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# Livestock: A Reliable Source of Income Generation and Rehabilitation of Environment at Tharparkar

**Gobind M. Herani<sup>\*</sup>, Pervez Wasim<sup>\*\*</sup>, Allah Wasayo Rajar<sup>\*\*\*</sup> and Riaz Ahmed Shaikh<sup>\*\*\*\*</sup>**

## ABSTRACT

This paper attempts to identify the farming and growth rate of livestock and demographic conditions helping in its growth and focus is specially to examine: (i) to know the trend of growth of performance of livestock farming; (ii) to promote fencing of farmland and conservation of rangeland for fodder (iii) to find the new topics for further research. Hypothesis given below are tested in the light of above objectives: (i). it is hypothesised that livestock farming is reliable source of income generation; (ii). it is also hypothesised that reforming of farmland and rangeland will provide abundant fodder and will prove sustainable source of income generation and rehabilitation of environment. Two alternatives hypothesis are also set: (i). livestock farming is not reliable source of income generation, if properly managed too. (ii) reforming of farmland and rangeland will not provide abundant fodder and will prove sustainable source of income generation and rehabilitation of environment. The study reveals that the important component of agriculture sector is livestock and is an insurance against harvest failures and a source of easily cashable investment capital. It has more than 22 percentage of share of whole province's livestock. Agriculture dependent families are 81 percent and 92 percent families have opinion that livestock is the only first level sustainable source of livelihood in Tharparkar and needs more attention of researchers to evaluate it.

JEL. Classification: Q12; O13.

Keywords: Livestock, Trends, Comparison, Tharparkar, Growth rate, Rehabilitation, Reforming

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## 1. INTRODUCTION

Livestock has been given very much importance since time immemorial all over world even in developed countries. It is very important in developing countries, where level of mechanization in agriculture is very low. In these countries livestock rearing is draught power for the agriculture sector. On the other hand, the use of animals for draught purpose is low in developed countries owing to high level of farm mechanization and the animals are mainly reared for the consumption of meat and milk. The important component of agriculture sector is livestock in Pakistan, especially in Tharparkar of Sindh province and livestock is an insurance against harvest failures and a source of easily cashable investment capital. Livestock of Tharparkar has more than 22 percentage of share of whole province's livestock. (Derived from Table-2) Indeed, crop and livestock activities are, to a great extent, interdependent upon each other for their functioning within the farm sector. The latter provides inputs like farm yard manure (IFYM) and draught power for the crop sector and, in turn uses fodder, crop products and residues.

Pakistan's livestock activities accounted for about 36 percent of the total value of agricultural output and about 9.0 percent of the GDP in the country during the year 1999-2000 (Economic Survey 2000-2001). In the year 2005-06 (Economic Survey 2005-06) livestock sectors contributes almost 50 percent to the value addition in the agriculture sector, and almost 11 percent to Pakistan's GDP, which is higher than the contribution made by the crop sector (47.4% in agriculture and 10.3% in GDP). The role of livestock sector in the rural economy of Pakistan is very critical as 30-35 million rural population of the country are engaged for their livelihood. With in the livestock sector, milk is the largest and the single most important commodity. Despite decades of neglect, Pakistan is the fifth largest milk producer in the world. The total value of milk produced is higher than the value of two major crops, that is, wheat and cotton.

The contribution of livestock to the national economy takes different forms such as, yielding milk, providing meat and by-products like leather, hide and manure. Its products constitute an important source of foreign exchange earnings.

Third World countries largely depend on the ability of the rural poor to increase their disposable incomes. It is estimated that some 55 percent of all the world's cattle are found in the tropics of the Third world as are 60 percent of the world's buffaloes (mainly in Asia). In countries like Pakistan, 40 to 60 percent of all goods taken to market are transported by animals including camels, donkeys, buffaloes and oxen. In predominantly agricultural countries (like Pakistan), livestock is an insurance against harvest failures and a source of easily cashable investment capital. (Wasim 2007)

Table – 1

Percentage Distribution of Cattle, Buffaloes, Sheep, Goats and Camels  
by Province according to 1986 and 1996 Censuses

Province	Cattle		Buffaloes		Sheep		Goats		Camels	
	1986	1996	1986	1996	1986	1996	1986	1996	1986	1996
Punjab	50	46	71	64	29	26	36	37	34	23
Sindh	22	27	20	28	11	16	23	24	23	28
NWFP	19	21	8	7	9	12	14	16	7	8
Balochistan	7	6	1	1	48	46	24	23	36	41

Source: Pakistan Livestock Census, (1986 and 1996), Agricultural Census Organization, Government of Pakistan.

