



Municipality of Bacarra, Ilocos Norte
ECOLOGICAL PROFILE

2020



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Ecological Profile

1 Ecological Profile

1.1 Brief history

Historical files state that the place now known as Bacarra was first settled by an Igorot named “Baksalandok”. Baksalandok was hunting in the areas near the Bacarra-Laoag boundary when he took notice of the beauty and vegetation of the place. He made his hut at the site where the Roman Catholic Church and Convent now stand. Other Igorot settlers followed suit, and soon afterwards, other tribes settled the town. The community was called *Baraniw* which was retained as the name of a *barrio* west of the Poblacion. The Eastern settlement was called *Vira* and the Middle one was called *Parparia*. Records indicate that these settlements started in about 1600 AD. About 1.5 centuries later, in 1778, Bacarra was officially recognized as a municipality by the Spanish Government, and another two centuries later, Bacarra has metamorphosed and evolved to its present state, as a third class municipality in the province of Ilocos Norte.

1.2 Geo-physical characteristics

1.2.1 Location and total land area

Bacarra is located at the northwestern part center of the Province of Ilocos Norte within the coordinates of 120° 36’31.42” to 120°45’37” latitude and 18° 15’ 31.42” to 18°17’55” longitude. It is bounded by the north by the Municipality of Pasuquin, by the east by the Municipality of Vintar, by the West by the West Philippine Sea and the south by the City of Laoag. It is approximately 495 kilometers from Manila; 280 kilometers from regional center of San Fernando City, La Union; and 8 kilometers north of the provincial capital – Laoag City. It is about 15 kilometers from the nearest gateway (Laoag International Airport).

Table 1. Land area per Barangay

Urban Barangays	Land Area (hectares)	Rural Barangays	Land Area (hectares)
#01 Sta Rita	52.06	#19 Nambaran	650.58
#02 San Andres	12.18	#19A Tambidao	334.19
#03 San Andres II	12.86	#20 Pulangi	436.96
#04 San Simon	20.23	#21 Libtong	348.88
#05 San Simon II	4.42	#22 Bani	180.73
#06 San Pedro	5.02	#23 Paninaan	441.38
#07 San Pedro II	11.18	#24 Macupit	195.31
#08 San Agustin	9.09	#25 Tubburan	325.60
#09 San Agustin II	7.37	#26 Teppang	179.60
#10 San Vicente	9.48	#27 Duripes	187.03
#11 Sta Filomena	7.95	#27A Pungto	146.40
#12 Sta Filomena II	9.03	#28 Cabusliigan	134.34
#13 San Gabriel	5.74	#29 Pasngal	146.71
#14 San Gabriel II	6.96	#30 Cadaratan	162.89
#15 San Roque	12.48	#31 Calioet-Libong	192.93
#16 San Roque II	7.54	#32 Corocor	143.85
#17 Santo Cristo	17.45	#33 Cabulalaan	80.80
#18 Santo Cristo II	5.13	#34 Cabaruan	480.20
Sub-total Urban	216.17	#35 Pipias	45.76
		#36 Natba	110.76
		#37 Ganagan	291.22
		#37A Casilian	231.37
		#38 Sangil	257.84
		#39 Pasiocan	238.31
		#40 Buyon	391.13
		Sub-total Rural	6,334.77
		Total	6,550.57

Based on the Cadastral Survey of the Municipality of Bacarra executed from January 1982- February 1983 in accordance with the provisions of Cadastral Law Act (Act 2259) as amended under the direction of the Director of Lands, the total area of the municipality is 6,550.57 hectares. It is subdivided into 43 barangays, of which 18 are urban and 25 rural. The land distribution in each of the barangays are provided in Table 1.

1.2.2 Topography, elevation and slope

The terrain of the whole area of the municipality is generally flat with the western portion predominantly flat low lands about 1 to 3 meters above sea level, rising gradually to the east with moderate hills with an elevation of 15 to 38 meters above sea level, with the highest point located in the northeastern portion in Barangay Paninaan with an elevation of 60 to up to 199 meters above sea level (see map in Annex C).

Table 2. Elevation Profile

Elevation	Area (hectares)	% of Total Area
0-10	1,775.30	27.1%
11-20	2,004.59	30.6%
21-30	877.83	13.4%
31-40	484.77	7.4%
41-50	419.26	6.4%
51-60	340.65	5.2%
61-70	216.18	3.3%
71-80	144.12	2.2%
81-90	104.82	1.6%
91-100	65.51	1.0%
>100	124.47	1.9%
Total	6,550.57	100.0%

Source: GIS Estimate, 2020

In terms of slope, about 4,670.8 hectares (71.3% of total land area) are flat within the slope range of 0 to 3% and 1,519.8 hectares of gentle slopes with 3 to 8% (23.2%). While only 353.8 hectares or 5.4% are moderately steep (18 to 30% slope).

Table 3. Slope Profile

Slope	Area (hectares)	% of Total Area
0 – 3 (flat)	4,670.82	71.3%
3 – 8 (gentle)	1,519.82	23.2%
8 – 18 (moderate)	353.75	5.4%
18 – 30 (rugged)	-	0.0%
30 – 50 (steep)	-	0.0%
50 and above (broken)	-	0.0%
Total	6,550.57	100.0%

Source: GIS Estimate, 2020

1.2.3 Geology

Bacarra has four (4) geologic settings:

- Recent Old Alluvium – at the low lying areas of Sta. Rita, San Andres I, San Andres II, San Simon I, San Simon II, San Pedro I, San Pedro II, San Agustin I, San Agustin II, San Vicente, Sta. Filomena I, Sta. Filomena II, San Gabriel I, San Gabriel II, San Roque I, San Roque II, Sto. Cristo I, Sto. Cristo II, Nambaran, Tambidao, Pulangi, Libtong, Bani, Paninaan, Macupit, Tubburan, Teppang, Duripes, Pungto, Cabusligan, Pasngal, Cadaratan, Calioet, Corocor, Cabulalaan, Cabaruan, Pipias, Natba, Ganagan, Casilian, Sangil, Pasiocan, and Buyon.
- Recent Sand Dunes landforms along the barangays surrounding Bacarra River and the coastal shores;
- Plio-Pleistocene Fine to Coarse Grained (N3) type of land forms are found in areas which have slope of 8-18%; and
- Middle to Upper Miocene Sediments (Folded, N2Sed) which can be seen in mountainous part of the municipality (see map in Annex C).

Table 4. Geologic Profile

Geological Setting	Area (hectares)	% of Total Area
Recent Old Alluvium	3,937.35	60.1%
Recent Sand Dunes	284.17	4.3%
Plio-Pleistocene	1,615.98	24.7%
Middle to Upper Miocene Sediments	713.43	10.9%
Total	6,550.57	100.0%

Source: GIS Estimate, 2020

1.2.4 Soil type and classification

Generally, the type of soil in the municipality are clay loam and silt loam types. These are very suitable for agriculture. Other minor types include clay, clay loam, sand, and silty clay (see map in Annex C).

Table 5. Soil Type and Classification

Soil Type	Soil Classification	Area (hectares)	% of Total Area
Clay	Faraon clay / River wash	492.77	7.5%
	San Fernando clay	179.23	2.7%
Clay Loam	Bantay clay loam	1,738.45	26.5%
	San Fernando clay loam	190.50	2.9%
Loam	Bantay loam	529.01	8.1%
Sand	Sandy Manuel sandy	35.40	0.5%
Sandy Clay Loam	San Manuel sandy clay loam	261.03	4.0%
Sandy Loam	San Manuel sandy loam	691.98	10.6%
Silt Loam	San Manuel silt, San Manuel silt loam, San Miguel silt loam	1,783.29	27.2%
Silty Clay	San Manuel silty clay	649.27	9.9%
Total		6,550.57	100.0%

Source: GIS Estimate, 2020, based on Bureau of Soils and Water Management, www.geoport.gov.ph

1.2.5 Water resources

The surface water resources in the locality include the Bacarra River also known as Bislak River, the Paninaan-Cabulalaan Creeks, and the Malilitao Creeks.

The Bacarra River traverses seventeen barangays from Vintar up to waterfront at the West Philippine Sea. The river is a major source of irrigation and livelihood (fishing). The riverbed contains huge deposits of sand and gravel and stones primarily used for backfilling or embankment and slope protection projects. Fishery products include *tilapia*, *carpa*, *bukto*, shrimps, crabs, *hito*, mudfish, eel, prawn, shellfish, and clams.

The Cabulalaan-Corocor-Teppang Creek passes through eleven barangays at the northern part of Bacarra. Water flows from the overflow of the Malilitao Small Impounding Dam at Brgy. 23 Paninaan, watershed at Brgy. Sta. Catalina Pasuquin, Ilocos Norte, Brgy. Malampa, Vintar, Ilocos Norte, National Irrigation Administration North Main Canal, and irrigations from the upper stream of the creek section at Brgy. 22 Bani. The creek supplies the irrigation canal of Brgy. 22 Bani, Brgy. 29 Pasngal, Brgy. 33 Cabulalaan, Brgy. 35 Pipias and Brgy. 36 Natba. It is also rich in fresh water fishes and shell products.

1.3 Climate change and disaster risk assessment

Given the geological characteristic and geographical situation of Bacarra, it is confronted by several climate stimuli and geological hazards such as typhoons, flooding, storm surge, sea level rise, landslide, and tsunami. With global warming and changing of the climatic conditions resulting to the onset of more extreme, unpredictable climatic events, the vulnerability of communities are likely to increase. Potential impacts on economic activities, food supply, water availability, health, and infrastructure could lead to loss of income and livelihood, increased poverty, and reduced quality of life. It is imperative for local government units to effectively address existing risks, and avoid the creation of new risks to people, assets, and economic activities through the proper identification of hazard susceptibility levels and vulnerabilities.

As such, mainstreaming climate change disaster risk assessment (CDRA) into the comprehensive land use plans (CLUPs) and comprehensive development plans (CDPs) are important in order to:

- better understand natural hazards and climate change and how these would likely alter the development path of the locality;
- understand risks posed by natural hazards and climate change on exposed areas, sectors and communities;
- identify priority decision areas and development challenges posed by climate change and natural hazards
- make informed decisions to effectively address risks and vulnerabilities; and
- identify appropriate risk reduction and climate change adaptation measures.

This section provides a summary of the results of the DILG 6-step CDRA of the municipality of Bacarra. The associated tables are appended in this report as Annex D.

1.3.1 Climate information

Temperature and wind

The town has a Type I Climate, based on the Corona Classification. This is characterized by two pronounced seasons; dry season from November to April and wet season from May to October.

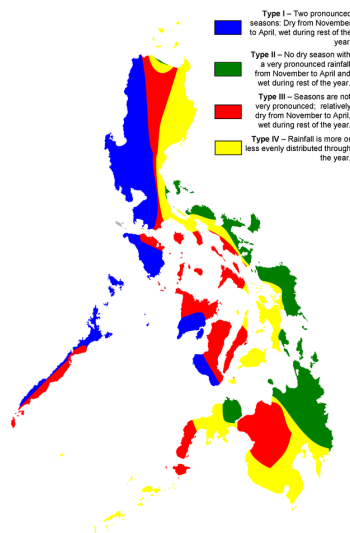
Wind direction is generally from the North. The coolest temperature was recorded in December 13, 1988 with a value of 12.9°C, and the hottest temperature was recorded in May 10, 2003 with a value of 39.5°C. Average temperature is ranged from 23°C to 30°C.

Table 6. Climate Temperature and Wind, 1989-2019

1989-2019	Temperature							Wind			
	Maximum		Minimum		Dry Bulb	Wet Bulb	Relative Humidity (%)	Velocity (mps)		Weather Phenomena	Date
	°c	Date	°c	Date				Ave	Max		
Jan	35.7	22-2008	13.0	26-1992	24.6	21.4	75	3 – N	16-N	NE Monsoon	07-2012
Feb	35.9	28-2009	13.0	10-1996	25.3	22.0	75	3 – N	17-N	NE Monsoon	20-2006
Mar	37.7	28-1999	14.7	10-1989	26.9	23.3	74	3 – N	18-N	NE Monsoon	12-2001
Apr	37.8	26-2007	16.3	14-2015	28.5	25.0	75	2-NNW	18-NNE	NE Windflow	05-2018
May	39.5	10-2003	20.4	08-2000	29.1	25.9	77	2 – W	20-SW	SW Monsoon/ Local Tstm	22-1997
Jun	38.0	22-2008	21.4	01-1993	28.6	26.1	8	3 – SW	34-W	T Igme	30-2004
Jul	36.8	18-2003	19.9	03-1989	27.9	25.9	85	2 – SW	43-SW	T Feria	04-2001
Aug	35.5	18-2010	21.4	15-1994	27.5	25.7	86	3 – SW	30-SW	T Karen	20-2008
Sep	36.2	30-2010	20.0	26-1994	27.4	25.6	86	2 – SW	37-NNE	T Ompong	15-2018
Oct	37.0	12-1998	17.5	29-1989	27.4	24.7	80	3 – NE	35-NNW	T Trining	27-1991
Nov	36.6	12-2004	14.3	30-2007	27.0	23.7	76	3 – Ne	23 – N	T Mina	26-2007
Dec	35.2	03-1998	14.0	03-1989	25.7	22.2	74	3 - NE	23-SSW	T Yoyong	03-2004

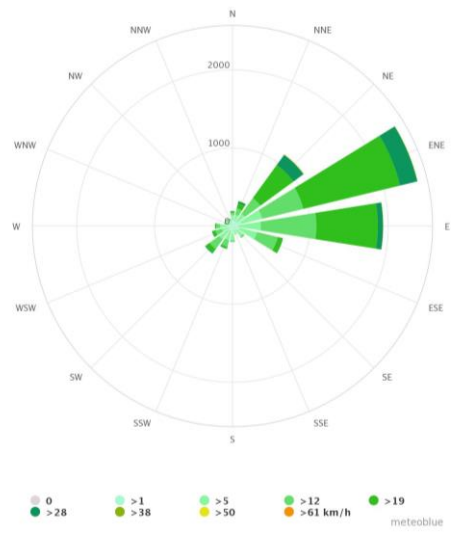
Source: DOST-PAGASA Weather Station, Laoag City

Figure 1: Climate Map of the Philippines



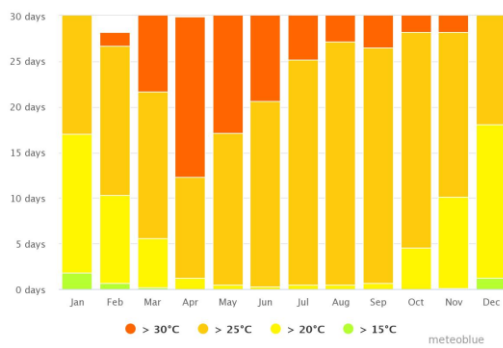
Source: PAGASA

Figure 2: Wind Rose



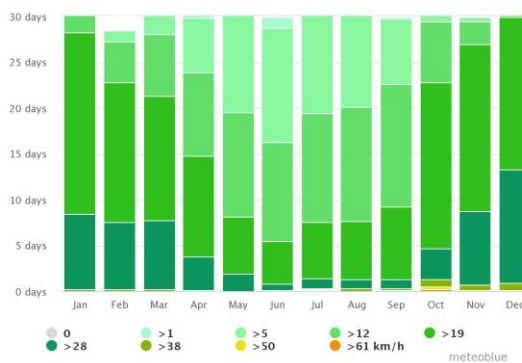
Source: meteoblue.com

Figure 3: Temperature



Source: meteoblue.com

Figure 4: Wind Speed



Source: meteoblue.com

Rainfall

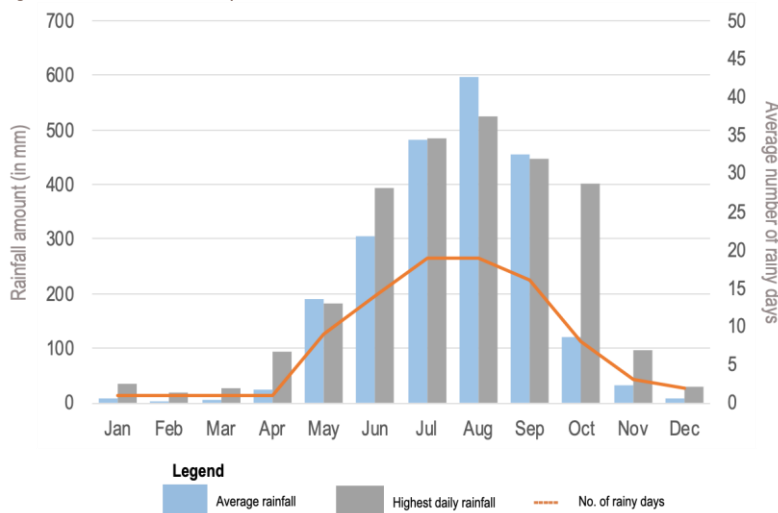
There is a variation in the distribution of rainfall throughout the year, with maximum rains coming in late May until October with June, July and August, September as the wettest, and October to April as the driest. The

highest rainfall size of daily rainfall was recorded in August 23-24, 2019 brought by TD Ineng with a daily rainfall size of 525.8 millimeter. Moreover, the largest average rainfall size is 596.0 millimeter falling on the month of August with 19 rainy days. Table 7 provides the observed baseline statistics of wind and rainfall sizes in 1989 to 2019.

Table 7. Rainfall Pattern, 1989-2019

1989-2018	Average	Rainy Days	Highest Daily (mm)	Weather Phenomena	Date
Jan	8.7	1	34.1	Frontal System	15-1998
Feb	3.7	1	18.0	TECF	20-1994
Mar	6.4	1	28.0	TECF	09-2000
Apr	24.9	1	94.2	TECF	06-2013
May	191.3	9	181.3	Local Thunderstorm	23-1990
Jun	305.5	14	393.6	Typhoon Dindo	28-2012
Jul	480.4	19	483.9	Tropical Storm Helen	15-2008
Aug	596.0	19	525.8	Typhoon Ineng	23-2019
Sep	454.3	16	446.8	Tropical Depression Weling	10-1994
Oct	121.10	8	402.6	Typhoon Pepeng	04-2009
Nov	31.9	3	95.2	Tropical Depression Toyang	11-1996
Dec	7.2	2	28.5	North East Monsoon	17-2013

Figure 5: Rainfall and Temperature



1.3.2 Climate and geologic hazards

Historical information as well as projections from national agencies provide that the municipality is prone to an array of climatic and geologic hazards, including: typhoons, flooding, landslides, storm surge, and tsunami, among others.

Typhoon and tropical cyclones

The annual average number of typhoons visiting the country is 20 typhoons. And from 1990 to 2019, the Province of Ilocos Norte had experienced 3 to 6 typhoons every year.

There are four kinds of typhoons. These are tropical depressions (<17 m/s), tropical storm (18-33 m/s), typhoons (34-64 m/s) and super- typhoons (>65 m/s). In general, typhoons are considered extreme weather events.

Flooding

Flooding due to monsoon rains and typhoon is anticipated to intensify due to climate change. Recurrent problems of flood and destruction of properties and loss of lives due to typhoons are expected to aggravate during rainy season. A flood is an overflow or accumulation of an expanse of water that submerges land. It may result from the volume of water within the body of water, such as a river which overflows from its usual banks and result to the flow of water beyond its normal boundaries. While size of the body of water will vary with seasonal changes in precipitation and snow melt, it is not significant flood unless such escapes of water endanger land areas used by human communities.

