

# **DATABASE-DRIVEN WEBSITE FOR THE LOCAL GOVERNMENT OF BARANGAY CASIBARAG SUR, CABAGAN, ISABELA USING OPEN SOURCE TOOLS**

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## **ABSTRACT**

*The Local Government of Casibarag Sur, Cabagan, Isabela publishes its own website on the internet by using open source tools in order to feature its accomplishments, transparency schemes, basic services, financial allocations, expenses, local cultural attractions, and products in agriculture, forestry, environment, natural resources, and the arts. The design of the website is based on the client-server architecture. As a database-driven website, it brings to light a feedback mechanism at the forum page where the users convey their opinions and suggestions.*

*The different files of data contained in the websites are organized, designed and made accessible to the online public with the use of different open source tools such as Hypertext Preprocessor (PHP) as programming language; Hypertext Mark-up Language (HTML) as internet language; Open Graphics as a drawing tool for the design of the website; MySql as a database tool and Open Browsers for displaying of information on the internet.*

*Data from the barangay was extracted and uploaded through web hosting using an account in cPanel tool from the web server of [www.web.com.ph](http://www.web.com.ph). The configuration of the database utilizes the phpMyAdmin from the xampp software which supports MySql database tool, the back-end database of the developed website; and PHP, a programming language was used to communicate with the web server. The domain name of the website is registered at [www.casibaragsur.ph](http://www.casibaragsur.ph).*

*Based on the user-end evaluation employing a 5-point Likert scale, the general assessment of the website's design and layout are very satisfactory and that its overall structure is logical; coupled with the appraisal that navigation is easy and sensible with accurate information.*

*Keywords: PHP, HTML, Website, Domain Name, Open Source Tools, Database*

## INTRODUCTION

The Philippine society has been perceived to be promising and resilient mainly because of the potentials of its human resources, Filipinos being known worldwide to be highly educated, hard-working, and adaptable to different environments. However, despite the aptitudes of its human resources, the Philippines is weak in transparency, business, investment, human rights protection, and law enforcement; and it still relies heavily on remittances from abroad and foreign assistance. Hence, the Philippine government has never really reached a stable status as an economically independent nation (Heritage Foundation, 2009).

It is a universally accepted fact that local governance and transparency in government are key factors in economic growth and advancement. They are valuable factors for business and law enforcement, thereby contributing to the economic development of the local community. Thus, if the Philippines aims to boost and strengthen its economy, the government is expected to create reforms and development in the grass-roots level such as in the barangay by initiating an information infrastructure on which the local constituents can virtually visit at anytime and from anywhere at their own convenience and just by the click of their fingertips, they can acquire local information and services that are in accord with mandates of the Local Government Code. It is only then that a rural barangay can compete and can be at par with the other more equally privileged local government units.

Indeed, a website highlighting information about a barangay helps to inform the people of the powers and duties of the administrators in the barangay level. Structural mechanisms such as the Katarungang Pambarangay will likewise be aided in its implementation considering that people could have direct access to information and connection to administrators. As a consequence, the justice system is benefited as it would help unclog the court dockets in a substantial manner. Transparency in governance is also enhanced since the local government is now obliged to publish all fiscal and administrative matters under the scrutiny of their local constituents. Thus, a dynamic website which is database-driven is an important economic and administrative asset; empowering the people, and allowing them to be better informed and be more participative in barangay activities which are the basic fabric of nation building. In a study by the Global S&T Competitiveness Report in 2008, the Philippines ranked 69<sup>th</sup> in terms of the technological readiness or the ability of a country to adopt a technology, and we have lagged in terms of technology readiness and transparency as compared with other Southeast Asian neighbours like Malaysia, Thailand, and Singapore. Therefore, there is a need to use technology to increase the awareness of barangay constituents on the importance of transparency and local governance participation for purposes of economic growth and technological development.

The setting of this research is the Local Government of Casibarang Sur in the Municipality of Cabagan, Province of Isabela, Philippines. This barangay envisions being a transparent local government that is able to publish on the internet its accomplishments, services, financial allocations, expenses, local cultural attractions, and products in agriculture, forestry, environment, natural resources, and the arts. It is committed to render quality services to the people of Casibarang Sur - those that are useful to the continuing improvement of the quality of life for the local community.