Table – 2  
Population Comparison of Cattle, Buffaloes, Sheep, Goats and Camels  
by District in Sindh during 1986 and 1996 Censuses  
(In '000' Numbers)

Division/ District	Cattle		Buffaloes		Sheep		Goats		Camels	
	1986	1996	1986	1996	1986	1996	1986	1996	1986	1996
Hyderabad	2140	2777	1394	2484	1727	2174	4213	5939	173	178
Hyderabad	218	436	333	772	50	173	399	854	5	7
Badin	221	289	194	368	96	163	276	302	7	7
Thatta	307	339	145	314	170	170	369	241	10	11
Dadu	367	511	262	437	358	371	744	868	29	36
Tharparkar	695	849	242	340	792	1100	1679	2971	103	109
Sanghar	332	353	218	253	261	197	746	703	11	8
Sukkur	962	1453	997	1606	431	489	1756	2364	34	28
Sukkur	272	381	271	363	119	119	542	644	9	8
Khairpur	289	436	294	493	95	124	576	694	14	9
Nawabshah	401	636	432	750	217	246	638	1026	11	11
Larkana	705	776	697	930	413	758	605	815	10	10
Larkana	246	128	292	253	177	85	182	112	5	1
Shikarpur	145	52	163	113	51	40	135	41	1	–
Jacobabad	314	596	242	564	185	633	288	662	4	9
Karachi	67	172	132	105	45	43	181	323	1	2
Karachi	67	172	132	105	45	43	181	323	1	2

Source: Agricultural Statistics of Pakistan (1999-2000), Government of Pakistan.

Tharparkar desert is disadvantaged district of Sindh Province (Pakistan). According to census 1998 it covers 2000 square kilometers area with population of one million. Its' main source of income is livestock, but people like agriculture too and it fails due to droughts falling every alternate

year; so farming is done as a lottery. Farmland and rangeland are the open meadows for animal grazing. This meadow helps the farmers supplying the fodder in drought conditions at very low level. Rangeland is going to be destroyed due to cutting trees for fuel purpose and not knowing the importance of it. Old cultural and traditional measures for crops cultivation and livestock rearing; and present physical, social, economical and infrastructure changes have made Thar disadvantaged too. 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. If these things will improve than Thar will improve rapidly. Increase in livestock would lead Thar to agro-based industrial economy.

There is need to stop cultivation and same land can be used for non-crops where ever it depends fully on rain. Non-crops (natural vegetation) need less care, no investment and labor work. In case of no product, at least it does not waste the time and invested money. Actually it contributes production in kinds; if one gets the fruit of it then each and every observer will replicate it. Some areas of Thar at present are more suitable for livestock like Muhrano and Vat, because of natural vegetable. 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 can do it.

**Live Stock Farming:** The main source of Tharies to make both ends meet is rearing of livestock that is why there is a saying that ‘Thar depends upon animals not on crops’.<sup>1</sup> The livestock of Tharparkar consists of buffaloes, goats, sheep, and camels, horses, donkeys and poultry. Each of these is described in details in this paper. All Tharies who are living in villages rear livestock as a nutritional and commercial purpose. And those who are living in towns rear it for the purpose of nutrition, e.g. milk, butter ghee and yogurt. They think that they should have own milk ghee, butter and yogurt Tharies like yogurt from which butter is extracted by old traditional methods. All Tharies use yogurt, less dense than used in cities. Tharies like yogurt at substitute of vegetables; they can pass the whole day with using yogurt rather than using vegetable.

‘In rural Tharparkar the standard of richness is having of livestock. It was pointed out, more than once, that a poor man was one who owned no cattle or goat’.<sup>2</sup>

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, microfinance, easily accessible animal husbandry and marketing facilities for their production.