Areas susceptible to flooding are located near the upper and lower stream of the Bacarra River, and intersections of major irrigation canals and the Cabulalaan-Corocor-Teppang Creek. Projections from the

Department of Science and Technology Nationwide Operational Assessment of Hazards (DOST-NOAH) provided three (3) flooding projections:

- Five year flood hazard, which has a 1/5 (20%) probability of occurrence with a 5-year return period occurring in a single year, with a rainfall intensity duration frequency of 331.70 mm;
- Twenty-five year flood hazard, which has a 1/25 (4%) probability of occurrence with a 25-year return period occurring in a single year, with a rainfall intensity duration frequency of 479.80 mm; and
- Hundred year flood hazard, which has a 1/100 (1%) probability of occurrence with a 100-year return period occurring in a single year, with a rainfall intensity duration frequency of 602.00 mm.

The DOST flood hazard maps reflect three levels:

- low susceptibility, where areas could expect 0.1 to 0.5 meters of flood;
- moderate susceptibility, where areas could expect between 0.5 and 1.5 meters of flood; and
- high susceptibility, where areas could expect a flood with height above 1.5 meters.

The following figures and table illustrate the areas within the municipality that are susceptible to flooding for each of the DOST projections. As noted, based on the 5-year projection, 25 year and 100 year projections, about 2,613.18 to 3,063.07 hectares of the municipal area is susceptible to flooding.

Table 8. Areas Susceptible to Flooding

Area	5-year			25-year			100-year		
	Low	Mod	Hi	Low	Mod	Hi	Low	Mod	Hi
Urban	46.45	30.44	24.48	48.19	27.04	21.20	43.02	22.16	16.99
Rural	809.29	1,143.27	559.25	836.33	1,302.93	705.31	811.29	1,370.99	798.61
Sub Total	855.74	1,173.70	583.73	884.52	1,329.96	726.51	854.31	1,393.15	815.60
Total	2,613.18			2,940.99			3,063.07		

Rain-induced landslides

There are two main types of erosion processes caused by rainfall. One process is caused by the accumulation of a large volume of water flowing in the Bacarra River. This produces high energy resulting to the scouring or cutting of soils along the curves of river banks. The other process is water infiltration particularly in sloppy mountainous areas.

Table 9. Areas Susceptible to Rain-induced Landslides

Area	Low	Moderate	High	Total (ha.)
Urban	-	-	-	-
Rural	1,851.15	107.50	-	1,958.66
Total	1,851.15	107.50	-	1,958.66

The landslide hazard maps prepared by DOST-NOAH provided that based on the second type (water infiltration) of landslide simulation, about 1,958.66 hectares of the municipality is susceptible to low/moderate landslide susceptibility, while no areas were tagged as highly susceptible/no build zones. As opposed to highly susceptible areas which are proposed to be no-build zones, areas of moderate susceptibility can be built on but with proper engineering interventions, while areas of low landslide susceptibility, could be built upon but with proper monitoring.

Storm surge

According to PAGASA and the National Disaster Risk Reduction Management Council (NDRRMC), storm surge happens when there is an abnormal increase in the level of water within the seashores when a storm is near the coastal area. This is caused by the strong winds brought by the low pressure at the eye of the storm. Due this, water is accumulated leading to the abnormal increase in water level towards the shores. The most common form of storm surge related issues results from low atmospheric pressure and wind from tropical depressions. Irregular coastlines, weak natural barriers like mangroves, and high tidal events are exacerbating factors.

During the onslaught of storm surge, affected and susceptible areas could experience widespread flooding that extends inwards from the shore, depending on the shape and height of the wave and the topography of the affected area. At the extreme, a storm surge could washout and destroys trees and structures (offices and houses).

Based on the projections made by UP NIGS (nababaha.com), storm surge projections are divided into four scenarios: (1) storm surge advisory 1 (SSA1) with a storm surge height of 2 meters; (2) storm surge advisory 2 (SS2) with a storm surge height of 3 meters; (3) storm surge advisory 3 (SSA3) with a storm surge height of 4 meters; and storm surge advisory 4 (SSA) during a storm surge height of 5 meters.

Based on the projections, it is estimated that 268.27 hectares are exposed on an event of a 2-meter storm surge (SSA1), while almost double the size exposed to a 3-meter height storm surge. Some 650.98 hectares are exposed on an event of a 4-meter high storm surge, while 896.97 hectares exposed on the event of a 5-meter storm surge, or the same height as was caused by Super typhoon Yolanda (TS Haiyan) in Leyte in 2013.

Table 10. Areas Susceptible to Storm Surge

Area	SSA 1			SSA 2			SSA 3			SSA 4		
	Low	Mod	Hi	Low	Mod	Hi	Low	Mod	Hi	Low	Mod	Hi
Urban												
Rural	48.12	136.22	83.93	44.58	181.67	234.18	61.10	168.80	421.09	61.03	227.83	608.11
Sub Total	48.12	136.22	83.93	44.58	181.67	234.18	61.10	168.80	421.09	61.03	227.83	608.11
Total	268.27			460.43			650.98			896.97		

Sea level rise

The rise of global temperature will melt the polar ice sheets and glaciers and add to the volume of water in the ocean. This will correspondingly result to the rise of the sea level. The international panel on climate change (IPCC) predicted that global sea levels are likely to rise by one meter and unlikely to be less than 50 cm at the end of the century 2100. It is estimated that the country will lose 661.6 km² or about 0.2 percent of its total land area to a one-meter sea level rise. In Bacarra, this translates to about 238.21 hectares.

Figure 6: Sea Level Changes in the Philippines, 1992-2015

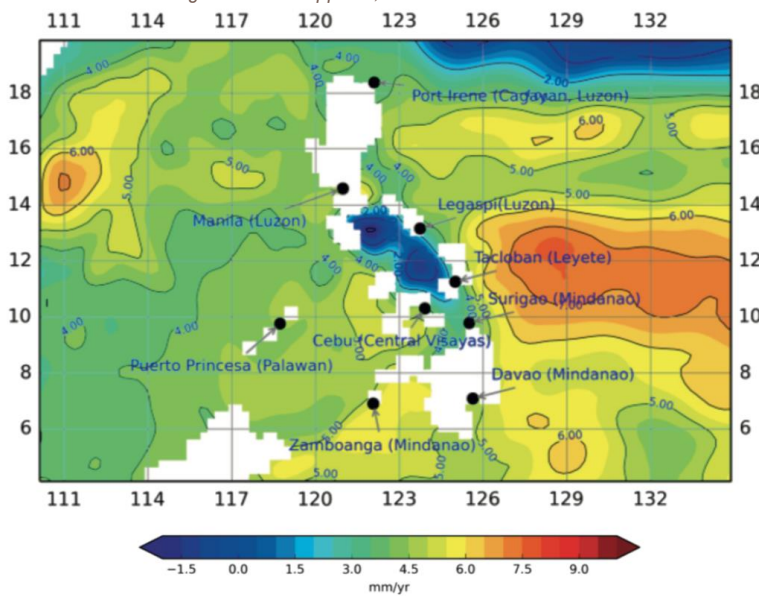


Table 11. Areas Susceptible to Sea Level Rise

Barangay	Susceptible Area (ha.)	% of Total Area
Calioet-Libong	47.22	19.8%
Cabaruan	14.46	6.1%
Natba	78.65	33.0%
Ganagan	11.92	5.0%
Casilian	85.95	36.1%
Total	238.21	100.0%

Ground shaking

The entire municipality of Bacarra lies on Zone 1 based on the Map of Seismic Source Zone of the Philippines with peak ground acceleration (PGA) value of 0.45 and equivalent magnitude of 6.2 to 6.9 at PEIS VIII (worst case scenario). Damage from previous earthquake events are evidenced by the damage to several of the municipality's heritage structures, mainly the Bacarra church and bell tower. Major earthquake events were recorded in the years 1931, 1971, 1981, and 1983.

The return period of an Intensity VIII event is estimated to be between 23.3 and 62.2 years from the last event in 1983 (i.e. 2006 and 2045).

Tsunami

Tsunamis are a series of waves caused commonly by an earthquake under the sea. It causes flooding; coastal erosion; drowning of people and damage to properties. The presence of the Manila Trench and the North Luzon Trough at the West Philippine Sea subjects the coastal municipalities of Ilocos Norte to tsunami hazard. As noted in the following Table, there are an estimated 1,497.06 hectares of land exposed to tsunami inundation in eleven (11) barangays.

Table 12. Areas Susceptible to Tsunami

Barangay	Susceptible Area (ha.)	% of Total Area
Pasngal	103.50	6.9%
Cadaratan	53.30	3.6%
Calioet-Libong	198.74	13.3%
Corocor	100.50	6.7%
Cabulalaan	88.31	5.9%
Cabaruan	275.30	18.4%
Pipias	49.88	3.3%
Natba	132.47	8.8%
Ganagan	276.66	18.5%
Casilian	214.33	14.3%
Sangil	4.06	0.3%
Total	1,497.06	100.0%

Liquefaction

Liquefaction is a phenomenon wherein sediments, especially near bodies of water, behave like liquid similar to a quicksand, resulting to sinking and/or tilting of structure above. Although, there is no presence of evidence/record of this type of hazard, the PHIVOLCS identified areas susceptible to liquefaction due to its soil type (clayey to salty sand underlain by gravel).

It is estimated that 3,686.3 hectares (56.3% of total land area), including 5,154 households, at least 164 critical government facilities, and 28.29% of the local road network are exposed to liquefaction.

Table 13. Areas Susceptible to Liquefaction

Area	Low	Moderate	High	Total (ha)
Urban	-	205.23	-	205.23
Rural	1,051.33	1,242.28	1,184.57	3,478.18
Total	1,051.33	1,447.51	1,184.57	3,683.41

Summary

Table 14 summarizes the level of exposure of each of the barangays by system of interest (e.g. population, natural resource, critical facilities, urban uses, and lifeline facilities), while Table 15 summarizes the level of vulnerability or risk of each of the barangay's settlement areas for each hazard (see Annex D for detailed Tables and maps).

Table 14: Exposure Database by Barangay

Barangay	Population	Natural Resources (ha.)	Critical Facilities	Urban Uses (ha.)	Lifeline Facilities (km)
#01 Sta Rita	1,090	-	18	43.37	6.68
#02 San Andres	765	-	2	12.62	3.35
#03 San Andres II	724	-	2	13.15	3.70
#04 San Simon	720	-	2	9.15	1.53
#05 San Simon II	367	-	2	4.67	2.00
#06 San Pedro	428	-	1	5.55	1.91
#07 San Pedro II	760	-	3	11.08	2.32
#08 San Agustin	644	0.66	1	3.32	0.92
#09 San Agustin II	354	1.02	3	4.13	0.93
#10 San Vicente	911	-	2	9.55	3.08
#11 Sta Filomena I	241	-	1	2.94	0.89
#12 Sta Filomena II	450	-	1	4.24	1.31
#13 San Gabriel	262	0.23	2	4.46	1.16
#14 San Gabriel II	443	-	2	6.13	1.69
#15 San Roque	531	-	1	6.39	1.82
#16 San Roque II	444	0.02	1	5.45	1.37

Barangay	Population	Natural Resources (ha.)	Critical Facilities	Urban Uses (ha.)	Lifeline Facilities (km)
#17 Sto Cristo	458	5.49	2	13.10	1.50
#18 Sto Cristo II	441	1.30	2	5.95	1.91
#19 Nambaran	1,048	303.64	4	14.16	19.55
#19A Tambidao	755	163.35	4	12.86	12.96
#20 Pulangi	1,137	222.75	3	19.79	13.13
#21 Libtong	1,703	176.83	5	33.63	12.91
#22 Bani	952	135.63	2	17.71	8.38
#23 Paninaan	486	86.48	3	7.34	10.32
#24 Macupit	709	77.57	3	7.72	7.70
#25 Tubburan	950	114.89	4	11.12	14.20
#26 Teppang	709	91.88	2	9.61	7.80
#27 Duripes	1,206	126.88	2	14.68	9.73
#27A Pungto	653	83.93	4	9.75	7.48
#28 Cabusligan	1,196	106.98	5	16.43	7.14
#29 Pasngal	815	128.65	2	11.98	5.34
#30 Cadaratan	1,434	54.83	5	41.82	6.96
#31 Calioet-Libong	863	116.70	4	28.63	7.33
#32 Corocor	902	110.28	3	20.51	5.88
#33 Cabulalaan	814	58.57	5	20.12	4.37
#34 Cabaruan	1,435	229.07	3	21.17	9.69
#35 Pipias	976	32.52	2	11.20	2.81
#36 Natba	601	58.04	5	6.28	3.17
#37 Ganagan	796	158.15	3	8.66	6.23
#37A Casilian	1,171	76.56	5	10.40	5.07
#38 Sangil	1,095	119.67	4	16.55	7.93
#39 Pasiocan	1,239	90.35	3	45.10	7.95
#40 Buyon	1,662	185.98	5	36.97	17.75
Total	35,340	3,118.90	138	619.44	259.85

Table 15: Barangay Urban Area Level of Risk/Vulnerability by Type

Barangay	Flooding	Landslide	Storm Surge	Liquefaction	Earthquake	Tsunami	Sea Level Rise
#01 Sta Rita	Mod			Mod	Mod		
#02 San Andres	High			Mod	Mod		
#03 San Andres II	High			Mod	Mod		
#04 San Simon	High			Low	Mod		
#05 San Simon II	Mod			Low	Mod		
#06 San Pedro	Mod			Low	Mod		
#07 San Pedro II	Mod			Mod	Mod		
#08 San Agustin	Mod			Low	Mod		
#09 San Agustin II	Mod			Low	Mod		
#10 San Vicente	Mod			Mod	Mod		
#11 Sta Filomena	Mod			Low	Mod		
#12 Sta Filomena II	Mod			Low	Mod		
#13 San Gabriel	High			Low	Mod		
#14 San Gabriel II	Mod			Low	Mod		
#15 San Roque	Mod			Low	Mod		
#16 San Roque II	Mod			Low	Mod		
#17 Sto Cristo	Mod			Mod	Mod		
#18 Sto Cristo II	Mod			Low	Mod		
#19 Nambaran	Mod	Mod		Low	Mod		
#19A Tambidao	Mod	Low		Low	Mod		
#20 Pulangi	Mod	Mod		Low	Mod		
#21 Libtong	Mod	Low		Low	Mod		
#22 Bani	Mod	Low		Low	Mod		
#23 Paninaan	Mod	High		Low	Mod		
#24 Macupit	Mod	High		Low	Mod		
#25 Tubburan	Mod	High		Mod	Mod		
#26 Teppang	Mod	Low		Low	Mod		
#27 Duripes	Mod	Low		Low	Mod		
#27A Pungto	Mod	Low		Low	Mod		
#28 Cabusligan	Mod			Mod	Mod		
#29 Pasngal	Mod			Mod	Mod	Mod	
#30 Cadaratan	Mod		Low	Mod	Mod	Mod	

Barangay	Flooding	Landslide	Storm Surge	Liquefaction	Earthquake	Tsunami	Sea Level Rise
#31 Calioet-Libong	Mod		Mod	High	Mod	High	
#32 Corocor	Mod			Mod	Mod	Low	
#33 Cabulalaan	Mod		Low	Mod	Mod	Low	
#34 Cabaruan	High		Low	High	Mod	High	
#35 Pipias	High		Low	Mod	Mod	Mod	
#36 Natba	High		Mod	Mod	Mod	High	Mod
#37 Ganagan	Mod	Low		Mod	Mod	Low	
#37A Casilian	High		Mod	Mod	Mod	High	Mod
#38 Sangil	Mod	Mod		Mod	Mod		
#39 Pasiocan	High	Mod		Mod	Mod		
#40 Buyon	Mod	High		High	Mod		

Based on the technical assessment of the areas' exposure to various hazards and the associated level of risk and/or vulnerability, it can be noted that the areas of highest risk are :

- coastal barangays which are subject to a combination of storm surge, sea level rise, and tsunami risks;
- areas in the Poblacion moderately to highly impacted by floods, liquefaction, and earthquake; and
- communities near the riverbanks also prone to flooding, soil erosion and liquefaction.

The proposed policy interventions for each risk area is summarized in the following Table.

Table 16: Climate Change and Disaster Risk Assessment Summary Matrix

Decision Area	Description	Problems/Hazards	Impacts/Implications	Policy Interventions
Coastal barangays	Calioet-Libong Natba Casilian	Areas at risk to storm surge, tsunami, sea level rise and earthquake, and prone to flooding, liquefaction and/or soil erosion	Severe potential damage to residential areas; Potential permanent inundation of structures due to sea level rise; Increased possible impacts related to flooding and storm surge due to increased rainfall and wind intensities	Improved early warning systems; improved/concreting/ widening or roads to improve access; Consider assigning no-build zones within areas of high risk, low-lying permanent inundation areas; climate proofing of structures; and encouraging use of climate-resilient varieties for farming.
Corocor-Cabulalaan riverside	Corocor Cabulalaan Pipias Cabaruan	Areas at risk to tsunami and ground shaking, and prone to flooding and liquefaction	Potential damage to settlements and structures resulting to loss of life due to flash floods; Riverbank erosion and possible failure of riverbank slopes affecting structures	Construction/ improvement of slope protection; clearing/dredging of irrigation and drainage canals; promoting climate resilient varieties; encouraging/supporting availment of property insurance among residents.
South of Bacarra river	Buyon Pasiocan	Areas at risk to ground shaking, and prone to flooding, landslide and liquefaction	Potential damage to settlements and structures resulting to loss of life due to flash floods/landslides; Riverbank erosion and possible failure of riverbank slopes affecting structures	Construction/ improvement of slope protection; clearing/dredging of irrigation and drainage canals; encouraging/ supporting availment of property insurance among residents.
Poblacion	All urban barangays	Areas at risk to ground shaking, and prone to flooding and liquefaction	Potential damage to settlements and structures resulting to loss of life due to flash floods; Riverbank erosion and possible failure of riverbank slopes affecting structures	Construction/ improvement of slope protection; clearing/dredging of irrigation and drainage canals; encouraging/ supporting availment of property insurance among residents.

The complete results of the CDRA is attached as Annex D of this report.

1.4 Population and demography

1.4.1 Provincial population

Municipality of Bacarra is one of the municipalities in the Province of Ilocos Norte located north of the provincial capital – Laoag City. According to the recent report released by the Philippine Statistical Authority (PSA), in

2015, province of Ilocos Norte population has reached 593,081, with an annual average growth rate of 0.87% on 2010.

