long run. For tree plantation above purposes should be there. It should be on commercial purposes on individual form lands. Tharies landowners have to think into distant future, so that they can see advantage of this programme. For this programme important aspects are choice of plants,

technical how-know, from where plants should be brought, in which season to be planted and in which places should be planted that death rate and watering problem should be low. Example of AKRSP can be taken, where they have planted 1 million trees in spite of so harsh climatic conditions. In this concern forest department AKRSP, PFI, IVCN may be helpful. Plantation of local plants like Khejdi (propos ginerasia), *Salvadora oleoides* (*Salvadora oleoides* (Khabar), *Capparis aphylla* (kirur), Ber, which are perennial and may be useful for dual purpose, one for fodder and second for fruits and vegetables too. Their result is in long run, but if only these are planted and successful then future of Thar is bright. Agriculture is fail due to recurring of famine and drought conditions. These lands can be used for tree plantation. There should be some grasses sustainable for few years as a fodder to be planted in the farms and gawchars and near to boundaries of their farmlands as ethno forestry.

(3). Animal Health Care

There are some animals care facilitates, but they are not enough for Tharies, due to present conditions of Thar. There are units, which are sanctioned for the service, but persons appointed are not so aware and due to government's inactiveness they do not perform the duties very well. Need is that those who keep the animal more than 50 should be trained at villages level by workshops holding at villages. When they will be aware then they will be also independent for doing treatment of animals, which they are already doing by ill and traditional methods. Some traditional methods, which they use, are very useful and they should be encouraged.

b). Use of Livestock

In Thar people keep the livestock additional to agriculture for nutritional and commercial purpose also. All Tharies who are living in villages are keeping this for nutritional and commercial both purposes. Those who live in urban they also keep for nutritional purposes e.g. milk, ghee, curd and yogurt etc. They think that every body should have their own milk and yogurt. Tharies like yogurt from which butter is taken out by old traditional methods. All Tharies use yogurt, which is less dense than which is used in cities. Tharies like yogurt at the time of meal and villagers use it as a substitute of vegetables. If they do not get vegetable, they can pass the whole day but, if do not have yogurt then it is very difficult to pass the whole day.

People use four types of livestock goats, sheep, cows and buffalos for commercial and milk purposes. Camel, donkeys and horses are used for labour animals. Their use by kinds is given as under:

(1). Donkeys

They are thought inferior but they are very cheap in fodder, owner has to give less it for eating. That is why donkeys do not give loss in capital, which is invested to buy donkeys. But earn a lot of as compared with other as a labour animal in pulling water, ploughing as a cheaper servant animal.

(2). Camels

They are use full in riding, pulling water polluting and loading purpose etc. It is called ship of desert. In villages it is must but every villager is unable to keep it. Because it is on the one hand costly and on the other hand it is expensive in fodder. Its food is costly and it eats a lot of fodder. Middle class villagers and upper class villagers keep it. This animal is labour animal those who use it can get much benefit from its labour. Some villagers keep it only for riding and loading and ploughing, for them it some times becomes costly and some times cheaper, depending upon the work. Mostly in Thar agriculture is not sure, income source, so, one this work is not sure and in drought/famine it give loss. Riding and loading are not regular jobs, so mostly for all it is not cheap. But some who do daily wages work with its share they can get benefit. From above discussion it is clear that it is one kind of facility and honor for a person but not financially useful.

(3). Horses

They are mostly for riding, some people use low type of horses for ploughing. Horses we can compare with cars, camels we can think substitute of motorcycles for loading purpose.

(4). Goats

They are used for two purposes the nutritional and commercial purposes. They give milk, which is used for butter ghee, curd and yogurt. These things save to buy much vegetable too, because they are also their substitute. In this way they are on one side performing the work of nutrition, which is good for health, it save the money, meat of it is also used for diet. These goats give some times kids twice a year and some time once in a year.