One way of managing the administrative services of Barangay Casibarag Sur is to invest in information infrastructure such as a website where the local people, tourists, balikbayan, researchers, students, and other visitors can congregate and exchange ideas and information in order to strengthen and improve its delivery of services and development capacity. Such infrastructure strategy shall also establish collaboration with the business sector where companies may consider investing its money and properties in Casibarag Sur based on the information that they will obtain from the website. This way, Casibarag Sur shall be enticing opportunities from all sectors of society such as business, non-government organizations, academe, research and even funding agencies whether local or abroad.

The popular web application softwares used to create websites are most often expensive, hampering the availability of such technologies to Casibarag Sur where resources are meager. However the access to open source tools has revolutionized in recent times, and alternative ways in designing a website have now become boundless, and only the creativity and resourcefulness of IT practitioners limit the expression of ideas and knowledge on the internet. Hence, this research proposes to utilize open source tools or commonly known as freewares.

The barangay website shall further promote information technology and internet use by the constituents and administrators, and shall serve as an avenue to advocate transparency, and ultimately to emphasize and cultivate the distinct culture of the Ibanags which in the present time has slowly waned.

## **METHODOLOGY**

The website development process can be divided into different life cycle steps namely, the Planning Phase, Architectural and Design Phase, Development Phase, Deployment Phase and Maintenance Phase. This development process will help the researcher format the content of the website effectively, and the standards and procedures can be adopted to achieve maximum quality.

### **Planning**

The first phase of the website development process covers all the aspects on how the website is going to join the existing system. The development of the website would include the present hardware, software, people and data. A complete analysis as to how the barangay website application is going to help the present system and how the website is going to help the local community is previously discussed with the local constituents, the punong barangay, the sanguniang barangay, barangay tanods and other workforce of the local government for the development of the website.

### **Architecture and Design**

#### **1. Organizational Layout**

The organizational structure of the barangay website is an important aspect of the web development as it represents the layout and site map that shows the content of the barangay website. The website is broken down into two main groupings namely: The main pages and the subsidiary pages. The main pages consists of the information on the barangay, government, services, programs and project, transparency at work, forum and site credit which serve as the

gateway and roadmap to the website that links to the subsidiary pages. The first subsidiary page are created to consist of the description of the barangay such as the history of the barangay, development thrust, facts and figures, culture and music, description of their barangay official seal and the photo gallery. The second subsidiary page, are the people who are involved in the organization of the barangay which are comprised of the barangay officials, sanguniang kabataan members, lupong tagapamayapa, the employees of the barangay and the members of the development council. The third subsidiary page consists of the basic services offered by the barangay. The next page involves the programs and projects implemented, and covers the on-going programs and projects of the barangay. Other subsidiary pages show the budget and expenditures incurred by the barangay for 2011, 2012 and the current year which promote system of transparency in the barangay. Calendar of activities are also provided for the announcement of the events for the barangay. A way of expressing of ideas, comments or suggestion are also provided in order for the local constituents to help improve the barangay. Administrator account is also created to allow the assigned technical personnel to delete posted messages in case there are messages which are harmful to the image of the barangay. The technical personnel assigned are also responsible in changing and deleting the access in the administrator account of the barangay website. These pages are a subset of the main topic page and were used to integrate the barangay information into a website.

