Original Research

Socio-Economic Status of Tenyi- vo Pig Farmers of Nagaland, India

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Rec. Date:	May 31, 2019 07:19
Accept Date:	Sep 27, 2019 10:21
DOI	10.5455/ijlr.20190531071952

Abstract

The study was designed to assess the socio-personal and economic attributes of Tenyi-vo pig farmers in Kohima and Peren Districts of Nagaland. Fifty farmers from each district were selected randomly on the basis of random sampling and interviewed with the help of a structured, pre-tested, reliable and valid interview schedule. Results of analysis revealed that majority of the pig farmers were female (58.0%), in the middle age group (30-51 years), medium income (61,000/--1,09,000/-) and marginal land holding (0.1-2.5 acres). Majority of the farmers reared their pigs in confinement and fed with kitchen waste and locally available agriculture products and leaves.

Key words: Nagaland, Pig Rearing, Socio-Economic Status, Tenyi-vo

How to cite: Kath, K., Rahman, S., Das, S., Chaudhary, J., Goswami, R., Tochhawng, L., & Chutia, B. (2019). Socio-economic status of Tenyi- vo Pig Farmers of Nagaland, India. International Journal of Livestock Research, 9(11), 196-203. doi: 10.5455/ijlr.20190531071952

Introduction

In India, majority of pigs are reared in traditional small-scale subsistence-driven production systems and is a protein source for human consumption, in addition, pigs are often one of the main sources of cash income in rural areas and provide manure for cropping (Chauhan *et al.*, 2016). Pig is a popular livestock among the tribes of north-east India (NEI), who traditionally rear pigs as a source of food and income. Nagaland is one of the eight states in NEI. The small and marginal farmers mostly raise local pig, while well-organized fanners rear exotic pig breeds in NEH region of India (Rohilla *et al.*, 2000). For the tribes of Nagaland pig plays a significant role in improving their economic status (Patr *et al*., 2014). With a mean live body weight of 19.9±6.10 kg (male) and 20.1±6.08 kg (female), indigenous pigs are highly preferred by the tribal people of Nagaland (Borkotoky *et al*., 2014). Indigenous to Nagaland Tenyi-vo breed of pig was certified by the

Breed Registration Committee of the Indian Council of Agricultural Research on 21st June 2016 (Accession No.: INDIA_PIG_1400_TENYI-VO_09004). The local animals are known to be well suited as resource for poor households, as they are able to produce even with minimal inputs. (Ashley and Nanyeenya, 2005). Pigs in Nagaland are mostly reared in the backyard mainly with kitchen waste, garbage crop residues (Kumaresan *et al.*, 2007) and seasonally available plants (Moanaro *et al*., 2011).

Materials and Method

The data were collected from Kohima and Peren districts of Nagaland. These districts were purposively selected for the current study where rearing of Tenyi-vo population is more concentrated. Hundred respondents, 50 each from the two districts, were selected randomly on the basis of proportionate random sampling to constitute the total population of 100 (hundred) pig farmers keeping in view the objectives of the study. A semi-structured pre-tested interview schedule was prepared incorporating all the pertinent information to achieve the objectives of the study. The final schedule was used to collect primary data from the sampled respondents through personal interview method at their available convenient time. The data thus collected were scored, aggregated, organized and subjected to appropriate statistical analysis in order to arrive at a conclusion as per the objectives set.

Results and Discussion

Socio-Economic Profile

The Socio-economic profile assessment (Table 1) revealed that majority of the pig farmers (58.0%) were females. As traditional rearing of pig is not labour intensive, women might have been enthusiastic for the enterprise that provide income to meet the needs of the house expenses the finding was in concurrence to Ahmed *et al.* (2017) among the pig farmers in Tripura but contrary to the findings of Shadap *et al.* (2017). Further, majority of the respondents had male as the head of the family (89%), married (89%), middle aged 78.00 per cent (30-51 years) group, nuclear family (93%) and medium family size (68%) the findings were contrary to Patr *et al.* (2014). The study found that majority of the respondents (36%) had an experience of above 10 years, indicated the dependence and close relation of the people and piggery or piggery as one among the primary source of income which was in agreement with Tochhawng and Rewani (2013) and Shadap *et al.* (2017) who studied the pig farmers in Mizoram and Meghalaya, respectively. Among the respondents, 29.00 per cent had education qualification up to high school level followed by primary (26%), graduate and above (20%), higher secondary (14%) and illiterate (11%), and have active social participation (55%). It can be seen that more farmers were concentrated in lower educational qualification but at the same time the high qualification group were also on the rise which might be due to the demand of pork

 DOI 10.5455/ijlr.20190531071952

which is surging higher day by day, piggery has become a dependable enterprise which has drawn people from all section of society.