Table 17: Province of Ilocos Norte Population 1990-2015

Location	Status	Population Census			
		5/1/1990	5/1/2000	5/1/2010	8/1/2015
Ilocos Norte	Province	461,661	514,241	568,017	593,081
Adams	Municipality	1,119	1,480	1,785	1,792
Bacarra	Municipality	26,940	29,668	31,648	32,215
Badoc	Municipality	25,627	27,862	30,708	31,616
Bangui	Municipality	12,921	14,327	15,025	14,672
Banna	Municipality	15,342	16,704	19,051	19,438
Batac	City	43,092	47,682	53,542	55,201
Burgos	Municipality	7,643	8,534	9,687	9,777
Carasi	Municipality	632	1,154	1,473	1,567
Currimaos	Municipality	9,467	10,615	11,970	12,184
Dingras	Municipality	30,519	33,310	37,021	38,562
Dumalneg	Municipality	828	1,486	1,814	2,947
Laoag	City	83,756	94,466	104,904	111,125
Marcos	Municipality	12,990	15,154	16,984	17,777
Nueva Era	Municipality	5,238	6,095	7,837	9,506
Pagudpud	Municipality	16,558	19,315	21,877	23,770
Paoay	Municipality	20,680	21,745	23,956	24,866
Pasuquin	Municipality	21,410	24,739	27,952	28,980
Piddig	Municipality	17,078	19,059	20,606	21,497
Pinili	Municipality	14,950	15,903	16,732	17,300
San Nicolas	Municipality	27,632	31,688	34,237	36,736
Sarrat	Municipality	21,272	22,886	24,770	25,212
Solsona	Municipality	18,883	21,338	22,990	24,121
Vintar	Municipality	27,084	29,031	31,448	32,220

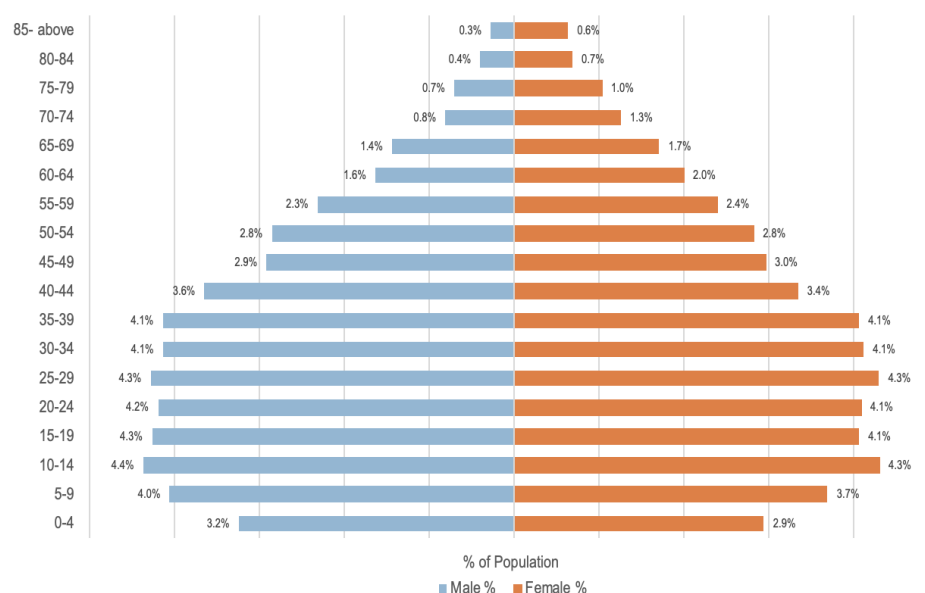
1.4.2 Local population

The 2019 Barangay profile indicates that the Municipality of Bacarra has a total population of 35,340, with an annual average growth rate (AAG) of 1.15% on 2015. About 49.47% or 17,481 are male and 50.53% or 17,859 are female. The age-sex distribution of the population is provided in Figure 7.

Table 18: Population by Age Group and Sex

Age Group	2010			2015			2019		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	1,446	1,448	2,893	1,332	1,168	2,500	1,144	1,042	2,186
5-9	1,580	1,460	3,040	1,537	1,396	2,933	1,431	1,307	2,738
10-14	1,560	1,430	2,990	1,548	1,404	2,952	1,541	1,523	3,064
15-19	1,573	1,446	3,019	1,483	1,370	2,853	1,505	1,438	2,943
20-24	1,432	1,445	2,877	1,473	1,470	2,943	1,480	1,447	2,927
25-29	1,342	1,225	2,567	1,471	1,477	2,948	1,510	1,521	3,031
30-34	1,205	1,107	2,312	1,440	1,401	2,841	1,459	1,457	2,916
35-39	1,126	1,033	2,159	1,330	1,204	2,534	1,460	1,438	2,898
40-44	1,096	1,046	2,142	1,115	1,062	2,177	1,286	1,184	2,470
45-49	904	879	1,783	1,109	1,009	2,118	1,028	1,050	2,070
50-54	691	720	1,411	935	915	1,850	1,006	1,000	2,006
55-59	590	587	1,177	677	688	1,365	815	849	1,664
60-64	390	497	887	519	616	1,135	575	709	1,284
65-69	369	40	809	362	499	861	505	607	1,112
70-74	273	313	586	306	449	755	284	447	731
75-79	153	229	382	195	284	479	247	368	615
80-84	105	191	296	107	189	296	138	245	383
85- above	108	210	318	91	220	311	94	227	321
Total	15,942	15,706	31,648	16,940	16,821	33,761	17,481	17,859	35,340

Figure 7: Population Pyramid, 2019



The total dependency ratio of the municipality considering the aggregate total of the young and old population is estimated to be 45.8, wherein young dependency ratio is 32.8 and old dependency ratio is 12.9.

The economic dependency ratio is computed to 34.8. The school-age group has a total share of 30.6% of the municipality's total population.

The population of school-going age groups at pre-school is 837 (2.4% of 35,340), at elementary school is 3,694 (10.5%), at secondary school is 3,224 (9.12%) and in the tertiary school is 1,160 (3.2%).

Table 19: Population Composition by School-Age, Dependent-Age Group and Sex

Age Group	2010			2015			2019		
	M	F	Total	M	F	Total	M	F	Total
School going Population									
Preschool (3-6)	1,210	1,163	2,373	nd	nd	841	420	417	837
Elementary (7-12)	1,884	1,734	3,618	nd	nd	3,112	1,847	1,847	3,694
Secondary (13-16)	1,253	1,150	2,403	nd	nd	3,091	1,605	1,619	3,224
Tertiary (17-21)	1,517	1,446	2,963	nd	nd	1,606	575	585	1,160
Working age (15-64)	10,349	9,985	20,334	11,552	11,212	22,764	12,124	12,093	24,217
Labor Force (15-above)	11,357	11,368	22,725	12,613	12,853	25,466	13,392	14,232	27,624
Dependent Population									
Young (0-14)	4,585	4,338	8,923	4,327	3,968	8,295	4,089	3,872	7,961
Old (65-over)	1,008	1,383	2,391	1,061	1,641	2,702	1,268	1,894	3,162

Population distribution

As of 2019 Barangay Profiling, the ten most populated barangays are Brgy. #21 Libtong consisting a percentage share of 4.8%; followed by Brgy #40 Buyon with 4.7%, Brgy. #30 Cadaratan and Brgy. #34 Cabaruan both with 4.1%, Brgy. #39 Pasiocan with 3.50%, Brgy. #27 Duripes with 3.4%, Brgy. #28 Cabusligan with 3.4%, Brgy. #37A Casilian with 3.3%, Brgy. # 20 Pulangi with 3.2%, and Brgy. #01 Sta. Rita and Brgy. #38 Sangil with 3.1%.

The least populated barangay is Brgy. #11 Sta. Filomena I housing 0.68% of total population.

Table 20. Population Distribution per Barangay

Barangay	Population	No. of HH	Barangay	Population	No. of HH
Urban			Rural		
#01 Sta Rita	1,090	270	#19 Nambaran	1,048	245
#02 San Andres	765	170	#19A Tambidao	755	164
#03 San Andres II	724	187	#20 Pulangi	1,137	307
#04 San Simon	720	166	#21 Libtong	1,703	420
#05 San Simon II	367	80	#22 Bani	952	243
#06 San Pedro	428	102	#23 Paninaan	486	111
#07 San Pedro II	760	165	#24 Macupit	709	163
#08 San Agustin	644	132	#25 Tubburan	950	225
#09 San Agustin II	354	71	#26 Teppang	709	191
#10 San Vicente	911	195	#27 Duripes	1,206	325

Barangay	Population	No. of HH	Barangay	Population	No. of HH
#11 Sta Filomena	241	52	#27A Pungto	653	159
#12 Sta Filomena II	450	104	#28 Cabusligan	1,196	313
#13 San Gabriel	262	65	#29 Pasngal	815	195
#14 San Gabriel II	443	116	#30 Cadaratan	1,434	338
#15 San Roque	531	134	#31 Calioet-Libong	863	204
#16 San Roque II	444	104	#32 Corocor	902	204
#17 Sto Cristo	458	111	#33 Cabulalaan	814	218
#18 Sto Cristo II	441	98	#34 Cabaruan	1,435	326
Sub-total/Average	10,033	2,322	#35 Pipias	976	260
			#36 Natba	601	166
			#37 Ganagan	796	244
			#37A Casilian	1,171	266
			#38 Sangil	1,095	254
			#39 Pasiocan	1,239	278
			#40 Buyon	1,662	418
			Sub-total/Average	25,307	6,237
			TOTAL	35,340	8,559

Source: 2019 Barangay Profile

Population density

With the total land area of 6,550.57 hectares and total population of 35,340, the municipality has a gross population density of 5.40 persons per hectare.

Table 21: Population Density per Barangay

Barangay	Land Area	2010		2015		2019	
		Population	Density	Population	Density	Population	Density
#01 Sta Rita	52.06	1,099	21.11	1,037	19.92	1,090	20.94
#02 San Andres	12.18	730	59.93	703	57.72	765	62.81
#03 San Andres II	12.86	817	63.53	749	58.24	724	56.30
#04 San Simon	20.23	626	30.94	731	36.13	720	35.59
#05 San Simon II	4.42	384	86.88	275	62.22	367	83.03
#06 San Pedro	5.02	379	75.50	414	82.47	428	85.26
#07 San Pedro II	11.18	403	36.05	666	59.57	760	67.98
#08 San Agustin	9.09	475	52.26	609	67.00	644	70.85
#09 San Agustin II	7.37	270	36.64	293	39.76	354	48.03
#10 San Vicente	9.48	621	65.51	710	78.89	911	96.10
#11 Sta Filomena	7.95	306	38.49	228	28.68	241	25.42
#12 Sta Filomena	9.03	326	36.10	404	44.74	450	49.83
#13 San Gabriel	5.74	254	44.25	291	50.70	262	45.64
#14 San Gabriel II	6.96	426	61.21	436	62.64	443	63.65
#15 San Roque	12.48	496	39.74	503	40.30	531	42.55
#16 San Roque II	7.54	392	51.99	375	49.73	444	58.89
#17 Sto Cristo	17.45	436	29.99	444	25.44	458	26.25
#18 Sto Cristo II	5.13	458	89.28	419	81.68	441	89.96
Sub-total Urban	216.17	8,898	41.16	9,287	42.96	10,033	46.41
#19 Nambaran	650.58	965	1.48	1,021	1.57	1,048	1.61
#19A Tambidao	334.19	762	2.28	796	2.38	755	2.26
#20 Pulangi	436.96	1,076	2.46	1,137	2.60	1,137	2.60
#21 Libtong	348.88	1,547	4.34	1,638	4.70	1,703	4.88
#22 Bani	180.73	948	5.25	939	5.20	952	5.27
#23 Paninaan	441.38	401	0.91	449	1.02	486	1.10
#24 Macupit	195.31	635	3.25	638	3.27	709	3.63
#25 Tubburan	325.60	823	2.53	921	2.83	950	2.92
#26 Teppang	179.60	707	3.94	702	3.91	709	3.95
#27 Duripes	187.03	989	5.29	1,107	5.92	1,206	6.45
#27A Pungto	146.40	551	3.76	621	4.24	653	4.46
#28 Cabusligan	134.34	1,036	7.71	1,128	8.40	1,196	8.90
#29 Pasngal	146.71	685	4.67	729	4.97	815	4.67
#30 Cadaratan	162.89	1,156	7.10	1,406	8.63	1,434	8.80
#31 Calioet-Libong	192.93	753	3.90	804	4.17	863	4.47
#32 Corocor	143.85	741	5.15	879	6.11	902	6.27
#33 Cabulalaan	80.80	748	9.26	783	9.69	814	10.07
#34 Cabaruan	480.20	1,437	2.99	1,473	3.07	1,435	2.99
#35 Pipias	45.76	983	21.48	1,049	22.92	976	21.33
#36 Natba	110.76	501	4.52	591	5.34	601	5.43

Barangay	Land Area	2010		2015		2019	
		Population	Density	Population	Density	Population	Density
#37 Ganagan	291.22	734	2.52	755	2.59	796	2.73
#37A Casilian	231.37	901	3.89	1,079	4.66	1,171	5.06
#38 Sangil	257.84	985	3.82	1,044	4.05	1,095	4.27
#39 Pasiocan	238.31	1,162	4.88	1,179	4.95	1,239	5.20
#40 Buyon	391.13	1,524	3.90	1,606	4.11	1,662	4.25
Sub-total Rural	6,334.77	22,750	3.59	24,474	3.86	25,307	3.99
TOTAL	6,550.57	31,648	4.83	33,761	5.15	35,340	5.40

Brgy. #10 San Vicente has the highest population density at 96.10 persons per hectare, about twice the average for urban barangays in the municipality. Meanwhile, the most dense rural barangay is noted to be Piplas with a density of 21.33 persons per hectare.

Population growth

Population has changed with corresponding correlation of birth and death rate, immigration and emigration. The average annual growth between 1960 and 2019 is 1.10% per annum, while population grew by an average rate of 1.15% between 2015 and 2019.

Table 22. Historical Growth of Population

Year	Population	Increase (Decrease)	Average Annual Growth (%)
1960	18,570	2,719	1.11%
1970	20,736	2,166	1.30%
1975	22,118	1,382	1.11%
1980	23,371	1,253	1.43%
1990	26,940	3,569	0.65%
1995	27,827	887	1.29%
2000	29,668	1,841	1.50%
2007	31,485	1,817	0.17%
2010	31,648	163	1.30%
2015	33,761	2,113	1.15%
2019	35,340	1,579	

1.4.3 Population characteristics

Language and dialect

Ilocano is the most commonly used language in the municipality. It is spoken by 34,631 or 97.99% of the total populace. Other residents use other languages or dialects such as Tagalog, Waray, Bicol and other, which constitute the remaining percentage. However, Tagalog and English are the medium of instructions in different educational institutions.

Table 23: Language and Dialects Spoken

Language/Dialect	2010		2015		2019	
	Population	%	Population	%	Population	%
Ilocano	30,857	97.50	33,169	98.25	34,631	97.99
Tagalog	587	1.85	457	1.35	540	1.53
Bicolano	48	0.15	17	0.05	45	0.13
Panggalatoc	8	0.03	4	0.01	0	0
Ilonggo	8	0.03	21	0.06	12	0.03
Waray	8	0.03	30	0.09	21	0.06
Cebuano	16	0.05	4	0.01	33	0.09
Others	116	0.37	59	0.17	58	0.16
Total	31,628	100.00	33,761	100.00	35,340	100.00

Religious affiliation

The Roman Catholic religion is the predominant religion in Bacarra, with around 69.7% or 24,623 of the total population being a member. The Philippine Independent Church ranked next with membership of 10.3% of the total population, follows by the Iglesia ni Cristo with 9.01%, and Born Again Christians comprising 6.17%.

Table 24: Religious Affiliation

Language/Dialect	2010		2015		2019	
	Population	%	Population	%	Population	%
Roman Catholic	21,712	68.60	22,657	67.11	24,623	69.67
Iglesia ni Cristo	1,621	5.12	2,117	6.27	2,185	9.01
Filipina Independiente	4,261	13.46	4,633	13.72	3,649	10.33

Language/Dialect	2010		2015		2019	
	Population	%	Population	%	Population	%
Seventh Day Adventist	377	1.19	400	1.18	426	1.21
Baptist	461	1.46	404	1.20	414	1.17
Born Again	1,726	5.45	1,879	5.57	2,181	6.17
Jehovah's Witnesses	560	1.83	587	1.74	607	1.72
Others	910	2.88	1,084	3.21	1,255	3.55
Total	31,628	100.00	33,761	100.00	35,340	100.00

Labor force and employment

In the Municipality of Bacarra, the total in labor force population (economically active population 15 years old and above who are either employed or unemployed) of the municipality is 24,217 or 68.5% of the total population, wherein 12,124 are males while 12,093 are females. Of the total in labor force population, 15,792 or 65.2% are employed and 8,425 or 34.8% are unemployed. It can be seen in the table below that males constituted a slightly bigger share of the employed population which is 53.5%.

Table 25: Labor Force Participation by Sex and Employment Status

Status	2010			2015			2019		
	M	F	Total	M	F	Total	M	F	Total
Population 15 years and over	11,357	11,368	22,725	12,613	12,853	25,466	13,392	14,232	27,624
Labor Force	8,017	3,561	11,578	11,552	11,212	22,764	12,124	12,093	24,217
Employed	7,404	2,920	10,324	8,189	6,688	14,877	8,455	7,337	15,792
Unemployed	612	642	1,254	3,499	4,674	8,168	3,669	4,756	8,425
Not in the Labor Force	3,340	7,807	11,147	1,061	1,641	2,702	1,268	2,139	3,407

Poverty incidence

Data on poverty incidence has not been updated since the last conduct of a community-based monitoring system (CBMS). However, the number of registered 4Ps and indigent families in each barangay is being used as a proxy figure for determining incidence of poverty. Based on this figure, it is estimated that 33.2% of households can be considered poor.

Table 26: Distribution of 4Ps Beneficiaries and Indigent Households 2019

Barangay	Households	4Ps Beneficiaries		Indigent Families 2019	Total 2019	% of Total
		2018	2019			
#01 Sta Rita	270	5	5	44	49	18.1%
#02 San Andres	170	5	5	36	41	24.1%
#03 San Andres II	187	6	6	23	29	15.5%
#04 San Simon	166	5	5	45	50	30.1%
#05 San Simon II	80	-	-	20	20	25.0%
#06 San Pedro	102	3	3	14	17	16.7%
#07 San Pedro II	165	10	10	23	33	20.0%
#08 San Agustin	132	10	10	26	36	27.3%
#09 San Agustin II	71	6	5	33	38	53.5%
#10 San Vicente	195	5	5	10	15	7.7%
#11 Sta Filomena	52	6	6	6	12	23.1%
#12 Sta Filomena	104	3	3	17	20	19.2%
#13 San Gabriel	65	4	4	43	47	72.3%
#14 San Gabriel II	116	9	9	12	21	18.1%
#15 San Roque	134	3	3	20	23	17.2%
#16 San Roque II	104	2	2	37	39	37.5%
#17 Sto Cristo	111	4	3	35	38	34.2%
#18 Sto Cristo II	98	2	2	55	57	58.2%
#19 Nambaran	245	27	27	24	51	20.8%
#19A Tambidao	164	19	21	70	91	55.5%
#20 Pulangi	307	49	49	57	106	34.5%
#21 Libtong	420	31	33	68	101	24.0%
#22 Bani	243	23	23	89	112	46.1%
#23 Paninaan	111	13	14	16	30	27.0%
#24 Macupit	163	12	11	48	59	36.2%
#25 Tubburan	225	29	29	25	54	24.0%
#26 Teppang	191	18	19	34	53	27.7%
#27 Duripes	325	28	28	22	50	15.4%
#27A Pungto	159	14	16	36	52	32.7%
#28 Cabusligan	313	22	21	80	101	32.3%

Barangay	Households	4Ps Beneficiaries		Indigent Families	Total 2019	% of Total
		2018	2019	2019		
#29 Pasngal	195	8	7	15	22	11.3%
#30 Cadaratan	338	17	17	50	67	19.8%
#31 Calioet-Libong	204	22	20	92	112	54.9%
#32 Corocor	204	7	8	25	33	16.2%
#33 Cabulalaan	218	8	9	66	75	34.4%
#34 Cabaruan	326	24	25	21	46	14.1%
#35 Pipias	260	14	14	22	36	13.8%
#36 Natba	166	18	17	55	72	43.4%
#37 Ganagan	244	18	17	16	33	13.5%
#37A Casilian	266	56	55	51	106	39.8%
#38 Sangil	254	15	15	30	45	17.7%
#39 Pasiocan	278	15	15	20	35	12.6%
#40 Buyon	418	48	46	82	128	30.6%
Total	8,559	731	728	2,112	2,840	33.2%

1.4.4 Population projection

Based on the historical growth of population between 2015 and 2019, which has grown 1.15% annually, the projected population of the municipality was computed. By the year 2025, the local population is projected to increase to 37,876, and in 2030 increase to 40,155. The table and graph that follow illustrate the projected population increase in the next ten (10) years.

