Research paper

Characterization of Poda Thurpu cattle: A native livestock population of Telangana State

K K Siripurapu[1], S Das[2]*, S Sharma[3], V R Akinepalli[2], M Reddy[2] and V Yadav[2]

[1]*Revitalizing Rainfed Agriculture Network (RRAN), Secunderabad, (Telangana) India*

[2]*WASSAN,12-13-310, 7th St, Doctor ZMES Society, Krishna Giri Enclave, Tarnaka, Secunderabad, (Telangana) India*

[3]*Telangana State Biodiversity Board, Hyderabad, (Telangana) India*

ABSTRACT

India is home to approximately 1.4 billion cattle population, however, systematic process of characterization of around 70 percent of the indigenous livestock population of the country has not been carried out. Therefore, they are considered as yet undefined populations. *Poda Thurpu*, a yet undefined cattle population had been identified in the Indian state of Telangana for systemic characterization and registration. An estimated 15076 (approx.) cattle heads of *Poda Thurpu* cattle are present in the state. A sample of 3997 (approx.) from 101 breeder herds have been selected from four Mandals of Nagarkurnool District of Telangana for the purpose. Data pertaining to the physical characters, biometric and performance (dairy and draught) was collected following the format prescribed by NBAGR and analyzed. Results suggest that *Poda Thurpu* cattle could be classified as a distinct breed, under the draught cattle group.

Keywords: Poda Thurpu, Indigenous Cattle Populations, Golla, Lambada/Banjara.

***Corresponding author:** sabyasachidasindia@gmail.com

Manuscript received: 15.07.2019 ; accepted: 03.08.2019

INTRODUCTION

India has an estimated total livestock population of 512.05 million (19th Livestock Census, 2012). India is home to approximately 1.4 billion cattle population, which is almost 30 percent of the cattle population of the world, (Ahmad et al., 2018; Kennedy et al., 2018). Acknowledging the fact that systematic process of characterization of around 70 percent of the indigenous livestock population of the country has not been carried out, therefore, considered yet undefined populations. The National Bureau of Animal Genetic Resources (NBAGR), mandate the identification, evaluation, systematic characterization, conservation and utilization of livestock and poultry genetic resources of the sub-continent.

Telangana, youngest state of the country, does not have any registered cattle breeds of its own. Nevertheless, the state is rich in both indigenous domestic livestock and agro-biodiversity. In this background, the livestock node of Watershed Support Services and Activity Network (WASSAN), under Revitalizing Rainfed Agriculture (RRA) programme have initiated field surveys to identify any yet undefined livestock populations in the state for further systemic characterization and registration. The present project was conducted in collaboration with the Telangana State Biodiversity Board and the Global Environment Facility (GEF). One such population that has been identified was PodaThurpu Cattle which had been maintained mainly by the local *Lambada/Banjara* and *Golla/Yadava* communities. The population of this cattle had been identified in and around Amrabad Forest areas of Achampet, Amrabad, and MannanurMandalsof now Nagarkurnool district of the former undivided Mahbubnagar district of Telangana State.

Table 1: Age group wise distribution of Thurpu Poda cattle sampling survey

S. No.	Age Group	Male	Female	Total
1	Calves (up to 1 yrs)	257	276	533
2	Stock (1 to 3 yrs)	452	744	1196
3	Adult (3 yrs and above)	276	1992	2268
	Total	985	3012	3997

MATERIALS AND METHODS

Amrabad plateau, also the present study area is a mandal in Nagarkurnool district of the once undivided Mahabubnagar district in the eastern Indian state of Telangana. The study area is located at 16.3833°N 78.8333°E, at an elevation of 576 m, in the Deccan plateau region of India. The topography of the area is highly undulating and hilly, covered in forests and tall grasses. The mandal has an area of 727 sq. miles, comprising 14 villages and a total population of 45,589, (Census, 2011).

A rapid survey and reconnaissance study was initiated in the year 2016 - 17, for systemic characterization and registration of Poda Thurpu Cattle as potentially distinct breed of Telangana state. The breed descriptor has been developed following the guidelines of NBAGR and organizing Poda Thurpu Cattle Breeders to constitute Breeders' Association crucial for participatory characterization, registration, improvement and conservation of the Poda Thurpu Cattle Germplasm.