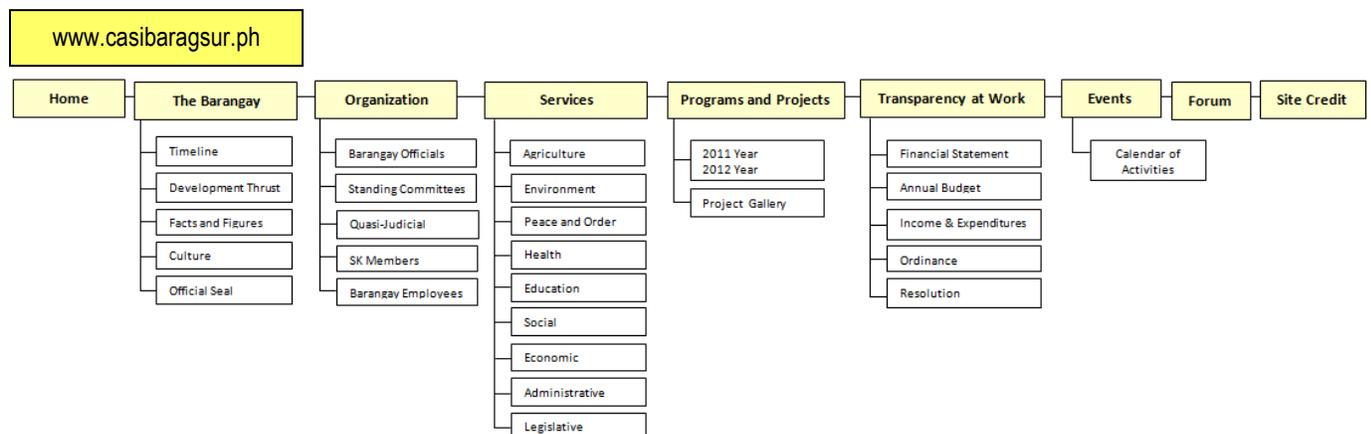


Figure 1. Organizational Layout of the Website.

## 2. Architectural Specification

The architectural design of the website tool is based on the client-server architecture. It consists of two main components, the web server and the terminal; the web server comprises of a file manager which will manage the information of the barangay website using cPanel tool. Data or information from the barangay was extracted and uploaded through web hosting using an account in cPanel tool from the web server of www.web.com.ph. for integration via internet. A web application using Hypertext Preprocessor (PHP) and Hypertext Mark-up Language (HTML) are utilized to facilitate the administrative tasks. The Web Services Description Language (WSDL) describes the rules for interfacing and interaction. The terminal request services and the server respond to these requests. The barangay website information is exchanged as HTML documents using Uniform Resource Locator (URL) over Hypertext Transfer Protocol (HTTP). The barangay data or information through the use of web server can be accessed through terminals which are the users of the website. The website consists of the information of the

barangay such as the history, development thrust, facts and figures about the barangay, the description of their official seal, elected local leaders, administration personnel and staff, programs and projects implemented, budget allocation of funds, basic services, local attractions, culture and arts of the barangay, contact information, expenses, local legislation, law enforcement, and other transparency issues. A forum is also provided to allow users to post their feedback for the improvement of the barangay. This information through the web services are used to integrate the barangay information into a database driven website for the local government of barangay Casibarang, Cabagan, Isabela.

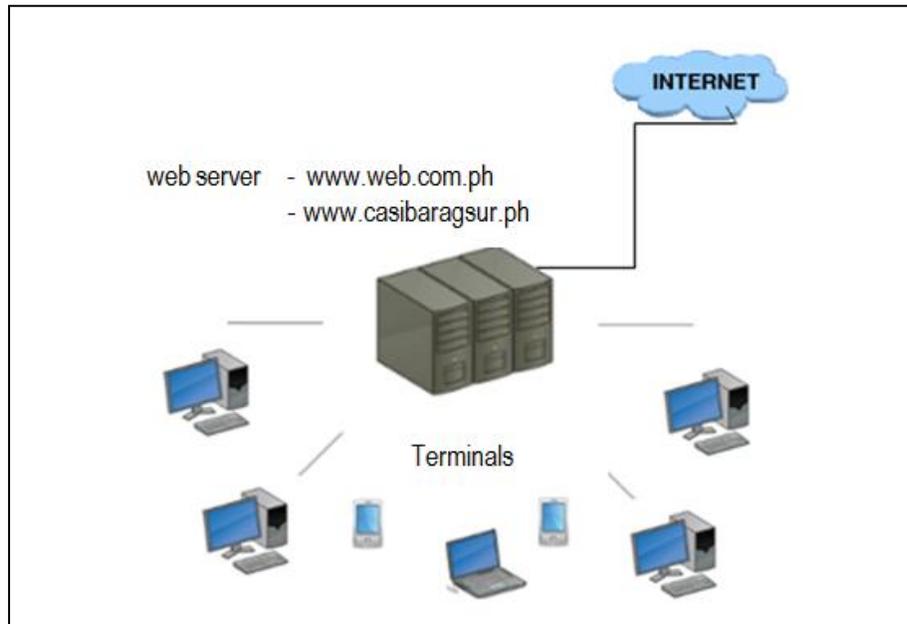


Figure 2. Architectural Design of the Website.

