### Morphometric Characteristic Of Domesticated Local Ducks In Gembela And Benishangul Gumuz Region Of South West And North-West Ethiopia

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Abstract: This study aimed at analyzing morphologic characteristic of domesticated indigenous ducks in area of Gambela and Benishangul Gumuz regions of south-West and North-west Ethiopia. These regions were selected purposefully based on their potential availability of domesticated duck flock size and their contribution to the community. Body weight and linear body measurements were taken from mature adult domesticated indigenous duck. 170 Matured ducks were randomly selected from both sex of which 77 and 93 were male and female respectively. parameters considered to capture information about ducks were body weight (BW), supper length (SUL), shank circumference (SC), shank length (SL), chest circumference (CCF), body length (BL), wing span under (WSU), and wing span top (WST). All parameters between regions were significantly different at (P- value of 0.01 and 0.05). the average mean value of  $52.16 \pm 6.57$ ,  $54.52 \pm 6.43$ ,  $51.57 \pm 5.93$  cm were greater than of  $50.33 \pm 6.17$ ,  $52.77 \pm 5.84$ ,  $51.77 \pm 6.90$  and  $39.52 \pm 5.85$  cm of Wing span top, wing span under, body length, chest circumference and supper length in Benishangul and in Gambel respectively. The total mean value of 2.67  $\pm$  3.23 and 2.21  $\pm$  .53 super length differently greater in Gembela than in Benishangul Gumuz respectively. As the study result revealed that average body weight in Gambela were greater than average body weight in Benishangul Gumuz which value of  $2.54 \pm 0.88$ kg and  $2.26 \pm 0.71$ kg respectively. Total average body weight of both region considering together was resulted about 2.41  $\pm$  0.81kg. Live body weight was positively correlated (r=.628, 622, .699, .739, .623, 716, .568, P < 0.01) with Wing span top, Wing span under, Body length, Chest circumference, Shank length Shank circumference, and supper length respectively. So it is scientifically true that prediction of live Weight possible using the value of measurable traits given above in the list especially using the chest circumference and body length. The analysis of the study result revealed that plumage color of neck was dominant of white with black mix color 65 (38.2 percent) followed by 50 (29.4 percent) and 28 (16.5 percent) of white and white brown respectively. The sum total observed plumage color of male and female dominantly 38.2, and 29.4 percent were mix of white with black and pure white respectively. Back is dominantly White and black combination color and then followed by brown and white, and white respectively. The analysis also considered the color of bean, eye, shank, Bill and Skin color were 77, 1 black, 30.6 black, 62, 4 grey, 19.4 black -brawn and hundred percent no pigmentation respectively. All Duck have, 100 percent feather on the shank and normal skeleton shape while earlobe were hundred percent absent with v-shaped comb as well as snake shape of head which dominated in female population. Male and female duck have 43.5 percent and 29.4 percent saddle shape and of 38.8 and 32.5 percent uniform shape in Gambela and Benishangul Gumuz respectively. As matter of fact that of super length is an indicators of age and gene differentiation in particular duck breed which helps to determine our production type in the area. Understanding all these qualitative and quantitative permeants value information are very important sources for using to genetic improvement program and correlate to DNA information in near future for farther study.

Keywords: Morphometric, Qualitative, Quantitative, Parameter, Domesticated, Duck

#### I. INTRODUCTION

Genetic diversity provides the raw material for breed improvement and for the adaptation of livestock populations to changing environments and demands. Local domesticated birds including chicken and ducks are kept in many parts of the world irrespective of the climate, traditions, life standard, with limited religious taboos relating to consumption of eggs and ducks meat (FAO, 2004). Poultry are among the most economical and adaptable domesticated animals, except few places on the globe where climatic conditions make the keeping of chicken flock impossible (Bishop 1995 old citation).

The indigenous poultry belong to a group of local unimproved breeds commonly found in developing countries and may include mixed (unspecified) breeds resulting from uncontrolled breeding or probably unknown breeds and their potential. Most of the farmers have small land holdings and thus small-scale poultry plays a substantial role in ensuring food security for the family besides assisting in poverty reduction. The importance of village poultry production in the national economy of developing countries and its role in improving the nutritional status and incomes of many small farmers and landless communities has been recognized by various scholars and rural development agencies for the last few decades.