Figure 8: Historical and Projected Population

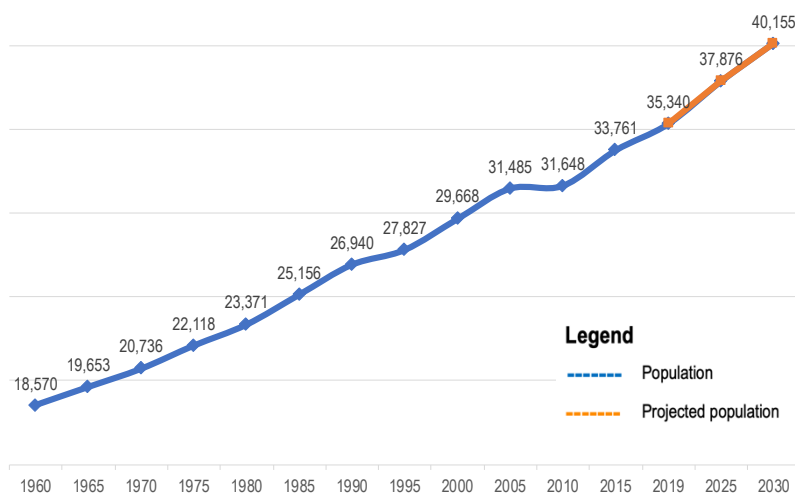


Table 27: Population Projection per Barangay 2020-2030

Barangay	2019	2020P	2022P	2024P	2026P	2028P	2030P
Urban							
#01 Sta Rita	1,090	1,110	1,155	1,201	1,248	1,297	1,348
#02 San Andres	765	780	811	843	876	910	946
#03 San Andres	724	738	767	797	829	861	895
#04 San Simon	720	734	763	793	824	857	890
#05 San Simon	367	374	389	404	420	437	454
#06 San Pedro	428	436	454	471	490	509	529
#07 San Pedro	760	775	805	837	870	904	940
#08 San Agustin	644	657	682	709	737	766	796
#09 San Agustin	354	361	375	390	405	421	438
#10 San Vicente	911	929	965	1,003	1,043	1,084	1,127
#11 Sta Filomena	241	246	255	265	276	287	298
#12 Sta Filomena	450	459	477	496	515	535	557
#13 San Gabriel	262	267	278	289	300	312	324
#14 San Gabriel	443	452	469	488	507	527	548
#15 San Roque	531	541	563	585	608	632	657
#16 San Roque	444	453	470	489	508	528	549
#17 Sto Cristo	458	467	485	504	524	545	566
#18 Sto Cristo	441	450	467	486	505	525	545
Sub-total	10,033	10,227	10,632	11,050	11,486	11,938	12,408

Barangay	2019	2020P	2022P	2024P	2026P	2028P	2030P
Rural							
#19 Nambaran	1,048	1,057	1,075	1,093	1,111	1,130	1,149
#19A Tambidao	755	761	774	787	801	814	828
#20 Pulangi	1,137	1,147	1,166	1,186	1,206	1,226	1,247
#21 Libtong	1,703	1,717	1,746	1,776	1,806	1,836	1,867
#22 Bani	952	960	976	993	1,009	1,026	1,044
#23 Paninaan	486	490	498	507	515	524	533
#24 Macupit	709	715	727	739	752	764	777
#25 Tubburan	950	958	974	991	1,007	1,024	1,042
#26 Teppang	709	715	727	739	752	764	777
#27 Duripes	1,206	1,216	1,237	1,258	1,279	1,300	1,322
#27A Pungto	653	658	670	681	692	704	716
#28 Cabusligan	1,196	1,206	1,226	1,247	1,268	1,290	1,311
#29 Pasngal	815	822	836	850	864	879	894
#30 Cadaratan	1,434	1,446	1,470	1,495	1,521	1,546	1,572
#31 Calioet-Libong	863	870	885	900	915	930	946
#32 Corocor	902	910	925	941	956	973	989
#33 Cabulalaan	814	821	835	849	863	878	892
#34 Cabaruan	1,435	1,447	1,471	1,496	1,522	1,547	1,573
#35 Pipias	976	984	1,001	1,018	1,035	1,052	1,070
#36 Natba	601	606	616	627	637	648	659
#37 Ganagan	796	803	816	830	844	858	873
#37A Casilian	1,171	1,181	1,201	1,221	1,242	1,263	1,284
#38 Sangil	1,095	1,104	1,123	1,142	1,161	1,181	1,201
#39 Pasiocan	1,239	1,249	1,270	1,292	1,314	1,336	1,358
#40 Buyon	1,662	1,676	1,704	1,733	1,762	1,792	1,822
Sub-total	25,307	25,520	25,950	26,388	26,834	27,286	27,747
Total	35,340	35,747	36,582	37,438	38,320	39,224	40,155

1.5 Social services

1.5.1 Education

Schools

The Municipality of Bacarra has twenty four (24) primary and elementary schools. Four (4) schools are located in the Poblacion and the other twenty (20) schools are in the rural barangays. Two of which are privately operated by the Roman Catholic and private investor. A secondary curriculum is being offered in Bacarra National Comprehensive High School, the Cadaratan National High School, and the Saint Andrew Academy. And post and tertiary education are offered at the Bacarra School of Midwifery.

Local enrollment

Data from the local education institutions provide that there is an average enrollment of 7,490 students in the last five school years across all levels. It would be noted that there was a surge in enrolment in the secondary level in school year 2017-2018, which is the effect of the implementation of the K-12 program.

Table 28: Historical Enrollment

Level	SY 14-15	SY 15-16	SY 16-17	SY 17-18	SY 18-19
Elementary	4,646	4,564	4,325	4,199	4,179
Secondary	2,367	2,368	2,495	3,532	3,698
Tertiary	nd	nd	5	14	10
Total	7,013	6,932	7,871	7,745	7,887

Student participation rate

Data in 2019 provide that there was a student participation rate of 77.2%, based on the ratio of the school going age population and the enrollment in local institutions.

Teacher-student and classroom-student ratio

There were 233 classrooms for public elementary schools and 128 classrooms for secondary school in 2019. The pupils/students to classroom ratios for the elementary and secondary level are 17:1 and 30:1 respectively. Teacher to student ratios are also well within the national Department of Education (DepEd) target of 35:1 for elementary and 40:1 for secondary.

Table 29: School Statistics by Level and Type 2019

Type	Level	Enrollees	Teachers	Classrooms	Student-Teacher Ratio	Student Classroom Ratio
Private	Primary	451	22	22	21:1	21:1
	Secondary	86	8	6	11:1	14:1
	Tertiary	10	14	4	1:1	1:2
Public	Primary	3,492	190	211	18:1	17:1
	Secondary	3,744	137	122	27:1	31:1

1.5.2 Health

Health services

In the delivery and provision of primary health care services, the municipality of Bacarra has its own Rural Health Unit manned by one (1) doctor, one (1) dentist, three (3) nurses, two (2) sanitary inspectors, one (1) dental aide, one (1) medical technologist, and seven (7) midwives. The LGU also have five (5) satellite stations at Barangays Nambaran, Tubburan, Cadaratan, Cabulalaan and Sangil. There are also five (5) newly constructed barangay health stations in barangays an Pedro II, Pungto, Corocor, Calioet-Libong, and a new one in Cabulalaan. Services rendered include: immunization and communicable disease control, supplemental feeding, medical and dental consultation, personal and community health, sanitation and hygiene and maternal and child care. Health service providers are always ready on-call to provide assistance and services at any given with two (2) units of ambulance available for faster delivery of services with 24/7 services.

Births and deaths

Bacarra has a recorded 356 live births or 12.08% birth rate and a total of 184 death or a 5.02% death rate in 2019.

Causes of mortality and morbidity

There were 180 recorded deaths in the municipality in 2019. The top causes for mortality were:

- Hypertensive Heart Disease (29);
- Cancer (28);
- Pneumonia (18); and
- Diabetes Mellitus II (12).

Meanwhile, some 10,974 patients were treated in the municipal health facilities, the majority of clients needing treatment for the following illnesses:

- Upper respiratory tract infection (3,479);
- Toothache (1,353);
- Wounds (1,264);
- Vertigo (590); and
- Nasopharyngitis (497).

Family planning

Barangay data in 2019 reported that of the total 524 family planning acceptors, 287 employ basal body temperature, and 237 have lactational amenorrhea.

Table 30: Family Planning Acceptor

Method	2010			2019		
	New	Continuing	Total	New	Continuing	Total
Cervical Mucus	32	92	124	0	0	0
Lactational Amenorrhea	51	122	173	22	215	237
Basal Body Temperature	0	0	0	81	206	287
Total	83	214	297	103	421	524

1.5.3 Social Welfare and Services

The following programs are offered to indigents and residents.

Table 31: Social Welfare Programs

Program	Description
Child and Youth Welfare	Provision of supplemental parental care to 0-6 year's old children who may be neglected, abused, exploited or abandoned during part of the day when parents cannot attend to their needs.
Self-employment Assistance	Provision of capital assistance to the more disadvantage and indigent families in order for them to undertake income generating projects and gainful opportunities, to enhance the development of positive work habits, self-sufficiency and improvement of their living conditions.
Aid to Individuals in Crisis Situation	Provision of assistance to persons in crisis situation. Assistance provided is either in cash, medicines, relief goods, referrals and/or counseling.
Family and Community Welfare Services	Provision of pre-marital counseling for future couples and marriage applicants in order to inculcate in them matters necessary for a healthy and happy husband-wife-children relationship or responsible parenthood and community welfare and development involvement.
Senior Citizens	Provision of gifts/ free medical consultation and medicines, master listing and provision of OSCA ID's for discounts in buying medicines and transportation fare.
Programs of Disabled and Elderly Persons	Provision of assistance for physical restoration of disabled persons; gifts; self-enhancement services, special social service for the elderly, community-based vocational rehabilitation, after care follow-up, and information dissemination on disability prevention.
Relief Services	Provision of relief goods to victims of man-made and natural calamities and disasters.
Emergency Assistance	Provision of limited financial and material assistance, capability building and disaster preparedness, basic services for rehabilitation and restoration, balik-probinsya, supplemental feeding, care shelter assistance and emergency shelter assistance.
Women's Welfare Services and Skills Development	Provision of maternal and childcare, self-enhancement skills development, community participation skills development, leadership and basic business management skills development and women in especially difficult circumstances.

In the year 2019, the Municipal Social Work and Development Office (MSWDO) reported to have assisted 1,051 individuals, of which 59% were children, 25% were needy adults, and 10% were persons with disabilities.

Table 32: Number of Clientele Served by Type

Type	2010*	2017	2018	2019
Persons with disabilities (PWD)	27	97	231	133
Children	124	703	700	616
Other needy adults	240	269	232	290
Fire victims	1	0	0	4
Battered women	2	4	4	8
Distressed victims	1	0	0	0
Other		0	0	0
Total	395	3,494	1,167	1,051

1.5.4 Protective Services

Police services

The Philippine National Police deployed 20 members of its force in the Municipality of Bacarra. This translates to a 1:1,767 police to population ratio, well below the national target of 1:500. The police officers hold office at their PNP headquarters located at the southeastern portion of the Municipal Plaza and the substation situated at the Checkpoint Post at the National Road. In support to the services rendered by the PNP, there are also organized brigades exhibiting police powers at the barangay level. These tanod brigades are equipped with hand radio transmitter and receiver in order to achieve an easier contact with the police force and are at the same time provided with tanod outposts in conspicuous areas in the barangay.

Crime incidence

Based on statistical record, the municipality recorded an increase in crime volume from 139 in 2017 to 169 in 2019. Of the total in 2019, 15 or 8.9% were index crimes. Top crimes reported were: physical injuries, reckless imprudence resulting to homicide, rape, illegal drugs, and alarm and scandal.

Table 33: Crime Incidence Record

Indicators	2010*	2017	2018	2019
Crime Volume	21	139	167	169
- Index Crime	15	20	12	15
- Non-index Crime	6	119	155	154
- Physical Injuries	7	7	5	6
- Frustrated Murder		1	2	2
- Homicide/Frustrated Homicide	3	1	0	2
- Rape		4	2	4
- Robbery	2	3	2	1

Indicators	2010*	2017	2018	2019
- Theft	1	2	2	2
- Illegal Drugs		10	12	4
- Illegal Gambling		4	8	3
- Alarm and Scandal		0	0	4
- Reckless Imprudence resulting to Homicide		3	5	5
- Child Abuse		1	0	1
- Other		96	125	135
Ave. Monthly Crime Rate	5.19	32.69	39.27	39.74
Crime Solution Efficiency	90.47	78.42	88.62	73.96
Crime Solved	19	109	148	125

Fire protection

The existing fire service of Bacarra is manned by 14 firemen, resulting to a fireman to population ratio of 1:2,524 (slightly short of the national target of 1:2,000). The BFP has two units of fire truck; its station located at Brgy. #10 San Vicente, Bacarra, Ilocos Norte. One fire incident has been recorded in the last three years. The Bacarra PNP and BFP are augmented by the presence of Barangay Fire Brigades. There are also NGO's who have been supportive in the maintenance of peace and order and disaster management activities in the locality.

1.5.5 Housing and Basic Utilities

Ownership status

Of the Barangays that reported the housing ownership status of its residents, it is revealed that 92% of households in the municipality are owned by residents, while 1.2% of households are renting their homes. Meanwhile, some 6% and 0.3% respectively share their unit with either the owner or the rented. About 39 households are reported as informal settler families (ISFs). Majority of these ISFs are located at Brgy. Calioet-Libong.

Table 34: Housing Ownership 2019

Area	Ownership				
	Owned	Rented	Shared with Owner	Shared with Rented	Informal Settler
Urban	2,007	54	140	6	16
Rural	5,348	44	343	16	23
Total	7,355	98	483	22	39
% Total	92.0%	1.2%	6.0%	0.3%	0.5%

Construction materials

The reporting Barangays also recorded that for wall materials, 80.2% of households used concrete, 14.8% semi-concrete, 195 households (2.2%) used light materials (e.g. wood, cogon), while some 245 households (2.8%) made use of salvaged materials such as paper, cardboards, or plastic materials.

Table 35: Housing Wall Materials, 2019

Area	Materials			
	Concrete	Semi- Concrete	Light Materials	Salvaged Materials
Urban	1923	343	40	0
Rural	5123	961	155	245
Total	7,046	1,304	195	245
% Total	80.2%	14.8%	2.2%	2.8%

Utilities access

The barangays recorded that in 2019, 55.9% of households have access to Level III water distribution systems while 38.1% remain to use deep well and 3.6% open/dug wells. Other households rely on surface water sources (3.6%) and others retrieve their water through sharing. In terms of power, 99.6% of households have electricity, while some 29 households (0.3%) rely on kerosene/candles. About 45.1% use modern type toilets, with 53.2% water sealed. Only 1.7% remain to use pit type. All barangays are covered by the municipal garbage collection system.

Table 36: Housing Facilities and Utilities Situation

Item	2012		2019	
	HH Served	Coverage	HH Served	Coverage
Water Supply	7,090	90.7%		
- Piped Tube/Level III			4,810	55.9%
- Deep Well			3,279	38.1%
- Open/Dug Well			313	3.6%
- Surface Water (lake/river)			79	0.9%
- Other sources (sharing)			124	1.4%
Electricity	7,183	91.9%		
- Grid			8,528	99.6%
- Solar			29	0.3%
- Kerosene/Candle			2	0.02%
Water-Sealed Toilet	7,553	96.6%		
- Modern Type			3,831	45.1%
- Water Sealed			4,523	53.2%
- Pit Type			34	0.4%
- None/Sharing			114	1.3%
Garbage Collection System	2,947	37.7%	8,559	100.0%

1.5.6 Sports and Recreation

The most common sports facility in the municipality is a covered (basketball) court. There are 24 barangays equipped with basketball courts. Recreational activities like walking, jogging and biking can be done in 15 parks and 16 playgrounds can be located in 21 of the 43 barangays.

1.6 Local economy

The structure of the local economy in the countryside is classified into three parts; the primary, secondary and tertiary sectors. The primary sector includes agriculture, fishery, and livestock. The secondary sector consists of quarrying, manufacturing and construction. And the tertiary sector is comprised of all service activities like trade and commerce, real state, finance, personal and community services, and transportation and communications.

1.6.1 Agriculture

Crop Production

Based on the land cover map of the municipality as of 2020, there are 3,417.83 hectares (GIS estimate) of agricultural land in Bacarra, all located in the rural barangays of the municipality. To ensure the efficient utilization of land for agriculture and agro-industrial development and promote sustainable growth, the Department of Agriculture delineated the Network of Protected Areas for Agriculture and Agro-Industrial Development or NPAAAD, which refers to agricultural areas for protection per the Agriculture and Fisheries Modernization Act of 1997. The law stipulates that the NPAAAD covers:

- all irrigated areas;
- all irrigable lands already covered by irrigation projects with firm funding commitments;
- all alluvial plain land highly suitable for agriculture whether irrigated or not;
- agro-industrial croplands or lands presently planted to industrial crops that support the viability of existing agricultural infrastructure and agro-based enterprises;
- highlands, or areas located at an elevation of five hundred (500) meters above and have the potential for growing semi-temperate and high-value crops;
- all agricultural lands that are ecologically fragile, the conversion of which will result to environmental degradation; and
- mangrove areas and fish sanctuaries.

As such, the policy is for these prime agricultural lands to be treated as environmentally critical and therefore protected for the purpose of providing venue for replenishing lost groundwater used for domestic purposes (recharge area for groundwater) and for the amenity it gives to place and people where they are found. As can be noted, there are 1,883.96 hectares of agricultural areas tagged as NPAAAD irrigated alluvial lands.

The Municipal Agriculture Office (MAO) reported that the main crop products in Bacarra include rice, corn, root crops, legumes, and vegetables fruit trees. Table 97 provides a comparison of the land area distribution for each of the major crops in 2010 and 2019.

Table 37: Comparative Agricultural Crop Areas and Production

Crop	Area (ha.)				Production (MT)			
	2010	2017	2018	2019	2010	2017	2018	2019
Rice	4,373.00	4,380.00	4,393.26	4,393.04	27,046.26	25,292.34	26,724.25	26,674.80
Corn	580.00	700.00	710.00	710.00	2,610.00	4,092.60	4,132.60	4,132.60
Sweet Potato (Camote)	3.00	3.00	3.00	3.00	60.00	60.00	60.00	60.00
Eggplant	34.00	30.00	30.00	30.00	560.32	519.00	519.00	519.00
Ampalaya	3.50	3.50	5.00	10.00	31.50	46.50	93.00	93.00
Beans	12.00	30.00	30.00	30.00	67.50	153.00	153.00	153.00
Tomato	41.00	60.00	60.00	60.00	756.45	1,260.00	1,260.00	1,260.00
Squash	6.00	5.00	5.00	5.00	50.00	100.00	100.00	100.00
Okra	5.00	7.00	7.00	7.00	50.00	70.00	70.00	70.00
Pechay	2.00	4.00	4.00	4.00	16.00	35.30	35.20	35.20
Pepper- Finger Long	9.00	5.00	5.00	5.00	50.00	25.00	25.00	25.00
Banana	5.00	5.00	5.00	5.00	37.00	37.00	37.00	37.00
Papaya, Ripe	0.50	0.50	0.50	0.50	3.75	3.75	3.75	3.75
Onion	65.00	60.00	70.00	80.00	764.40	738.00	861.00	984.00
Garlic	30.00	60.00	70.00	75.00	90.00	240.00	280.00	300.00
Bell Pepper	35.00	50.00	50.00	60.00	700.00	250.00	250.00	300.00
Mongo	25.00	110.00	110.00	110.00	37.50	171.60	171.60	171.60
Watermelon	20.00	16.00	20.00	40.00	400.00	320.00	400.00	800.00
Peanut	34.00	10.00	10.00	20.00	42.00	15.20	15.20	30.30
Mango	40.00	40.00	40.00	40.00	225.00	368.00	368.00	368.00

As can be noted, the top agricultural products in Bacarra are rice and corn. These are widely planted in the rural farming barangays in the municipality. The total area planted to rice and corn, and the volume and value of production in 2019 for each of the producing barangay is provided in the following Table.

