

## Short Research Article

### **ECONOMIC VALUATION OF BACKYARD DUCK REARING IN THE BORDER COVERING DISTRICT HOUSEHOLDS OF VEMBANAD LAKE – MARKET PRICE APPROACH**

#### **Abstract:**

The Vembanad lake provides various provisional services which are directly used for consumption through various means like fishing, aquaculture paddy cultivation, duck farming etc. In this study, the economic valuation of duck rearing activities practiced by the households situated in the three districts bordering Vembanad lake are presented. The economic value of duck rearing in the study area was estimated using market price method and was INR 27.62 crores out of which the value generated from the egg and duck (meat) was about INR 15.43 and INR 12.18 crores respectively.

**Keyword:** Duck rearing, Market price method

#### **Introduction**

Kerala is gifted with fresh water lakes and backwaters which are suitable for rearing duck in the backyard water bodies near households living there. Vembanad lake is one of the largest lakes situated in the Kerala, covering three districts namely Ernakulum (EKM), Alappuzha (ALPY) and Kottayam (KTYM). Duck rearing is an important economic activity followed as a backyard farming method of many households situated around the Vembanad lake and is considered as an additional income generating livelihood activity. Alappuzha district alone has 26% of total duck population of Kerala and the Kuttanad area in this district is considered as a major duck rearing area. The major two breeds farmed are i.e Chara and Chemballi which are most preferred locally Mathew & et al (2020).

Duck rearing is a lucrative livestock industry as it requires less labour for supervision Rajput DS et al (2014), Farmers only need to ensure night shelter and nest for laying eggs.

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**Comment [SAA3]:** The two major breeds faemed are

Duck is also resistance to various common avian diseases and the size of the duck egg is more than hen egg by 10 to 15 gm in terms its weight.

In the Kerala the duck population contribute only 5.14 percentage of the total poultry population. There are two ~~type~~ types of duck breeds i.e desi (Kuttanad breeds) and improved breeds both with 50% of each type being reared in the Vembanad area. The rearing of duck is mainly for meat and egg which has good demand. Duck egg are comparatively bigger in size and is considered to be more ~~taste~~ and having high nutritional value. ~~Since supply is less the price of duck meat and its egg is also comparatively higher.~~

**Comment [SAA4]:** delete

**Comment [SAA5]:** tasty

**Comment [SAA6]:** this sentence is hanging. Could be deleted or represented to have a clearer meaning

Farmers practice duck herding in their harvested paddy field, and this system of herding duck in the fields were predominantly followed in the southern part of Vembanad where below sea level paddy farming is undertaken. In the paddy field, ducks forage for feed such as insects, snails, clams, small fishes and feed on the left out paddy grains as well as clams and small fishes etc. Duck grows faster in the paddy field and in turn it controls the weed growth in paddy field by stirring of water and duck dropping ~~turn's~~ paddy field more ~~fertile~~ there is thus symbiotic effect.

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Duck also required very ~~less~~ quantity of supplement feed available at low cost such as fresh domestic waste, fresh prawn waste (FPW), rice bran, broken rice and pulses etc *Abraham et al (2009)*. Normally the FPW is generated as waste from peeling shed and pre-processing plants situated in the region which would otherwise cause environmental pollution. The feeding rate of FPW is 230-250g/day/duck. Broken rice grain is feed at the rate of 94-100g/day/duck. FPW gives salmon red colour to the yolk (due to the xanthene pigment) ~~In addition to that shows improvement in egg weight, albumin index, yolk index, shell quality.~~

**Comment [SAA10]:** recast this sentence for clarity

## Methodology

The economic value generated by rearing of duck by the household situated in around the Vembanad lake was estimated. A sample of 30 households rearing duck in their backyard farm were selected. Based on the total duck population in each district the sample units were distributed based on the probability proportional sampling procedure gives (EKM-7, ALPY-17 and KTYM-6). Data related to the district-wise total number ducks available in the three districts situated around the Vembanad lake were obtained from report on Integrated Sample Survey (2018-19), Govt of Kerala. The primary data collected related to the estimation of the gross value of backyard duck rearing household units and included number of ducks reared,

egg produced annually and selling price of duck egg and meat in local markets. The formula for quantifying gross value of the duck reared by the sample household are given below.