According (FAO, 2004) report that Ducks have several advantages over other poultry species, in particular their disease tolerance, they are hardy, excellent foragers and easy to herd, particularly in wetlands where they tend to lock together. In Asia, most duck production is closely associated with wetland rice farming, particularly in the humid and subtropics. An added advantage is that ducks normally lay most of their eggs within the three hours after sunrise compared with five hours for chickens. This makes it possible for ducks to freely range in the fields by day, while being confined by night. A disadvantage of ducks relative to other poultry, when kept in confinement and fed balanced rations, is their high feed wastage, due to the shovel-shape of their bill. This makes their use of feed less efficient and thus their meat and eggs more expensive than those of chickens. Moreover, Duck feathers and feather down can also make an important contribution to income producer. However, Sustainable rural poultry programs should build on what exists and match with technological intervention (Clarke, 2004).

There are huge number of cattle, sheep, goats, horse, donkeys, mules, camels, poultry and bee species in the country Ethiopia. This sector has been contributing considerable portion to the economy of the country, and still promising to rally round the economic development of the country (CSA 2014/15). The country has about 1.2 million TLU of chickens, of which 95.86% are local (CSA, 2016/17), indicating the significance of indigenous chickens as potential farm animal genetic resources of the country without considering the ducks. Though, it has not been considered in the national accounts, Different types of ducks are usually available in different parts of the country especially in Gambela and Benishangul Gumuz regions. The phenotypic characteristic and the unique genetic diversity of those duck resources were largely remained uninvestigated and as well as underexploited. Documentation of Information on the origin and history, characteristics of animal genetic resources (AnGR) is essential to the design of strategies for their sustainable management and utilization (Nurilgn etal. 2017).

Thus a research team from animal biodiversity directorate in Ethiopian Biodiversity Institute (EBI) has made a formal survey on those two regions to collate data and information on duck species of the regions. This study was designed to assess the phenotypic characteristics which have indicates genetic potential of the local ducks under the existing situation of their natural environment of of those regions in Ethiopia.

#### II. MATERIALS AND METHODS

### DESCRIPTION OF THE STUDY AREAS

The study was conducted in Gambella and Benishangul Gumuz regions of South West and North West Ethiopia.

GAMBELLA NATIONAL REGION STATE: is located south west Ethiopia between the geographical coordinates  $6^{0}28'38''$  to  $8^{0}34'$  North attitude and  $33^{0}$  to  $35^{0}$  11'11'' East Longitude, which covers an area of about  $34.063 \text{ km}^2$ . About 3% human population of Ethiopia. The Region is bounded to the North, North East and East by Oromia National Regional State, to the South and Southeast by the Southern Nations and Nationalities People's Regional State and to the Southwest, West and North West by the Republic of Sudan. The topography of the Region is divided in to two broad classes, i.e. the Lower Piedmonts between 500 to 1900 masl and the Flood Plains of below 500 m contours John young (1999). According to central statistical authority report (CSA, 2016/17) that the region has total of 7,735 TLU of chicken which is about 0.65 percent of the countrys total population that is not include domesticated duck in the region.

**BENISHANGUL-GUMUZ** NATIONAL REGIONAL STATE: is located in the north-western part of Ethiopia which covers an estimated area of 51,000 km<sup>2</sup> hat accounts about 4.5% of the country total area. It shares common borders with the National State of Amhara in the east, the Sudan in the north-east, and the National State of Oromia in the south. The state has diverse topography and climate. The later includes the familiar traditional zones - "kola", "dega", and "woynadega". "About 75% of the State is classified as "kola" (law lands) which is below 1500 meters above sea level. The altitude ranges from 550 to 2,500 meters above sea level. The average annual temperature reaches from 20-25<sup>o</sup>C. During the hottest months (January - May) it reaches a  $28 - 34^{\circ}_{C}$ . The annual rainfall amount ranges from 500-1800mm. The rainy season spreads through May to October indicated that country profile of Ethiopia (2002). The region has two major river basins like Abay and Akobo with smaller basins such as Dabus, Yabus, Dura, Julia, and Beles with significant potential for irrigation agriculture and hydroelectric power generation. Its natural resources include precious minerals such as gold and copper. According to central statistical authority report (CSA, 2016/17 the region has total of 24,992 TLU of chicken about 2.1 percent of the country total 1.2 million TLU of chicken, which is not include domesticated duck in the region. (The same parameters should be describe for both Gambela and Benishangul regions like population, altitude, boarder and areas etc.)