An estimated 15076 (approx.) cattle heads of Poda Thurpu cattle are present in the state. Samples of 3997 (approx.) from 101 breeder herds have been selected from four Mandals of Nagarkurnool District of Telangana for purpose of the study. Data pertaining to the physical characters, biometric and performance (dairy and draught) was collected following the format prescribed by NBAGR. Other pertinent information related to animal husbandry, socio-economics of the breed and the 101 breeders have been collected through household surveys, personal interviews and focus group discussions administering a semi-structured questionnaire. Market surveys have been conducted at the local livestock markets for collection of data related to market price of the Poda Thurpu cattle as well as identification of traders and potential buyers of the cattle. In addition, study team has also travelled along with the migrating herds to observe the native habitat and agro-forest ecosystems through which the cattle herds move for seasonal migration. The age and sex wise distribution of the sample is presented in the table (1).

Fig. 1. Thurpu Poda cattle

RESULTS AND DISCUSSION

Documental evidence suggests that Poda Thurpu cattle and their breeders have been around prior to the year 1951 (Fig. 1.). The native place/tract of Poda Thurpu cattle breed is Amrabad forest and its adjoining areas of Achampet, Amrabad, Lingal, Padramandals, of Nagarkanool District of once undivided Mahabubnagar district of the Indian state of Telangana. There are 15076 (approx.) number of cattle are present in the state. The cattle breed had been reared mainly by the indigenous agro-pastoral communities the Lambada, Kuruva, and Gollas. Local communities identify the cattle breed as Poda edlu (Poda locally means spotted/ speckles/blotches), the cattle usually has speckled/blotched coat (brown spots on white coat). The cattle breed is commonly known as Thurpu edlu in the western parts of Mahbubnagar and Nagakurnool districts and western parts of Telangana. The average herd size is 44.91 + 0.84 (Range: 23 to 75). Farmers who use

Table 2: Details of Physical Characters of Poda Thurpu Cattle

S.No	Character	Male (in %)	Female (in %)
I.	COLOUR		
a	Coat colour		
	Light Brown to dark brown patches on white coat	93.26	88.20
	Brown coat	6.74	11.80
b	Muzzle		
	Black	1.12	5.06
	Brown	98.88	92.13
	Red	0.00	1.12
	White	0.00	1.69
c	Eyelids		
	Black	13.48	12.50
	Brown	85.39	85.80
	White	1.12	1.70
d	Tail Switch		
	Black	13.48	14.63
	Brown	82.02	74.80
	Red	0.00	0.81
	White	4.49	9.76
f	Hooves		
	Black	8.99	10.80
	Brown	91.01	89.20
II	HORNS		
a	Color		
	Black	6.74	14.77
	Brown	93.26	85.23
b	Shape (Straight/curved)		
	Curved	47.19	8.99
	Straight	52.81	91.01
c	Orientation		
	Backward	10.11	1.69
	Downward	7.87	0.56
	Forward	28.09	1.69
	Upward	29.21	96.05
	Inward	24.72	0
III	EARS		
	Orientation (horizontal/drooping)		
	Drooping		2.250.57
	Horizontal	97.75	99.43
IV	HEAD		
a	Forehead (convex/concave/straight): In majority, forehead of Poda Thurpu cattle is bulging/convex with a depression in the middle/center.		
b	Poll		
	Prominent	100	100
V	BODY		
a	Hump (large/medium/small)		
	Large	1.12	0.00
	Medium	73.03	61.90
	Small	25.84	21.47
b	Dewlap (large/medium/small)		