Table 38: Existing Major Agricultural Crops By Area, Production And Market, 2019

Barangay	Rice			Corn		
	Area	Volume (MT)	Value ('000)	Area	Volume (MT)	Value ('000)
#19 Nambaran	446.00	2768.55	49,833.90	27.50	150.825	1,809.900
#19A Tambidao	265.60	1737.89	31,282.02	35.00	200.950	2,411.400
#20 Pulangi	330.00	2026.75	36,481.50	31.25	184.125	2,209.500
#21 Libtong	272.70	1718.57	30,934.26	34.00	198.675	2,384.100
#22 Bani	217.33	1333.98	24,011.69	64.00	359.500	4,314.000
#23 Paninaan	69.00	295.20	5,313.60	14.50	83.300	999.600
#24 Macupit	60.00	245.00	4,410.00	14.00	81.300	975.600
#25 Tubburan	90.00	447.69	8,058.42	23.25	134.400	1,612.800
#26 Teppang	114.50	592.73	10,669.05	33.00	191.800	2,301.600
#27 Duripes	131.00	693.15	12,476.70	38.50	225.300	2,703.600
#27A Pungto	63.50	272.40	4,903.20	21.75	126.100	1,513.200
#28 Cabusligan	160.00	928.70	16,716.60	20.50	119.375	1,432.500
#29 Pasngal	216.00	1393.38	25,080.84	14.50	85.600	1,027.200
#30 Cadaratan	107.50	663.40	11,941.20	12.75	74.000	888.000
#31 Calioet-Libong	102.25	607.26	10,930.73	16.75	95.750	1,149.000
#32 Corocor	162.33	1048.70	18,876.60	54.00	324.100	3,889.200
#33 Cabulalaan	83.00	518.45	9,332.10	14.00	82.450	989.400
#34 Cabaruan	477.50	3038.30	54,689.40	65.75	398.700	4,784.400
#35 Pipias	58.00	371.30	6,683.40	14.25	83.450	1,001.400
#36 Natba	71.00	388.40	6,991.20	14.25	85.175	1,022.100
#37 Ganagan	334.00	2179.76	39,235.68	20.75	119.800	1,437.600
#37A Casilian	35.50	178.55	3,213.90	8.00	47.525	570.300
#38 Sangil	118.00	705.60	12,700.80	43.00	251.350	3,016.200
#39 Pasiocan	131.33	813.98	14,651.71	40.25	234.800	2,817.600
#40 Buyon	277.00	1707.10	30,727.80	34.50	194.350	2,332.200
Total	4,393.04	26,674.79	480,146.30	710.00	4,132.70	49,592.40

Considering 2010 and 2019 as the years of comparison for areas and production yield, the production yield for rice is increased by 20 hectares, however, with a decrease of yield by 371.5 metric tons. It must be noted

that agricultural production has been affected by the changing climatic conditions hence resulting to the rise and fall of production volume in the recent years.

Livestock production

The presence of open grassland makes livestock and poultry raising a viable agricultural activity in Bacarra. Records from the MAO indicate that there are at least seven (7) commercial scale livestock/poultry farms in the municipality (goat, swine) in Barangays Tubburan, Sangil, Ganagan, Tambidao, Corocor, Paninaan, and Buyon.

Table 39: Livestock and Poultry Commercial Farms

Type	Location	Classification	Production Vol (MT)	Production Value ('000)	Product Market
Livestock					
Carabao/Cattle	Brgy 19A Tambidao		No data		
Goat	Brgy 25 Tubburan	Commercial	3.60	1,368.00	Local
Goat	Brgy 38 Sangil	Commercial	4.50	1,710.00	Local
Goat	Brgy 37 Ganagan	Commercial	2.70	1,026.00	Local
Swine	Brgy.19A Tambidao	Commercial	30.00	6,000.00	Local
Swine	Brgy 38 Sangil	Commercial	12.00	2,400.00	Local
Swine	Brgy.32 Corocor	Commercial	45.00	9,000.00	Local
Swine	Brgy 23 Paninaan	Commercial	15.00	3,000.00	Local
Poultry					
Chicken	Brgy. 40 Buyon		No data		

Meanwhile, data indicate that backyard production for carabao, cattle, goat, swine, chicken and ducks totaled 10,378 heads in 2019. Top 7 barangays with the most animal production (in no. of heads, incl. backyard production) are: Brgys. Tambidao, Libtong, Pungto, Corocor, Sangil, Tubburan, and Buyon.

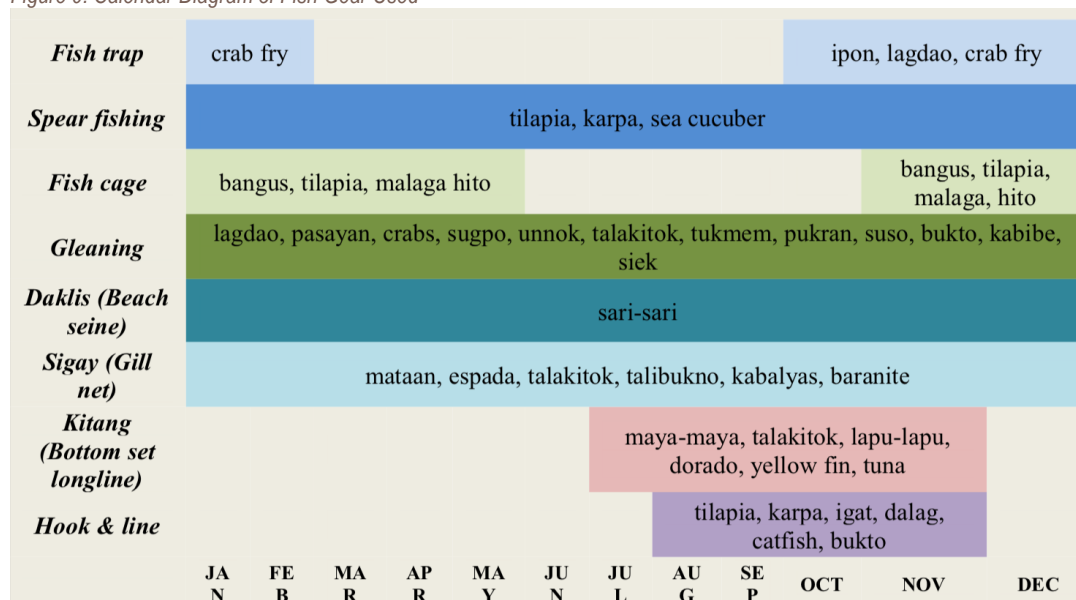
Table 40: Distribution of Animal Population, 2019

Area	Carabao	Cattle	Goat	Swine	Chicken	Duck
Urban	127	126	258	197	741	117
Rural	219	854	1,630	1,108	4,558	443
Total	346	980	1,888	1,305	5,299	560

Fisheries and aquaculture

The municipality of Bacarra has a coastline of 3 kilometers, and a total of approximately 6,783.4 hectares of municipal coastal waters. It also has a total of 1,486.82 hectares of inland water bodies, the largest of which as the Vintar-Bacarra (Bislak) river, and the Cabulalaan-Corocor-Teppang creeks. The coast is a fishing ground for prawn, bangus and prawn fries, fish, crab, seaweed shrimp, squid, tuna, shellfish. Various fishing gears and used by the local fisherfolk, including: fish traps, spear fishing, fish cages, gleaning, daklis (beach seine), sigay (gill net), kitang (bottom set longline), and hook and line.

Figure 9: Calendar Diagram of Fish Gear Used



Source: Integrated Coastal Management Plan 2016-2021

Data from the Integrated Coastal Management Plan 2016-2021 indicated that spear, beach seine (daklis) and gill net (sigay) are employed year-round along with gleaning while fish trap is used from October to February to catch crab fry, lagdao and ipon. Fish cages are used from November to May while Kitang or bottom set long line is utilized from July to November. Hook and line on the other hand is used from August to November to catch tilapia, karpa, igat, dalag, catfish and bukto.

Data from the MAO indicate that in 2019, a total of 100.7 MT of fish produce were extracted from the various fishing grounds including fishponds and cages and estuaries. As indicated, majority of fish catch are caught at sea (combined total of 9,013.20 MT), followed by fishpond catch (2,414.4 MT), and rivers and creeks with 583.5 MT, and estuaries with 195 MT. The total volume of fish catch has doubled from the recorded 50.5 MT in 2010.

Table 41: Fishing Grounds and Aquaculture Production, 2019

Fishing Grounds	Barangay	Area	Volume (MT)	Value (Php '000)	Market
Sea	#31 Calioet-Libong	97.50	22.77	2,732.40	Local
	#36 Natba		14.92	1,790.40	Local
	#37A Casilian		37.70	4,524.00	Local
River/creeks/major canals	#1, 4, 8, 9, 11, 12, 15, 16, 19, 19A, 20, 21, 22, 23, 31, 32, 33, 34, 36, 37, 37A, 38, 40	151.50	3.89	583.50	Local
Fishponds/cages	#26, 29, 31, 35, 36		20.12	2,414.40	
Estuaries	#31 Calioet-Libong		1.30	195.00	
	#36 Natba				
	#37A Casilian				

Post-harvest facilities

Data from the MAO provide that post-harvest facilities in the municipality include 18 rice mills, 6 flatbed dryers, 37 multi-purpose drying pavements (MPDPs), 12 warehouses, and 14 corn shellers. And there are also 3 marketing centers serves as buying stations of agricultural products.

Table 42: Agricultural Support Facilities and Services

Facility	Urban Barangays	Rural Barangays	Total
Milling	1	17	18
Flatbed dryer	0	6	6
Warehouse	2	10	12
Corn sheller	2	12	14
Multi-purpose drying pavement	7	30	37
Market	1	2	3

There is also a Community Fish Landing Center and fishery warehouse located in Brgy. Natba.

Agricultural occupation

The barangay profile of 2019 provided that there were 5,151 individuals that were employed in agriculture in the past year. About 20.8% percent of total workers were women.

As noted, the barangays with the highest number of agricultural occupations are Brgy. #21 Libtong, Brgy. #20 Pulangi, Brgy. 27 Duripes, Brgy. #37A Casilian, and Brgy. #25 Tubburan.

Table 43: Major Agricultural Occupations, 2019

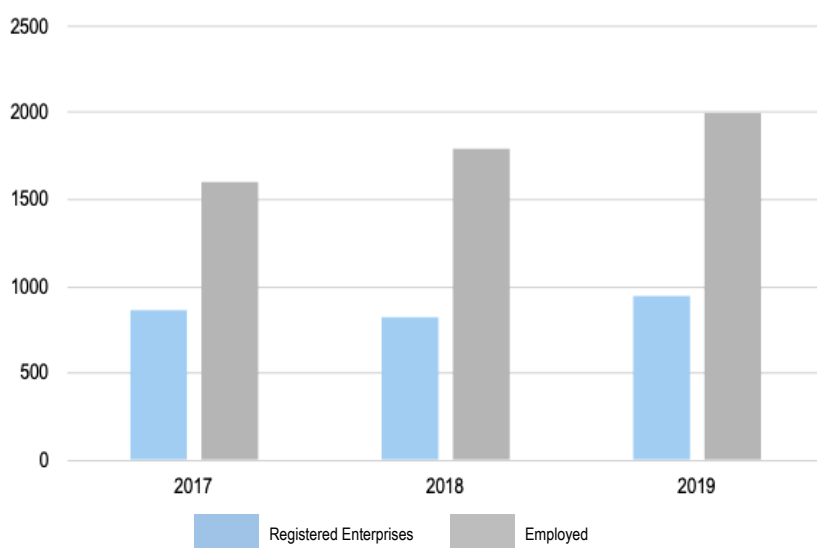
Barangay	Farming			Livestock and Poultry			Fishing		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Urban									
#01 Sta Rita	23		23						
#02 San Andres	23	2	25						
#03 San Andres	12	17	29				18		18
#04 San Simon	6		6						
#05 San Simon	5		5						
#06 San Pedro	7		7						
#07 San Pedro	9	7	16				13		13
#08 San Agustin	36	10	46				1		1
#09 San Agustin	15		15				15		15
#10 San Vicente	101	31	132						
#11 Sta Filomena	0	7	7				2		2
#12 Sta Filomena	4		4	4	2	6			

Barangay	Farming			Livestock and Poultry			Fishing		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
#13 San Gabriel	14	2	16						
#14 San Gabriel	5		5						
#15 San Roque							5		5
#16 San Roque	7	2	9						
#17 Sto Cristo	38		38						
#18 Sto Cristo	23		23						
Rural									
#19 Nambaran	115	31	146				15		15
#19A Tambidao	83	49	131						
#20 Pulangi	237	145	382						
#21 Libtong	512	353	865						
#22 Bani	173	29	202						
#23 Paninaan	83	2	85	5	8	13			
#24 Macupit	145	30	175	1	16	17			
#25 Tubburan	244	34	278						
#26 Teppang	116		116						
#27 Duripes	254	84	338						
#27A Pungto	26		26						
#28 Cabusligan	132	4	136						
#29 Pasngal	133	65	198				5		5
#30 Cadaratan	102		102						40
#31 Calioet-Libong	86		86				12		12
#32 Corocor	44	1	45						10
#33 Cabulalaan	53		53				3		3
#34 Cabaruan	185	9	194				17		17
#35 Pipias	115	31	146				15		15
#36 Natba	33		33				10		10
#37 Ganagan	205	11	216				5		5
#37A Casilian	182	50	232				67	5	72
#38 Sangil	82	26	108						
#39 Pasiocan	116	9	125						
#40 Buyon	32	1	33						
Total	3,816	1,042	4,857	10	26	36	203	5	258

1.6.2 Industry, commerce and trade

Based on records from the Business Permitting and Licensing Office (BPLO), the municipality issued 947 business permits in 2019, almost 70% of which were involved in the wholesale and retail trade; repair of motor vehicles and motorcycles industrial class (based on the 2009 Philippine Standard Industrial Classification), registered businesses being mainly sari-sari stores, and general merchandise. It is followed by accommodation and food service class (7.8%), mainly food stalls and eateries, and manufacturing (5.3%) mainly bakery/pastry shops and local furniture.

Figure 10: Local Enterprises and Employment, 2017-2019



The total number of business registrations has notably increased between 2017 and 2019 (net addition of 89 establishments). In 2019, 6 (0.6%) were involved in primary/extractive industry activities; 62 (6.5%) were involved in secondary/manufacturing industry activities, and 879 (92.8%) in tertiary/service industry activities. In terms of employment, it could be noted that overall, there is an increase in the number of employed in local enterprises. Between 2017 and 2019, there was an average annual increase of employment by 11.5%. About 2.1 individuals are employed for every 1 enterprise in the municipality.

Table 44: Business Permits Granted by Type, 2017-2019

Classification	2017			2018			2019		
	New	Renew	Total	New	Renew	Total	New	Renew	Total
Primary									
A - Agriculture, forestry and fishing	0	1	1	0	1	1	1	2	3
B - Mining and quarrying	1	0	1	0	0	0	0	3	3
Primary Sub-Total	1	1	2	0	1	1	1	5	6
Secondary									
C - Manufacturing	8	37	45	1	43	44	7	43	50
D - Electricity, gas, steam and air conditioning supply	0	0	0	0	1	1	0	1	1
E - Water supply, sewerage, waste treatment and remediation activities	3	8	11	0	11	11	0	11	11
F - Construction	2	2	4	0	0	0	0	0	0
Secondary Sub-Total	13	47	60	1	55	56	7	55	62
Tertiary									
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	138	485	623	25	607	632	104	555	659
H - Transportation and storage	1	1	2	0	2	2	0	2	2
I - Accommodation and food service	18	40	58	0	14	14	12	62	74
J - Information and communication	0	1	1	1	2	3	0	1	1
K - Financial and insurance activities	1	21	22	0	20	20	2	23	25
L - Real estate activities	1	17	18	1	19	20	4	21	25
M - Professional, scientific and technical	1	2	3	0	5	5	1	6	7
N - Administrative and support service	6	20	26	0	31	31	1	32	33
P - Education	1	2	3	0	2	2	1	3	4
Q - Health and social work activities	0	3	3	1	3	4	1	3	4
R - Arts, entertainment and recreation	2	11	13	0	5	5	3	5	8
S - Other service activities	3	21	24	2	24	26	8	29	37
Tertiary Sub-Total	172	624	796	30	734	764	137	742	879
TOTAL	186	672	858	31	790	821	145	802	947

Table 45: Employment in Registered Businesses by Type, 2017-2019

Classification	2017	2018	2019
A - Agriculture, forestry and fishing	3	4	10
B - Mining and quarrying	5		11
Primary Sub-Total	8	4	21
C - Manufacturing	108	145	179
D - Electricity, gas, steam and air conditioning supply	0	20	25
E - Water supply, sewerage, waste treatment and remediation activities	11	30	32
F - Construction	34		
Secondary Sub-Total	153	195	236
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	980	1,164	1,083
H - Transportation and storage	2	2	11
I - Accommodation and food service activities	172	75	236
J - Information and communication	1	12	5
K - Financial and insurance activities	61	93	106
L - Real estate activities	22	22	26
M - Professional, scientific and technical activities	10	41	23
N - Administrative and support service activities	27	39	36
P - Education	18	24	27
Q - Human health and social work activities	33	26	23
R - Arts, entertainment and recreation	50	10	13
S - Other service activities	68	82	150
Tertiary Sub-Total	1,444	1,590	1,739
TOTAL	1,605	1,789	1,996

1.6.3 Tourism

Attractions

Bacarra has within its borders the existing and potential natural and man-made tourist attractions. Among these are:

- **Bacarra Church and Bell Tower.** The Roman Catholic Church situated at the center of the town. It is a massive Spanish Structure built in 1663 and inaugurated in 1782. Under Presidential Decree No. 165, the church was declared as a national shrine in the Philippines. The Bacarra Bell Tower is located at the right side of the church. The three-storey structure was built in 1830s made up of coral blocks and stucco. Originally fifty (50) meters high with walls five (5) meters thick, it was wrecked by a strong earthquake in 1931 causing it to tilt sideward. Another strong earthquake in August 17, 1983 caused the total collapse of the dome, and later hailed “Domeless Dignified Bell tower of Asia”.
- **Town Plaza.** The town plaza located in front of the municipal building with an area of one (1) hectare. It has a wide playground equipped with tennis court, children’s park, videoke bar and a mini forest that serves as a potential tourist spot and recreation center.
- **Natba and Calioet-Libong Beach.** The Natba and Calioet-Libong beaches are natural tourist attractions which have potential for swimming and water sports such as surfing and waterboarding.
- **Viquia Watchtower.** The old watchtower is a 17th century structure located at Brgy. #36 Natba. The Viquia Watch Tower was a guardhouse used by the Spaniards at the coastline to monitor the attacks of pirates.

