

Soil Types and Soil Suitability

The soil type of the municipality is of volcanic origin of alluvial deposit ranging from sandy loam to silt loam. It is classified into six major soil types which are best suited for agricultural purposes. The soil type consisting vast track of rice paddies located within the valley floor are Irosin Silt Loam and Irosin Sandy Loam with an aggregate area of 2,988 hectares or 21% of the total land area of the municipality.

Irosin Silt Loam is the soil type found mainly in the valley floor. This is the most extensive and important lowland soil of the municipality. It is easy to till and moderately drained. This soil type is conducive to various crops. Irosin Silt Loam is found in barangay Bagsangan, Batang, Monbon, Tinampo, San Pedro, San Julian, San Juan, San Agustin and Bacolod at an approximate area of 2,421.29 hectares or 17% of the town's total land area. The Irosin Sandy Loam is basically the sandy soil of Irosin in the valley floor that adjoins the Irosin Silt Loam on the north. The soil surface contains gravel, which differentiates it from the Irosin Silt Loam. It is fairly well drained and can be found at barangay Bagsangan, Monbon and Mapaso.

Castilla Clay Loam has a relief from undulating, rolling to hilly areas. Surface drainage is excessive while the internal drainage is poor. This soil is located in Batang, Casini, Carriedo, Gabao, Gumapia, Liang, Tabon-tabon and Tongdol. The Annam Clay Loam soil type is well drained to excessively drained and fairly drained internally. It is subjected to erosion and should not be cultivated under clean tilled cropping system. It is found in barangay Gabao, Gulang-Gulang, Tinampo and Tongdol.

Bulusan Loam is well drained to excessively drained at the surface. The internal drainage is slow to fair. This soil may be planted to clean-tilled crops but appropriate conservation measures should be followed. Some sections of this soil type need intensive conservation measures whereas the roughly rolling and mountainous areas must be kept under good forest cover to prevent soil losses due to erosion. This soil type can be found in barangay Cawayan and Tabon-Tabon. The Bulusan Sandy Loam differs from the Bulusan Loam since the former is characterized by the sandy texture of the surface soil. It is well drained to excessively drain in the surface. This is found in almost all barangays except Bagsangan and Casini. Annam Clay Loam, Bulusan Loam, Bulusan Sandy Loam and Castilla Clay Loam can be found in all barangays covering an aggregate area of 11,414 hectares or 79% of the total land area of the municipality.

The soil bearing capacity in the urban area is 40.698 Paschal as registered in various soil capacity tests conducted by structural engineers in the preparation and design of big buildings in the municipality.

There are four land capability classes in the municipality they are A, B, D and M. Class A are found in 18 barangays with an aggregate area of 2,421.29 hectares. This land class is a very good land, which can be cultivated to a wide variety of crops and requires good management and simple farming practice. Class B lands is widely scattered and can be found in Gabao, Gulang-Gulang, Tinampo, Tongdol, Cawayan, Bagsangan, Mapaso, Monbon and Tabon-Tabon with an approximate area of 1,523.25 hectares. This land class can be cultivated safely in conjunction with good conservation practices. Class D is a fairly good land suited for pasture or forest and must be cultivated with extra caution, require careful management and complex conservation methods should be introduced for safe cultivation. This land type is concentrated in Batang, Casini, Gumapia, Carriedo, Gabao, Liang, tabon-Tabon and Tongdol.

Class M is widely scattered in 18 barangays and this land type is shallow and steep which can be severely to excessively erode. This is highly limited to pasture and forest and needs careful soil management practices.

Climate

The climate of Irosin belongs to the Type II of the modified Corona System, the classification of Philippine Climate. The Type II climate is characterized of having no dry season or not a single dry month, a very pronounced maximum rain period from December to February and minimum monthly rainfall occurring during the period from March to May.

It must be noted that the local climate is mainly influenced by the proximity of a great body of water and the effects of elevation and mountain barriers. In this regard, Irosin's topographical make-up and its proximity to South China Sea on its west and the Pacific Ocean on the east makes the municipality's climate fall under the Tropical Wet with Short Dry Season of the Tropical Rainy Climate as classified under the World Climate. Northeast Monsoon or "*amihan*" and Southwest Monsoon or "*habagat*" are the two main air streams which influences the climate pattern of the municipality. Cold northeast winds usually start in October and prevails until April. During the month of January the wind intensity reaches its peak and gradually weakens in March and April. Abnormal wind direction happens during the month of May on the onset of the southwest wind, which normalizes towards the months of June and July and intensifies in August. The southwest wind gradually weakens until the next main stream in October.

Irosin experiences rain almost all year round. Rainfall is

observed at an annual average of 234 days a year. Maximum rainfall comes in November to January caused by the intensification of the Northeast Monsoon. In the period 2012 to 2013, the heaviest rainfall is in the month of January with a monthly mean of 381 millimeters and with 26 days of rain. On the other hand, May has the lowest rainfall with a monthly mean of 61 millimeters with only 9 days of rain. The mean annual rainfall is 2,632 millimeters. The heaviest recorded rainfall in a day in the municipality was 200 millimeters which occurred on February 22, 2008.