	Large	2.25	9.04
	Medium	95.51	69.49
	Small	2.25	21.47
c	Naval flap (large/medium/small)		
	Large	0.00	0.56
	Medium	98.88	92.66
	Small	1.12	6.78
d	Penis sheath flap		
	Large	0.00	---
	Medium	100	---
	Small	0.00	---
e	Basic temperament		
	Docile	14.61	11.86
	Moderate	5.62	4.52
	Tractable	76.40	81.36
	Wild	3.37	2.26
VI	UDDER		
a	Shape (bowl/round/trough/pendulous)		
	Pendulous	---	0.56
	Round	---	99.44
b	Fore-udder size (large/medium/small)		
	Large	---	2.84
	Medium	---	97.16
	Small	---	0.00
c	Rear-udder size (large/medium/small)		
	Large	---	0.00
	Medium	---	100
	Small	---	0.00
d	Teat shape (cylindrical/funnel/pear)		
	Funnel	---	100
	Teat tip (pointed/round/flap)		
	Flat	---	2.84
	Round	---	97.16
e	Milk vein (large/medium/small)		
	Large		0.56
	Medium		97.18
	Small		2.26

bullocks of the population for draught purposes refer to them as Thurpu (means East, in local language Telugu), because they are believed to have come from the eastern side of the state.

Animals usually show wild and aggressive disposition, however they are tractable. The aggressive nature could be attributed to life inside the forests as it helps the animals to ward-off predators and protect their vulnerable calves. Herds of the population are maintained under zero input system. Breeders do not provide any supplementary feed to animals, except salt. Herds are exclusively maintained under open grazing, zero-input system, which reduces the investment. Low maintenance costs enable the breeders in maintaining large herds.

The coat colour of the population is predominantly light brown to dark brown patches on a white coat (93.26 % M, 88.2 % F). In majority of the population, the forehead is bulging/convex with a depression in the middle/center (table. 2). Details of Body Weight (in kgs) of Poda Thurpu Cattle is given in table 3. The average height of cows, bullocks, heifers, young

Table 3: Details of body weight* (in kgs) and performance of Poda Thurpu cattle

S. No.	Body weight at	Male			Female		
		Average	Range	N	Average	Range	N
1	Birth weight	18.76 + 0.12	16 - 21	101	17.86	16-19	79
2	1-12 month weight	131.31 + 21.67	78.44 -173.81	6	108.49 + 10.02	60.59 – 151.88	11
3	1yr -2 yr weight	157.13 + 9.66	101.60 – 216.93	17	170.76+ 3.09	101.07–254.72	115
4	2 -3 yr weight	154.12 + 8.01	78.44 – 216.93	25	166.62 + 3.03	60.59 – 254.72	152
5	Adult weight	254.93 + 5.21	98.24 – 402.20	89	208.50 + 2.60	125.47–309.89	177
6	Bullock	266.94 + 3.75	105.47 – 469.85	202	-	-	-

**Birth weights are measured, whereas the rest are estimated.*

Table 4: Details of body measurements (in cm) of Poda Thurpu cattle

Parameters	Cows (N=202)	Range	Bullocks (N=202)	Range	Heifers (1-3 years of age) (N=153)	Range	Young males (1-3 years of age) (N=25)	R	Breeding bull (N=101)	Range
Height	111.84± 0.56	97-135	121.94 ±0.77	99-154	103.07±0.80	58-140	105.36±1.71	86-129	119.38±0.74	104-137
Body Length	98.77±0.67	76-128	105.53±0.77	83-153	89.24±0.73	61-24	88.72±1.75	69-106	103.04±1.05	78-127
Circumference of Girth	150.23±0.82	137-177	164.97±1.03	87-208	141.65±1.15	99-189	136.16±3.31	106-162	162.92±1.27	107-184
Horn Length	29.98±0.66	9-54	31.85±0.69	8-54	12.91±0.57	3-34	11.16±1.50	3-31	30.45±0. 83	12-49
Ear Length	20.27±0.16	15-29	22.17±0.18	17-29	19.79±0.22	9-32	19.00±0.48	14-24	21.74±0.24	17-28
Face Length	41.72±0.32	25-49	44.98±0.34	34-62	37.54±0.36	21-49	37.20±0.86	31-51	43.74±0.41	36-53
Face Width	18.45±0.13	14-28	19.76±0.17	12-27	17.32±0.15	12-23	16.96±0.43	12-21	20.17±0.27	17-29
Tail Length	89.85±0.73	55-119	97.81±0.85	54-121	82.94±1.05	33-135	74.80±2.98	42-98	95.55±1.11	69-124
Tail Length with Switch	113.12±0.91	76-173	120.65±0.97	70-159	103.05±1.33	45-174	92.48±3.24	56-122	119.17±1.41	80-151

