 NATIONAL COMMISSION FOR CULTURE AND THE ARTS NCCA	Document Reference Code: NCCA-FR-PPF/DIS-003	
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NCCA RESEARCH PROPOSAL FORM

<p>1. <i>Ano ang tawag sa pag-aaral na ito? Working title of the research.</i></p> <p>MAPPING AND DISTRIBUTION OF SALT PRODUCERS, TRADERS AND IMPORTERS IN PANGASINAN: A SURVEY OF INTERNAL AND EXTERNAL QUALITY SERVICES AND DELIVERIES</p>
<p>2. <i>Ibigay ang buod ng pag-aaral (150 salita). Abstract of the proposed project (150 words).</i></p> <p>This research is proposed with the aim of mapping the distribution of salt farms in Western Pangasinan using GIS. This research would provide significant information on the number and distribution of salt producers and salt importers, traders and producers (SITPs) in Western Pangasinan. This will also provide a detailed map on the quality of the services and deliveries of these SITPs. This information will also be useful to partner agencies of Pangasinan State University such as DA-Region 1, BFAR-Region 1, DOST-Region I and local government units in Western Pangasinan in terms of providing substantial information from basic research that could help in developing technologies that could improve the quality of local salt products.</p>
<p>3. <i>Ano ang gustong malaman sa pamamagitan ng proyektong ito? May guwang o kawalan ba ng kaalaman na mapupunan ng proyekto? What is the research question and what is the research gap addressed?</i></p> <p>1. To survey and map the established SITPs in Western Pangasinan using GIS. 2. To survey and map the quality of services and deliveries of SITPs in Western Pangasinan in terms of a. Production of non-iodized salt b. Storage and packaging of non-iodized salt c. Selling practices of non-iodized salt d. Practice of iodizing salt e. Purchasing practices of salt f. Marketing and distribution of salt g. Equipment used in salt iodization h. Iodine levels during salt iodization i. Report use of iodized salt j. Packaging material used in re/packing iodized salt k. Storage, handling and distribution of iodized salt</p>
<p>4. <i>Ano-ano na ang mga pag-aaral ang naisagawa o nalathala tungkol o na may kalamayan sa bagay, gawain, lugar, atbp. Na subjek ng riserts? Paano ang mga ito nakatutulong sa pag-aaral na ito? Review of related literature/studies.</i></p> <p>The province of Pangasinan is known as the land of salt as its name is derived from "Panag-asinan" which literally means "where the salt is made". For over 80 years, salt production has been generating livelihood for local farmers in the western section of the province. In fact, for some time, Pangasinan had been the country's top salt producer, making salt farming in the Philippines a thriving industry.</p> <p>At one time, the country almost attained, if not fully attained, self-sufficiency when it comes to salt. However, in an analysis made by Tan (2020). The salt-sufficiency of the country changed in 1995 during the implementation of Republic Act No. 8172, or the Act for Salt Iodization Nationwide (ASIN) which required all food-grade salt sold in the Philippines be iodized. While the law mean well as there was a high incidence of iodine deficiency at that time, the law, however, unintentionally yet adversely affected the poor salt farmers who have no financial ability to buy salt iodization machines and build relevant facilities. As a result, salt production in the country significantly dropped by a huge margin. Today, Pangasinan representative Ramon Guico III, along with seven other lawmakers from North Luzon, reported the Philippines produces only about seven percent of the country's total salt consumption. As a result, the</p>


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In the Philippines, GIS has been utilized for assessing various land concerns such as soil erosion, upland utilization, and property values. These issues are priorities of the government because they deal with the single most important resource, land (Brion & Balahadia, 2017). In Philippine agriculture, GIS have been utilized to site characterize corn production areas (Gabo et al., 2010) and crop suitability and soil fertility mapping in Bukidnon (Adornado & Yoshida, 2008), map the spread of abaca bunchy-top and mosaic diseases in Bicol (Raymundo et al., 2002), assessment and mapping of bioresources in Davao (Novero et al., 2018), suitability analysis for beekeeping sites in La Union (Estoque & Murayama, 2010), predicting rice yield (Maloom et al., 2014) and estimating water productivity (Ines et al., 2002) in Ilocos Norte, detect changes in urban agricultural landscape that affects community food security in Calamba City, Laguna (Bagarinao, 2015), and even suitability mapping of banana in the entire Philippines (Bato, 2019). However, no published reports are available regarding the distribution of salt farms in Pangasinan, let alone in the Philippines.