The annual average temperature registered is 27.06 °C. The hottest month is May with a mean temperature of 28.23 °C while January is the coldest month with a monthly mean of 25.76 °C. The hottest recorded temperature was 36.36 °C on May 19, 2013 while the coldest was 17.6 °C on January 26, 2014.

Irosin's annual relative humidity is recorded at 79.90%. January is the most humid month at 83.24% while April is the driest at 75.69%. The highest humidity recorded is 98% on January 2012 and the lowest humidity at 48% was measured on May 17, 2013. It must be noted that Irosin's humidity is the result of the interaction of the municipality's topography and its proximity to Philippine Sea, San Bernardino Strait, Sorsogon Bay and Ticao Pass. The annual average wind speed recorded was 1.01 meters per second or 3.636 kilometers per hour. November is the windiest month with a monthly average wind speed of 2.07 meters per second and the calmest month is May at 0.37 meters per second.

Hydrogeology

Irosin's basal soil and rock formation and composition are mainly of volcanic origin. The greater geologic make-up in the northwest and southwest sectors is of recent alluvial plain deposits. The north, south and east points is composed of undifferentiated Bulusan volcanic, debris flows and mud flow deposits, pyroclastic flow deposits, lava dome deposits, recent alluvial plain deposit and pre-Bulusan caldera deposits. The prominent peak of Mt. Jormajam and the bounding barangays of Bulusan Volcano are also made up of volcanic.

Water resources are abundant in Irosin. The most prominent water resource is the extensive river system of the municipality. The sources of the creeks and streams, which are the main feeders of the river network, are springs which are located in the upland and hilly landscapes of volcanic hill landforms. This spring source of the riparian system has an elevation range from a low 35 to a high 370 meters elevation level. The total length of rivers is 68.43 kilometers, the total length of creeks is 46.51 kilometers and there is 12.72 kilometers of dry creek. The Irosin riparian system has an approximate total length of 127.66 kilometers.

Cadac-an River is the biggest and longest river and has 4 main river tributaries and 8 collateral creek feeders. This river covers a length of 16.59 in the territory of Irosin and with a total length of 37 kilometers. This river originates from the slope of Bulusan Volcano and the Mount Mara-ot Banwa ranges and almost cut Irosin in half due to its geographic location in the heart of the municipality and this finally empties in Juban before it flows to Sorsogon Bay. The average volume of water flow is measured at 2,845 liters per second.

Due to its length, the Cadacan River has the most traversed points and areas starting from Mapaso to its outfall in Bolos.

It is to this fact that the orientation of the riparian system of the municipality follows the course of the Cadac-an River which has a southeasterly to northwesterly direction. Salvacion, Liang, Manankas and Cawayan Rivers are not tributaries to Cadac-an River instead they flow to the south towards the river system of Bulan, Matnog, Sta. Magdalena and Bulusan.

There is one lake in Irosin, the Danao Lake located in barangay Patag with an approximate area of 5.05 hectares and with a depth of 4 meters. There are plenty of natural and cold springs that are presently utilized for household consumption, recreation and irrigation. The major springs are located at barangay Bolos, Gulang-Gulang, Bagsangan, Tabon-tabon, Carriedo and Monbon.

The broad-rimmed alluvial plain is the catchment basin for the mountain-sourced riparian network. With this topographical feature, Irosin is believed to have a vast aquifer and is the recipient of the water recharge capacity of its surrounding mountains. Bulusan Volcano, Mt. Jormajam and Mt. Mara-ot Banwa are the major watershed areas not only of Irosin but also the adjoining barangays of the surrounding towns.

Ground water has an average water level of 15 meters, while the average water extraction depth for wells ranges from 12 to 30 meters which is indicative of the possibility of the existence of vast underground aquifers. Surface water volume has an estimated capacity of 810,000 cubic meters.

The valley floor of Irosin with a base that starts from barangay Tabon-Tabon and extends to the barangays of Carriedo, Buenavista, San Isidro, Batang, Gumapia, Tongdol, Gabao, San Pedro, Bagsangan, Monbon, Gulang-Gulang and Bolos is akin to a very big basin. Waters that accumulate and flow down from the surrounding mountains are contained in the valley and drain-up naturally through ground absorption, evaporation and by continuously flowing downstream either gradually or in great

volume through the Cadac-an River network before it integrates with sea waters of Sorsogon Bay in the municipality of Juban. During the eruptions of Bulusan Volcano, lahar deposits flow down through the gullies and water tributaries and finally settled in the catch basin along the Cogon and Gulang-Gulang areas.

Topography and Slope

Irosin has a very irregular terrain characterized by the plain on the valley floor, secluded plains and valleys on the mountaintops and undulating hills and mountain peaks. The valley of which Irosin is famous is located inside the Irosin caldera. The Irosin caldera is estimated to be 200 meters deep and 11 kilometers in diameter and was formed during a calderagenic eruption of Bulusan Volcano that occurred about 40,000 years before present. The valley floor is a contiguous zone from the south to northeast which occupies an area of 35 sq. km. or 23% of Irosin's land area. The Irosin valley is 5 kilometers at its widest point at southwest to northeast orientation and 8.3 kilometers wide at southeast to northwest orientation.