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<sup>1</sup> It is the saying in Thar that they depend upon livestock not on crops (grains). It is commonly used when they talk about sources of income at Thar.

<sup>2</sup> Livestock is the standard of richness commonly used at Thar, according to their standards.

Production contributed by livestock to the economy of Thar takes different forms such as, yielding milk, butter, ghee, providing meat, by-products like leather, furs, hides, bones and manure. Its products constitute an important source of foreign exchange earnings.

These products need promotion and progress of small-scale industry 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.

During the last two censuses the importance of livestock in Sindh is increasing as compared to other provinces (table-1). Livestock population of Sindh, increased more percentage wise, in NWFP and Balochistan. We have chosen the livestock population of Sindh mainly, Tharparkar because of the reasons:

- i) Sindh is the major agricultural province after Punjab. The productivity of most of the crops of Sindh is higher as compared to Punjab. The population of cattle, buffaloes, sheep, goats and camels increased by more percentage in 1996 as compared to NWFP and Balochistan.
- ii) Tharparkar is the biggest belt of desert and its economy depends upon the livestock as compared to whole Pakistan, because of rain-fed agriculture. Since majority of the small and medium farmers are poor therefore they kept their own livestock for draught and milk purposes. Due to small holdings both they can use machinery nor afford it and they have natural resources of fodder in the free meadows of Tharparkar except the monsoonal season.
- iii) Livestock population is round about more than 22 percent of whole Sindh and needs more attention of researchers to evaluate it. Agriculture dependent families are 81 percent in Tharparkar. (Herani 2002, p.253; Herani 2007)
- iv) In spite of the important role of livestock in agriculture and Sindh economy, especially Tharparkar, it has not yet received adequate attention in economic planning of Thar district.
- v) It seeks to stimulate the thinking of professional scientists and owners of livestock in the rural areas of Thar with a view to increase the livestock population and the support provided by this resource to people's livelihood.

Main objective of the study is thus to identify the farming and growth rate of livestock and demographic conditions helping in its growth area.

Specific research objectives of the study are specially to examine: (i) to know the trend of growth of performance of livestock farming; (ii) to promote fencing of farmland and conservation of rangeland for fodder (iii) to find the new topics for further research.

This paper is structured as follows: In section 2 research methods are described like: primary source and secondary sources, hypothesis, data collection technique and analysis. Section 3 is about livestock, dairy products

review, effect of droughts and challenges. In section 4 fencing of farmland and conservation of rangeland are given. Conclusions of the study are given in section 5.

## **2. RESEARCH METHODS**

### **2 Literature Review**

The Secondary data was collected through different sources such as: Libraries, Newspapers, Magazines, Thesis, Census Reports, Addresses delivered by Govt. officials, Press Releases. It was also collected by: websites of Government of Sindh and Thar, Rural development studies by government; data collected by NGOs and Urdu Science Board (1989). From Tharparkar: (Herani 2002; Herani 2007); Thar Book a compilation of seminar papers by (Mangi 1993); NGOs: Thardeep, Banh-Beli, different CBOs. Out of Tharparkar: (Wasim 1990); Wasim 2007; Khan and Habibur 1982) and Studies of foreign origin such as: similar studies of Denmark, Somalia Indian Gujarat and Indian Thar of Rajasthan; Grameen Bank of Bangladesh; (Rajendran 1992; Rath 1992); and Denmark website.

### **2.2 Hypothesis**

Hypothesis given below are tested in the light of above set objectives: (i). it is hypothesised that livestock farming is reliable source of income generation; (ii). it is also hypothesised that reforming of farmland and rangeland will provide abundant fodder and will prove sustainable source of income generation and rehabilitation of environment. Two alternatives hypothesis are also set: (i). livestock farming is not reliable source of income generation, if properly managed too. (ii) reforming of farmland and rangeland will provide abundant fodder and will prove sustainable source of income generation and rehabilitation of environment.

### **2.3 Data Collection Technique**

To achieve the purposes of the study both primary and secondary sources were used. First of all review of available literature was undertaken, which were based on published and unpublished materials mentioned in literature review. A systematic review of the electronic database references was also undertaken. Sample survey is also carried out and used for the evaluation. This sample survey is taken out from the original thesis of (Herani 2002).