### 3. Database Schema

The database schema of the barangay website technically describes how the different tables and data elements be integrated and how the data is organized to create a blueprint of how a database will be constructed. There are two types of tables involved in the designing of the database schema of the developed website. These are administrator and messages tables. The administrator table had the full control over the messages table, such as adding messages and deleting messages. This will be in the form of one to one relationship or one to many relationship. The administrator table can also delete an account or change existing account in the form of deleting or updating the administrator account using the phpMyAdmin cPanel tool of the website.

### Development

The developed website has utilized the open source tools in developing the website which can be downloaded from the internet. A Hypertext Preprocessor (PHP) scripting language with the combination of HTML is used to display dynamic elements on the page and to facilitate administrative tasks. A Notepad++ is used as the text editor for the scripts; MySQL is used as the back-end database for the data of barangay information on posted comments and information of administrator which was build-in the xampp software; Open Designs and Open Graphics serve

as the templates and tools in designing and development of the website. The applications of CometBird, FlashFire, Chromium and Firefox browsers are used to test the created website. For the connection of the database, an open source tool such as PHP programming language is used to communicate with the web server. Lines of codes are created to allow the administrator to have an access and to manage the data from the web server.

### **Deployment**

The developed barangay website will be accessed publicly through the use of internet using the domain name [www.casibaragsur.ph](http://www.casibaragsur.ph). An annual fee of Php 5,000.00 was paid by the office of the Punong Barangay as the web hosting fee. The researcher has coordinated with the technical staff of the web services company for the web hosting and management of the barangay website data to allow users to access the website. Training was conducted to orient barangay officials and barangay secretary on how to navigate the website.

### **Maintenance**

Once the web site becomes operational, modifications on current data are inevitable such as ongoing programs, projects, services and other updates. Furthermore, technical maintenance, content management, site visit activity reports, and staff training are needed on a regular basis depending on the complexity of the web site and the needs within the organization.

### **Website End-user Evaluation**

Stratified random sampling technique was utilized in selecting the number of respondents in the user evaluation of the barangay website. Questionnaires were distributed to evaluate the barangay website using the standard website criteria. Among the aggregate of two hundred seven (207) respondents, one hundred (100) are from the local constituents of barangay Casibarag Sur; seventy (70) from the fourth year BSIT students; and seven (7) from IT faculty of ISU ICT Department; and thirty (30) come from the employees of the local government unit of municipality of Cabagan, Isabela.

## **RESULTS AND DISCUSSIONS**

### **Description of the Barangay Website**

The development of the barangay website for Casibarag Sur allows the local constituents, here or abroad and its leaders to congregate in order to promote transparency in government delivery of the basic services in the barangay. The website represents a centrally managed group of web pages, containing the texts, images and graphic files. The different files of data contained in the websites is organized, designed and made accessible to the online public with help of the internet languages such as the use of HTML and PHP. The information contained in the website draw attention to the organizational structure, services, programs and projects, transparency at work, events and forum to allow the users for express their feedbacks. In order for the programmed web pages to be presented on visitors' monitors, they need to be hosted on a web server, which will allow them to be transferred to any web browser via HTTP, the main protocol of the World Wide Web. In this sense, [www.web.com.ph](http://www.web.com.ph) was identified as the web hosting for the local government website.



Figure 3. The Home Page of the Website.

Considering that the website is database-driven, it brings to light a forum page where the users can convey their opinions, suggestions, reactions and views on the governance of the barangay. Such information directly communicated by the public will become part and parcel of the website database as depicted in figure 4.

