EUROPEAN ACADEMIC RESEARCH
Vol. II, Issue 10/ January 2015

Impact Factor: 3.1 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Economy of Pandharpuri Buffalo in Solapur District of Maharashtra (India)

Dr. SHIVAJI SHANKAR MASKE
Assistant Professor
Department of Geography
Sangameshwar College, Solapur
India

Abstract:

Buffalo is a very important dairy animal in the study region. Buffalo gives more milk than cow. The dairy industry of the study region is depending mainly on buffalo. Male buffalo make excellent draught animals, particularly for heavy carting. The aim of present paper is to assess economics of pandharpuri buffalo in Solapur district of Maharashtra (India). The present study is based on primary data and supplemented by secondary data. Primary data is collected through buffalo farmer survey conducted in the study region. Thus the sample size for the survey got 96 buffalo farmers from 16 villages spread at the micro-level in the selected tahsils of Solapur district. Stratified sampling procedure was applied for the case study of buffalo and sample buffalo farmers. Secondary data has been obtained from the District census handbook, District Gazetteers, District statistical department and socio-economic review, livestock census, Department of animal husbandry Zilla Parishad Solapur, Department of livestock conservation and animal conservation ministry of state government. Collected data is processed and presented in the forms of tabular and graphical methods. It is observed that pandharpuri buffalo is a main dairy animal in the study region. The net income from the unit of 5 pandharpuri buffalo is Rs. 78065/- in a year. The net income from a pandharpuri buffalo is of Rs. 15613/- in a year and cost benefit ratio is 1:1.26.

Key words: Pandharpuri buffalo, Gross cost, Net income, Cost benefit ratio (CBR).

Introduction

The Pandharpuri buffalo is an important buffalo breed in south east Maharashtra of India. The Pandharpuri buffalo is a native of Kolhapur, Solapur, Sangli and Satara district in south Maharashtra of India. These buffaloes are named after the name of the geographical area, i.e. Pandharpur block in Solapur district. It is hardy and well suited to dry conditions in this area. The Gawali and Joshi communities are local breeders. They maintain these buffaloes. There are various types of buffaloes in the study region, such as Pandharpuri, Murrah, Nagpuri, Surati and Marathwadi etc. In the study region Pandharpuri buffalo variety is important and its population is high in number as compared to other buffaloes.

Buffalo is the third ranking animal after Goat and Cattle in the study region. Out of the total livestock population, Buffalo shares 18.78 per cent livestock population (Livestock census 2007). Regarding Buffaloes Solapur district is one of the important districts in Maharashtra. It ranks third position next to Kolhapur and Sangli districts in the state. At present, according to 18th livestock census held in 2007, total population of buffalo was 409552. As compared to 9th livestock census (1961) to 18th livestock census (2007) 207.18 per cent of buffalo population is increased.

Choice of the Topic:

Animals are an important bio-resource in India. Animal husbandry and dairy farming have an important place in economy of India. This is an important occupation of landless and small landholders. In the suburban areas, it is a complementary occupation. Since agricultural products are inadequate for the people in the hilly, tribal and drought prone

region, people of these regions have domesticated livestock. In India, the livestock population consists of cattle, buffaloes, goats, sheep, horses, camels, pigs etc.

1. Source of Food

Livestock provides some foods like milk and meat, which is an important source of balanced diet. Healthy nation cannot survive without balanced diet. Milk is the most important food derived from animals like buffalo, cow and goats. The contribution of buffalo milk is account for the largest share and it is followed by cows and goats. Milk and many milk products such as butter, curd, milk powder, cheese, cream, ice cream, etc. are obtain ultimately from livestock. Meat is an important food given by animals.

2. Importance for Agriculture

The agriculture operations depend upon the male buffalo and bullock such as cultivation of the land, because machinery is very costly and it is not reach to poor small farmers. The entire fields operations from ploughing to the harvesting of crops are mainly carried out by the draught animal's mainly male buffalo and bullocks. They are the key power in farming activities.

3. Use of Transportation

Male buffalo are also used for transportation. Our agriculture product is mainly transported from rural areas to urban areas by the male buffalo and bullock. The product is transported to the market with the help of animals.