Table 46: Existing and Potential Tourist Attractions, 2019

Attraction	Area (hectares)	Type of Attraction	Facilities	Ownership
Existing				
Roman Catholic Church and Tower	2.00	Cultural	CR, shed	Private
Bacarra Town Plaza	0.50	Man Made	Music; Glorietta; CR	LGU
Natba Beach	0.60	Natural	Picnic Shed, CR	LGU
Viquia Watch Tower	0.03	Cultural		LGU
Calioet Beach	0.60	Natural	Picnic Shed, CR	LGU
Museo de Bacarra		Cultural	Museum	LGU
Potential				
River Resort (Brgy. #16 San Roque)	0.75	Man Made	Picnic Shed	Barangay
River Resort (Brgy. #8 San Agustin)	0.50	Man Made	Picnic Shed	Barangay
Boating Cruise (Brgy. #33 Cabulalaan)	1.50	Man Made	Eco-tourism area	LGU/PGIN
Beaches (Brgy. #31 Calioet-Libong)	1.00	Natural	Picnic Shed	Barangay
Impounding Water; Tree Farm (Brgy. #23 Paninaan)	0.50	Man Made	SWIP	Barangay
Estuary; Beach (Brgy. #36 Natba)	2.75	Natural	Picnic Shed	Barangay
River; Beach; Estuary (Brgy. #37A Casilian)	3.00	Natural	Picnic shed	Barangay
Bacarra River Picnic Shed (Brgy. 40 Buyon)		Man Made	Picnic Shed, CR	Barangay

Establishments

As of 2020, there is only one (1) tourism-related establishment in the municipality, a tourism inn located in Brgy. Corocor (Villa del Marj). It has 43 rooms with a bed capacity of around 160. It employs a total of 10 staff of which 5 are on-call (as needed basis). A room night is costed between Php 400 to Php 500 for its family rooms, Php 800 for its single rooms, and Php 1,200 for its double occupancy rooms.

Visitor arrivals

Records indicate that Bacarra received more than 20,000 visitors in its tourist attractions in 2019 (Bacarra church), 98.5% of which were domestic/local tourists. The other site attractions such as the town plaza and beach areas are visited mainly by locals for recreation. A large volume of tourists typically visit Bacarra during the summer months and during the municipal fiesta held every November.

Table 47: Arrivals in Attractions, 2017-2019

Attraction	2017			2018			2019		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
Tourist Attractions									
Bacarra Church/ Museo de Bacarra	17,575	463	18,038	11,660	310	11,970	21,453	228	21,681
Local Attractions									
Bacarra Town Plaza	15,000	350	15,350	22,000	450	22,450	25,000	500	25,500

Attraction	2017			2018			2019		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
Natba Beach	4,000	300	4,300	4,500	450	4,950	5,000	470	5,470
Viquia Watch Tower	4,000	300	4,300	4,500	450	4,950	5,000	470	5,470
Calioet Beach	4,000	300	4,300	4,500	350	4,850	5,000	400	5,400
Bacarra River Picnic Shed	7,000	70	7,070	7,200	95	7,295	8,000	70	8,070

1.6.4 Employment

The following Table provides the distribution of employed by location, type, and employer, as well as the number of unemployed per barangay in 2019.

Table 48: Employment by Type, 2019

Barangay	Location		Type		Employer			Unemployed
	Local	Overseas	Professional	Skilled	Govt	Private	Self-Employed	
#01 Sta Rita	244	25	51	4	75	182	248	265
#02 San Andres	76	18	44	29	55	39	195	237
#03 San Andres	57	21	34	10	46	32	129	292
#04 San Simon	83	15	8	0	51	40	230	170
#05 San Simon	50	0	23	15	31	19	93	123
#06 San Pedro	50	19	42	4	47	21	54	181
#07 San Pedro	72	14	20	100	26	39	231	203
#08 San Agustin	152	17	61	46	94	75	140	130
#09 San Agustin	22	15	20	0	7	15	149	85
#10 San Vicente	286	45	66	50	53	278	144	169
#11 Sta Filomena	35	5	10	10	12	28	45	77
#12 Sta Filomena	133	24	25	16	16	140	46	112
#13 San Gabriel	103	10	9	0	17	45	40	78
#14 San Gabriel	158	21	24	0	16	139	24	135
#15 San Roque	84	36	30	68	54	66	122	151
#16 San Roque	27	49	26	25	27	49	88	137
#17 Sto Cristo	32	22	17	0	33	21	190	78
#18 Sto Cristo	178	14	17	15	37	82	65	137
#19 Nambaran	237	22	17	0	80	77	228	261
#19A Tambidao	20		20	0	17	122	244	231
#20 Pulangi	262	57	64	45	54	244	241	237
#21 Libtong	425	96	47	0	289	236	254	403
#22 Bani	60	74	106	92	49	85	387	112
#23 Paninaan	64	20	12	7	16	67	111	128
#24 Macupit	153	25	38	14	30	115	232	116
#25 Tubburan	245	15	23	45	49	211	278	116
#26 Teppang	135		8	13	13	122	171	188
#27 Duripes	102	41	52	68	32	126	415	232
#27A Pungto	61	91	23	16	63	56	48	248
#28 Cabusligan	296	65	45	142	23	334	213	236
#29 Pasngal	248	25	32	0	3	72	196	296
#30 Cadaratan	40	82	64	9	33	4	836	122
#31 Calioet Libong	131	52	72	33	36	139	226	197
#32 Corocor	188	47	62	21	58	113	134	264
#33 Cabulalaan	68	37	45	50	29	39	375	136
#34 Cabaruan	294	73	28	5	51	243	442	281
#35 Pipias	205	22	61	46	68	152	233	231
#36 Natba	59	8	12	0	2	15	201	178
#37 Ganagan	24	46	31	10	18	0	228	306
#37A Casilian	690	50	2	8	24	22	607	131
#38 Sangil	195	80	116	676	70	103	187	343
#39 Pasiocan	101	63	53	74	58	41	471	302
#40 Buyon	284	27	22		102	75	540	400
Total	6,429	1,488	1582	1766	1964	4123	9731	8455

1.7 Infrastructure

1.7.1 Economic support

Road network

The road network of the municipality is consisted of the National Highway (10.74 kilometers), the Provincial Roads (31.82 kilometers), the Municipal Roads (37.9 kilometers), and the Barangay Roads (182.45 kilometers)(based on GIS estimate). About 47.20% of the total road network is concrete paved, 4.58% asphalt, 5.43% earthen and 42.79% gravel/dirt road.

They are inter-connected with 184 bridges to include the Bacarra River Bridge, Bangsirit and Tamucalao Bridges along the Manila North Road.

Public utility vehicles

As at 2019, there are 2 bus service providers plying the Bacarra-Manila route, and one group with 85 units of jeepneys plying Laoag-Bacarra and vice versa. The 29 Tricycle Operators and Drivers Associations (TODA) combine to a total of 500 units operating within the municipality.

Table 49: Public Utility Vehicles and Routes, 2019

Route	Provider	No. of Units	Location of Terminal
Bus			
Bacarra-Manila	GV Florida Bus	1 trip/day	Brgy. 5 San Simon II Bacarra
Bacarra-Manila	Fariñas Trans	1 trip/day	Brgy. 1 Sta. Rita, Bacarra
Jeep			
Laoag-Bacarra	New Bacarreños Transport Corp. (NBTC)	85	Brgy. 1 Sta. Rita, Bacarra & Brgy. 10 Laoag
Tricycle (municipal wide)			
Labtoda	Nelson Sagayaga – Pres.	40	
Balandra	Reynaldo Bumagat – Pres.	10	
Cadaratan North	Reymar Cadiz – Pres.	15	
Cadaratan South	Melecio Natividad – Pres	15	
Crossing	Edwin Pancio -Pres.	15	
Duripes	Alex Niepen – Pres.	16	
Ma-Pa	Roger Daguio – Pres.	18	
Pababaco	Redentor Malacas – Pres.	20	
Pasagabu	Justo Mandac – Pres.	20	
Rango	Mario Tarayao – Pres.	13	
Trio-Uno	Elmer Villanueva – Pres.	11	
Tubburan	Federico Maneja – Pres.	17	
Mangga	Bobby Andres – Pres.	10	
7-11	Edgar Tumamao – Pres.	10	
AJ	Jimmy Andres – Pres.	9	
All Around	Leonco Vidad – Pres.	16	
Bac-Vin	Roger Tangonan – Pres.	18	
BMC	Cresencio Acorda – Pres.	12	
Cabaruan	Policarpio Maquera – Pres.	35	
Cocapina	Dencio Sales – Pres.	60	
JOKER	Miguel Tangonan – Pres.	14	
Lucky 9	Lito Arucan – Pres.	9	
Mabolo	Loreto Calma – Pres.	19	
Millenium	Rodel/Sherwin – Pres.	19	
Mountain Side	Jerry Acido – Pres.	16	
Tag-Cas	Rolan Ramoran – Pres.	14	
Top 40	Valentin Vea – Pres.	9	
WIFI	F. Acob – Pres.	12	
San Roque	Roldan Albano – Pres.	8	

Power

In 2019, 2,318 or 99.83% of urban households and 6,212 or 99.6% of rural households have access to electricity. This translates to an overall connection rate of 99.66% within the municipality, with only 29 households that remain unconnected and rely on kerosene lamps/candles.

The Ilocos Norte Electric Cooperative (INEC) is the sole service provider of power, to which 8,528 households are connected. Only two (2) households reported to use solar power systems for their electricity needs. INEC provides 24/7 service, supplied by the North Grid Transmission Corporation located at Brgy. Barit, Laoag City.

Domestic water supply

Level I water supply in the urban barangays consists of 34 units of shallow wells and 147 units of deep well. They are used for laundry, bathing, washing of vehicles, washing floors, and watering of gardens. In the rural areas, this type of source provides the water requirements of the people for drinking, laundry, bathing, and watering gardens. It consists of 894 units of shallow well and 2,847 units of deep well.

The main source of water supply of the people in the Poblacion and 15 rural barangays is a five-spring area known as "Dilumot" Spring located in the mountainous part of the Municipality of Pasuquin tapped by the Ilocos Norte Water District. The supply rate of the 8" - 10" main pipe of the system is 560 gallons per minute. That is inadequate to supply the requirements of Bacarra, Pasuquin and Laoag City. A pumping station is installed at the southern bank of the Bacarra River, west of the southern approach of the Bridge, to augment the needs. Two reservoir tanks (one elevated steel tank in Brgy. 27A Pungto, and one elevated concrete reservoir tank in Brgy. 19A Tambidao) are also constructed to store and supply the consumers located at the north of the Bacarra River.

The Paninaan Potable Water Supply System is a Level III type of water supply which tapped its sources at shallow wells in Brgy. Sta. Catalina, Pasuquin, Ilocos Norte. A 6.0 x 6.0 x 3.5 meter concrete reservoir tank is constructed along the center of Brgy. 23 Paninaan, Bacarra, Ilocos Norte.

Irrigation

There are five main irrigation canals to supply the water requirement of the agricultural lands of Bacarra. Their main source is the Bacarra River otherwise known as the Bislak River.

At the south of the Bacarra River, the Zanjera de Ganagan serves the water requirements of all irrigated land at Brgy. 39 Pasiocan, Brgy. 38 Sangil, Brgy. 37 Ganagan and some barangays in Laoag City. The NIA North Main Canal and Pasuquin Extension River Irrigation System (RIS) irrigates the operational areas of various Zanjas at Brgys. 19 Nambaran, Brgy 19A Tambidao, Brgy 20 Pulangi, Brgy 21 Libtong, Brgy 25 Tubburan, Brgy 26 Teppang, Brgy 27 Duripes, and Brgy 27A Pungto. The Laoag-Vintar RIS serves the water requirements of all irrigated land at Brgy. 40 Buyon, and several in Brgy 39 Pasiocan and Brgy 38 Sangil. Irrigated lands at the north are provided for the Zanjera Sales and Zanjera Diniega. A small water impounding dam good to supply 10 hectares in Brgy. 23 Paninaan was constructed in 1999.

Market facilities

The municipal government supports agriculture and fisheries production through the maintenance and operation of the following structures/facilities:

- Community Fish Landing Center (Brgy Natba)
- Fisheries Warehouse (Brgy Natba)
- Old Market Building (Brgy San Simon I)
- New Market Building (Brgy Buyon)

Flood control and drainage

Within the urban barangays, a 16.33-kilometer drainage canal system is installed to collect and transport water runoff as quickly as possible to prevent flooding.

Outside of the urban center, a series of flood control projects (combined length of 7.81 kms) were installed along the riverbanks to serve as protection from increased water volume due to heavy rainfall.

Telecommunications

There are five telecommunications providers in Bacarra, namely: Smart, Globe Telecom, Innove, Signal, and PLDT. They offer telephone, internet and mobile communications services. There are five communication towers located in barangays Sta. Rita, Buyon, Teppang, Nambaran and Corocor.

Liquid waste management

There is no organized sewage disposal facility in the municipality. A sewage material from domestic and commercial establishment is discharged unto individual septic tanks and open pits. Other types of domestic wastewater are discharged into earth canals that drain to rivers or creeks or are simply allowed to seep naturally into the ground.

Solid waste management

At present, solid wastes are treated in the 1.1 hectare Category I Sanitary Landfill located in Barangay #27A Pungto, and at the 43 Material Recovery Facilities in all the 43 barangays.

Table 50: Inventory of Solid Waste Management Facilities

Facility	Number	Location	Status
Sanitary Landfill	1	Brgy. 27A Pungto	Operational
Materials Recovery Facility	43	All barangays	Operational
Garbage Compactor	3	NA	Operational

1.7.2 Social support

Health facilities

The health facilities in the municipality include: municipal Rural Health Unit (RHU) and five (5) existing barangay health satellite stations, and five (5) new BHS. These are augmented by the presence of one (1) private hospital, one (1) Renal Bliss Dialysis Center, five (5) medical clinics, two (2) ob-gyne clinics and six (6) dental clinics professional health services are readily available in the municipality.

The Dr. Bonifacia V. Albano Memorial Hospital located at Brgy. #21 Libtong provides 24 hours health services. It has a 25-bed capacity hospital with a medical staff of three (3) physicians, twenty-six (26) nurses including relievers, and four (4) midwives.

The Renal Bliss Dialysis Center manned by two (2) doctors assisted by four (4) nurses also situated at the DBVA Memorial Hospital and it is a six (6)-bed capacity.

Table 51: Inventory of Health Facilities, 2019

Facility	Ownership	Medical Workers				Bed Cap	Specialized Services
		Doctor	Nurse	Midwife	Other		
Rural Health Unit	Public	1	1	7	1 dentist (PHO); 1 dental aide (PHO); 1 med tech; 2 ambulance nurses; 2 sanitary inspectors	5(free)	Medical, dental, pediatrics, family
Dr. Bonifacia V. Albano Memorial Hospital	Private	3	26	4	1 med tech 1 nurse aide 1 pharmacist 1 Xray technician	25	Gen. medicine, pediatrics, ob-gyn, nursing care
Renal Bliss Dialysis Center	Private	2	4		1 med. clerk; 1 technician	6	Dialysis
Saldua Dental Clinic	Private	1			1 dental aide		Dental consultations
Victoria Dental Clinic	Private	1			1 dental aide		Dental consultations
Aranda Dental Clinic	Private	1					Dental consultations
Quiambao-Dacuycuy Dental Clinic	Private	1			1 dental aide		Dental consultations
Ramiro Dental Clinic	Private	1			1 dental aide		Dental consultations
Dela Rosa Dental Clinic	Private	1					Dental consultations
Corpuz-Dallo Medical & Pediatric Clinic	Private	1			1 medical secretary		Medical, pediatrics
Magcalas Internal Med. Nephrology & Pediatric	Private	2			1 medical secretary		Medical, pediatrics
New Care Medical & Pediatric Clinic	Private	1	1				Medical, pediatrics
E. Padron Medical Clinic	Private	1			1 med tech		Medical consultation
Estrela-Gregorio OB Gyne Clinic	Private	1		1	1 med. clerk		OB Gyne
Galiza Ob-Gyne Clinic	Private	1			1 med Clerk		OB Gyne

Table 52: Barangay Health Centers, 2019

Location	Barangays Served
Cadaratan	Cadaratan, Pungto, Pasngal, Calioet-Libong Cabusligan
Cabulalaan	Cabulalaan, Casilian Natba, Pipias, Cabaruan
Tubburan	Tubburan, Macupit, Teppang, Paninaan, Bani, Duripes
Nambaran	Nambaran, Tambidao, Pulangi, Libtong
Sangil	Ganagan, Sangil, Pasiocan, Buyon

Educational facilities

The Municipality of Bacarra has twenty-five (25) elementary schools and one (1) primary school. Four (5) schools are located in the Poblacion and the other twenty (22) schools are in the rural barangays. Two of which are privately operated by the Roman Catholic and private investor. A secondary curriculum is being offered in Bacarra National Comprehensive High School, the Cadaratan National high School, and the Saint Andrew Academy. Post graduate and tertiary education are offered in Bacarra School of Midwifery.

Table 53: Inventory of Schools by Level, 2019

School	Location	Type	Area (ha.)
Tertiary			
Bacarra Medical Center	Brgy. #21 Libtong	Private	0.35
Secondary			
Bacarra National Comprehensive High School	Brgy. #01 Sta. Rita	Public	6.08
Cadaratan National High School	Brgy. #30 Cadaratan	Public	3.83
Saint Andrew Academy	Brgy. #01 Sta. Rita	Private	0.64
Elementary			
San Agustin Elementary School	Brgy. #09 San Agustin II	Public	0.56
SPED Center	Brgy. #01 Sta. Rita	Public	0.32
Bacarra Central Elementary School	Brgy. #01 Sta. Rita	Public	2.16
Sto. Cristo Elementary School	Brgy. #17 Sto. Cristo I	Public	0.38
Ganagan Elementary School	Brgy. #37 Ganagan	Public	0.50
Sabas Sagisi Memorial Elementary School	Brgy. #38 Sangil	Public	0.28
Casilian Elementary School	Brgy. #37A Casilian	Public	0.21
Buyon Elementary School	Brgy. #40 Buyon	Public	0.51
Tambidao Elementary School	Brgy. #19A Tambidao	Public	0.35
Nambaran Elementary School	Brgy. #19 Nambaran	Public	0.35
Pulangi Elementary School	Brgy. #20 Pulangi	Public	0.61
Apaleng-Libtong Elementary School	Brgy. #21 Libtong	Public	0.40
Parang Elementary School	Brgy. #27 Duripes	Public	1.09
Tubburan Elementary School	Brgy. #25 Tubburan	Public	0.41
Macupit Elementary School	Brgy. #24 Macupit	Public	0.99
Paninaan Elementary School	Brgy. #23 Paninaan	Public	0.54
Bangsirit Elementary School	Brgy. #28 Cabusligan	Public	0.26
Cadaratan Elementary School	Brgy. #30 Cadaratan	Public	0.75
Calioet Elementary School	Brgy. #31 Calioet-Libong	Public	1.06
Cabulalaan Elementary School	Brgy. #33 Cabulalaan	Public	1.46
Pungto Elementary School	Brgy. #27A Pungto	Public	0.04
Cabaruan Elementary School	Brgy. #34 Cabaruan	Public	0.43
Pasiocan Elementary School	Brgy. #39 Pasiocan	Public	0.54
Riverdeep Academy	Brgy. #28 Cabusligan	Private	0.13
Saint Andrew Grade School	Brgy. #01 Sta. Rita	Private	0.09
Casilian-Taguiporo Primary School Annex	Brgy. # 37A Casilian	Public	0.10

Protective services facilities

There are two police facilities in the municipality, the police headquarters located in Brgy. #1 Sta Rita and the police outpost located along the national highway in Brgy #19A Tambidao. Combined they have five (5) units of vehicles which are all operational and serviceable. The BFP fire station is located in Brgy #10 San Vicente where there are a total of 13 personnel. They have two (2) firetrucks that are both operational and serviceable. Meanwhile, the Philippine Coast Guard has a station in Brgy #36 Natba, with two (2) service vehicles both operational and serviceable.