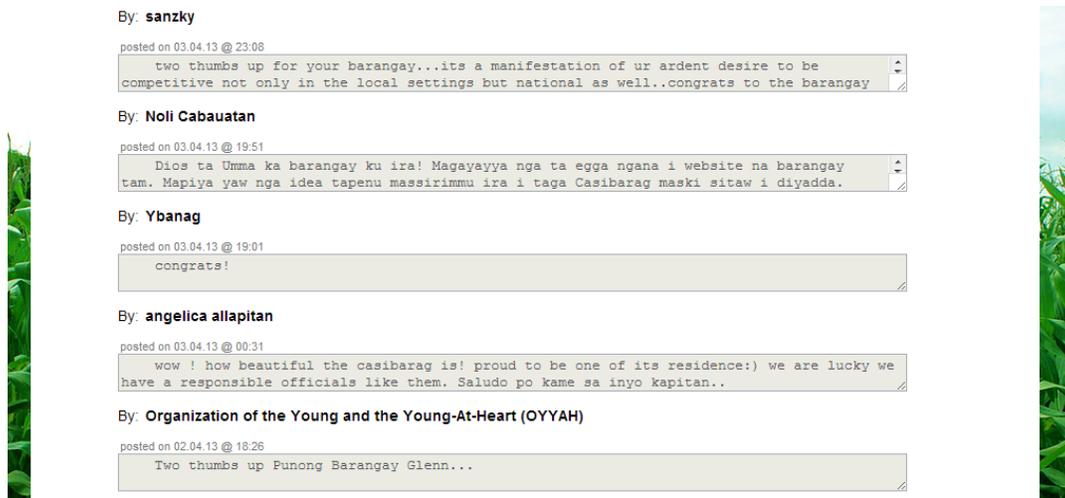


Figure 4. The Forum Page of the Website.

### Domain Name of the Website

Using the *www.casibaragsur.ph* as the domain name, users can access the barangay website by simply typing the web address in the address bar of their web browsers to allow them to view the site.

## Management of Data in the Website

Relevant data are uploaded using the cPanel tool specifically on the file manager through the web server from www.web.com.ph, the business company of providing server space for website. An account was provided to allow the administrator to manage the data of the barangay website such as adding, updating and deleting of the information. The web server is used to communicate with the web browsers as its clients and the communication protocol via the internet.

## Database Configuration

The configuration of the database is done by using the phpMyAdmin from the xampp software which supports MySQL database tool, the back-end database of the developed website. Tables are created with their corresponding name of field and data type. These tables and fields are utilized as variables for the connection of the database from the web server.

## On Open Source Tools

With regard to the utility of the open source tools in the development of the website, it was demonstrated that the following open source tools, namely PHP, Open Design Graphics, HTML, Notepad++ and Browsers (cometbird, firefox) can be combined to come up with an efficient and attractive website without spending the usual price for commercial softwares.

## Evaluation of the Developed Website

The overall appraisal of the various end users of the website is very satisfactory as illustrated in Table 1. Majority of the respondents have strongly agreed that the overall structure of the website is logical and the navigation links work well.

Description	Respondents								Overall Weighted Mean	Overall Description
	Local Constituents of Casibarang Sur		BSIT 4 <sup>th</sup> Year Students		LGU Employee Cabagan		IT Faculty			
About the design and layout of the website	Weighted Mean	Description	Weighted Mean	Description	Weighted Mean	Description	Weighted Mean	Description		
<b>Q.1</b> The design ( <i>overall appearance</i> ) of the web pages is pleasing to look at.	4.58	SA	4.50	SA	4.45	SA	4.60	SA	<b>4.53</b>	<b>SA</b>
<b>Q.2</b> The choice of colours enhances the layout of the pages.	4.60	SA	3.06	A	4.47	SA	4.80	SA	<b>4.23</b>	<b>SA</b>
<b>Q.3</b> The layout of the pages ( <i>e.g. location of different sections</i> ) works well.	4.53	SA	4.51	SA	4.55	SA	4.40	SA	<b>4.50</b>	<b>SA</b>
<b>Q.4</b> The images on the web pages complement the text information and are appropriate to the layout ( <i>e.g. placement, size and theme of the images</i> ).	4.48	SA	4.50	SA	4.48	SA	4.20	SA	<b>4.42</b>	<b>SA</b>

<b>About finding your way around (navigating)</b>										
<b>Q.5</b> The overall structure of the Barangay website is logical.	4.60	SA	4.53	SA	4.47	SA	4.50	SA	<b>4.53</b>	<b>SA</b>
<b>Q.6</b> Using the Barangay navigation links to locate information is easy and works well.	4.60	SA	4.44	SA	4.67	SA	4.50	SA	<b>4.55</b>	<b>SA</b>
<b>Q.7</b> The words used on the navigation links are sensible and helpful.	4.24	SA	4.38	SA	4.33	SA	4.50	SA	<b>4.36</b>	<b>SA</b>
<b>About the actual content of the website</b>										
<b>Q.8</b> The content is well written and formative.	4.56	SA	4.56	SA	3.60	A	4.40	SA	<b>4.28</b>	<b>SA</b>
<b>Q.9</b> The content is accurate.	4.55	SA	4.55	SA	3.63	A	4.40	SA	<b>4.28</b>	<b>SA</b>
<b>Q.10</b> The words in the content are appropriate (e.g. commonly used language that is well understood).	4.29	SA	4.29	SA	3.60	A	4.60	SA	<b>4.20</b>	<b>SA</b>

SA- Strongly Agree A - Agree

Table 1. Summary of the Statistical Values based from the End-User Evaluation.