4. Supply of Raw Material

Livestock sub-sector is vital for the economy as it provides essential raw material such as hides, skins, hair, bones and wool for some of the domestic industries like carpets, rugs, leather, foot wear etc. Leather is obtained from skins of animals. It is used to make foot wears, bags, purses, wallets,

jackets and suitcases, belts, automobile seats, sandals etc. as well as hairs are used for making the brushes.

5. Manure and Fuel

Dung of buffalo is used as a valuable manure to maintain the fertility of soil. Dung is also used in biogas or gobar gas plants. These plants provide the gas for cooking and heating as well as good manure. Dung cakes are used as fuel; however it is misuse of valuable dung as it deprives the fields as important manure.

6. Source of Foreign Exchange

Buffalo provide valuable foreign exchange. There is in visible export share which is admirable.

7. Share of GDP

The livestock industry of India contributes 8 per cent of the GDP whereas 32 per cent of agriculture GDP contribution.

In view of above, this problem is selected for the detailed study of this region.

Selection of the Region

Solapur district is selected for the present inventory in general and Malshiras, Sangola and Pandharpur tahsils of this district are in particular. Buffalo farming is mainly concentrated in Malshiras, Sangola and Pandharpur tahsils of Solapur district.

Solapur district is an administrative unit in Maharashtra of India. Solapur is a head quarter of Solapur district. The Solapur district is extended between 17^0 10' and 18^0 32' North latitudes and 74^0 42' and 76^0 15' East longitudes. The total geographical area covered by Solapur district is of 14895 Sq. Km. and the district it is divided into eleven administrative tahsils. Total population of the district is 4315527 as per 2011 Census. The district is surrounded by Ahmadnagar district to the north, Osmanabad district to the

north-east and east, Karnataka state to the south, Sangli district to the south-west, Satara district to the west and Pune district to the north-west.

Climatic condition of Solapur district is dry as daily mean maximum temperature ranges between 30^0 C and 37^0 C and minimum temperature ranges between 18^0 C and 21^0 C with highest temperature of about 45^0 C records in the May. The annual average rainfall is 678 mm in the district. Solapur district is situated on Deccan plateau region and famous for fertile black soils on the banks of rivers. Bhima, Sina, and Man are the major rivers in Solapur district. In this district vegetation is scattered, which includes short thorny trees, bushes grow along with tree. These trees have long system and few small leaves, short grasses grow during rainy season.

Beside this following are the specific reasons for selection of the region.

1) Due to the erratic nature of monsoon, presence of poor, low quality of soil and traditionally poor peasantry has led to the agriculture practice at subsistence level.
2) The scarcity of water both surface and ground put limits for the development of irrigation facility in the region. However, to cope up with the environment, the farmers of the region have adopted livestock farming as best alternative on a trail basis since last few years. Hence buffalo farming in such backward area has become a topic of current importance.
3) Since the researcher is born and brought up in this region, he has a live mental map of this experience.
4) According to Livestock Census of 2007, Solapur district rank third position next to Kolhapur and Sangli in Maharashtra, in respect of buffalo population and its share is **4.53** per cent of Maharashtra.

Objectives:

This study is also attempted with the following two main objectives.

1) To study the economic characteristics of Pandharpuri buffalo in the study region.
2) To calculate the economy of Pandharpuri buffalo in the study region.

Data Base:

The important of the study lies in the fact that entire analysis is based on the empirical data collected through intensive field work. It is supplemented by secondary sources of data wherever necessary. The details of collection of data work are as mentioned below.

I. Primary Data

Questionnaire technique is employed for the collection of facts regarding the buffalo farming. It is followed by informal discussion with farmers of this region. The questionnaire was filled in at the spot survey. Interview and discussion with the buffalo rears were attempted during the field visits. The village and herd or flocks level data pertaining to the herd or flock strength, management practices, feed and feeding practices, breeding and health, buffalo marketing, production from buffalo, gross and net returns of buffalo etc was generated through intensive field work.

Beside actual field survey, discussions were conducted with buffalo economists, animal marketing agents, officers of Departments of livestock conservation and officers of the breed farm center.