Table 54: Inventory of Protective Services Facilities, 2019

Type	Location	Area (m ²)	No. of Personnel	Personnel to Pop Ratio	Vehicle	Firearms	Condition
Police/Traffic							
Headquarters	Brgy 1	155	20	1:1,767	3	Yes	Operational, serviceable
Outpost	Brgy 19-A	49	8		2	Yes	Operational, serviceable
Fire Protection							
Station	Brgy 10	374.4	13	1:2,718	2	No	Operational, serviceable
Coast Guard							
Station	Brgy. 36	45	6	1:5,890	2	No	Operational, serviceable

1.7.3 Public administrative support

The municipal government operates and maintains several government structures and facilities to effectively deliver of public services to its constituents. These are:

- Municipal Hall
- Municipal Agriculture Office
- Liga ng mga Barangay Building
- Veteran's Building
- Puericulture and Family Planning Center
- PCV Socio-Civic and Cultural Center
- Municipal Evacuation Center
- DIWA Building
- Bacarra USA National Cultural Center
- Bacarra Senior Citizen Building

Local governance is also augmented by services by the barangays, whose headquarters are located in the designated barangay halls. The location of the above-cited infrastructure support facilities are provided in the maps in Annex C.

1.7.4 Land classification

Land classification defines the different legal classification of land (not the vegetative cover) as determined by the DENR. Based on information from the Municipal Assessor, all lands in Bacarra is declared alienable and disposable (A&D).

1.7.5 Land cover

As of 2020, the land cover of Bacarra is divided into eight categories. More than 50% of lands are annual cropland, while 22.5% are covered by brush or shrubs. A total estimated area of 797.53 comprise waste bodies (inland) while only 10.6% of total area consist built-up areas.

Table 55. Land Cover, 2020

Elevation	Area (hectares)	% of Total Area
Built-up	696.82	10.6%
Annual Crop	3,302.34	50.4%
Perennial Crop	115.49	1.8%
Brush/Shrubs	1,475.53	22.5%
Fishpond	4.12	0.1%
Grassland	41.06	0.6%
Inland Water	797.53	12.2%
Open/Barren	118.06	1.8%
Total	6,550.57	100.0%

Source: www.geoportal.gov; GIS mapping 2020

1.7.6 General land use

Based on the municipality's Comprehensive Land Use Plan (CLUP 2013-2021), which described the planned distribution of land uses within the municipality. About 49.8% will consist agricultural lands, while the forest patches consist 20.2%.

Table 56. General Land Use 2013-2021

Land Use	Existing	% Total
Agriculture		
- Cropland	3,264.30	49.8%
- Pasture/Livestock	14.00	0.2%
- Inland Fishing	278.52	4.3%
- Agro-forest	1,320.46	20.2%
Settlements/built-up		
- Residential	257.14	3.9%
- Commercial	30.41	0.5%
- Institutional	160.96	2.5%
- Parks/Playground	3.31	0.1%
- Industrial	84.14	1.3%
- Tourism/Eco-tourism	14.00	0.2%
- Special Uses	16.88	0.3%
Roads/bridges/irrigation canal/dams	461.85	7.1%
Coastal/river/creeks	644.59	9.8%
Total	6,550.57	100.0%

1.7.7 Waste management

In line with the provisions of Republic Act No. 9003 or the Ecological Solid Waste Management of 2001, the solid waste management system implemented in Bacarra starts from the households where waste segregation is enforced; with the barangay councils to providing waste collection services and storing in MRF for separating recoverable wastes; and the municipal government for the collection from MRFs to final disposal in the municipality's sanitary landfill (SLF).

The recent waste amount and characterization study (WACS) in 2019 revealed that the municipality has a waste generation rate of 0.11 kilogram per capita per day. It is estimated that about 9,600 cubic meters of solid wastes are collected annually, of which 55.2% consist domestic wastes, 9.4% commercial, 6.5% institutional, 6.5% health care waste, 9.4% industrial waste, and 13% other (construction, street wastes, etc.). Further, it is estimated that at least 50% of wastes would be diverted and the remaining 50% for final disposal at the SLF facility.

The existing SLF has a capacity of 10,000 cubic meters or 5,932.77 tons for residuals and non-hazardous wastes. Its waste cell has a trench area of 1,650 square meters that is connected to a leachate pond with a capacity of 54 cubic meters. The SLF has a disposal facility life of ten (10) years [ECC-R01-1102-0038], or up to year 2022.

1.8 Institutional machinery

1.8.1 Local government bodies and officials

The municipality of Bacarra, Ilocos Norte is administered and managed by officials and employees headed by its Municipal Mayor, Hon. Fritzie Ann Kaye Dela Cruz-Gapasin and the Sangguniang Bayan (legislative branch) headed by the Presiding Officer, Municipal Vice-Mayor Hon. Jose A. Pilar, and the Kagawads as members. The executive branch is composed of 16 departments and offices. The municipality belongs to the first district of Ilocos Norte and represented in congress by Hon. Ria Christina G. Fariñas. The municipality has 43 barangays, of which 18 are urban and 25 are rural.

Table 57. Local Officials 2019-2021

Name of Official	Position/Office
Hon. Fritzie Ann Kaye Dela Cruz-Gapasin	Municipal Mayor
Hon. Jose A. Pilar	Municipal Vice Mayor
Hon. Ma Jadel Jansseña M. Velasco	Sangguniang Bayan Member
Hon. Jonathan Blas P. Ramit	Sangguniang Bayan Member
Hon. Bryant C. Ramos	Sangguniang Bayan Member
Hon. Winston C. Corpuz	Sangguniang Bayan Member
Hon. Richard M. Arquillo	Sangguniang Bayan Member
Hon. Dondee D. Visaya	Sangguniang Bayan Member
Hon. Mario M. Lazo	Sangguniang Bayan Member
Hon. Jonathan Daniel R. Sagario	Sangguniang Bayan Member
Hon. George G. Padre	Liga President & Ex-Officio Member
Hon. Rolan R. Diniega	SK Federation President & Ex-Officio Member

1.8.2 Organizational Structure

The following organizational chart shows the structure and number of personnel per office as of 2020.

Figure 11: Municipality of Bacarra Organizational Chart

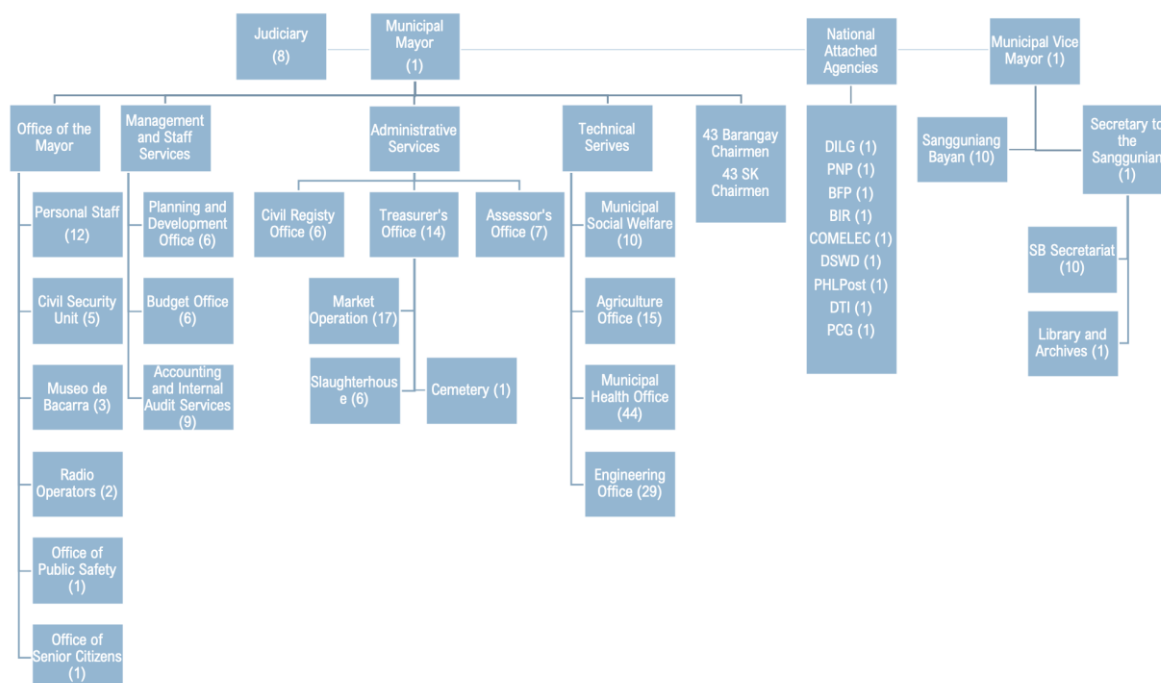


Table 58: List of Municipal Government Departments and Heads of Offices, 2020

Head of Office	Position/Office
Joe Ann B. Viernes	Office of the Vice Mayor and Sangguniang Bayan
Filomena S. Acidera	Office of the Municipal Budget Officer (MBO)
Christian R. Buted, EnP	Office of the Municipal Planning and Development Coordinator (MPDC) and Office of the Municipal Environment and Natural Resources Officer
Lydia A. Mann	Office of the Municipal Accountant
Engr. Rommel D. Acoba	Office of the Municipal Assessor
Dr. Clemente S. Galiza	Office of the Municipal Civil Registrar (MCR) and Training and Employment (CTEC)
Joselito A. Long-gat	Office of the Municipal Treasurer (MTO)
Dr. Manuel A. Andres	Office of the Municipal Health Officer (MHO)
Veronica B. Salmon	Office of the Municipal Social Welfare and Development Officer (MSWDO)
William P. Ulep	Office of the Municipal Agriculturist (MA)
Engr. Rafael R. Galicinao II	Office of the Municipal Engineer and Building Official (MEO)
Mary Joyce M. Mendoza	Office of the Municipal Disaster Risk Reduction and Management (DRRMO)
Sanny T. Duldulao	Office of the Senior Citizens Affairs (OSCA)
Mency V. Tolentino	Office of the Municipal Nutrition Action Officer (MNAO)

The municipal government employs a total of 220 staff (including contract of service positions). The Treasurer's office has the largest number of personnel, employing 22.3% (49 positions) of the total municipal workforce. This is followed by the Office of the Mayor comprising 16.4% (36 personnel).

Contract of service positions comprise 44.5% of the workforce while about 95.1% of plantilla positions are filled (116 of 122). As of 2019, only six (6) plantilla positions are vacant, with a total of 102 employees holding permanent positions.

Table 59. Personnel Complement by Office and Employment Status as of 2019

Offices	Total Staff Complement	Total Plantilla Positions	Total Filled-Up Positions	Elected	Temporary	Perma- nent	Co- Term	Vacant	Contract of Service
Office of the Mayor	36	11	10	1	1	7	1	1	25
Office of the Vice Mayor/SB	23	17	17	11		6			6
MPDC	5	2	1			1		1	3
MCR/CTEC	5	2	2			2			3

Offices	Total Staff Complement	Total Plantilla Positions	Total Filled-Up Positions	Elected	Temporary	Permanent	Co-Term	Vacant	Contract of Service
MBO/HR/GSO	6	2	2			2			4
Accountant	8	4	4			4			4
Treasurer	10	10	9			9		1	0
- Market	29	20	19			19		1	9
- Slaughter house	8	4	3			3		1	4
- Cemetery	2	1	1			1			1
Assessor	5	4	4			4			1
MHO	31	16	15			15		1	15
MSWDO	11	6	6			6			5
Municipal Agriculturist	15	13	13			13			2
Municipal Engineer	26	10	10			10			16
Total	220	122	116	12	1	102	1	6	98

Representative-officers from the National Government Agencies (NGAs) assist and support the operations of the Municipality of Bacarra in terms of services and delivery to the constituents of the municipality. The NGAs present in the municipality and their representative employees are:

Table 60. List of National Government Agencies Representatives

Office	Name of Official
Department of Interior and Local Government (DILG) – Municipal Local Government Operations Officer	Immaculada B. Dela Cruz
Philippine National Police (PNP) – Officer-in-Charge (OIC)	PMAJ. Rommel L. Ramos
Bureau of Fire Protection (BFP) – OIC Fire Marshal	SFO3 Anthony C. Talaro
Philippine Coast Guard (PCG) – Substation Commander	PO1 Roberto Verdadero
Commission on Elections (COMELEC) – Election Officer 1	Marilou L. Tubera
Bacarra Municipal Trial Court – Presiding Judge	Hon. Jose R. Feril Jr.
Department of Trade and Industry (DTI) – Negosyo Center	Mhay V. Cabusas
Philippine Postal Corporation (PHLPost) – Post Master	Engr. Gilda D. Santos
Department of Social Work and Development (DSWD) 4Ps – Municipal Link	Jurinda A. Tabangcay
Bureau of Internal Revenue (BIR) – Revenue Collection Officer	Merle L. Suguitan

1.8.3 Municipal Development Council

The local planning of the municipality of Bacarra is headed by the MDC which initiates multi-sectoral development planning. The Municipal Mayor (Chairman of MDC) has full knowledge on the plans, programs, and projects to be implemented in the municipality within the specified planning period. The Municipal Mayor also approves and signs the plans, programs and projects planned to be implemented in the municipality.

The MDC formulates socio-economic plans, project and program, medium-term investment plan, annual investment plan, local investment incentives, and other development plans in the municipality. The MDC endorsed these development plans, programs and projects to the Sangguniang Bayan for legitimization and some legislative actions in form of ordinances, resolutions, executive orders, and among others. The MDC also monitors, evaluates, and coordinates the implementation of the development plans, programs and projects.

The MDC consist of 44 elected officials (including the local chief executive, district representative, Sangguniang Bayan members, and Punong Barangays), and 16 representatives from civil society organizations (CSOs) or private/peoples organizations (POs), with CSO/PO representation consisting 26% of the MDC membership. This is well within the prescribed 20% membership share of POs to elected officials in the MDC.

Table 61. Municipal Development Council Membership

Member	Position/Organization
Hon. Fritzie Ann Kaye Dela Cruz - Gapasin	Municipal Mayor/MDC Chairman
Hon. Ria Cristina G. Fariñas	Congressman, 1st District I. Norte/Member
Hon. Winston C. Corpuz	Member/Chairman, Committee on Appropriation
Hon. George G. Padre	Liga ng mga Barangay President/Member

Member	Position/Organization
Mr. Francis S. Padron	Punong Barangay/Member
Mr. Reymar A. Sagario	Punong Barangay/Member
Mr. Angelo V. Sales	Punong Barangay/Member
Mr. Rommel Ponce	Punong Barangay/Member
Mr. Daniel G. Lacar	Punong Barangay/Member
Mrs. Nelia C. Cudal	Punong Barangay/Member
Mr. Conrado M. Galam Jr.	Punong Barangay/Member
Mr. Nodenson S. Galiza	Punong Barangay/Member
Mr. Benjamin P. Galiza	Punong Barangay/Member
Mr. Arnold M. Acoba	Punong Barangay/Member
Mr. Rosephil R. Ramones	Punong Barangay/Member
Mr. Godofredo Madariaga	Punong Barangay/Member
Mr. Michael C. Padilla	Punong Barangay/Member
Mr. Erwin G. Ruiz	Punong Barangay/Member
Mr. Julius M. Ramones	Punong Barangay/Member
Mr. Infante C. Reginaldo	Punong Barangay/Member
Mr. Alexander A. Asuncion	Punong Barangay/Member
Mr. Aldrin P. Suguitan	Punong Barangay/Member
Mr. Antonio A. Visitacion	Punong Barangay/Member
Mr. Casimiro P. Galicinao	Punong Barangay/Member
Mr. Eugene P. Casil	Punong Barangay/Member
Mr. Manuel S. Cadienete Jr.	Punong Barangay/Member
Mr. Amadeo P. Cardona	Punong Barangay/Member
Mr. Mamerto B. Reyes	Punong Barangay/Member
Mr. Romeo C. Macadangdang	Punong Barangay/Member
Mrs. Visitacion V. Cabusas	Punong Barangay/Member
Mr. Rellie L. Ramos	Punong Barangay/Member
Mr. Reymundo C. Macuray	Punong Barangay/Member
Mr. Edwin C. Vea	Punong Barangay/Member
Mr. Glicerio V. Cadiz Jr.	Punong Barangay/Member
Mr. Richard L. Pascua	Punong Barangay/Member
Mr. Angel A. Ramil	Punong Barangay/Member
Mr. Sidney L. Ramos	Punong Barangay/Member
Mr. Reynold B. Visaya	Punong Barangay/Member
Mr. Roldan M. Mendoza	Punong Barangay/Member
Mr. Demsey A. Albano	Punong Barangay/Member
Mr. Maximo D. Asuncion	Punong Barangay/Member
Mr. Allan A. Agtarap	Punong Barangay/Member
Mr. Feliberto V. Lazaro	Punong Barangay/Member
Mr. Avelino A. Pasion	Punong Barangay/Member
Mr. Derek B. Velasco	Punong Barangay/Member
Mrs. Flordeliza F. Aceret	President, BOFWA/Member
Mr. Laurentino Subia	MAFC Chairman/Member
Mrs. Norma Castro	Bacarra RIC President/Member
Mr. Edilberto John G. Ramos	BZIMPCI VP/Member
Mr. Donald U. Sales	Fed. of Bacarra Zanjas Inc. President/Member
Mr. Nestor Padron	Northeastern Bacarra Farmers Association
Ms. Mayrose Damo	Fed. BNS President/Member
Ms. Editha L. Ramil	Pasngal Sewers Association /Member
Ms. Gemma Curotan	President, Bacarra Vegetable Vendors Association/ Member
Mr. Rogelio Baxa	Education Institution Secretariat/Member
Mr. Ligaya-Tan Miguel	President, Bacarra Association of Retired Teachers and Gov't Employees/Members
Mr. Samuel R. Eugenio	MFARMC President/Member
Mr. Jian Einnor R. Cadiz	President, Bacarra 4h Club/Member
Mr. Sanilee Adviento	Grand Knight KC/Member
Mr. Arnolfo M. Cadavona	Malampa MPVC, Chairman/Member
Mr. Prudencio Galiza	Chairman, One Ilocos Norte Seed Producers Coop./Member
Mr. Belino Albano	President, Bacarra Meat Vendors Association/Member
Christian R. Buted	MPDC/MDC Secretariat

The Office of the Municipal Planning and Development Coordinator (MPDC) is the secretariat of the MDC. The MPDC is in-charge of translating policies, programs and projects into the required formats of the different plans required of the council, national and provincial levels, funding agencies and other Non-Government Organizations (NGOs).

1.9 Local plans and planning documents

The municipality has a total of thirteen (13) active/updated plans, while two (2) are dated/currently being updated.

Table 62. List of Plans

Name of Plan/Planning Documents	Inclusive Years
Comprehensive Land Use Plan	2013-2022
Comprehensive Development Plan	2013-2018
Local Development Investment Plan	2019-2024
Annual Investment Plan	2020
Local Disaster Risk Reduction and Management Plan	2020
Local Climate Change Action Plan (LCCAP)	2013-2018
Action Plan for the Protection of Children	2020
Gender and Development Plan	2020
Integrated Area Community Public Safety Plan	2020
Solid Waste Management Plan	2013-2022
Peace and Order Public Safety Plan (POPS Plan)	2020-2022
Nutrition Action Plan	2020-2022
Local Shelter Plan	2013-2021
Coastal Management Plan	2016-2021
Capacity Development Agenda/HRMD Plan	2020-2022

1.10 Local fiscal management

The municipality generally able to finance both its operating and development needs as shown in the income and expenses data from 2015-2019 (Table 33). The municipality incurred savings over the last five years 2015-2019.