Table 1: Socio-economic profile of Tenyi-vo farmers

		District		Total
		Kohima (Frequency n=50)	Peren (Frequency n=50)	(n=100)
Gender	Male	26 (52)	16 (32)	42
	Female	24 (48)	34 (68)	58
Age (Years)	Young (20-29)	1 (2)	0	1
	Middle (30-51)	35 (70)	43 (86)	78
	Old >52	14 (28)	7 (14)	21
Marital status	Married	44 (88)	45 (90)	89
	Un-married	1 (2)	3 (6)	4
	Widow	5 (10)	2 (4)	7
Type of House	Mud/ Bamboo	14 (28)	25 (50)	39
	Assam Type	24 (48)	22(44)	46
	RCC	12 (24)	3 (6)	15
Fam. Type	Nuclear	47 (94)	46(92)	93
	Joint	3(6)	4 (8)	7
Head of family	Male	45 (90)	44 (88)	89
	Female	5 (10)	6 (12)	11
Family size	Small (1-3)	5 (10)	9 (18)	14
	Medium (4-6)	35 (70)	33(66)	68
	Large (7-9)	6(12)	5(10)	11
	Very large (>9)	4(8)	3(6)	7
Social participation	Yes	25 (50)	30 (60)	55
	No	25 (50)	20 (40)	45
Annual income	<60K (low)	14 (28)	19 (38)	33
	61K-1.09L (medium)	18 (36)	16 (32)	34
	>1.10L (high)	18(36)	15(30)	33
Education	Illiterate	4 (8)	7 (14)	11
	Primary	14 (28)	12(24)	26
	High school	15 (30)	14 (28)	29
	Class 12	6 (12)	8(16)	14
	Graduate and above	11 (22)	9 (18)	20
Land area (acres)	Landless	1 (2)	1 (2)	2
	Marginal (0.1-2.5)	34 (68)	34 (68)	68
	Small (2.6-5)	13 (26)	13 (26)	26
	Medium (5.1-10)	1(2)	2(4)	3
	Large (>10)	1 (2)	0	1
Occupation	Agriculture + AH	24 (48)	23 (46)	47
	Govt. service	14 (28)	14(28)	28
	Private sector	7 (14)	8 (16)	15
	Service + business+ Agri., AH	5 (10)	5 (10)	10
Experience	<1 year	4 (8)	0	4
	1-5 years	10 (20)	15 (30)	25
	6-10 years	17 (34)	18 (36)	35
	>10 years	19 (38)	17 34)	36

**Figures in the parenthesis indicate percentage.*

DOI 10.5455/ijlr.20190531071952

As per the finding's majority (34%) of the respondents has medium income followed by low and high income (33%), akin with the pig farmers in Meghalaya (Shadap *et al.*, 2017), while contradicting to the findings of Tochhawng and Rewani (2013) and Patr *et al.* (2014) in Mizoram and Nagaland state respectively. Furthermore, majority (46%) of the respondents live in Assam type house and have marginal land holding capacity (68%) followed by small (26%), landless (2%) and large (1%) indicating that still majority of the farmers were from medium to low socio-economic status.

Agriculture and livestock rearing were the major occupation of the respondents (47%), which was in line with the findings of Shadap *et al.* (2017), followed by government sector (28%), private sector (15%), while 10 per cent of the respondents were engaged in agriculture, AH and service.