Average is counted one kid per year. In this calculation they became double in one year. In goats, if the kids are male, then they are sold for income purpose and middleman purchase these and sell these in cities for the purpose of meat. In this way goats are performing both functions regularly and fulfilling owner's requirements partially. Goats, which are used for meat, their skins are sold in market for commercial purpose. The wool of goats is also used for making different things by Tharies. From wool Tharies make threads, ropes, which are locally, used Boras (Bags) and Rugs are woven from these threads and are also used in local market. One-kg wool per goat twice in a year is taken.

(5). Sheep

They are also used in Thar for both purposes. Sheep give milk but in low quality. But they give kids twice in a year that is why their number multiplies soon. Their wool is also costly and used for different things, which gives income. In this way their meat is also sold in market. They are much income generating.

(6). Cows

They are used in Thar for both commercial purpose and nutritional purposes. They give much milk and poor people cannot keep these, because they are costly and at the same time expensive in famine conditions. When in Thar famine conditions are at the peak, at that time dry grass (fodder) for these cows are costly. In these conditions only goats are preferable. Their food is easily found in jungle by goats themselves and they need low quantity of fodder from owners. But cows eat much fodder that is not available in jungle/ rangeland. Stored fodder is used for them and that becomes very expensive. The fodder is brought from barrage area, which is also expensive in Thar. From this it is clear that cows are suitable in favorable conditions only when grasses are available in jungle/rangeland but in famine conditions it is very difficult to keep cows. Only those who keep them only for commercial purpose they keep it in large numbers, and live in those areas in which fodder is easily available for them. At drought/famine time those who keep cows in small number for nutritional purpose become fed up from cows and sell these in low rates. The prices of cows also fall down so much because cows become so weak and are sold more than before.

In this way they are not so income generating. But they fulfill the nutritional requirements of Tharies. In this way in kind they saved money by not buying milk, ghee and butter.

(7). Buffalos

They are also used in Thar but in very small numbers. Because they want much water and fodder which is out of approach of every Tharies. Only rich people keep the buffalos. They are performing at the same time two functions nutritional and commercial. Their males are sold in markets for meat and are also used in Thar for ploughing and pulling water from wells. Fur of them is very costly and is sold in markets. But mostly they are not much income generating because of eating much and not demand of milk.

c). Area Wise Suitability for Special Animals

In all over Thar, all types of animals can be kept, but every area is differing from other due to difference in kinds of plants, which are fodder of animals. Due to this easily some animal get their fodder in jungle themselves e.g., in Samroti and Vat fodder for camels and goats are easily available and in Chachro taluka from Chachro to New Chhor and border side trees and shrubs are less and not good for livestock.

d). Better Livestock for Nutrition

Better livestock for nutrition is buffalo and cow for milk, butter and ghee. Villagers feel that these animals for this purpose are good but in drought conditions they are very difficult to feed and are so expensive at this time. They are out of range of ordinary people; and in Thar every alternate year is mostly drought or semi drought.

Goats are also good for nutrition as meat, milk ghee butter but they are taken in little quantity. But every Thari mostly has some number of goats for milk butter yogurt and ghee in little quantity. Goats are not so expensive their fodder is available also in drought conditions. They also eat in little quantity, which are bearable for every Tharies. Their meat is much expensive than all others. Sheep is full filling nutritional requirements in low quantity in shape of milk butter and ghee but their meat is sold as meat of goats. Its meat is second to goats but is sold in the same rate mostly.

e). Better Livestock for Income Generating

Those people, who keep animals for commercial purpose, in large quantity and remain in the search of fodder, can migrate place to place and can keep all kinds of lives tocks. All livestock generate income in much quantity for those who depend upon fully on it. They sell milk ghee and livestock itself to fulfill the requirements of them and of animal's fodder etc. They do some agriculture but not other work except lives tocks.

For those who keep livestock for the purpose of nutrition as milk, ghee, curd and yogurt and keep livestock in such a quantity, which requires only their nutritional needs. But they are also income generating in kinds e.g. milk and ghee they would buy from market that money is saved that is also income and some times when male kids are mature, they are sold for income generating purpose a partially.