II. Secondary Data

The data is collected from various sources, which includes both published and unpublished books, government publications and private publications. Data published by Government and non government agencies, research organizations, research studies formed the source of secondary data. Secondary data has been obtained from the District census handbook, District Gazetteers, District statistical department and socio-economic review, livestock census of India and Maharashtra. Beside it data have been obtained from the Department of animal husbandry Zilla Parishad Solapur and Department of livestock conservation. In addition to this secondary data have obtained from the report of animal conservation ministry of state government.

Methodology:

The present study is based on primary data and supplemented by secondary data. Primary data is collected through buffalo farmer survey conducted in 16 villages spread over three tahsils in the district. Stratified sampling procedure was applied for the case study of buffalo and sample buffalo farmers.

In the first stage, for present investigation Solapur district of Maharashtra is selected as a study region on the basis of buffalo population. According to 2007 livestock census, Solapur district ranks third position next to Kolhapur and Sangali in the state.

The second stage of sampling involved the selection of tahsils. Out of total tahsils in Solapur district 25 per cent tahsils are selected for micro-level study on the basis of high ranking of buffalo population. According to 2007 livestock census, Malshiras (17.01 per cent), Sangola (14.51 per cent) and Pandharpur (14.5 per cent) tahsils are leading in the Solapur district. Therefore, Malshiras, Sangola and Pandharpur tahsils are selected for the present study.

The third stages of the sampling involved the selection of one animal i.e. buffalo for micro-level study. In the study region there are various domesticated animals such as cattle, buffaloes, sheep, goat, pigs, horses, donkey, camels and mules. Out of these animals, one animal is selected for micro-level study on the basis of its population in the study region. According to 2007 livestock census, buffalo is 18.78 per cent of total livestock population of Solapur district. Therefore buffalo is selected for micro-level study.

Fourth stage of sampling which is involved selections of 5 villages from the selected tahsils. From every selected tahsils 10 per cent villages are selected for micro-level study on the basis of high ranking of buffalo population. Therefore from Malshiras, Sangola and Pandharpur tahsils 2, 2, 1 village are selected for micro-level study.

The fifth stage of the sampling process involved the selection of 6 buffalo farmers from each of the 5 villages using the stratified random sampling procedure. The size of buffalo herd or flocks holding is the criteria used for selection of stratified random buffalo farmers. The buffalo farmers were categorized into three different categories viz. small, medium and large, on the basis of buffalo population. The buffalo farmers categorized as on buffalo population; as small up to 5 buffalo, medium 5 to 10 and large more than 10 buffalo. From the each size of buffalo holding category 2 buffalo farmers are selected as sample respondents; such as 2 from small category, 2 from medium and 2 from large buffalo holding category.

Thus the sample size for the survey got 30 buffalo farmers from 5 villages spread at the micro-level in the selected tahsils of Solapur district.

Discussion:

The present research paper is discussed on the economic characteristics of pandharpuri buffalo, concept and method of cost calculation and economics of pandharpuri buffalo.

Economic Characteristics of Pandharpuri Buffalo:

Solapur district is the home tract of Pandharpuri buffalo. This buffalo are named after the name of the geographical area i.e. Pandharpur block in Solapur district of Maharashtra (India). Pandharpuri buffalo is a milch breed. These buffalo males are hardy and well suited for drought purpose. It is of outmost importance to study the various economic characteristics of Pandharpuri buffalo (Table 1).

Table 1 Economic Characteristics of Pandharpuri Buffalo

Economic characteristics	Pandharpuri Buffalo
I. Age at first calving (Days and Month)	1255 and 40-45
II. Lactation length (Days)	330
III. Lactation milk yield (Litter)	1802
IV. Calving interval (Days)	465
V. Dry period (Days)	144

Source: Based on Field Survey.

Concept and Method of Cost Calculation:

The cost of buffalo keeping processes broadly covers two types of expenses; i.e. fixed cost and recurring cost. These are the two main heads of expenses. Under these main heads there are several other items, which are given as following.

A. Fixed Cost

The fixed costs are the costs which do not change in magnitude as the amount of output of the production process changes and are also incurred when production is not undertaken. These comprise depreciation on buffalo, buildings, equipment and the interest on the capital investment. In short buffalo, buildings,

equipment and interest on the capital investment constitute fixed cost.