Rearing practices followed by Tenyi-vo Farmers

Housing of Tenyi-vo (Table 2) revealed 80.00 per cent of the farmers reared their pigs in confinement system which was in concurrence to Kumarasen *et al*. (2007) and Patr *et al.* (2014) findings among the pig farmers in Nagaland, while 20% of the respondents reared their animals in free range system which was contrary to De *et al*. (2014) findings where the indigenous Nicobari pigs were reared under a free-range system. Furthermore, majority (80%) of the respondents used CGI sheets for roofing besides thatch, while locally available bamboo and timbers were used for wall (76%) and flooring (38%) which was in agreement with that of the findings of Kumarasan *et al*. (2007), though a portion of the farmers used bricks and concrete for wall (6%) and flooring (28%) while 17.00 percent reared their pigs in mud.

Most of the farmers suggested that the animals grow better in free range rather than confined system of rearing, but due to hygiene and restrictions from village councils on free range rearing, people had opted for confined system of rearing, owing to which many people have stopped rearing Tenyi-vo.

Table 2: Housing of Tenyi-vo

		District		Total
		Kohima (n=50)	**Peren (n=50)**	**(n=100)**
Housing	Confined	39 (78)	41 (82)	80
	Free-range	11(22)	9 (18)	20
Roof	Thatch/ tin sheets	11 (22)	9 (18)	20
	CGI sheet	39 (78)	41 (82)	80
Wall	Free	9 (18)	9(18)	18
	Timber/ bamboo	38 (76)	38 (76)	76
	Bricks	3 (6)	3 (6)	6
Floor	Free	8 (16)	9 (18)	17
	Timber/bamboo	20 (40)	18 (36)	38
	concrete	15 (30)	13 (26)	28
	Mud	7 (14)	10 (20)	17

**Figures in the parenthesis indicate percentage.*

DOI 10.5455/ijlr.20190531071952

Feeding Practices Followed by Tenyi-vo Farmers

Feeding practice followed by Tenyi-vo farmers (Table 3) revealed most of the respondents (80%) fed their pigs stall fed, and feed the animal twice daily, while 10 percent still follows scavenging and 10.00 percent scavenging followed by evening feeding.

Table 3: Feeding practices followed by Tenyi-vo farmers

		District		Total
		Kohima (n=50)	Peren (n=50)	(n=100)
Method of feeding	Scavenging	1 (2)	9 (18)	10
	Scavenging + evening ration	10 (20)	0	10
	Stall fed	39 (78)	41 (82)	80
Type of ration	Rice bran + concentrates	1 (2)	0	1
	Kitchen waste + farm products	47 (94)	50 (100)	97
	Only concentrates	2 (4)	0	2
Frequency	Once daily	5 (10)	0	5
	Twice daily	45 (90)	50 (100)	95

**Figures in the parenthesis indicate percentage.*

The table also indicated 97.00 per cent of the farmers used kitchen waste and farm products, vegetable and leaves as feed, while 2.00 per cent used only concentrate ration while 1.00 per cent used concentrates along with locally available by products which is in agreement with the findings of Kumaresan *et al*. (2007); Njuki *et al*. (2010); Moanaro *et al.* (2011) and Patr *et al.* (2014) in Nagaland. Some locally available leaves like pumpkin, bamboo shoots, banana (pseudostem, leaves and green banana fingers), colocasia (leaves and stems), sweet potato (leaves and tubers) and tapioca (tubers) etc. were fed. Due to the higher price of concentrate feeds, and unavailability of concentrates in time and abundance of locally available leaves, the respondents were still using kitchen waste and farm products as animal feed.

Breeding in Tenyi-vo

The results in Table 4 suggested the mean age of first estrus was 186.70 $\pm$ 3.87 days (range 108-365), gestation period 115.82 $\pm$0.22 days (range 110-120) akin to Chusi *et al*. (2016), while Boro *et al.* (2016) reported local pigs of Bareilly district was less. The age of first furrowing was 314.30 + 3.63 days (range 260-480), which was found to be in between with the findings of Chusi *et al.* (2016), Borkotoky *et al.* (2014), (Boro *et al.*, 2016) in local pigs of Nagaland and indigenous pigs of Bareilly, respectively. It was found to be less than the findings of Kumaresan *et al.* (2007) on non-descript pigs of Nagaland, while it was found to be more than Ghungroo breed (Haldar *et al.*, 2017)