Such people keep animals for nutritional purpose and mostly keep cows and goats. For such people goats are income generating. Cows are not income generating. Cows fulfill the requirements, which are equal to expend upon them.

From above discussions it is clear, that those livestock, which perform the function of nutrition as well as income generating. Out of these goats, and sheep are much income generating, on the first hand and on the second hand, cows are income generating but only for those who goes in search of food place to place in Thar and in barrage because of much eating of fodder.

Other animals, which are labour animals the donkeys, are much income generating. They do much labour but need fodder in less; they can get their fodder from environment themselves. Therefore poor people keep it. We can say it the animal slave for Tharies.

The camels are also income generating for only those who use it in work but its output is equal to expenditure done on it. It is income generating but depends upon owner. If he uses it more than it is income generating and income saving other wise it gives loss. We can compare it with car, which is expensive for owner but gives facility to owner.

In this way horses are not income generating, because we also can compare these with car of large number of c.c.and consume much fuels.

f). Steps Taken by NGOs for Livestock

There are only few numbers of NGOs, which are working in Thar at this time; they are save the Children Fund SCF-UK, now in the name of Thardeep, Baanh -Belli, PVDP and Aghakhan foundation etc. There are only four NGOs are registered in Thar and more than 50 are working. Out of all these NGOs Thardeep is working in Thar in place of TRDP "Thar rural development project". This project is working in limited area of Islamkot and its surroundings, in Chelhar and surroundings, Chachro and surroundings and Diplo and surroundings. All the NGOs are also working on experimental based and working in lot of disciplines. They are also working in discipline of livestock; this project is collecting data and experience to evaluate the proper position of livestock. PVDP is working on tree plantation and it has planted four thousand plants and in 2001 other two thousands are in plan said Allah Bux employ of PVDP Islamkot. TRDP has worked upon it, at the same time Baanh-belli is also working about it too. There is need of long term plan for plantation. At this time Thardeep is also encouraging in the project areas to farmers for health care.

g). Steps Taken by Government for livestock.

Government has not done any proper work for it by plan. But only husbandry facilities have been given. In some villages dispensaries are there and dispensers are appointed for them and in taluka head quarter's doctors are appointed. These facilities are not enough for whole Thar to give full treatment to animals in proper way. Another step government has taken for animals are gawchars, which is only for animals this is a good step for animals. These two steps are good but except these lots of other factors are needed, which are necessary for growth rate of animals.

2. Fish Farming

There is no fish farming in Thar but if steps are taken then in the season of rain when water is stored near to Runn, then farming can be done over there.

3. Poultry Farming

In very small quantity poultry birds are kept. They are not costly but perform both functions nutritional and commercial .In jungle/rangeland some birds are there e.g. peacock, Taloor, Teetar, Bataibar, etc. They are hunt by people. But in very small numbers because birds are in low number and other it is necessary that from forest department permission license should be there. Some people also catch these birds. These are sold in markets in very low quantity, which also generate income for so many people in partially.

D. Dairy Products and livestock byproduct

Livestock is reliable source of income generating of Thar. In future livestock will prosper Thar and will meet the longer needs of Tharies. Its products are milk ghee butter, furs, bones and wool. At present wool, bones and furs are going to be sold in the market of cities through middleman. Furs were used in local tannery industry in traditional ways, but now days they do not do this job due to hates. Due to this reason this industry is totally finished. The leather locally produced by local tannery industry was very nice free from chemical effects and was cheaper than others. Due to this there was another industry based on it was shoes making which were traditional and on full swing 40 years back and it is finished now.

Now days these traditional shoes are liked at cities as a fashion and are somewhat modernized in shapes and designs. This arts based on livestock is now very low because of introduction of special leather made by cities on large-scale industry with modern fashion. Tannery industry can be successful now if it is again started with new modern concept and with some new disciplinary method. This industry should be started in those areas where there is rare population. There should be one guard on gate and there should be pass system on gate. Without permission no entry should be there. There should be bath system properly with nice soap. After going out nice dress should be worn. Inside dresses should be other and not allowed wearing out side, in properly arranged way. People will come for work and will earn too much money. And in long run this simple and small-scale industry would lead Thar into industrial economy. At the same time shoes factory will get promotion and progress. Other product, which is bone and is sold in cities, can be used in Thar, but for this there is a need of feasibility report. At this time bone of camel is used as a substitute of elephant bones, so bones of camel should be collected separately.