I. Pandharpuri Buffalo

The fruitful age of a Pandharpuri buffalo is only 10 years. The cost of one Pandharpuri buffalo is Rs. 48000/. So Rs. 240000/- are invested for unit of 5 Pandharpuri buffalo. As buffaloes live in the same flock for fourth coming ten years, the expenditure on the buffalo purchase remain (240000 / 10 = 24000/-) and if we charge interest @ Rs. 12 per annum on the basic capital i.e. Rs. 240000/- for per year it comes Rs. 28800/- as amount of interest. Thus cost of buffaloes per year is Rs. 24000 + 28800 = 52800/- .

II. Buildings

Rs. 78000/- are needed for construction of building for 5 buffalo unit. Its life is about 20 year. So the expenditure on the buildings for per year is (78000 / 20 = 3900/-) and after charging @ Rs. 12 per annum interest on the basic capital i.e. Rs. 78000/- for per years, the amount of interest is Rs. 9360/-. Therefore expenditure of buffaloes building is Rs. 3900 + 9360 = 13260/- per year.

III. Equipment

Rs. 30000/- is the expenditure on the purchasing equipments. These equipments remain for 15 years. So the expenditure on the equipments of per year is (Rs. 30000 / 15 = 2000/-) and after charging @ Rs. 12 per annum interest on the basic capital i.e. Rs. 30000/- for per years, the amount of interest is Rs. 3600/-. So the expenditure on the equipment for per year is Rs. 2000 + 3600 = 5600/-.

B. Recurring Cost

This cost includes the costs of using variable inputs and cost of fodder and feed, labour, veterinary charges, miscellaneous costs etc.

I. Feed and Fodder Cost

All types of fodder and feeds, viz. green fodder, dry fodder and the concentrate mixture are taken into account. The cost of production of green fodder should be calculated on the basis of information obtained through field survey. The average cost of green fodder per gunta is Rs. 700/- and we can gate 100 bunches of green fodder per gunta.

$$\text{Cost of green fodder per bunch Rs.} = \frac{\textit{Average rate per gunta}}{\textit{Average bunches per gunta}}$$

$$= \frac{700}{100} = \text{Rs. } 7 \text{ /-}$$

Whereas the prevalent market rates are considered to calculate the cost of dry fodder such as Rs. 11 /- for per bunch of Jawar (Kadaba) and Rs.16 /- for per Kg of concentrate mixture.

Pandharpuri buffalo needs 1425 bunches of green fodder for one year and each needs 730 bunches of dried fodder for per year. However Pandharpuri buffalo needs 660 Kg concentrate for one year.

Whereas for one year one Pandharpuri buffalo needs green fodder 1425 x 7 = Rs. 9975/-, dried fodder 730 x 11 = Rs. 8030/- and for concentrate 660 Kg x 16 = Rs. 10560/-. In this way, total Rs. 28565/- needs as the expenditure on fodder and concentrate for one year.

Whereas the prevalent market rates are considered to calculate the cost of dry fodder such as Rs. 11 /- for per bunch of Jawar (Kadaba) and Rs.16 /- for per Kg of concentrate mixture.

II. Labour Cost

The labour cost calculation is based on the information collected from field survey. One full time labour is sufficient for

maintaining the each unit of 5 buffalo. In the study region 80 per cent buffalo farmers stated that Rs. 3750 / are paid to per labour for a month.

III. Medicinal and Veterinary Cost

The medicinal and veterinary cost is apportioned into different breeds or categories of animals on the basis of adult units and the utilities drawn by each breed. Medicinal and veterinary cost is calculated on the basis of information collected from field survey. From the field study it has been found that there on an average medicinal and veterinary cost is of Rs. 400 /- for per Pandharpuri buffalo for per year.

IV. Miscellaneous Cost

Under this head, all other expenditures viz. electricity and water charges, minor repairs of the buildings and equipments, consumable and detergents, petrol and diesel oil etc. are included. Miscellaneous cost is calculated on the basis of information collected from field survey. On an average miscellaneous cost is of Rs. 250/- for per Pandharpuri buffalo per year.