### STUDY TECHNIQUES

The study was conducted in support of the biodiversity centers and regional livestock agencies of the respective regions. The study was made in two weeks between January –

ton --2017. The study site were selected purposively based up on availability of the duck flocks in the area.170 Matured ducks were selected and measured from both sexes randomly, of which 77 were male and 93 were female. The qualitative and quantitative parameters FAO (2012) guideline measurements were taken and their values were registered.

### DATA COLLECTION AND PROCESSING

The collected Qualitative data were : feather morphology, feather distribution, plumage pattern, plumage colour, skin colour, shank colour, ear-lobe colour, comb type, comb size, eye colour, and skeletal variants used standard descriptors. Quantitative parameters were measured using tailors measuring tape while weight was measured using suspended spring balance having 25 kg capacity. Collected Quantitative data were shank length (cm), wattle length (cm), body length (cm), wing span(cm), chest circumference(cm), age, and body weight (kg) of matured ages which are more directly correlated to production traits than qualitative traits.

#### DATA ANALYSIS

Data collected through body measurement were entered into Microsoft EXCEL 2007 and Statistical Package for Social Sciences (SPSS 20 for Windows) and data analyzed using SPSS software. Quantitative data was analyzed using General Linear Model (GLM) of SAS (version 9.3). Descriptive statistics using frequency and cross-tabulation procedures were employed for some qualitative characteristics. All data analyzed and its results were summarized with convenient tables.

### III. RESULT AND DISCUSSION

## ANALYSIS RESULTS OF QUANTITATIVE PARAMETERS

A total of 170 matured ducks were measured for analyzing the phenotypic characteristic. 81 of the birds were in Benishangul and 89 were in Gambela regions, more or less have got equal chances to be considered (Table 1). The quantitative (linear) character parameters considered were body weight (BW), supper length (SUL), shank circumference (SC), shank length (SL), chest circumference (CCF), body length (BL), wing span under (WSU), and wing span top (WST). Results of average mean values as well as the minimum and maximum value ranges of quantitative parameters analyzed were indicted in table 1. All parameters observed between regions were significantly different at Pvalue of 0.01 and 0.05. The average mean value result of  $52.16 \pm 6.57, 54.52 \pm 6.43, 51.57 \pm 5.93$  and  $39.23 \pm 5.58$  cm for Wing span top, wing span under, body length, chest circumference and supper length in Benishangul-Gumz region were greater than the mean value of 50.33  $\pm$  6.17, 52.77  $\pm$ 5.84, 51.77  $\pm$  6.90 and 39.52  $\pm$  5.85cm in Gambela. The total mean value of  $2.67 \pm 3.23$  cm super length of duck in Gembela was greater than total mean value of 2.21  $\pm$ .53 cm super length of duck in Benishangul region. The result also showed that the heaviest average body weight were measured in Gambela than in Benishangul-Gumz and its values were  $2.54 \pm 0.88$ kg and  $2.26 \pm 0.71$ kg respectively while the total average body weight measured for both regions were  $2.41 \pm 0.81$ kg.

The result of this study is comparable with the result reported by (FAO, 2009) that the average body weight of male and female were 2.29 and 1.67kg and ranges between 1.0-3.8 and 1 - 1.3kg respectively in Egypt and Cambodia. The average shank length of this study result is 5.58cm which is comparable with shank length reported in (FAO, 2009) that of 5.8 cm is average super length duck in Egypt. The variant of all this values are important and can used as source of selection to improve the population of duck in study areas.

Region	WST	WSU	BL	CCF	SL	SC	SUL	BW
	N(mean	N (mean ±	N(mean ±	N(mean ±	N (mean	N (mean ± St.	N (mean ±	N (mean ±
	± St. D)	St. D	St. D	St. D)	± St. D)	D)	St. D)	St. D)
Panishangul	81 (52.16 ±	80 (54.52 ±	80 (51.57 ±	81 (39.73	81 (5.69	81 (5.35 ±	81 (2.21 ±	81(2.26 ±
Benishangui	6.57)	6.43)	5.93)	$\pm 5.58)$	±.77)	.746)	.53)	0.71)
Comholo	89 (50.33 ±	89 (52.77 ±	89 (51.77 ±	89 (39.52	89 (6.11	89 (5.792 ± .82)	87 (2.67 ±	89 (2.54 ±
Gambela	6.17)	5.84)	6.90)	± 5.85)	±.97)		3.23)	0.88)
total	170 (51.20	169 (53.60	169 (51.67	170 (39.62	170	170 (5.58 ±.82)	168 (2.28	170 (2.41 ±
	± 6.41)	± 6.17)	$0 \pm 6.44)$	± 5.70)	$(5.91 \pm$		± 0.55)	0.81)
					0.91)			
Min mon	29 - 68 cm	39 - 67 cm	36-67	30 - 59	4 – 9	4 - 8	1 - 3.8 cm	1 – 4.7 kg
wini - max			cm	cm	cm	cm		_
P - value	**	**	**	**	*	*	**	*