### **2.4. Data Analysis**

Finally collected data were analysed and presented in the form of tables, maps, graphs and description. This analysis were the base of conclusion drawn and recommendations were made keeping in view the

demographic, physical, social, economic changes, natural environment of the district and live stock.

## **1. LIVESTOCK AND DAIRY PRODUCTS REVIEW**

The Present Situation of livestock: As we have mentioned above that the kinds of live stock which are at present in Thar are buffaloes, cows, goats sheep, camels, horses, donkeys and, poultry. Detailed description of each is as follows:

### **1.1 Buffaloes**

Buffaloes give more milk than all animals. They also like to bath and swim in water and water is not abundant in Thar. They eat too much that is why the poor people can not rear it because of much cost itself and much expenditure to fodder; so only well to do people rear it.

The growth according to TRDP research is 312 % for three years and per annum is 104% (table-4).

From census report 1986 given by SAZDA population was 0.19 millions (1, 90,000) in all over Thar.

According to 1996 national census report (0.039 millions) 39,842 buffaloes are in Thar. It shows decrease and growth rate is 20.96 % for ten years and per annum it is 2.01 %.

It is concluded from above that growth rate according to TRDP research from 1989-92 in their project area is impossible by reproduction. Because of not giving kids annually; this growth rate may be due to new purchase of buffaloes from out of area. If any body or planner follow this then it will misguide and planner could not conclude the best suggestion for future; so, we think that all animals are decreasing due to drought so this also decreases because it eats too much, which is very difficult. As we know that it is expensive than others. Every body cannot have it due to high poverty ratio of Tharies.

### **1.2 Cows**

Cows are found in all over Thar. It is very difficult for cows to survive in Thar in drought conditions. The growth rate is 253 % in the project area of TRDP in the year 1989-1992, for three years and per annum is 84.3 %.

According to figures given by SAZDA in 1986 it was 0.55 million (table-4).

In census report of 1996 cows were 485,137 (0.48 million). It Shows decrease and its growth rate is 88.20 % for ten years and 8.82 % per annum. It shows that due to drought, it decrease and in 2001 it is expected less than that as observed by different ways and by personal meetings with people.

Cows give kids after one year, if conditions are favorable for fodder. They are difficult to keep for every villager due to expensive. They meet the



nutritional needs of the family and only those who keep them in herds they can earn from it only.

### **1.3 Sheep**

Sheep is found in much quantity in Thar. In Thar only sheep is that livestock whose growth rate is highest to others. It is 317% for 1989-1992, for three years and per annum is 15.7 % (table-4).

According to the figures of SAZDA taken from census report 1986 sheep are 1.33 millions.

According to census report 1996 total number of it is 89, 8542 (0.898 millions). It shows decrease and growth is 67.56 % for ten years and 6.75 % per annum.

After 1996 also drought were affecting it and drought of 2000 and cyclone of May 2000 also decreased the number. And in Chachro Taluka its ratio is highest.

It gives milk but in low quantity which is used for daily life use as other. It gives wool twice years, which gives support in income generating. Its meat is not so popular but it is sold with the same ratio as of goats.

### **3.4 Goats**

Goats are found all over Thar and 93 % people keep at least one goat. (See table-18 of primary data of Herani (2002).

They are cheap that is why every body keeps it easily and sale it at the time of emergency.

According to the figures of census 1986 given by SAZDA, total number of goats is 1.33 millions. According to TRDP its growth rate is 216 % for (1989-1992) three years and 72 per annum.

According to census report of 1996 its number is 1970852 (1.97 millions). It shows increase and its growth rate is 148 % for ten years and 14.8 % per annum.

It gives kids twice a year if suitable fodder is available. Its wool is cut twice a year. It can survive in drought and meets the needs of nutrition. This is the reason that is why only milk giving animal goats has increased and all the others decreased.

### **3.5. Horses**

Horses are used for riding and some low quality is used in ploughing for the farmland. Every body cannot keep it because it is too expensive due to expensive fodder.

According to census report 1986 horses are 0.003 million and according to census report 1996, they are 8132 (0.008132 million). It shows increase and growth rate 271 % for ten year and 27.1 per cent per annum.