C. Gross Cost

Gross cost is the total cost incurred on the different cost components (fixed cost + recurring cost) given as above.

D. Net Income

Net income calculated from E-C (Gross income – Gross cost).

Economics of Pandharpuri Buffalo:

I. Capital Investment

For setting up such Pandharpuri buffalo farms, the investment is required to purchase the animals, equipments and

construction of shed etc. The detail of the capital investment on 5 buffalo unit is given below (Table 2).

Table 2 Capital Investment for a Unit of 5 Buffalo

Sr. No	Particular	5 Buffalo unit (in Rs.)
1	Buffalo @ Rs. 48000/- Per buffalo	240000
2	Buildings A. Buffalo sheds (45 sq. ft. one buffalo @ Rs. 150/-With construction) (22 sq. ft. one calf @ Rs. 150/- With construction) B. Store room (100 sq. ft. @ Rs.150/-) C. Shed for chaff cutter (85 sq. ft.@ Rs. 150/-)	78000 50250 33750 16500 15000 12750
3	Equipments (Grading machine, electric motor 1 hp, Buckets, cands etc.)	30000
	Total	**348000**

Source: Based on Field Survey.

For setting up a 5 buffalo units an investment of Rs. 348000/- is required. The investment on purchasing of buffaloes, buildings and equipments is 68.96, 22.41 and 8.63 per cent respectively on unit of 5 buffaloes.

II. Gross Cost

Gross cost includes the fixed cost and recurring cost (Table 3).

Table 3 Per Year Gross Cost and Return from Unit of 5 Buffalo

Sr. No	Particular				5 Buffalo unit in Rs.
A	**Fixed cost**				
	Item	Cost in Rs.	Depreciation in Rs.	Interest (12 per cent /year)	
	1.Buffalo purchase cost	240000	24000	28800	52800
	2. Building	78000	3900	9360	13260
	3. Equipment	30000	2000	3600	5600
	Total fixed cost				**71660**
B	**Recurring cost** 1. Feed and fodder cost I) Green fodder: 20 bunches per day, 20 x 330 lactation days = 6600 bunches, 15 bunches per day, 15 x 35 dry days =525				49875

	bunches,	
	@ Rs. 7 per bunch. Total 7125 bunches x 7 = Rs. 49875/-	40150
	II) Dry fodder: 10 bunches per day, 10 x 365 days = 3650 bunches,	
	@ Rs. 11 per bunch, Total 3650 x 11 = Rs. 40150/-	52800
	III) Concentrate: 10 Kg. per day, 10 x 330 lactation days = 3300 Kg	
	@ Rs. 16 /- Per Kg, Total 3300 x 16 = Rs. 52800/-	15000
	IV) Feed for calf:	45000
	2. Labour cost: @ Rs. 3750/- Per month, 3750 x 12 = Rs. 45000/-	2000
	3. Veterinary cost: @ Rs. 400/- Per buffalo a year, 400 x 5 = 2000/-	1250
	4. Miscellaneous cost: @ Rs. 250/- Per buffalo a year,250 x 5= 1250	12000
	5. Insurance charges: @ 5% per annum	**218075**
	Total recurring cost	
C	**Gross cost** (A + B)	**289735**
D	**Income from the cow unit**	
	1.Sale of milk: 1802 liter per lactation from a cow, 1802 x 5 = 9010	270300
	Liters, @ Rs. 30/- per liter, Total milk 9010 x 30 = Rs. 270300/-	
	2. Sale of manure: 4.5 Trolley per year, @ Rs. 5000/- Per trolley,	22500
	3. Sale of calf: @ Rs. 15000/- per calf, 15000 x 5 = Rs. 75000/-	75000
	Gross income	**367800**
E	**Net income** (D – C) unit a year	**78065**
	Net income from one buffalo a year	15613
	Cost benefit ratio (CBR)	1:1.26

Source: Based on Field Survey.