\*\* = value is significant at the 0.01 level (2-tailed) and \* = value is significant at the 0.05 (2-tailed) between the region N = number of observation, St. D = standard deviations from sum the mean. BW= body weight, SUL= supper length, SC = shank circumference, SL = shank length, CCF = chest circumference BL= body length, WSU =wing span under, WST= wing span top, Min = minimum, and Max = maximum value measured

## Table 1: Measurement value of the quantitative parameters of domestic duck in study areas

The data measurements for all parameters were analyzed separately for males and females, details indicated in (table 2). Body weight, wing span top and wing span under measured  $55.65\pm5.20$ cm,  $47.70\pm4.94$ cm and  $3.09\pm.65$ kg,  $1.87\pm.41$ kg of male and females respectively. The minimum and maximum range value were analyzed so that 39-67 and 29-68 of wing span top and wing span under of male and female with body weight range value of 1.1 - 3.6 and 1.4 - 4.7kg of male and female ducks respectively. The shank length values of  $6.43\pm.89$  and  $5.50\pm.68$ cm male and female were respectively.

Most of the results measured were comparable with the result of Cambodia which were reported by (FAO, 2009) that the average shank length were ranges between 4.0-5.7cm and average body weight of male and female duck were 1.99kg and 1.34 kg respectively which were also comparable but less than the weight of local ducks in the study area. Analysis reveals that birds of both sexes in Gambela and Benishangul-Gumz have the longest shanks, ranges between 4.0-9.0 cm as compared with shank of ducks in Cambodia, which have overall shank length ranges from 2.5 to 8 cm (FAO, 2009).

sex		WST	WSU	BL	CCF	SL	SC	SUL	BW
Fema	N	95	95	94	95	95	95	92	95
le	(Mea	(47.70±	(50.07	(47.52±	(35.7	(5.50	(5.1	(2.04	(1.87
	n ±	4.94)	±4.53)	3.99)	5±3.	±.68)	3±.	±.47)	±.41)
	St. D)				2)1		52)		
	Min.	29.0 -	42.0 -	36.0 -	30.0	4.0 -	4.0	1.0 -	1.1
	and	61.0	66.0	60.0	-	7.5	-	3.8	.6
	Maxi.				46.0		6.8		
	(cm)								

Male	N	75	74	75	75	75	75	76	75
	(Mea	(55.65±	(58.14	(56.88±	(44.5	(6.43	(6.1	(2.57	(3.09
	n ±	5.20)	±4.91)	4.99)	2±4.	±.89)	6±.	±.51)	±.65)
	St. D)				21)		75)		
	Min.	34.0 -	39.0 -	40.0 -	34.0	5.09.0	4.5	1.2 -	1.44.
	and	68.0	67.0	67.0	59.0		8.0	3.5	7
	Maxi.								
	(cm)								
	Total	170	169	169	170	170	170	168	170
		(51.21±	(53.60	(51.67±	(39.6	(5.91	(5.5	(2.28	(2.41
		6.41)	±6.17)	6.44)	2±5.	±.91)	8±.	±55)	±.81)
					71)		81)		
	Min.	29.0-	39.0-	36.0 -	30.0	4.0 -	4.0	1.0 -	1.1-
	and	68.0	67.0	67.0	-59.0	9.0	-	3.8	4.7
	max.						8.0		
Sign.		**	**	**	**	*	*	**	*
level									

\*\* = value is significant at the 0.01 level (2-tailed) and \* = value is significant at the 0.05 (2-tailed) between the region N = number of observation, St. D = standard deviations from sum the mean. BW= body weight, SUL= supper length, SC = shank circumference, SL = shank length, CCF = chest circumference BL= body length, WSU = wing span under,

value measured. Table 2: Measured mean value analysis between sexes of local ducks