Wool is partially used in Thar for some arts e.g. blanket, Rugs, Ropes, Boras (Big bags) etc. And some quantity of it is sold as a raw material to cities through middleman. If some technical mechanism is searched and brought to Tharies and new small-scale technology is introduced then this raw material wool would be utilized in Thar and result in raise of income level and progress of small-scale industry and in long run in large-scale industry.

The others products are milk, butter and ghee. They are not sold in Thar local market except ghee with low prices in villages. Milk is sold in towns of Thar called cities of Thar. So the villagers who are living near to cities can sale their produce. But other who is away cannot reach cities and cannot sale their products. There is need of small-scale industry introduction with some modern techniques e.g. milk packing and butter preservation. Ghee extraction they know but need market. Ghee preserving and packing in time is needed and it can be done by right now with introduction of modern packing.

There are other two products, which are not in practice at this time, but they are based upon livestock milk, these are cheese and Cush. These both do not need too much expertise. There is market of these things in cities, especially in Quetta.

E. Edible Oils

These are concerned with crop production that is why, it is not successful and it will not progress until and unless some important plants for herbal oil for health care are used and introduced.

F. Mills

Except flourmills, there is neither mill in the Thar area.

IV. NGOs Working in Tharparkar

There are some NGOs working in Thar should be described here for bright future of Thar. Some names are pointed out for example, TRDP, Baanh Belli, PVDP, Maroora, Aghakhan Foundation, which are popular in all over country. Their work is looking better, may be they are still in experimental conditions and getting experience.

Baanh-belli and its branches are looking somewhere, except Nagarparkar, but in Nagarparkar work is good. Their objectives are good out put is good. Aghakhan Foundation is working but work done by them could not be collected. PVDP is also working at Islamkot; so, its work is good but is in limited areas. Other round about 50 NGOs are in Thar but their better work is not described even in the seminar of Thar in 1992 at Mithi. Only few NGOs are active. They are not compared with each other on the basis of their work.

TRDP was working in small area, in about 70 villages in Islamkot Project area and now it is working in Mithi Chachro, Diplo and Chelhar in the name of Thardeep. These projects are newly introduced and out put of these is not at screen, because of, availability of evaluation report like in 1993. In spite of that some work is looking better, which is research on carpet "RATTA RANG KOOMAYAL BAR, 1999" and "Rain Water Harvesting" and

news letters. They have made VOs; example of this is one active VO of Chelhar Rathore Para.

At this time some active NGOs are working for better development and creating awareness among Tharies and aim is not to raise fund for NGO. As these NGOs have done their experiences and got training in the situation of Thar, it is lacking still in expertise. Some technical experts and suggestions are needed and funds are needed too. Tharies should do self-help following the example of Somalia taking help from TRDP Baanh-belli and other NGOs and other examples, which are given in chapter review of literature and in details.

One thing has become in experience that agencies like IUCUN, SDNP (Sustainable Development Networking Programme), which is in Pakistan is working in collaboration with IUCN NGO Unit make strategy that is also supply driven. If they will make the strategy according to needs then, result will be better. Other thing is that donor agencies donate for particularly field, so, NGOs are bound to do that work that is also supply driven strategy. But it is clear that work done by NGOs is much better as compared to government. The employment depends upon work, but not on pressure of politics and feudal landlord.

V. Government Working

The work done by government is supply driven not demand driven; for example government opens the schools, dispensaries and other schemes of water dug wells or socio-economic development. These schemes are supplied on political pressure on those places where they are needed but not on priority of demands of Tharies, where they are needed first. There are so many primary schools in Thar rural having no out put. Staff appointed is on political bases not on merits and they do not perform their duties honestly due to political pressure. The students of primary schools, secondary schools and higher educated persons can be help full to the awareness of Tharies and Thar development.