Table 63. Comparative Income and Expenditure

Year	Income	Expenditure	Surplus (Deficit)
2015	93,707,480.13	85,814,293.20	7,889,186.93
2016	100,696,303.06	98,626,433.76	2,069,869.30
2017	111,778,701.08	103,670,908.16	7,947,324.15
2018	120,050,987.56	108,831,376.93	11,219,610.63
2019	139,041,508.04	131,958,918.18	7,082,589.86

1.11 Development legislation

1.11.1 Local legislation

The Sangguniang Bayan (SB) passed a total of 310 resolutions and 57 ordinances in 2016-2019.

Ordinance and resolutions in 2019 which were passed to implement development actions and legislative solutions include administration; environmental management; economic development; education, culture, and arts development; financial management; health; infrastructure development; protective services; and social development.

Table 64. Legislation by Sector, 2016-2019

Sector	Ordinances				Resolutions			
	2016	2017	2018	2019	2016	2017	2018	2019
Administration	8	3	6	9	38	35	27	48
Environmental management	1		1	1	6	3	4	6
Economic development		1		1	12	15	8	10
Education, culture, and arts	5				5	7	3	6
Financial management	4	1	2	2	6	1	2	6
Health	1	2	1		3	9	6	7
Infrastructure development	3	2	3	2	8	8	5	11
Protective services	1	1	2		8	6	3	3
Social development	1	5	2	2	4	9	4	3
DRR/CCA		1		1	10	3	3	4
Total	24	16	17	18	100	96	65	104

1.11.2 Private and civil sector linkages

Based on the data from the OMPDC, there are 52 accredited civil service organizations and private organizations in Bacarra as enumerated below.

Table 65. Accredited Civil Service Organizations and Peoples Organizations

No.	Organization
1	Federated Disabled Association
2	Federated Day Care Workers and Parents Association (DCWPA)
3	Bacarra Association of Retired Teachers and Government Employees
4	Federated Day Care Workers Association
5	Meat Vendors Association
6	Bacarra Butchers Association
7	New Bacarra Dayo Association
8	Market Vendors' Association
9	Association of Barangay Secretaries and Treasurers
10	Paninaan Multi-Purpose Cooperative
11	Macupit Multi - Purpose Cooperative
12	Malampa Multi - Purpose Cooperative
13	Association for Community Development of Cabusligan (ACDC)
14	Bacarra Tricycle Operators and Drivers Association (BACTODA)
15	Bacarra Zanjera Irrigators Multi – Purpose Cooperative (BZIMPC)
16	Bangsirit Development Organization
17	BAPESTA Credit Cooperative
18	Invictus Roadrunners, Inc.
19	RACES
20	Municipal Agriculture and Fishery (MAFC)
21	Bacarra Zanjera Irrigators Association
22	Municipal Federation of Barangay Health Workers
23	Bacarra Overseas Filipino Workers Association (BOFWA)
24	Bacarra Federated Senior Citizens Association (BAFESCA)
25	Bacarra Federated PTA
26	Guardians (Torre Chapter)
27	Bacarra Municipal Employees MPC
28	EAGLES
29	Bacarra Jeepney Operators and Drivers Association (BAJODA)
30	Bacarra Burley Tobacco Farmers Cooperative
31	San Andres Garments MPC
32	Amianan Federation of Cooperative
33	Association of Barangay Nutrition Scholars of Bacarra
34	Tambidao Multi – Purpose cooperative
35	Pasngal Multi – Purpose Cooperative
36	Ganagan Multi – Purpose Cooperative
37	Teacher's Organization
38	BNCHS – AFFS MPC
39	One Ilocos Norte Seed Producers Cooperative
40	Couples for Christ
41	Bacarra Medical Center Employees Association
42	Bacarra Off – Road Trail Club
43	Bacarra Outdoor Shooting Sports (BOSS)
44	Singles for Christ
45	Knights of Columbus
46	So Far So Good
47	Sukisok Adventures Club
48	Philippine Guardians Brotherhood Inc. (PGBI) Torre Chapter
49	Bacarra Federated 4H Club
50	Bacarra Zanjera Irrigators Multi - Purpose Cooperative (BZIMPC)
51	Guardians Reform Advocacy and Cooperation Towards Economic Prosperity (GRACE Inc.)
52	Bacarra Norte Farmers Agrarian Reform Cooperative

1.11.3 Full Disclosure Policy

The municipality is compliant with the quarterly full public disclosure of government transactions including bid results, human resources, revenues collected and funds received, including the appropriations and disbursements, among others. Public documents are posted at the transparency board of the municipality

located at the lobby of the Municipal Hall, at the New Bacarra Public Market and at the Liga ng mga Barangay Building. These are also uploaded in the municipal website (www.bacarra.gov.ph) and the Full Disclosure Policy Portal of the DILG (<https://fdpp.dilg.gov.ph/documents>).

1.11.4 Anti-Red Tape Authority

In line with the requirements of the Ease of Doing Business Law (Republic Act 11032), superseding the Anti Red Tape Act of 2007 (RA 9485), to streamline current systems and procedures of government services, Municipal Resolution No. 2017-021 or the “Resolution Approving the Bacarra Citizen’s Charter” details the guidelines on the provision of municipal government services of the municipality of Bacarra, Ilocos Norte. It elaborates on the various steps and processes involved in the delivery of government services, spanning issuance of mayor’s permits, endorsements, business registration, building and zoning permits, property valuations, as well as bidding and awarding activities, among others.

The Bacarra Citizen’s Charter is set to be updated in this year 2020.

1.12 Local development financing potential

A parallel stream of activities was undertaken by the Municipal Planning and Development Office and the Local Finance Committee (LFC) to determine the extent of the financial resources of the municipality coming from regular revenue sources for investment programming for three years (CY 2020 to 2022). The revenue performance of the municipality for the last ten years was analyzed, including the Internal Revenue Allotment (IRA). The pattern of expenditures for the last five (5) years was also analyzed focusing on the class expense (persona services, maintenance and other operating expenditures and capital outlay). The total revenue and total expenditures were then matched to determine whether the municipality realized surpluses or incurred deficits for the five (5) years.

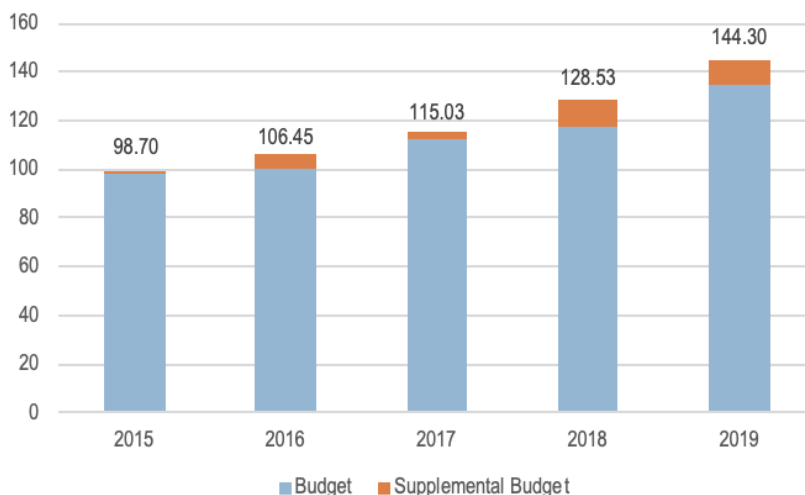
1.12.1 Annual budget

Annual budget for the municipality is increasing from 2015 to 2019.

Table 66. Annual Budget

Year	Budget	Supplemental Budget	Total
2015	97,730,532.00	967,693.00	98,698,225.00
2016	100,738,160.00	5,713,761.00	106,451,921.00
2017	112,286,388.00	2,741,775.00	115,028,163.00
2018	117,645,809.00	10,883,280.40	128,529,089.40
2019	134,547,088.00	9,752,215.10	144,299,303.10

Figure 12: Annual Municipal Budget (in Php '000), 2015-2019



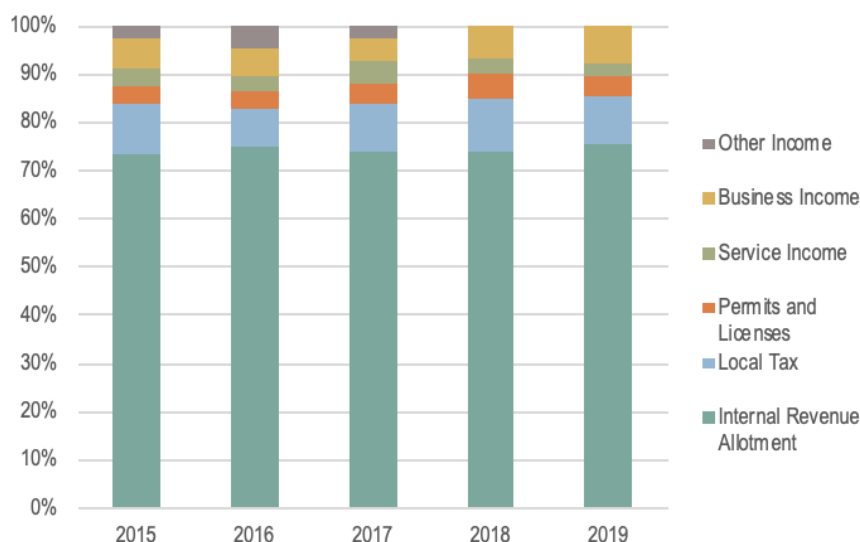
1.12.2 Revenues

The Municipality of Bacarra has basic revenue sources from tax revenues, non-tax revenues, IRA and other revenues. In 2019, it retrieved the most income from its business tax collection, followed by business income, and permits and licenses fees.

Table 67. Annual Revenues by Source

Revenue Sources	2015	2016	2017	2018	2019
Local Tax					
- Business Tax	7,157,461.98	7,124,217.26	7,583,192.17	7,977,871.13	10,094,300.86
- Real Property Tax	1,749,770.94	2,35,448.31	2,878,321.25	2,935,969.45	2,876,406.90
- Other Taxes	909,859.16	718,757.89	744,973.61	2,435,854.58	1,287,829.97
Permits and Licenses	3,755,073.78	3,434,530.69	4,531,401.21	5,943,422.84	5,176,640.01
Service Income	3,171,333.00	3,207,876.65	5,085,030.68	3,642,181.38	3,600,756.00
Business Income	6,093,082.23	5,795,517.43	5,196,900.66	8,459,879.22	9,754,047.20
Internal Revenue Allotment	68,612,508.00	75,538,212.00	82,675,838.00	88,655,808.96	96,499,312.00
Other Income	2,258,391.04	2,525,742.83	3,083,043.50	-	-
Total	93,707,480.13	100,696,303.06	111,778,701.08	120,050,987.56	129,289,292.94

Figure 13: Annual Revenues by Source (in Php '000), 2015-2019



Bacarra remains reliant on its Internal Revenue Allotment (IRA), with an average of 74.1% IRA dependency over the last five years.

Table 68. Annual Revenues by Source

Year	Amount of IRA	Total Local Income	IRA Dependence %
2015	68,612,508.00	25,094,972.13	73.2%
2016	75,538,212.00	25,158,091.10	75.0%
2017	82,675,838.00	29,102,863.08	74.0%
2018	88,655,808.96	31,395,178.60	73.8%
2019	96,499,312.00	32,789,980.96	74.6%
Five-Year Average			74.1%

Meanwhile, the revenue collection efficiency of the municipality has noticeably improved over the past five (5) years (2015-2019), with collection efficiency above 100% with actual collections exceeding estimated total receivables from 2016 to 2019.

Table 69. Revenue Collection Efficiency

Year	Total Receivables	Total Collections	Difference (Deficit)	Collection Efficiency %
2015	25,100,500.00	25,094,972.13	(5,527.87)	99.98%
2016	25,100,500.00	25,158,091.10	57,591.10	100.23%
2017	27,600,550.00	29,102,863.08	1,502,313.08	105.44%
2018	28,990,000.00	31,395,178.60	2,405,178.60	108.30%
2019	30,558,000.00	32,789,980.96	2,231,980.96	107.30%

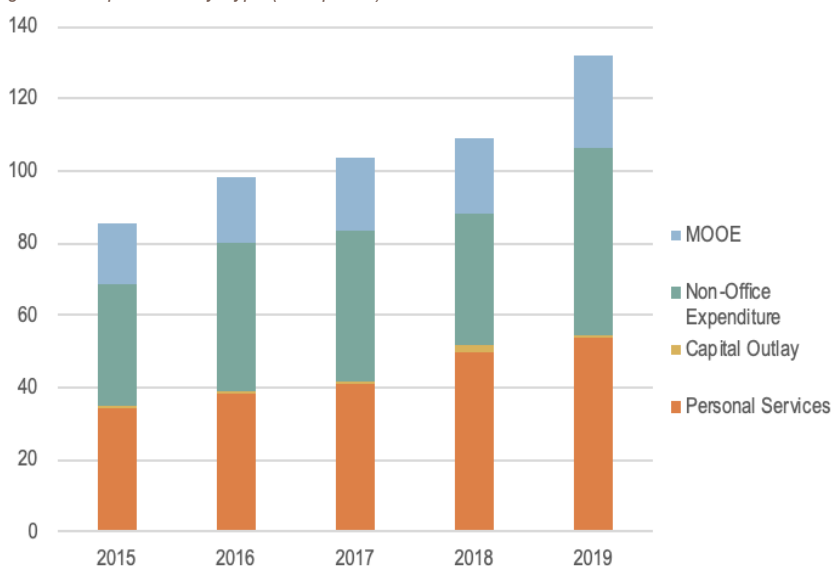
1.12.3 Expenditure

Bacarra's expenditure breakdown by class is shown in the following Table. The basic categories are; Personal Services (PS), Maintenance and Other Operating Expenses (MOOE), Capital Outlay (CO), and Non-Office Expenditure. Over the years, the average annual expenditure of Bacarra from PS to Non-Office Expenditure is Php 105.78 million.

Table 70. Expenditure by Class

Year	Personal Services	MOOE	Capital Outlay	Non-Office Expenditure	Total
2015	34,627,672.63	17,078,968.04	264,200.00	33,843,452.53	85,814,293.20
2016	38,171,572.69	18,608,946.10	867,028.00	40,978,886.97	98,626,433.76
2017	41,364,259.20	20,227,298.43	669,765.00	41,409,585.53	103,670,908.16
2018	49,818,937.16	20,510,984.38	1,811,430.00	36,690,025.39	108,831,376.93
2019	54,192,454.57	25,502,566.69	298,816.50	51,965,080.42	131,958,918.18

Figure 14: Expenditure by Type (in Php '000) 2015-2019



Local expenditure has notably increased over the last five years, by a factor of 11.4% annually. About 41% of expenditure is normally spent for Personal Services (PS), followed by NOOE (non-office operating expenditure) with 39%, while around 19% is spent on MOOE (maintenance and other operating expenses). Only about 0.7% is spent on capital outlay.

1.12.4 Comparative income and expenditure

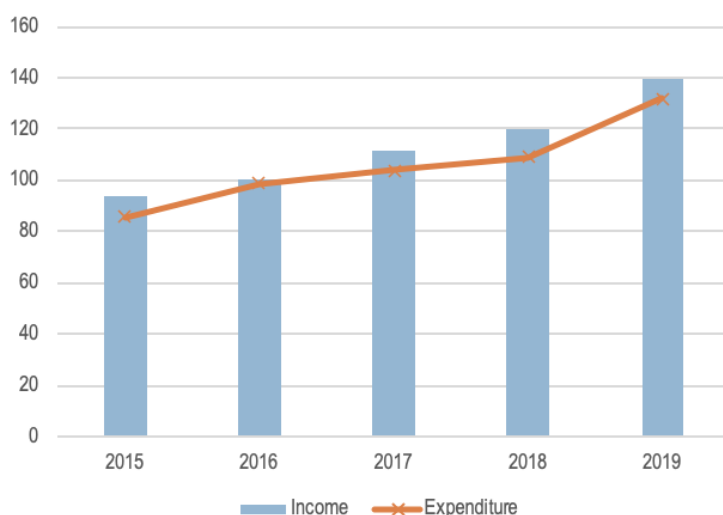
The municipality is generally able to finance both its operating and development needs as shown in the income and expenses data from 2015-2019. The municipality incurred savings from 2015 to 2019 with an average of Php 7.24 million per year.

Table 71. Comparative Income and Expenditure, 2015-2019

Year	Income	Expenditure	Surplus (Deficit)
2015	93,707,480.13	85,814,293.20	7,889,186.93
2016	100,696,303.06	98,626,433.76	2,069,869.30
2017	111,778,701.08	103,670,908.16	7,947,324.15
2018	120,050,987.56	108,831,376.93	11,219,610.63
2019	139,041,508.04	131,958,918.18	7,082,589.86

As can be noted, over the last five years, total income (including IRA) is sufficient to meet the total expenditure of the municipality. On average, income exceeded expenditure by 7.0% between 2015 and 2019.

Figure 15: Income and Expenditure Comparison (in Php million), 2015-2019



1.12.5 Medium Term Local Revenue and Expenditure Forecast (3 years)

Based on the local fiscal management performance of the municipality in the last five (5) years, forward estimates of the local revenue and expenditure, including contractual obligations, were projected for the next three years 2020-2022.

Table 72. Projected Revenues by Source, 2020-2022

Revenue Sources	2020P	2021P	2022P
Local Tax			
- Business Tax	8,090,000.00	8,494,500.00	8,919,225.00
- Real Property Tax	3,082,700.00	3,236,834.00	3,398,677.00
- Other Taxes	2,897,300.00	3,042,165.00	3,194,270.00
Permits and Licenses	5,245,000.00	5,507,250.00	5,782,600.00
Service Income	5,275,000.00	5,538,750.00	5,815,700.00
Business Income	8,375,000.00	8,793,750.00	9,233,440.00
Internal Revenue Allotment	108,475,022.00	116,260,011.00	124,515,000.00
Other Income (surplus from 2019)	7,365,302.00		
Total	148,805,324.00	150,873,260.00	160,858,912.00

Table 73. Projected Expenditure by Class, 2020-2022

Year	2020P	2021P	2022P
Personal Services	57,181,950.00	59,469,200.00	62,442,700.00
MOOE	27,840,240.00	30,550,000.00	32,800,000.00
Capital Outlay	2,700,000.00	500,000.00	500,000.00
Non-Office Expenditure	61,083,134.00	60,354,060.00	65,116,212.00
Total	140,805,324.00	150,873,260.00	150,873,260.00

Table 74. Projected Debt and Non-Debt Contractual Obligations Class, 2020-2022

Year	2020P	2021P	2022P
Debt Service	3,650,000.00	3,650,000.00	3,650,000.00
Other Contractual Obligation	1,428,000.00	1,243,000.00	2,000,000.00
Total	5,078,000.00	4,893,000.00	5,650,000.00

1.12.6 Estimation of fiscal surplus or deficit

The municipality is projected to be able to finance both its operating and development as in the previous five years.

Table 75. Comparative Income and Expenditure, 2015-2019

Year	2020P	2021P	2022P
Income	140,805,324.00	150,873,260.00	150,873,260.00
Expenditure	140,805,324.00	150,873,260.00	150,873,260.00
Surplus (Deficit)	0.00	0.00	0.00