males and breeding bulls is 111.84± 0.56, 121.94 ±0.77, 103.07±0.80, 105.36±1.71, and 119.38±0.74, respectively. The average length of cows, bullocks, heifers, young males and breeding bulls is 98.77±0.67, 105.53±0.77, 89.24±0.73, 88.72±1.75, and 103.04±1.05 respectively. The average circumference of girth at heart of cows, bullocks, heifers, young males and breeding bulls is 150.23±0.82, 164.97±1.03, 141.65±1.15, 136.16±3.31, and 162.92±1.27 respectively (table. 4).

The population is relatively poor yielders of milk and the average milk production is 2.45 + 0.02 liters per day (table. 5). Percentage of animals in different lactations were - 37% in 1st Lactation, 35 % in 2nd lactation, 13.36 in 3rd lactation, rest in 4th, 5th and 6th lactation. On an average, females usually have first calving at 50.3 months of age, with an average gestation period of 279 days and an average calving interval of 11.92+ 0.02 months (table. 6). Bullocks of the population are predominantly used for draught purposes and the average duration of work per day is 7.5 hrs. The population is immune to many common diseases, but there are very few incidences of out-break particularly of black quarter (BQ) and foot and mouth disease (FMD) (table. 7). Strong/hard hooves is one of the unique characteristics of Poda Thurpu population. The bullocks are powerful and very good for heavy ploughing and carting heavy loads. They are agile and fast, which makes them suitable for agriculture work in both plain and uplands.

Animals are usually maintained under open/zero input grazing system, predominantly in the forests, commons and agriculture fallows. However, the forest remains the major source of fodder for the

Table 5: Details of dairy performance of PodaThurpu cattle

S.No.	Performance trait	Average	Range	N
1	Daily milk yield (liters)	2.45 + 0.02	2 – 3	160
2	Peak milk yield(kg /days)	3	-	160
3	Days to reach peak yield	65	61-68	160
4	Lactation length(months)	7.5	6.5-8.5	160
5	Lactation milk yield	569.6	493.7-645.6	160
6	Fat %	3.9	3.7-4.1	40
7	SNF %	8.1	7.9-8.3	40
8	Productive life span No of Lactation))	8	7-10	202
9	Dry period(days)	129	75-165	202

Table 6: Details of reproduction of PodaThurpu cattle

S.No.	Reproductive trait	Average	Range	N
1	Age at first ejaculation in male (months)	37.08	30-42	101
2	Age at first mating in male (months)	46	42-54	101
3	Age at first estrous (months)	32	30-38	202
4	Estrous cycle duration (days)	21	18-24	202
5	Estrus duration (hrs.)	24	20-28	202
6	Age at first mating (months)	41.33	36-48	202
7	Age at first calving (months)	50.3	47-57	202
8	Interval from calving to first conception (days)	75	70-120	202
9	Service period (days)	85	80-100	202
10	Calving interval (months)	11.92+ 0.02	11-12	202
11	Gestation length (days)	279	275-284	202
12	Twinning percentage	3		202
13	Dystocia percentage	2		202
14	Placental retention (%)	5		202
15	Abortions (%)	2		202
16	Still births (%)	0		202
17	Post gestational mortality (%)	2	1-3	202

cattle. The important customary grazing areas of Amrabad forest area of Nagarkurnool and Mahbubnagar districts of Telangana (table. 8). No concentrates, but occasionally small quantities of black gram and dry fodder (paddy, sorghum, maize straw) is provided to the cattle in case of fodder shortage. Only salt (500 gm/animal at fortnightly) is provided to the cattle. The average water consumption of these animals in summer is 13.49 litres. The quantity of drinking water required/provided per animal is 8.27 + 0.09 liters during rainy season, 8.09 + 0.05 liters during winter season and 13.49 + 0.11 liters during summer. The sources of drinking water are streams (93.63 to 96.63%) and tanks (3.37 to 6.74 %) during rainy and winter season. During summer drinking water is provided from lakes (24.72%), streams (4.49%) and tanks (70.79%).