There is a need of awareness, which is only at this time done by TRDP, Baanh-beli and, PVDP not by government. If these schools and health care facilities are handed over, in the administration of NGOs and the local organized organizations. Government should fund it as usual then better results can come on the screen and prosperity of Thar will be soon as compared to expected with present government servant's work, which is supply driven. Government servant think that their jobs are secured, if they will not perform their duties, and only do the paper for formality no body will check their actual work. But in NGOs job is secured only on the basis of work done by them along with positive thinking of the development of Thar. Government itself cannot develop Thar, until and unless Tharies themselves take interest and have self-confidence among them and determine to develop Thar as the Somalian people done.

In Somalia local organization, the Local organization promised to do every thing themselves, so they developed their country themselves not on depending government. Government should know, the case of Somalia; and micro credit programme of Bangladesh, experience of TRDP; Indian ethno forestry, lesson learned (conclusion of AKRSP; Grameen Bank Bangladesh; Denmark as an agro based industry and others, which are described in details in chapter review of literature and help Tharies through NGOs. Government will not be successful till local organizations are not active, and participate in work, thinking that, this work is their own. The main thing is that each and every individual will think positive then every thing will be possible and planned work would be completed and result will be the positive.

VI. Economic, Social, and Institutional Problems For Ethno forestry

As the conditions, culture and traditions; habits and way of thinking of Indian Thar / Rajhistan is mostly same as in Thar of Pakistan; so, under this title sub-headings are taken from Internet site. The site could not trace out, due to expertness to "internet", but, I am giving these things with somewhat consideration, according to situation, along with own suggestions and opinions; these points are as under:

A. Social Relations in Thar is Fail

Quite simply, a policy that assumes a community of interests may fail because no such community exists. Social relations in Thar communities have some times been said to be based, on feelings of village solidarity, but such an image is often at odds with social reality. The coming together of divergent castes and groups may be limited to socio-religious occasions or ceremonies such as weddings or temple/mosques festivals, with each caste performing traditionally defined roles. There is no tradition of growing trees that falls with in the rubric of traditional common action. Even the right to use common lands may be a source of conflict instead of cohesion. One might expect the common to be a source of village unity, but here the rights of so many people in so little land have led to bitter, which have been a source of dissention. Ventures such as tree crops that will be ready for harvesting after several years.

B. Socio-Economic Problems

A Comparative Study of Agro-based Industry of Tharparkar with Canal Barrage Area Sindh (1988-2000), Suggested Techniques Leading to an Industrial Economy, PhD Theses, Department of Economics, University of Sindh, Jamshoro, April, 2002, Chapter-9. By: Gobind M. Herani

In Thar all these problems are there, TRDP, PVDP and Baanh-belli have practiced it like in ASAL India. The socio-economic, political, and cultural context of the ASAL constitutes the framework in which forestry Programmes are to be carried out. To some extent, this context can be a greater obstacle to tree planting than environmental and technical constraints. Acknowledge, of this context; is crucial, if potential obstacles are to be avoided. (See studies by Beteille 1965, 1969, 1974; Bose and Jodha 1965; Breman 1974; Chauhan 1967; Dasgupta 1977; Dube 1955, 1977; Griffin 1979; Jodha 1980; Lewis 1965; Mandelbaum 1970; Mathur 1977; Narain, Pande, and Sharma 1976; Pearse 1980; Purohit and Kalla 1978; Shah 1974; Singh and Joshi 1979; Srinivas 1963, 1975, 1977; and the various Village Survey Monographs from the 1960 census for descriptive and theoretical information on the ASAL or on rural Indian society in general). This is not to say that cultural practices and attitudes are always conducive to afforestation. Some cultural adaptations that are rational from the perspective of the local people may be irrational from the forester's viewpoint, as this observation by Srinivas (1977, p. 337)