WST= wing span top, Min = minimum, and Max = maximum

The correlation analysis results of parameters were shown in (table 3). The study result revealed that all quantitative parameters were significantly correlated each other positively at (p<0.01). As body weight of duck increases it shows that of all other measurable parameter which considered in study were increases its value positively in different proportions. Live body weight was positively correlated (r=.628, 622, .699, .739, .623, 716, .568, P <0.01) with Wing span top, Wing span under, Body length, Chest circumference, Shank length, Shank circumference, and supper length respectively. So it is scientifically true that prediction of live weight is possible using the value of measurable traits given above in the list, especially using the chest circumference and body length.



\*\*. Correlation is significant at the 0.01 level (2-tailed). BW= body weight, SUL= supper length, SC = shank circumference, SL = shank length, CCF = chest circumference BL= body length, WSU =wing span under, WST= wing span top

### Table 3: Correlation of measurable parameters on domestic ducks in study area

## RESULTS OF ANALYSIS OF THE QUALITATIVE TRAIT MEASUREMENTS

The analysis of plumage color of neck considered separately with the regions and with sex indicated in (table 4). 170 animal of both sexes were involved in the analysis of which 49, 44 female and 41, 36 male from Gambela and

benishangul Gumuz regions respectively. In analyzing the plumage color of neck, black, brown, white, white and black, and white and brown combination were recorded. The analysis of the study result revealed that mix of white and black color was dominant 65 (38.2 percent), followed by 50 (29.4 percent) and 28 (16.5 percent) of white and white brown. The black and brawn plumage color has not been observed in male of duck in Benishangul Gumuz region, while in Gambela region observed. As the analysis indicts male and female have different proportion of color combination. Male have 57.6 percent more white and black combination than other plumage color of neck in Gambela, while male plumage color in Benishangul Gumz was dominated by 60.0 percent white and brown. Higher proportion of white and black color was observed in female in both regions (table 5). Of the total observed plumage color of male and female, 38.2%, and 29.4% were mix of white with black and pure white rachactivaly

respectiv	Cry.						
region	sex		Total				
		black	brown	white	white and black	White brown	observation
Gambela	male	3 (100.0%)	3 (100.0%)	12 (42.9%)	19 (57.6%)	4 (40.0%)	41 (53.2%)
	female	13 <sup>a</sup> (26.5%)	5 <sup>a, b</sup> (10.2%)	13 <sup>a, b</sup> (26.5%)	14 <sup>b, c</sup> (28.6%)	4 <sup>c</sup> (8.2%)	49 (100.0%)
Benishangul	male			16 (57.1%)	14 (42.4%)	6 (60.0%)	36 (46.8%)
	female	2 <sup>a</sup> (4.5%)	1 <sup>a, b</sup> (2.3%)	9 <sup>a, b</sup> (20.5%)	18 <sup>b, c</sup> (40.9%)	14 <sup>c</sup> (31.8%)	44 (100.0%)
total		18 (10.6%)	9 (5.3%)	50 (29.4%)	65 (38.2%)	28 (16.5%)	170 (100.0%)

a, b, c = Each subscript letter denotes a subset of plumage color neck of the duck categories whose column proportions do not differ significantly from each other at the .05 level. Table 4: The plumage color comparison between the region

### and the sex of ducks

The analysis of back plumage color, bill bean color, eye color, shank color and skin color were treated together in both regions. The details in (Table 6). White and black combination color of back side is dominant followed by brown and white, and white respectively. Other colors have less observed. No Yellow color was observed in back of duck. Bill bean color was dominantly black (77.1%) which was followed by white bean color, while white and black mix and yellow of bill bean color were not observed during the study. This study result is not agreed with result of bill color of duck 38.6 percent, and 34.2 percent of pink and black respectively observed in Egypt (FAO, 2009). Other comparable results were reported from Cambodia in which ducks have eye color of a dominant 54-74 percent brawn and 13-30.5 percent of black in different region of Cambodia (FAO, 2009). The dominant eye color of duck which was 55.3 percent yellow color, followed by 30.6 percent and 12.9 percent of black and caruncle respectively. Brown and white, white and white and black color were not observed in eye of duck in study area. The comparable eye colors of duck were reported in Egypt (FAO, 2009) which were 58.9, 15.9, and 13. 3 brawn, yellow and black respectively.