The indigenous agro-pastoral communities follow selective breeding for maintaining high genetic purity, preferred physical features such as desired coat colour, orientation of horns, confirmation, and size. Poda Thurpu population shares similarities with other indigenous cattle breeds of Burgur

Table 7: Details of draught performance of Poda Thurpu cattle

S. No.	Variables	Values/Attributes	
1	Type of work	Ploughing, threshing, power etc	
2	Physiological parameters	Before work	After work
	Rectal temperature (F)	99.50 F	100.20F
	Respiration rate / min	13	18
	Pulse rate / min	45	56
3	Capacity for work (Hard/medium/light)	Hard	
4	Average duration of work per day (hrs)	7.5	
5	Drought tolerance (Excellent/ Very Good/ Good/ Average/ Low) - (Allocate grades 1-5, 1= high)	Very good	
6	Heat tolerance (Excellent/ Very Good/ Good/ Average/ Low) - (Allocate grades 1-5, 1= high):	Very good	
7	Resistance to diseases and parasites	Immune to many common diseases, but there are very few incidences of an out-break particularly of black quarter (BQ) and foot and mouth disease (FMD)	

(Pundir, et al, 2008), Khillar (Adgale, et al, 2017; Agri-IS, Animal Genetic Resources of India, 2019d; Om Prakruti Dharma, 2016c and Philips and Joshi, 1953),Hallikar, (Agri-IS, Animal Genetic Resources of India, 2019c; Om Prakruti Dharma, 2016b; Philips and Joshi, 1953; and Littlewood, 1936), and Amrithmahal (Agri-IS, Animal Genetic Resources of India, 2019a; Om Prakruti Dharma, 2016a; and Philips and Joshi, 1953). However, Poda Thurpu is a small-compact sized breed in comparison with the more robust Hallikar, Amrithmahal and Khillar and similar to the smaller and sleeker Burgur cattle breed of Tamil Nadu state. The breed looks strikingly similar to Burgur with regards to coat colour and Amrithmahal in terms of confirmation. However it has its own distinctive features and characters which distinguishes it from the other similar breeds. The breed not only sports a distinctive coat but also occupies a very different native breeding tract (table. 9).

Sale of male calves is the mainstay of the breeders of Poda Thurpu population. Breeders earn about 80 percent of their annual income from sale of animals and the remaining 20 percent from agriculture. The average local market price of a pair of Poda Thurpu cattle at (4 months age) is INR 25,159.25 (range INR 23,000 to 31,000). The local market price of an adult bull/bullock (usually 4 years old) is between INR 45,000 to 60,000. The local market price of a breeding bull (usually 4 years old) could be anywhere between INR 90,000 – 1,50,000. The average income of breeders through sale of male calves of Poda Thurpu is INR 2.05 lakhs, which accounts to major source of the household income. The breeders also earn some extra cash through sale ghee (clarified butter). The market price of Poda Thurpu ghee is INR 1500 -1650 per kg at the local market.

In a boost to strengthen the efforts of conservation of genetic purity of indigenous livestock breeds the Government of Telangana has restricted crossbreeding of Poda Thurpu population with other breeds, through artificial insemination. Following the instructions the Animal Husbandry Department of the state has directed all the artificial insemination centers around Amrabad area to forbid cross-breeding of Poda Thurpu population with other hybrid/exotic breeds, (Vinoo, 2018; Vadlamudi, 2016).

The PodaThurpu cattle breed is maintained almost exclusively under agro-pastoral and mobile pastoral systems by the agro-pastoral communities (Lambadi and Golla) of the Telangana state of the Deccan Plateau region of India. This also represents a classic case of c*ommunity-breed-ecosystem*, which most of the time are the actors of evolution of the germplasm. PodaThurpu/Thurpu cattle could be classified as the draught cattle group. The male calves of the breed are priced over female ones as they are extensively used for draught purpose in both dry land and wetland