C. Wealthier Households and Groups Have Greater Command Over Resources

Wealthier households and groups by definition have greater command over resources: capital, land, equipment, and labour (including the ability to hire it or command it through patron-client relationships), and generally better access to public services (agricultural extension, education). This conveys upon them the ability to risk longer-term investments, such as tree crops. This is not to say that they are any more "innovative" than other less wealthy households are. Financial ability to innovate and a willingness to do so should not be confused. Rather, wealthier community members, who have more resources to invest and greater reserves to fall back on than their poorer neighbours, can more easily afford to tie up their capital in long-range but potentially profitable Example of benefit of trees is as under:

Some private investment by wealthy individuals in tree planting has occurred. In Gujarat some wealthier landowners, having recognized the growing demand for wood products, have converted their irrigated plantations of cotton, rice, wheat, and sugar-cane into eucalyptus stands that are copied at four to five years and from which all products can be sold profitably. An analysis of one particular enterprise near Ahmadabad recorded internal financial rates of return of 213 per cent for each coppice crop excluding the value of the hectares of land or 61 per cent including land (Gupta 1979). Given this high rate of return, it is no surprise that some entrepreneurs have decided to invest in tree crops instead of annual crops. Approximately 300 landowners have begun growing hybrid eucalyptus. Although they cannot all expect the same high rate of return, they will contribute significantly to Gujarat's wood needs and to the rehabilitation of cultivable wastelands in the state, (which cover over 550,000 ha). (Internet).

D. Capital-Intensive Forestry

The apparent success of some entrepreneurs in tree farming suggests that forestry with a high level of fixed investment per unit of land may prove more economical than forestry with lesser investments. That is, capital-intensive forestry may be more productive economically than less intensive capital use. However, there are several consequences and limitations to such an approach. The strongest reason for not relying on a capital-intensive strategy is that it effectively bars participation by the poor and landless, except as employees or clients of the wealthy landowners.

1. Example of ASAL India

We can take the example of ASAL India. Besides the fact that, many inhabitants of the ASAL are landless or land poor. A chronic shortage of capital, a lack of reserves to depend on in case of adverse conditions and the necessity of waiting a relatively long time before any returns on investments are received, places poorer households at a severe disadvantage. Programmes such as social forestry based on community or public lands, government subsidies, free seedlings, abundant technical advice, and a cropping system that yields benefits early in the rotation can reduce these handicaps.

E. Sometimes Particular Trees are Preferred

Sometimes particular trees are preferred for certain uses. In Thar most important tree is khejdi, which is good fodder also in drought too. It is at the same time used as fuel, timber, fodder and its pod gives vegetables. In the same way ber, *Salvadora oleoides* (Khabar), and bubal/babul (*Prosopis juliflora*, (Devi) are important tree and can survive in drought too.

F. Examples of Similar Areas

The 1960 Indian Census Village Survey Monographs, for example, show that the babul was preferred for use in the lacquer crafts industry of Bhirandiara, Gujarat. In many Rajhistan villages, the khejra (*Prosopis spicigera*) was consumed mainly for fuel, although it was used in some areas for timber and agricultural implements.

Several different trees may be used for the same purpose, with a clearly established hierarchy of preference. To some extent, the scarcity of trees in general may not be as important or crucial to the local people as the scarcity of particular species

G. Competing Uses of Land and Other Resources

The feasibility of afforestation must be considered within the context of existing, land use and resource allocation patterns. Trees compete to some extent with other uses of land, water, labour, and capital. Thus, knowledge of resource use patterns is imperative, if potential obstacles are to be identified and remedied. Furthermore, such knowledge should be viewed within the total context of demographic, market, geographical, and other forces that influence resource use for Example:

Example. 1

This section first considers some of the broad forces that have influenced resource use in one particular arid region India and then it examines the competing uses of resources at the local level.

As a response to these markets and demographic and political forces, changes occurred in resource use patterns. Jodha states that many traditionally pastoral people now are farming in addition to their livestock activities, while traditional agriculturists are adopting dairying and sheep rising as subsidiary occupations. The desire to expand economic activities has not been accompanied by simultaneous improvement of the resource base. Besides the movement of agriculture into ecologically marginal areas and overgrazing, especially around watering places, traditional conservation practices such as periodic resting of the land are being discontinued. The consequences of these changes are a deterioration of the resource base and an accentuation of desert-like conditions.