The mean annual litter size per sow of Tenyi-vo was 7.64 $\pm$ 0.15 (range 4-12) which is in concurrence to the findings of Njuki *et al*. (2010) on indigenous local pigs of Nagaland. The variation in age of sexual maturity could be due to differences in their level of nutrition, social environment, body weight, season of the year, breed, disease or parasitic infestation and management practices. The unique behaviour of Tenyi-

 DOI 10.5455/ijlr.20190531071952

vo is that, the pigs breed by themselves and especially in free range system, the young piglets as young as two months breed their own Sow much older, which is earlier then the indigenous pigs of Bareilly (Boro *et al.*, 2016). Early sexual maturity of male piglets in Tenyi-vo which was found in line with Borkotoky *et al*. (2014). The early sexual maturity in male was attributed to faster testicular growth in nondescript local pigs compared to Hampshire and Large White Yorkshire pigs (Rohilla *et al*., 2000). The sexual maturity of both male and female Tenyi-vo was earlier than the local pigs of Bareilly district (Boro *et al.*, 2016). The adult boar weigh 41.64 ± 0.503 kg (range 35-80) and sow weigh 41.88 ± 0.512 kg (range 35-80), Tenyi-vo has annual meat production of 32.00 ± 0.414 kg (range 20-40 kg), the pigs were usually slaughtered at 540.60 ± 3.445 days (range 365-600 days) after attaining body weight 39.10 ± 0.288 kg(range 30-50 kg).

Table 4: Breeding in Tenyi-vo

	District		Mean
	Kohima (n=50)	**Peren (n=50)**	**(n=100)**
Age at first estrus (days)	186.06 ± 5.18	186.38 ± 5.80	186.70 ± 3.87
Age at first furrowing (days)	312.20 ± 5.210	313.25 + 5.093	314.30 ± 3.63
Annual litter size	7.48 ± 0.21	7.56 ± 0.222	7.64 ± 0.15
Average adult male body weight (kg)	40.50 + 0.908	41.07 ± 0.430	41.64 ± 0.503
Average adult female body weight (kg)	40.22 ± 0.917	41.05 ± 0.435	41.88 ± 0.512
Annual meat production (kg)	31.20 ± 0.639	31.60 ± 0.526	32.00 ± 0.414
Slaughter age (days)	544.00 ± 5.680	542.30 ± 3.949	540.60 ± 3.445
Slaughter body weight (kg)	38.40 ± 0.467	38.75 ± 0.333	39.10 ± 0.288
Gestation period (days)	115.54 ± 0.310	115.68 ± 0.301	115.82 ± 0.22

**Figures in the parenthesis indicate percentage.*

Health Care Practices

Table 5 revealed that, majority (64%) of the farmers never de-wormed their pigs, while 34 percent occasionally de-wormed, 1.00 percent de-wormed their pig regularly and while 1 percent remain unaware of de-worming.

Table 5: Health care practices in Tenyi-vo

		District		Total
		Kohima (n=50)	**Peren (n=50)**	**(n=100)**
Deworming	Regular	1 (2)	0	1
	Occasional	19 (38)	15 (30)	34
	Never	29 (58)	35 (70)	64
	Unaware	1 (2)	0	1
Vaccination	Yes	0	0	0
	No	50 (100)	50 (100)	100

**Figures in the parenthesis indicate percentage.*

None of the farmers recorded vaccinating their pigs against any diseases. Tenyi-vo is well adjusted to the environmental condition; they are sturdy and less prone to diseases compared to cross breeds and other breeds, and the occurrence of disease is minimal. The pigs sometime have anorexia, fever and some eye diseases which were usually treated by the farmers themselves or get healed by themselves. Due to which

 DOI 10.5455/ijlr.20190531071952

the respondents were not much aware of health care, however, Nut gall *Rhus semialata Murray (Rhus chinensis)* locally known as 'Athama' boiled with water or given along with feed was found effective for anorexia and inappetence.

Conclusion

From socio-economic status study, it can be concluded that pig rearing is not only an occupation of the poor anymore but regardless of the status. For any pig improvement programme, farmers community should be engaged in training programme. Training should be offered in such a way that people can follow. From housing and feeding system study, it can be said that awareness programme should be strengthened in light of providing scientific housing and feeding according to the need of the people.

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