Table 8: Details of management practices of PodaThurpu cattle breeders

S. N.	Management practices		Type of Practice	Percentage
1	Housing (Day/Night/Both day & night/None)		Night housing	42.53%
			None	57.47%
2	Roof (Open/Closed)		Open house/roof	71.26%
			Closed house/roof	28.74%
3	Wall (Kutcha/Pucca)		Kutcha house	100.00%
4	Separate/Part of residence		Separate from residence	100.00%
5	Vaccination practiced		(Yes)	100.00%
FMD & HS				
6	Flooring (Kutcha/Pucca)		Kutcha floor	100.00%
7	Full walled/half walled		Half walled	98.86%
			None	1.15%
8	Stall feeding/Semi stall feeding/ Grazing		Grazing	100.00%
9	Grazing pattern (Migratory/Stationary)		Migratory (long distance)	65.00%
			Stationary (short distance)	35.00%
10	Place of Migration		Migration area	I. Srisailam sub dam areas
				1.Vajralamadugu
				2.Gundhaneti penta
				3.Bokuleti
				4.Nallavagu
				5.Narre penta
				II. Many remain at Amrabad forest
				III. Guntur
				1.Hanmanpur tanda
				2.Veldurthi mandal
				3.Karampudi
				4.Sathennapally
				5.Agraram
				6.Chintapally
				7.Gurujala
				8.Ucharla
				9.Adivoppula
				10.Tenali
11	Migration period	January to June	82%	
12	Distance of grazing place from night shelter location (Km)		Monsoon & Winter	6.53 + 0.22 km
		Summer		5.20 + 0.28 km
13	Grazing hrs./day	Monsoon & Winter		7.89 + 0.05 hrs.
		Summer		7.30 + 0.10 hrs.
14	Time of grazing	Monsoon & Winter	Morning (am)	10:00 AM
			Evening (pm)	6:00 PM
		Summer	Morning (am)	7:00 AM
			Evening (pm)	3:00 PM

Table 9: Details of the Closely Resembling Breeds of PodaThurpu Cattle

Particulars	PodaThurpu	Bargur	Hallikar	Amrithmahal	Khillar
Native Breeding Tract	Amrabad forest area of Nagarkurnool district of Telangana state	Bargur hilly areas of Erode district of Tamil Nadu state	Tumkur, Mandya, Hassan Kolar, Chitradurga, Bangalore and Mysore of Karnataka state	Chikmagalur, Chitradurga, Hassan, Shimoga, Tumkur and Davanagere of Karnataka state	Dharwad, Bijapur, Gulbarga, Bagalkote and Belgaum districts of Karnataka, and Satara, Kolhapur, Pune, Solapur, Osmanabad, and Sangli regions of Maharashtra state
Main Use	Work - Draught	Work - Draught	Work - Draught	Work – Transport and Draught	Work - Draught
Management System	Extensive	Extensive	Semi-intensive	Extensive	Semi-intensive
Mobility	Stationary	Stationary	Stationary	Stationary	Stationary
Feeding of Adults	Grazing	Grazing	Fodder and Concentrate	Grazing	Grazing and Fodder
Size	Small	Small	Medium	Medium	Medium
Disposition	Fiery but Tractable	Very sensitive and Fiery	Moderate	Wild, fiery and unruly	Moderate
Average Height (cm)	119 (M), 118 (F)	117.59 (M), 108.36 (F)	134.5 (M), 124.7 (F)	132.7 (M), 126 (F)	136. 7 (M),126.5 (F)
Avg. Body Length (cm)	103 (M), 98.7 (F)	109.18 (M), 99.7 (F)	138. 9 (M), 130 (F)	134.1 (M), 133.6 (F)	144.2 (M), 132.2 (F)
Heart Girth (cm)	162.92 (M), 150.23 (F)	152.65 (M), 139.92 (F)	163.15 (M), 148.45 (F)	166 (M), 149.4 (F)	173.57 (M), 156.8 (F)
Birth Weight (Avg. kg)	18.76 (M), 17.86 (F)	18.9 (M), 18.1 (F)	21.3 (M), 20.2 (F)	20.8 (M), 19.9 (F)	25.35 (M), 21.9 (F)
Coat Colour	Predominantly White with light brown to dark brown patches all over	Brown with white patches	White to light gray	Shades of gray to almost black	Grayish in the Deccan plateau and white in Tapti
Muzzle Colour	Brown	Black	Black	Black	Black in Deccan plateau and carroty in Tapti
Tail Switch Colour	Brown	Black	Black	Black	Black
Hooves	Brown	Black	Black	Black	Black in Deccan plateau and carroty in Tapti
Horns Colour	Brown	Black	Pink	Black	Pink/Black
Horns Shape	Bow shaped and pointed	Bow shaped and pointed	Bow shaped and pointed	Bow shaped and pointed	Bow shaped and pointed
Horns Orientation	Curved Backward	Curved Backward	Curved Backward	Curved Backward	Curved Backward
Ears	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Head Size	Medium (bulging forehead with a furrow in the center)	Small and well developed	Small and well developed	Medium (bulging forehead with a furrow in the center)	Medium (bulging forehead with a furrow in the center)
Hump	Medium	Small	Small	Medium	Medium
Dewlap	Medium	Small	Small	Small	Small
Naval Flap	Medium	Small	Small and close to the body	Small and close to the body	Small and close to the body
Penis Sheath Flap	Medium	Short and tucked up	Small and close to the body	Small and close to the body	Small and close to the body
Udder Shape	Round	Poorly developed	Poorly developed	Poorly developed	Round