A common conflict over use of community or private lands is between grazing and tree planting. Livestock, through browsing and trampling, can destroy seedlings and young trees. However, stock rising is an important element in the Thar economy. Planting trees can mean closing land to grazing for at least a year, which can impose hardships on rural families. A related problem is providing adequate protection for newly planted trees. Importing fencing materials can be costly, a burden for limited-capital households or local organization. Local shrubs, trees, and other vegetation often provide hedges and fencing materials.

Planting of these living fences or sources of material would have to occur prior to the tree planting itself. Some observers suggest that attention should be given to improving the quality of livestock, so that productivity can be increased while overall numbers are reduced. Such a programme could prove very beneficial, but it is not an easy solution. Problems would include ensuring an equitable distribution of improved stock and preventing overstocking.

The competition between grazing and forestry can be reduced, by the planting of quick-growing grasses in afforested areas.

Example. 2

In Gujarat, after protection from livestock for a year, land that had been almost barren now produces grass that is used for fodder or harvested by hand (Eckholm 1979, p. 54). The combination of trees and grasses allows villagers to receive economic benefits from formerly marginal lands as well as a quicker return on their investment.

VII. Conclusion

After the detailed study of the thesis it is concluded that:

- i). Thar at this time is disadvantaged district of Sindh province. It is evident that there are wide gaps in the coverage of key pro-poor services such as primary education, prevention of health care and village electrification.
- ii). It depends on rain and its reliable source of income is livestock. Old cultural and traditional measures for crops and keeping livestock and present physical, social, economical and infrastructure changes have made Thar disadvantaged too. If these things will improve then Thar will improve rapidly.

- iii). Agricultural crops are completely failed but Tharies like it. There is need of change crops to non-crops where ever it depend fully on rain.
- iv). Non-crops need less care no investment and labour work. In case of no product, at least it does not waste the time and invested money. Actually it gives production in kinds, if one gets the fruit of it then each and every observer will replicate it.
- v). Some areas of Thar at present are suitable for livestock like Muhrano and Vat, because of natural vegetable.
- vi). In Vat area water is at low depth can be pulled out easily and can be used for crops and somewhere people do it. All the landowners of Vat areas should do it.
- vii). Fencing and reforming some acres of farmland at first time can save the natural vegetation, which is actual stock for fodder for present time and in long run too. It will give the fruits of non-crops and crops too. It also may prove honey farm at some level, if it is looked after and stocked.
- viii). There are so many natural herbs, which are used in medicine; they are grown naturally like Kunder, Leptadnia spartium (khip) and pilo. Kunder is used for making (Medicine) qushta of mercury; Khip is used for exzema, *Salvadora oleoides* (pilo), for constipation etc. After research in the field of these medicinally used herbs these can be conserved this may increase income.
- ix). For the purpose of fodder indigenous plants like Khejdi (*Prosopis cineraria*), ber (*Zyzyphus rotundifolia*) and (*Prosopis juliflora*) Devi should be planted. Some other exotic plants like, eucalyptus and Cactus can be planted. Climate is suitable for cactus plants that don't need much water and is expensive in cities used for purpose of home garden.
- x). For the improvement of livestock better and more productive races are required. There is need of conservation of livestock. It can be done, only by decreasing number of it, and improving quality. It will save time for labour and fodder too. Low stock of livestock will prove better for conservation of it. When natural vegetation will increase livestock automatically will increase.
- xi). When local leadership will organize Tharies, then they will conserve rangeland and non-crops and livestock properly.
- xii). Promotion of livestock will lead Thar to develop other agro based industries, first at small scales, like for use of wool, bones, furs, and dairy products and then somewhat larger like milk plants meat plants and looms will come into existence. In this way the promotion of agro based industry, will lead Thar, to an industrial economy.
- xiii). NGOs work is better than the government employs' work.

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