According to TRDP's report growth rate increased and it is 256 % from 1989 to 1992 in three years, and calculated per annum is 85.3 %. From TRDP's growth it is clear that these growths are not from reproduction but they

are imported from other areas. At the same time it shows that some people have increased their standard of living and use horses. Increase according to 1996 may be right and correct that it is from reproduction.

### **3.6 Donkeys**

Donkeys are cheaper as compared to all other animals. These are used like slaves and demand less fodder, because they eat whatever they find in home thrown things.

According to TRDP's report its growth rate is 277 % for 1989 to 1992 in their project areas, calculated growth rate per annum is 92 %.

According to census report 1986 its total number was 0.02 millions and according to census report 1996 its number was 150834 (0.15 millions). It has increased and growth rate is 751.7 % for ten years and 75.17 % per annum. The growth rate is acceptable because they give kids after one year. Its growth rate is more than all the others as shown in each heading. The reason of increase is only that they survive in drought needing less fodder. In drought people do not sell the donkeys, which support them in lots of labor works.

### **3.7. Camels**

According to TRDP's report in their project areas the growth rate is 177 % for three years. Calculated per annum is 59 %.

According to census report 1986 the number of camels in whole Thar is 0.015 million and according to census report 1996 is 103057. Its growth rate is 687 % for ten years and 68.7 % per annum.

These figures show that people of Thar like it and want to keep it with them in droughts too for the labor work. Kids are born after every three or four years so this growth rate is not from reproductions but they are imported from barrage areas.

He camel is used in different works, ploughing, loading; pulling water etc, but is costly also; every body can not have it. She camel is cheaper in rearing. Fodder for it is easily available in Thar also in famine conditions. Their milk is used in tea and drinking only for their owners. Mostly of the people do not like its milk. They generate income only by helping in work and giving their kids. Kids getting young are sold. wool is also used in rugs and is thought good quality because of its softness.

### **3.8 Poultry Farming**

In Tharparkar there are no formal poultry farms and some people less than 1 % keep it informally at home. According to census report 1996 total number of poultry is 1999,395.

### **3.9 Effect of Drought 2000 on the Livestock**

Losses in terms of mortality and forced culling were observed in the order of 10% for cattle, 30 % for sheep and 20% for goats in the worst affected district of Sindh. Domestic production of sheep and goat milk is estimated in the field to be down by 70-80 percent in the worst affected areas. The prices of livestock have declined by 80% for cattle, 75% for sheep and 70 percent for goats. The remaining small ruminants in affected areas are very weak and have limited resistance to incidence of diseases (Drought 2000) .

Table-3.  
Regarding Livestock

Particulars	Population	Population Millions	Growth rate %	Growth rate %	Status/ Trends
Cows	0485137	0.55	88.20	8.82	Decreased
Buffaloes	0039842	0.19	20.96	2.08	Decreased
Goats	1970852	1.33	148.00	1.48	Increased
Sheep	898542	1.33	67.56	6.75	Decreased
Horses	008132	0.003	271.00	2.71	Increased
Camels	103057	0.015	686.00	6.86	Increased
Donkeys	150834	0.020	751.70	7.51	Increased
Total Millions	3.85 6,328	3.43	89.01	8.90	Decrease
Census	1996	1986	1986- 996	Per Annum	

Source: National Census Report, 1998, Provincial Census Report, and Tharparkar Report and Sindh Government Website, Sindh at a Glance

Source: Livestock Census

In 1986 census was 3.43 millions (Source: SAZDA)  
 In 1991 projected was 3.88 millions. (SAZDA SOURCE)  
 In 1993 projected was 4 00 millions (An Introduction To TRDP)  
 In 1996 Census was 3.86 millions (Live stock & Agri., census)  
 In 2001 projected is 3.00 to 3.47 millions (10 -20 % Loss)  
 In 2006 expected 4.00 millions (because all over Sindh it has increased)

Table- 4  
Thar Animal Population in TRDP PA between 1989 and 1992

	1989	1992	Growth Rate Percentage
Cows	7 ,129	18,067	253
Buffalo	198	619	312
Sheep	8,612	227,303	317
Camel	2,916	5,167	177
Horse	146	374	256
Donkey	4,200	11,652	277

Data derived from TRDP's 1989 base line Survey and 1991 Animal Population Census

### **3.10 Dairy Products and its By-products**

Livestock is very important factor of Thar and an income-generating source for Tharies. Its importance is too much due to bones, wool, milk, butter ghee and meat etc. The livestock, which gives milk, butter and ghee, are buffaloes, cows, sheep and goats.