Source: Agri-IS, Animal Genetic Resources of India, 2019; Pundir, et al, 2008.

Table 10: Details of the Local Market Price of Poda Thurpu Cattle and Local Economy

S.N.	Details of the Animal/Product	Unit	Local Market Price (in INR)
1	Male Calves (4 month old)	Pair	23,000 - 31,000
2	Adult bullock (4 year old)	Pair	45,000 - 60,000
3	Breeding Bull (4 year old)	One	90,000 – 1,50,000
4	Ghee (Clarified Butter)	One Kilogram	1500 -1650
5	Penning on farms (herd)	One night	1000 – 2000
6	Cattle Dung	Truck load	1000 – 1600
7	Average Income from sale of Poda Thurpu cattle and associated products	Household	2,05,657

agricultural operations in Telangana and Karnataka state. The cattle have unique traits such as excellent draught power in terms of endurance, speed and stamina. The strong and very hard hooves of the breed are not infected from prolonged hours of either wetland or dry land agriculture operations.

Bullocks of this cattle population has huge demand not only among the farmers of Nagarkurnool / Mahabubnagar districts and other parts of the state but also of the neighbouring states of Karnataka. Male calves are sold at local markets as well as during yearly traditional festival of Kurumurthy mela being organized during Diwali festival. On an average 2500 - 3000 male calves/ bullocks, which are worth of INR 3-5 crores, are sold every year from Amrabad Mandal. Annual Economy of PodaThurpu cattle of the region is estimated at INR 15-20 crore, characterization, conservation and improvement of germplasm of this breed could further enhance the local economy. Support services, such as vaccination, shelter, etc are not provided adequately to these cattle as they are still considered as yet undefined. Mass mortality of the cattle from a fatal and undiagnosed disease has been reported by the local breeders. The disease is called locally as *"Gudalarogam"* or "*Gaddirogam"* (grass disease), as it was assumed that the disease was caused from eating some type of grass. Symptoms of the disease appear abruptly, limbs of the animals appear to have been locked and the animal collapses and die almost instantaneously. Therefore, there is a need for extending adequate animal health care services to animals to prevent mass mortality from future outbreaks. In addition, the ever shrinking commons and grazing lands, restrictions on access to customary grazing lands has been affecting the availability of enough fodder, water, and shelter, indispensable for maintaining large cattle herds. Local breeders reported to have downsized the cattle herds by 70 percent because of afore mentioned issues and challenges. There is a need for finding an appropriate and viable solution to address these issues and challenges to conserve and improve the breed.

This native population will come under threat if proper attention and measures are not taken. The State Livestock Development Board should take up conservation and improvement efforts of the breed once it is recognized as a distinct breed. Along with breed registration processes, it would be necessary for the state to extend support and announce incentives to indigenous cattle breeders (*Lambada* and *Golla* communities) and their associations for continued conservation of the breed.

A breeders' association named "*Amrabad Poda Laxmi Govu Sangam*" had been actively involved in conservation and improvement of PodaThurpu Cattle breed, with support of local and national level NGOs, and Telangana State Government by promoting indigenous cattle fairs and organizing awareness programmes. Public investment for conservation measures from State Livestock Development Agency can also be channelized through the breeders' association for maximized results and impact.