$$GR_i = (\sum_{i=1}^n(TW_{iD} P_D) + (Q_{iE} P_E))/N \quad \dots\dots (eq-1)$$

$$TW_{iD} = N_{iD}AW_{iD} \quad \dots\dots (eq-2)$$

For estimating the Total Value of the duck reared the following was used

$$TV_{DV} = ((TN_{DV}AW_D) P_D) + (TN_{EV} P_E) \quad \dots\dots (eq-3)$$

Where,

$TV_{DV}$  = Total value of the duck reared in around the Vembanad lake (₹ Lakhs)

$TN_{DV}$  = Total number of duck reared in around the Vembanad lake (Nos)

$TN_{EV}$  = Total number of duck egg obtained in around the Vembanad lake (Nos)

$GR_i$  = Average gross return of duck reared in sample household (₹/annum)

$N_{iD}$  = Total number of duck reared in  $i^{th}$  household unit per annum (Nos/unit/year)

$AW_{iD}$  = Average weight of duck reared in  $i^{th}$  household unit (Kg/duck)

$AW_D$  = Average weight of duck reared in the total sample household (Kg/duck)

$TW_{iD}$  = Annual total weight of duck reared in  $i^{th}$  household unit (Kg/duck/year)

$Q_{iE}$  = Annual total number of duck eggs obtained (Nos/year)

$P_D$  = Market price of duck (₹/Kg)

$P_E$  = Market price of eggs (₹/Piece)

$N$  = Total number of sample household units

$i$  = Individual duck rearing sample household unit

## Results and discussion

The district wise duck population and egg production for both desi and improved breed of ducks for the three districts is presented in the table 1. Alappuzha district has the largest number of desi and improved breed ducks 61% and 52% respectively of total duck population of Vembanad region. During the year 2018-19 there were a steep increase in the number of improved duck breed population in Alappuzha district by about 70% and a 10 percent decrease shown in the number of desi breed ducks. This was due to the demand for the duck egg and meat in the region.

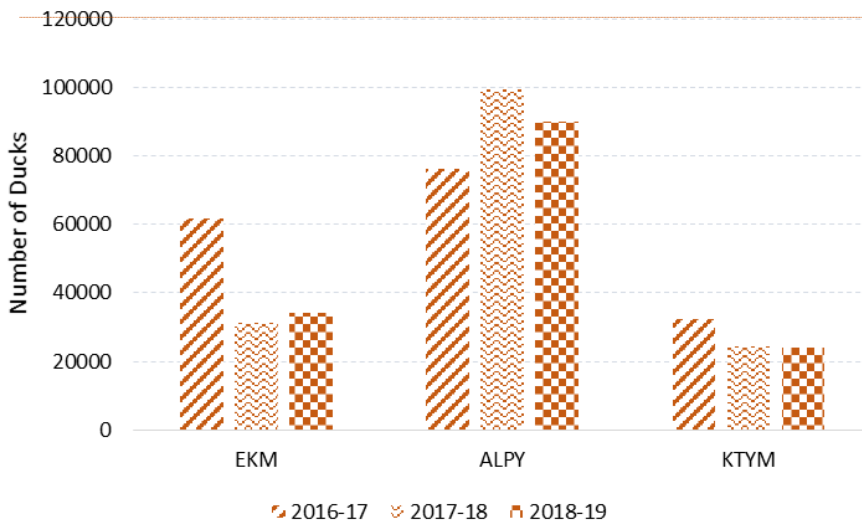
**Comment [SAA11]:** this article has not been discussed at all. Only results were presented.

**Table1: District-wise quantity of desi and improved breed ducks and egg production details during the year 2018-19.** (Quantity in Nos)

	Variety	EKM	ALPEY	KTYM	Total
Duck (No's)	Desi	34016	89811	24060	147887
	Improved	43062	99540	47926	190528
	<b>Total</b>	<b>77078</b>	<b>189351</b>	<b>71986</b>	<b>338415</b>
Egg (Lakhs)	Desi	54.99	149.94	35.14	240.07
	Improved	72.04	163.78	80.92	316.74
	<b>Total</b>	<b>127.04</b>	<b>313.73</b>	<b>116.05</b>	<b>556.81</b>