How much each of them gives productions, that is different for cows, buffaloes, sheep and goats and even for different species. At this time mostly milk is not sold in the village's .Due to lack of market they make yogurt butter and ghee and sale ghee at cheaper rates. There is no preserving system of these productions except ghee, which can remain as other oil, and vegetable ghee for some years. Their production depends upon fodder crops and imported feed from barrage areas.<sup>3</sup>

From all of the fodder sources the natural vegetation is better and if there is rain then natural vegetation is best for livestock as fodder, which is free of cost and it is also better for people of Thar too. Livestock fodder is based upon agriculture and rangeland vegetation. Therefore we should study agriculture and rangeland which is actual base of livestock industry. Without studying it, we cannot imagine development of livestock industry. Livestock and agriculture are inter-related

'Rangeland in the desert parts of Sindh represents the main source of livelihood for animal raisers especially the transhumant who are the only dominant group that exists in the deserts of Sindh. It may be reliable source of income in future if preserved. Agriculture is not reliable source of income and need reform of farmland by fencing some part of it for fodder. This means that if the desert has to generate animals, will have to be stall fed and many more trees will need to be planted. Many villagers feel that they could afford to stall feed their animals if there was a market for their dairy products, their animals and a cheaper source of fodder. They point out that the only saleable dairy product is ghee (butter oil), which middlemen buy from them at half the market price. Alternatively, they have to take small quantities of it themselves to the urban areas. The general feeling is that if roads could be constructed, fodder prices would fall and ghee and animal pieces would go up. Most villagers who owned animals were certain that it was livestock that sustained them and not agricultural activity. It was pointed out, more than one, that a poor man was one who owned no cattle or goats. The valley of Nagarparkar is richer in vegetable growth, which supports a large variety of livestock such as cattle, camels, goats and sheep (Hassan and Hardy 1993). At present in 2007 net work of roads is better in comparison of nineties and it is in progress and has resulted better for Tharies.

### **3.11 Challenges in Livestock Farming**

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<sup>3</sup> Opinion of Tharies at the time of open end poll questions

It is sustainable source for income generating livestock contributes as about 50 percent of the value produced by agriculture sector. Principal produces are milk, beef, mutton, poultry and wool. As agriculture activity becomes affected, and then this sector automatically becomes affected, resulting in decrease of numbers of livestock. People in the drought and famine conditions sale their livestock to meet their daily life requirements. Health care facilities are not enough in rural areas. There is no awareness of health care. Farmers are not aware about special species, which are more productive. Some farmers are so rigid and they follow old traditional methods for rearing and they do not follow the new methods and technology. Farmers do not use artificial way of fertilization.<sup>4</sup> Transport, road, middle man, desertification due to scarcity of rain and riverine water, lack of awareness and lack of investment for further improvement, loss in crops, lack of proper government encouragement, lack of use of new technology; all these are the indicators of problems for the improvement of livestock. In poultry farming health care is needed, there is no preservation of meat and there is no proper arrangement of export facilities.

'According to survey of" Children working in Carpet Industry" in 1999, round about 81 percent are loaner; out of that 64 percent are able to pay the loan easily. Mostly people are able to pay loan upto Rs. 5000. Amount of loan is from 10-50 thousands as a average. Less then 10 percent families are able to pay more then 10 thousands.

They are loaner in the following order: (i). 2% NGOs .(ii). 27% Money lenders. (iii). 5% Contractors.(iv). 7% Relatives/ (v).11%land Lord. (vi). 12%Neighbours'. (Ratta Rang Koomayal Baar.1999,. Pp.13-15)

### Health care facilities:

Table-5

Numer of veterinary healthcares

1998-99			1999-2000			2000-2001		
Govt. Hospitals	Dispensaries	Veterinary centers	Govt. Hospitals	Dispensaries	Veterinary centers	Govt. Hospitals	Dispensaries	Veterinary centers
6	2	146	6	2	146	1	7	67

Source: Agriculture statistics of Sindh, 2003, Bureau of Statistics, Govt., of Sindh

According to veterinary facilities given in above table, it is not clear that they are increased, but from the following table it is clear that these are increased in 2000-2001 in comparison of 1999-2000.