To see the shank color diversity, the entire dataset of 170 birds were considered too. The standard black, black brown, Brown /grey brown with white, white, white with black and yellow as indicated (Table 6). Frequency of total observation in qualitative traits of the duck in the study area. Except white with black color all the rest mentioned colors were observed in different proportions. Brown grey color was the most

dominantly observed eye color of duck in the study regions, followed by mix of white with brown and white color only respectively. White with black is not an observed color in the eye as listed in the standard. The skin color of the duck has been treated with pigmented or not pigmented as shown in (table 6). The skin colors of duck in study area were found to be 100 percent not pigmented. This study result is not comparable with report of Egypt which were 37 percent, 41.3 percent of shank color respectively were yellow and black (FAO, 2009). The same source indicated that skin color of duck in Egypt were pigmented black and yellow in different proportion. . This variation might be due to effect of environment and gene or the interaction of both which could be used as source of selection for improvement of the population in the area. The variation and variability of different body colors of duck help to select and improve duck population based on consumer preferences.

Table 6. Plumage color of back, bill bean, eye, shank and skin color of duck

Body	Observed traits percent								
parame ters	black	black brown	Brow n	brown white	white	white black	yello w	observat ion	
,	20	2 (1 22()	/grey	17	27		NO	170 (100	
plumag	20	2(1.2%)	9	47	27	65	NO	170 (100	
e color	(11.8%)		(5.3%	(27.6%)	(15.9%	(38.2		%)	
back			)		)	%)			
bean	131	3 (1.8%)	6	3	27	NO	NO	170 (100	
color	(77.1%)		(3.5%	(1.8%)	(15.9%			%)	
	(		)	(	)			,	
eye	52	22(12.9%	2	NO	ŃO	NO	94	170 (100	
color	(30.6%)	) caruncle	(1.2%)				(55.3	%)	
			)				%)		
shank	7 (4.1%)	4 (4.4%)	106	42	33	NO	15	170 (100	
color			(62.4	(25.3%)	(19.4)		(9.4%	%)	
			%)	(			)		
Bill	8 (4.7%)	33	13	12	45	59	ŃO	170 (100	
color		(19.4%)	(7.6	(7.1%)	(26.5%	(34.7		%)	
			%%)		)	%)			
Skin			17	0 (100%) no	t pigmented				
color					10		1		

Obs = number of frequently observed color in particular body of the duck and NO = not observed

# FEATURE OF DIFFERENT BODY MORPHOLOGY OF DUCK

The analysis result of different body condition was indicated in (table 7). Skeletal varietal was considered by recording normal or abnormal through observing presences. Super, shank feather, earlobe recorded as present, or absent, comb type, head shape bill bean, shape and comp size were considered in the analysis. All sampled Ducks have normal skeleton shape, 100 percent feather is available on the shank and, earlobe were absent in all ducks and have v-shaped comb, as well as all duck have snake shape of head which was dominated in female population. Male and female duck have 43.5 percent and 29.4 percent saddle shape of bill in Gambela region while 38.8 percent and 32.5 percent of male and female duck have uniform bill shape observed in Benishangul Gumuz region. This is comparable with bill shape of majority of ducks in Cambodia, (FAO, 2009). There is an indication of bill shape variation between region which might be due to gene and/or environmental effect. The results of the analysis also indicated that difference in comb size have been observed in the study areas. Comb size is distinguishing features of breed or subbreed in the population Data were recorded as large, medium and small. Both sexes of duck have small sized comb in Gambela region while 32.5, 52.9 percent of male and female respectively have medium and small sized comb in Benishangul gumuz region. The feather distribution and morphology and, body carriage, and also plumage pattern of tail also indicated in the figure 1, 2, 3 and 4 respectively. All duck have normal feather distribution and morphology with horizontal body carriage. The plumage pattern of 49, 9, 32.9 and 17.6 percent were observed to be plain, laced and berried respectively.