The lowest point of the municipality is 19 meters above sea level (ASL) at Barangay Bolos near the Cadacan River. The highest point is located at Bulusan Volcano at 1,502 meters, followed by Mt. Agoho at 771 meters and Mt. Jormajam at 710 meters. These prominent peaks are part of the Bulusan Volcano mountain complex at the north of Irosin valley and are located at barangays Cogon, Bagsangan and Bolos respectively. The fourth highest peak is Mt. Mara-ot Banwa at 611 meters located

at the east of the valley at barangays Tabon-tabon and Cawayan. From the south to the east of the Irosin valley are undulating hills which are remnants of ancient crater wall.

About 17% or 2,544 hectares of the land area has a slope range (steepness or degree of inclination) of 0 to 3% or level to moderately level. These areas are located in the valley floor and Macawayan has the most level slope with all of its area at 0 to 3% slope, followed by San Pedro and Buenavista with 98% and 86% of its lands at nearly level slope. Level to moderately level lands are also located in northeastern portions of Bulawan, Gabao, Tongdol, Gumapia, Batang, and San Isidro, to the southwest of Bolos, Gulang-gulang, Tinampo, Monbon, and Bagsangan, and north of Carriedo.

The land area with slope range 3 to 8% (gently sloping to modulating) is 1,949.4 hectares or 13% of the total land area. These lands are located in the southwest of Cogon, north of Tinampo, middle portion of Monbon, Mapaso, Patag and Sto. Domingo, in the urban barangays of San Agustin, Bacolod, and San Julian, and at the southwestern parts of Gumapia and Tongdol.

There are 2,548.9 hectares or 17% of land area with a slope range of 8 to 18% or moderately sloping to rolling. About 29% of the land area or 4,419.9 hectares has a slope range of 18 to 30% which is strongly sloping to moderately steep. Lands with 8 to 30% slope are located in the mountains and hills of barangays surrounding the Irosin valley.

Steep hills and mountains (slope range of 30 to 50%) occupies 2,600.4 hectares or 17% of the land area. Very steep hills and mountains or areas with 50% and above slope are about 7% of the land area with 1,036.2 hectares. These mountainous areas are found in Cogon, Bolos, Bagsangan, Monbon, Cawayan, Tabon-tabon, Mapaso, Patag, Salvacion, Casini, Liang and Carriedo.

Geographical, Administrative, and Political Domain

The Municipality of Irosin lies at the foot of Bulusan Volcano, the tail end of the Sierra Madre Mountain Ranges at the southern tip of Luzon Island. It is located at the center of Sorsogon Province bounded by coordinates 12.7780° N, 123.9521° E and 12.6373° N, 124.0962° E. It is nestled in a caldera with a valley floor that is surrounded by mountains and peaks making the town the only landlocked inland municipality of the province.

Irosin is approximately 643 kilometers south of Manila, 106 kilometers from Legaspi City and 43 kilometers from Sorsogon City. The adjoining towns of Bulan and Matnog, the gateway to Masbate, Visayas and Mindanao are 20 and 23 kilometers away respectively.

Irosin's official gross land area is 14,987 or 149.87 square kilometers. The recent CLUP land use study suggests that the land area is 15,110.67256 hectares.

The municipal boundary of Irosin has a perimeter distance of 52.52 kilometers. On the northwest is the municipality of Bulusan with a 10.47 kilometers shared boundary, on the southwest is Sta. Magdalena with 8.6 kilometers boundary, on the south is Matnog with 9.47 kilometers boundary, on the southeast is Bulan with 9.71 kilometers boundary and on the northeast is Juban with 14.27 kilometers boundary.

Irosin is comprised of 28 barangays of which five are

classified as urban barangays while 23 are rural mostly farming barangays. The *poblacion* or urban barangays of Bacolod, San Agustin, San Juan, San Julian and San Pedro are located in the valley floor at the center of the municipality. Most of the rural barangays are dispersed along the periphery of the valley while Salvacion, Casini, Cawayan and Liang are in hills and mountains.

To the north of urban areas are the barangays of Bagsangan, Monbon and Cogon. At the northeast are Sto. Domingo, Patag and Mapaso. To the east is Cawayan and to the southeast is Tabon-tabon. The barangays of Carriedo and Liang are in the south and at the southwest are Buenavista, San Isidro, Salvacion and Casini. To the east of the poblacion are Macawayan, Batang, Gumapia, Tongdol, Gabao and Bulawan and to the northwest are Tinampo, Gulang-gulang and Bolos.

The urban barangays has a land area of 318.333 hectares or only 2.11% of the total land area while the rural barangays has an aggregate area of 14,792.342 hectares or 97.89% of the total land area. The largest barangay in terms of area is Tabon-tabon with 1,837.4394 hectares or 12.17% of Irosin's total land area followed by Cogon and Cawayan with areas of 1,637.4932 and 1,163.3442 hectares respectively. The smallest barangays are in the urban barangays with San Juan having only 10.5334 hectares of land, followed by San Agustin with 15.1620 hectares and San Julian with 17.3498 hectares of land.