Table-6

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<sup>4</sup> It is artificial way of fertilization, which give good results.

#### Animals Vaccinated, Treated and Castrated

Year	Vaccinated	Treated	Castrated
1999-2000	1733879	70269	5203
2000-2001	1861798	160330	3558

Source: Agriculture statistics of Sindh, 2003, Bureau of Statistics, Govt., of Sindh

#### **4. FENCING OF FARMLAND AND CONSERVATION OF RANGELAND**

Fencing and reforming some acres of farmland 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 (uncultivated/unsowed crops) and crops (sowed /cultivated crops) too. It will contribute the same fruits and vegetables which we get from sown cultivated farmland and rangeland. It also may prove honey farm at some level, if it is looked after and stocked.

There are so many natural herbs, which are used in medicine; they are grown naturally like Kundeer, *Leptadnia spartium* (khip) and *pilo*. Kundeers are used for making herbal; Khip is used for exzema, *Salvadora oleioides* (*pilo*), for constipation etc. After research in the field of these medicinally used herbs these can be conserved this may increase fodder and generates income.

For the purpose of fodder and fencing plant indigenous plants like Khejdi (*propos ginerasia*), ber (*Zyzyphus rotundifolia*) and (*Prosopis juliflora*) Devi and Some other exotic plants can be planted, like: Cactus. Climate is suitable for cactus plants that don't need much water and is expensive in cities used for purpose of home garden.

When local leadership will organize Tharies, then they will conserve rangeland and non-crops and livestock properly. For the better prospects of Thar, we can improve livestock farming. Main factors of this industry are, first livestock races, second, its sustaining trees, and grass plantation. Through these things, Thar can reach up to an industrial economy.

Prosperity of any area depends upon the economic sources. And for every country or region these sources are different, because of different conditions of the areas. Thar is quite different from all of other areas, due to sandy dunes and scarcity of water, and so many others factor. Some factors are similar like in Denmark and some countries of Scandinavian, which were depending upon livestock as a reliable source. These are now days well developed in comparison of earlier conditions. This speed of prosperity and development shows that their future is bright due to livestock. Keeping in view development theories of different places which researchers and experts have given; show that how the development can be brought, in particular areas. Mostly all of them recommended that the measures of development are: to set programmes, experiences and research in particular areas. And indigenous knowledge is the main measure of development.

Those agencies, which are working on subject development, can continue with their work and record their experiences of training and also carry out assessment of the effectiveness of their work. They can evolve some objects

and valid ways of measuring the work of the objects. After one year participating agencies can meet for the review of the progress, in reference to these useful methods, which have been made in their follow-up work. These institutions can be available for training to trainee also. After that when their Programmes are evaluated according to objectives then in the light of experiences; Programmes can be re-framed and can proceed for the purpose.

Following examples can be taken: i). Tagore's Experiment in Rural Constructions Experiences of Mitranikatan. ii). Navajivan Mandal, An Experiment in Social Development Friends Rural Center Rasulia. v). Baroda Experiment. vi). the Firka Development Scheme of Madras Provinces. vii). Nivali Kanya Ashram of Kasturba Trust. viii). Gandhian Rural Service Institute a brief review of its rural development work. ix). Ramakirshna Missions' Role in Rural Development. x). Co-Operative Venture at Comilla. xi). Rural Development Work at Peshawar Academy. xii). Public Co-Operation in Rural Development, rural development in India and some cases of Somalia. xiii). TRDP's work at Tharparkar. xiv). UNDP, UNCDF, SPDC (2000). xv). Micro credit program of Grameen Bank Bangladesh and. xvi). Progress of Denmark and Scandinavian countries. xvii). Baanh-Belli Tharparkar. xviii). Aghakhan Foundation. xix). Maruara Foundation etc.