The respondents agree that the information is easy, simple and readable; and that the operator buttons are user friendly and provides for its functionality. They perceive that the website is well organized, and the contents are informative and accurate enough to provide the complete information of the barangay; however, some of the respondents suggested that the content of the website should be written in a local language or in the dialect in order to widen its niche.

Most of the respondents concur that the overall appearance or design of the web pages is pleasing to look at; and that the layout of the pages such as the location of the different sections works effectively. Moreover, they accept the fact that the images on the web pages complement the text information and are appropriate to the layout, this referring to the placement, size and theme of the images. Although younger respondents do not strongly agree that the choice of colors enhance the layout or usability of the pages, this perception could be attributed to relative cultural differences.

The assessment with regard to the actual content of the website likewise varies. Most of the respondents strongly agree that the content is accurate, well written, informative and the words used are appropriate for them. On the other hand, respondents comprising the local government agency do not give credence to the fact that English is used as a medium of communication of all information contained in the website. By and large, based on a 5-point Likert Scale, the evaluation of the respondents reveal that they strongly agree to the efficiency and benefits of the website to the local government of Casibarang Sur.

## CONCLUSION

The use of open source tools is feasible in order that a Local Government website can be created with adequate applicability and functionality with competitive appeal when compared with commercially created websites. The dynamics of this information infrastructure may be enhanced by driving the website with a database feature.

## RECOMMENDATIONS

It is imperative on the part of the local government of Casibarang Sur, Cabagan, Isabela to update the information uploaded on the website; hence necessitating the appointment of an administrator who will manage the data essential for the revision of the contents therein. Other local government units can adopt the technology infrastructure used in this research in order to showcase their transparency initiatives and other governance programs. Other open source tools using templates may be tested and combined with the open source tools used in this research to come up with a more advanced feature.

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## BIBLIOGRAPHY

- Heritage Foundation, (2013). 2009 Index of Economic Freedom. Retrieved January 15, 2013 from the world wide web: <http://www.heritage.org/Index/country/Philippines>.
- Palaniappan, S. And Huey, N.Y. (2006). *A Tool for Healthcare Information Integration*. Journal of Information and Communication Technology, 5:29-44, 2006.
- NHS Innovation Center (2013). Retrieved January 31, 2013 from the world wide web: <http://www.innovations.nhs.uk>.
- Westman, S. (2006). *Creating a Database-backed Library Web Pages: Using Open Source Tools*. p288 Chicago, ALA.
- Kepler, T.B., Martin-Renom, M.A., Maurer, S.M., Rai, G.T., Todd, M.H. (2006). *Open Source Research – the Power of Us*. Aust Journal of Chemistry. 59:291-294.

- Brown, K.L. and Candreva, A.M. (2002). *Managing Database-Driven Web Content*. Innovation, Net Connect, EBSCO Publishing.
- Tennant, R. (2000). *The Role of Open Source Software*. Library Journal, January 2000.
- Krbic, S., Bodroski, A., Pupovac, B., Rackovic, M. (2007). *Faculty Information System Based on Open Source Technologies*. Novi Sad J. Math. 37(2):181-192
- Ray, D.H. and Ray E.J. (2000) HTML Complete, 2nd edition, Sybex, Inc., San Francisco.
- Alexander, G.H. (2013). Website Development Process, Retrieved January 28, 2013 from the world wide web: <http://www.web-eze.com/process/website-development-process.html>
- DA-BAR (2013). Retrieved January 27, 2013 from the world wide web: <http://www.bar.gov.ph>
- Garcia IV, Himerio Jose Dela Llana, (2006). Handbook on Katarungang Pambarangay. Rex Printiing Company, Inc., Quezon City.
- RA 7160 (1991). The Local Government Code of 1991. 2001 edition, Rex Editorial Staff, Manila.
- Annual Report (2011). Barangay Casibarag Sur, Cabagan, Isabela.