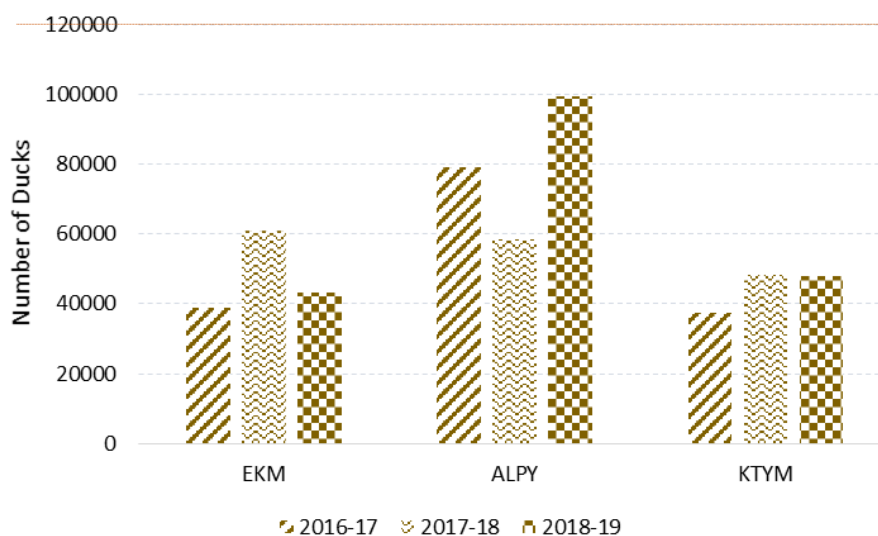
Source: SS 2018-19, GoK.

**Figure 1: Total number of desi breed ducks available in around Vembanad lake covering districts from year 2016-17 to 2018-19**



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**Figure 2: Total number of improved breed ducks available in around Vembanad lake covering districts from year 2016-17 to 2018-19**



**Comment [SAA13]:** check comment on figure 1

Table 2 depicts that the average number of duck reared by households situated in the along the Vembanad lake and it was estimated 239, out of which Alappuzha had greater of average duck per sample household of about 302. The total duck population in Alappuzha district was about 1.89 lakhs .i.e 26% of total duck population in Kerala and 56 percent along the Vembanad lake. The annual average gross revenue generated per household rearing duck is estimated to about INR 1.95 lakhs. The household situated in Alappuzha district got a gross income of about INR 2.45 lakhs per year. The average weight of the duck is about 1.2 kg and the total number of duck gives the total quantity of duck in terms of body weight is about 406 tonnes. The total value of duck was estimated at INR 12.18 crore based on the market price prevailing during 2018-19. Similarly for estimating the total value of egg produced in the study area. The annual average number of eggs laid per duck reared in all the sample households situated in around the Vembanad lake was taken as a base which was estimated at 60 per household. Using this estimate, the total number of eggs produced from the entire study area is estimated at about INR 203 lakhs and the value generated through sale of egg is about INR 1544 lakhs. The total value generated per annum thus INR 27.62 crores out of which almost 55.68 percent of the economic value is generated from Alappuzha district, where Kuttanad region is also a part. Though market price of both duck and egg were slightly

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lesser compared to the other districts in Alappuzha. The average number of ducks per farm household was higher and every household maximized their profits through duck rearing activities.

**Table 2: Gross economic value of duck reared by the household in around the Vembanad lake during the year 2018-19**

Particulars	EKM	ALPY	KTYM	Total
Number of duck rearing sample household (Nos)	7.00	17.00	6.00	30.00
Average number of duck reared per household (Nos)	82	302	132	239
Average gross income obtained by duck rearing per sample households (₹/Year)	66978	245224	104940	195024
Total number of duck (No's)	77078	189351	71986	338415
Average weight per duck (Kg/duck)	1.10	1.30	1.20	1.20
Total annual quantity of duck (Kg)	84786	246156	86383	406098
Average numbers of eggs laid/duck/year (No's)	56	64	58	60
Total number of eggs per year (Nos in Lakhs)	43.16	121.18	41.75	203.05
Market price of an duck (₹/Kg)	320	280	300	300
Market price of an egg (₹/piece)	8.30	7.00	7.50	7.60
Total value of ducks (₹ in Lakhs/Year)	271.31	689.24	259.15	1218.29
Total value of eggs (₹ in Lakhs/ Year)	358.26	848.29	313.14	1543.17
<b>Economic value of duck (₹ in Lakhs/ Year)</b>	<b>629.57</b>	<b>1537.53</b>	<b>572.29</b>	<b>2761.47</b>

### Conclusion

In this study of estimation of economic value of ~~the~~ duck rearing in the backyard of household. It is understood that Vembanad lake plays a significant role in providing various provisional services to their beneficiaries in which duck rearing is also a major revenue generating activity with the total economic value of about INR 27.62 crores. Duck rearing

can be considered as a major livelihood option for the households situated in the banks of the Vembanad lake.

### **Reference**

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**Comment [SAA17]:** Too few references because the article was not discussed

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