Body	characteristic		Total			
part		Gaml	oela	Benishan	gul Gumuz	observation
		Male duck	Female duck	Male duck	Female duck	='
skeletal	normal	41	49	36	44	170
varietal		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
super	present	41	49	36	44	170
-	-	(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
shank	present	41	49	36	44	170
feather		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
ear lop	absent	41	49	36	44	170
		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
comp	V-shape	41	49	36	44	170
type		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
head	snake	41	49	36	44	170
shape		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
bill	saddle	25	37	3 (6.2%)	20	85 (50%)
shape		(29.4%)	(43.5%)		(23.5%)	
	uniform	16	12	33	24	85 (50%)
		(16.2%)	(10.9%)	(38.8%)	(32.5%)	
	total	41	49	36	44	170
		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
comp	large	3 (3.3%)	0	3 (3.8%)	1 (1.1%)	7 (4.1%)
size	medium	14		26	8 (11.3%)	50 (29.4%)
		(15.5%)	(1.1%)	(32.5%)	25	112 (64 50()
	small	(26.8%)	48 (52.2%)	(17.1%)	33 (52.0%)	113 (64.5%)
	total	(20.8%)	(35.5%)	(17.1%)	(32.9%)	170
	totai	41(43.078)	(54.4%)	(45.0%)	(55.0%)	(100.0%)
skeletal	normal	41	49	36	44	170
varietal		(45.6%)	(54.4%)	(45.0%)	(55.0%)	(100.0%)





170 (100%)



Figures 1, 2, 3, 4: feather distribution, feather morphology, body carriage and plumage pattern respectively

#### IV. CONCLUSION AND RECOMMENDATION

### CONCLUSION

Ethiopia has about 1.2 million TLU of chicken of which of 95.86% are local, indicating the significance of indigenous chickens as potential farm animal genetic resources of the country without considering the domesticated indigenous duck in the country. Thus, this study was made to collate data and information about the morphologic characters of duck in the region. This particular study was conducted for the first time in the country, which draw the attentions to carry out future investigation about the domesticated duck in the study areas as well as other regions. In this study, qualitative and quantitative measurements of 170 animals of both sexes were taken, of which 49 and 44 female and 41, 36 male from were from Gambela and Benishangul-Gumuz region respectively. The quantitative measurement values of certain traits like average mean value of Body weight, wing span top and wing span under measured 3.09±.65kg, 1.87±.41kg 55.65±5.20cm, 47.70±4.94cm and of male and females were identified respectively. Body weight range value were revealed of 1.1 -3.6 kg and 1. 4 - 4.7kg of male and female duck respectively. Live body weight was positively correlated (r=.628, 622, .699, .739, .623, 716, .568, P < 0.01) with Wing span top, Wing span under, Body length, Chest circumference, Shank length Shank circumference, and supper length respectively. All this are important sources of selection to improve duck population the region.

In addition to quantitative traits, qualitative traits were also considered and identified in this study. The study result revealed that mix of white and black plumage colors of neck were found to be the dominant colors of 65, 38.2 percent, followed by 29.4 percent and 16.5 percent of white and white brown were observed. Color of bill bean, eye, shank, and skin were identified. Morphometric Features of different body parts of ducks like skeletal variant, presence of spur, shank feather, and earlobe and comb size were evaluated. All Duck have normal shape of skeleton, 100 percent feathered shank and earlobe was 100 percent absent and have v-shaped and snake shaped comb and head of duck population were observed in the study areas respectively.

Moreover Feather distribution, body carriage, plumage pattern were identified in this study. Duck production is an emerging economic activity in the country in general and in the study areas in particular so that phenotypic as well as genetical characterization studies of ducks were scanty except this piece of work. Thus we recommend future investigation and characterization studies would be carried in the regions to provide more information for the duck keepers that will help them to improve their ducks productivities and its economic benefits. In addition to those benefits nutritional requirement gaps of local people will be narrowed through provision and improvement economical important traits (products) of duck.

### RECOMMENDATION

This study was used very few sample size of animals for collecting and documenting information which might not enough to define and generalize about morphometric features of local duck in the region. But this little information could probably give important hints to dig and conduct enhanced research activities in the future. Therefore with this pieces of study possible recommendation could be:

- ✓ Detailed phenotypic and molecular level study both on station and on farm has to be carried out and documented.
- ✓ Conservation and sustainable utilization strategies on local ducks has to be developed and implemented
- ✓ Regular awareness creation and training has to be carried out by concerned institution to strengthen all stakeholders, especially duck keepers who are direct beneficiary of the sector.

### ACKNOWLEDGMENT

This pieces of work is financed by Ethiopian Biodiversity Institute (EBI) annual budget and we are thankful for the support. Our appreciation also goes to village duck owners, district agricultural and biodiversity experts and other who directly or indirectly participated in these research activities.

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