We are searching the theories and experiences of experts and in the light of these experiences work can be preceded forward. As there are so many experiences done on the subject development of rural we would like to give here some equations as a review. 'An expert socialist "Lenin pronounced, his famous equation for development, namely, socialism = soviets + electricity. He did not realize that it was impossible to provide electricity to every future soviets of the world. Pandat Nehru modified this equation for Indian conditions and he said, Socialism = Panchayat (local organization) + electricity, unless some other appropriate equation is developed for socialism, it is doomed to failure on the bedrock of electricity supply". But for the Thar we give an equation that: Alleviation of poverty = Panchayat (local organization) + live stock.

## 5 CONCLUSIONS

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

**The main attempt of this paper was to identify the farming and growth rate of livestock and demographic conditions helping in its growth.**

It shows that Thar at this time is disadvantaged district of Sindh province (Pakistan). 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.

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, economic and infrastructure changes have made Thar disadvantaged too. If these things will improve than Thar will improve rapidly.

Agricultural crops are completely failed but Tharies like it. There is need of decrease crops encourage to non-crops where ever it depends fully on rain.

Non-crops (natural vegetation) need less care, no investment and labor 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.

Some areas of Thar at present are more suitable for livestock like Muhrano and Vat, because of natural vegetable. 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 can do it. Overall conclusion is that in comparison of twenty years back change is to much positive and progressive and infra structure is comparatively to much better.

**Focus of this study was specially to examine:**

**(i) to know the trend of growth of performance of livestock farming**

It shows that Tharies like agriculture which is failure due to rain and they depend upon livestock. Live stock of Thar contributes more than 22 percent of whole provinces. In Sindh 50 percent is the contribution of livestock in the agriculture sector (Economics Survey, 2005-06). Agriculture dependent families are 81 percent and 92 percent families have opinion that livestock is the only first level sustainable source of livelihood in Tharparkar and needs more attention of researchers to evaluate it (Herani 2007). From it we conclude that Thar is sharing more share than other districts of Sindh in the form of livestock.

Livestock population from 1986 as a base reference has increased in 1991 and continued increasing till 1993. But it decreased in 1996 in comparison of 1993 and increased in comparison of census 1986. As over all livestock in Sindh has increased in 2005-2006 as mention in economic survey 2005-2006, so we expect the increase also in Thar. It is also concluded that fluctuation of growth trend is due to drought effects.

According to census 1996, number of goats is at first level in Tharparkar and in comparison of all districts of Sindh province it is also at first level. Number of sheep is at second level in Tharparkar and in comparison of all districts of Sindh province it is also at first level. Number of cows is at third level in Tharparkar and in comparison of all districts of Sindh province it is at second level. Number of asses is at fourth level in Tharparkar and in comparison of all districts of Sindh province it is at first level. Number of camels is at fifth level in Tharparkar and in comparison of all districts of Sindh province it is at first level. Number of horses is at seventh (last) level in Tharparkar and in comparison of all districts of Sindh province it is at second level. Number of buffalos is at sixth level in Tharparkar and in comparison of all districts of Sindh province it is at last level. (table-2)

**(ii) to promote fencing of farmland and conservation of rangeland for fodder**

It shows that 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 can be non-crops and fodder.

Fencing and reforming some acres of farmland can save the natural vegetation, consequently actual stock for fodder, fruit farm for cultivated and no cultivated fruits and may prove honey farm at some extent.

For the purpose of fodder indigenous plants like Khejdi (propos ginerasia), ber (*Zyzyphus rotundifolia*) and (*Prosopis juliflora*) Devi and Some other exotic plants can be planted, like Cactus.

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 can 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 can be done earlier than road and electricity, because both are concerned with government policies.

### **iii) to find the new topics for further research**

Suggestion given in the article (Herani spring 2007) must be implemented. Further empirical studies should be carried out identifying the correlation of droughts effects, roads constructed, telecommunication facilities, imported fodder and fenced and conserved rangeland.

*Testing of hypothesis:* Hypothesis set are tested theoretically, with the growth rate, comparison of livestock with cultivated agriculture, and characteristics given in the appendix. From this testing it is concluded that:

Hypothesis (i) is accepted which is: it is hypothesised that livestock farming is reliable source of income generation; and

Hypothesis (ii) is also accepted which is: it is also hypothesised that reforming of farmland and rangeland will provide abundant fodder and will prove sustainable source of income generation and rehabilitation of environment.

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