A. Fixed Cost

The total fixed cost on the unit of 5 buffaloes is of Rs. 71660/-. The detailed analysis of the fixed cost reveals that the depreciation on buffaloes is the major component of cost accounting for about Rs. 52800/- (depreciation + interest) which is 73.68 per cent of the total fixed cost. The remaining cost of Rs. 13260 (18.50 per cent) is depreciation on the building and Rs. 5600 (7.82 per cent) is depreciation on equipments.

B. Recurring cost

The recurring cost contributing expenditure incurred on feed and fodder, labour, veterinary, miscellaneous cost and insurance charges, amount of which is Rs. 218075/- in a year. The detailed analysis of the recurring cost reveals that feed and fodder cost is the major component of cost accounting for about Rs. 157825/- (73.37 per cent) of the total recurring cost. Labour cost is a second highest component of cost accounting for over

Rs. 45000/- (20.63 per cent) of the gross cost. The remaining cost of Rs. 12000/- (5.50 per cent) is the insurance charges, Rs. 2000/- (0.91 per cent) is the veterinary cost and Rs. 1250/- (0.57 per cent) is the miscellaneous cost.

C. Gross Cost

The gross cost comprising expenditure incurred on fixed and recurring cost. The total gross cost on the unit of 5 buffaloes dairy is Rs. 289735/- . Out of these total gross costs fixed cost shares 24.73 per cent and recurring cost shares 75.27 per cent respectively.

D. Income

Income from the unit of 5 buffaloes is calculated for one year period. The returns or gross income includes the income from sale of milk, manure and calf. The total gross income comes from a unit of 5 buffaloes is of Rs. 367800/- for one year. The major share of income in the gross income from a unit is from the sale of milk. The share of income from sale of milk is Rs. 270300/- (73.49 per cent), from sale of manure is Rs. 22500/- (6.11 per cent) and from sale of calf is Rs. 75000/- (20.40 per cent).

E. Net Income

The net income from the unit of 5 buffaloes is calculated as D - C (Gross income - Gross cost / Total cost). The net income from the unit of 5 buffaloes is Rs. 78065/- in a year. The net income from a buffalo is of Rs. 15613/- in a year and cost benefit ratio is 1:1.26.

Conclusion:

Buffalo is a very important dairy animal in the study region. The dairy industry of the study region is depending mainly on buffalo. Male buffalo make excellent draught animals,

particularly for heavy carting. The Pandharpuri buffalo is a native of Kolhapur, Solapur, Sangli and Satara district in south Maharashtra of India. Buffalo is the third ranking animal after Goat and Cattle in the study region. Solapur district is the home tract of Pandharpuri buffalo. This buffalo are named after the name of the geographical area i.e. Pandharpur block in Solapur district of Maharashtra (India). The net income from the unit of 5 buffaloes is Rs. 78065/- in a year. The net income from a buffalo is of Rs. 15613/- in a year and cost benefit ratio (CBR) is 1:1.26.

REFERENCES:

Banerjee G C (2010): A textbook of animal husbandry, oxford and IBH publishing co. pvt. Ltd, New Delhi PP 701 to 708.

Commissioner, Animal husbandry, Maharashtra state, Pune (2006): 17th livestock census 2003 Maharashtra state PP 81,

Commissioner, Animal husbandry, Maharashtra state, Pune (2007): 17th All India livestock, poultry, Agricultural implements and machinery and fishery census 2003 Maharashtra state.

Government of Maharashtra (1997): Gazetteer of the Bombay Presidency, Solapur District. The Government Photozinco Press Pune. pp. 13 to 18.

Government of Maharashtra (2006 to 2010): Socio-Economic Review of Solapur District. Directorate of Economics and Statistics, Government of Maharashtra, Mumbai.

Harbans singh (1986): Domestic animals, National book trust, India PP 12 to 14.

Indian Council of Agricultural Research (1979): Characteristics of Cattle and buffalo breeds in India, Indian Council of agricultural Research, New Delhi. PP 50-52, 55 to 58.

Indian Council of Agricultural Research (2008): Handbook of Animal husbandry, Indian Council of agricultural Research, New Delhi. PP 23 to 27.

Nivsarkar A E, Vij P K and Tantia M S (2000): Animal genetic resource of India cattle and buffalo,Indian council of agricultural research (ICAR), New Delhi PP 180 to 183, 189 to 197, 20.