ACKNOWLEDGEMENT

The authors would like to thank the local communities who have been improving the PodaThurpu cattle breed for generations and conserving the valuable indigenous germplasm despite many challenges and obstacles. The authors

would also like to thank profusely the Telangana State Biodiversity Board and Global Environment Facility (GEF), for funding the project, without which the project would not have been possible. The authors would like to thank the Animal Husbandry Department of Telangana and NBAGR-ICAR for technical support, Telangana State Biodiversity Board for guidance, and local NGO partners for field assistance. The authors would like to thank profusely, the Member Secretary, TSBDB, and Director, AH, Telangana, and Hanumathu Gantala, President, Amrabad Poda Laxmi Govu Sangam, breeders association for their constant and never ending support.

REFERENCES

Adgale AA, Katkade BS, Khade SB, Chopade MM and Komatwar SJ. 2017. Physical and Morphometric Characteristics of Khillar Breed of Cattle. Int.J.Curr.Microbiol.App.Sci (2017) 6(9): 513-518.

Agri-IS, Animal Genetic Resources of India, 2019a. Amrithmahal. Accessed online: http://14.139.252.116/agris/breed.aspx

Agri-IS, Animal Genetic Resources of India, 2019b. Bargur. Accessed online: http://14.139.252.116/agris/breed.aspx

Agri-IS, Animal Genetic Resources of India, 2019c. Hallikar. Accessed online: http://14.139.252.116/agris/breed.aspx

Agri-IS, Animal Genetic Resources of India, 2019d. Khillar. Accessed online: http://14.139.252.116/agris/breed.aspx

Ahmad S, Kour G, Singh A and Gulzar M. 2019. Animal Genetic Resources of India – An Overview. International Journal of Livestock Research, 9(3), 1-12.

Census. 2011. Amrabad Mandal – Mahbubnagar. Population Census 2011. Govt. of India. Accessed online: https://www.census2011.co.in /data/subdistrict /4578-amrabad-mahbubnagar-andhra-pradesh.html

Dharma OP, 2016a. Amritmahal. Save Indian Cows, Om Prakruti Dharma, India. Accessed online: https://saveindiancows.org/amrit-mahal/

Dharma OP, 2016b. Hallikar. Save Indian Cows, Om Prakruti Dharma, India. Accessed online: https://saveindiancows.org/hallikar/

Dharma OP, 2016c. Khillari. Save Indian Cows, Om Prakruti Dharma, India. Accessed online: https://saveindiancows.org/khillari/

Kennedy U, Sharma A, and Phillips CJC. 2018. The Sheltering of Unwanted Cattle, Experiences in India and Implications for Cattle Industries Elsewhere. Animals : An Open Access Journal from MDPI, 8(5), 64.

Littlewood RW. 1936. Livestock of Southern India 1936. Imperial Agricultural Research Institute, New Delhi. Accessed online: https://www.scribd.com/document/166446651/Livestock-of-Southern-India-1936

Philips RW, and NR, Joshi1953. Zebu Cattle of India and Pakistan, FAO Agricultural Studies No. 19. The Food and Agriculture Organization of the United Nations, Italy. Accessed online: http://www.fao.org/3/an469e/an469e06.pdf

Pundir RK., P, Kathiravan, P.K. Singh, P. Kumaraswamy, P. Kanakraj, and B.K. Joshi. 2008. Cattle Genetic Resources of India, Bargur, Hill Cattle of Tamil Nadu. NBAGR, Haryana, India.

Vadlakudi S. 2016. Govt. Bans Artificial Insemination of Thurpu Cattle. The Hindu, 1 Nov, 2016.

Vinoo R. 2018. Lesser Known Animal Genetic Resources of South India. In Kachwaha, R.N. et al., 2018, eds. National Symposium on Sustainable Management of Livestock and Poultry Diversity for Enhancing the Farmers' Income and XV Annual Convention of Society for Conservation of Domestic Animal Biodiversity (SOCDAB), NBAGR, Karnal. 22-27.