In the year 2010, the then Nutrition Center of the Philippines, now National Nutrition Council, under the Department of Health, conducted a survey on the salt producers, salt importers and traders in the Philippines, coincidentally evaluating the internal and external quality assurance and control performances of this industry (Nutrition Center of the Philippines, 2010). According to their survey, a total of 101 salt producers were interviewed in Pangasinan. However, this survey did not incorporate GIS technology in their methods. Therefore, there is a need to conduct a similar survey and evaluation, but this time with the aid of GIS to be able to establish a map of all the information provided during the interviews and surveys

5. Ilarawan o isalaysay kung paano isasagawa ang pananaliksik. Ano ang mga pangunahing ideya na pinagmumulan at anong mga pamamaraan ng pangangalap ng datos ang gagamitin? Describe the methodology and methods of the study.

I. Research Design

Descriptive-Survey method will be used in the conduct of this research and the data gathered from the survey will be used as database in the creation of a GIS-generated map.

II. Communication with Local Authorities

Communication letters and courtesy calls to the municipal LGU's will be conducted prior to the field interviews to seek their assistance in locating and interviewing the SITPs.

III. Study Area and Sampling Sites

These areas will be identified with the help of the LGU representatives.

IV. Development of Survey Instrument

The survey instrument to be used will be a modified version of the validated instrument used by the Nutrition Center of the Philippines (Nutrition Center of the Philippines, 2010).

V. Field Interview and Survey

Field interviews and survey will be conducted together with the LGU representatives. The location of the respondents and the salt manufacturing areas will be plotted using a GPS receiver.

VI. Hardware and Software

This research will utilize GIS and ground surveys to map the distribution of SITPs in Western Pangasinan. The software to be used will be QGIS which is a cross-platform free and open-source software. The Philippines and Pangasinan base maps with vector and raster datasets will be downloaded from PhilGIS, a website that provides free Philippine spatial data. Data from ground survey will be exported to QGIS from excel to CSV file.

VII. Statistical Analysis

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country relies heavily on importation to supply the remaining 93% of its salt requirements. While the immediate problem is solved by importation, the local salt industry is suffering as the salt farmers cannot compete with the low price of the imported salt. Eventually, importation will kill the salt farmers' livelihood, leading to the decline in salt production, if not the total disappearance of the salt industry in the country. Hence, the drastic times call for support for the Philippine salt industry from both government and private sectors to help salt farms and preserve Filipino salt-farming culture.

During these challenging times that the salt industry is traversing, the importance of research, development and innovation is once again highlighted. Accordingly, the Pangasinan State University has established the Salt Process Engineering Program that aims to support local salt farmers in the province by giving them technical and technological support through research, extension and innovation. The program's success, however, lies heavily on the support of the University's researchers and extensionists, thus the call for proposals.

Sodium chloride or common salt, table salt, or halite is a white crystalline chemical compound with the chemical formula NaCl that is usually observed in a cubic or rarely, an octahedral crystal form. It is an abundant mineral that is employed for industrial (manufacturing different chemicals), agricultural, and water-conditioning uses as well as a de-icer. Salt is also commonly used in the food industry as a flavor enhancer and it is important as a daily diet requirement of humans. The chemical industry represents the largest consumer of salt (56%) followed by human consumption (22%), road de-icing (12%) and other uses (10%) (Kovac et al., 2013). The process of sea salt production by the successive evaporation system is a traditional activity that requires the correct management of brine flows coming from the sea, which travel by gravity through well-defined sea pans until sodium chloride crystallizes (Galvis-Sanchez et al., 2013).

In developing countries, salt is one of the largest products in the agricultural industry, due to these countries' availability of areas that are typically hot, dry and sunny. It is a low-price commodity with good profitability due to its increasing demand in the local and international market (Macabutas et al., 2018). Annually, more than 200 million tons of salt are produced globally. Based on statistics, top salt exporters are Canada, the Netherlands, and Germany while top importers are the United States, China, and Japan (Macabutas et al., 2018). Back in 2010, the Philippine Chamber of Salt Producers reported the present salt producing areas in the Philippines which included Pangasinan, Bulacan, Occidental Mindoro, Iloilo and Cagayan De Oro (Philippine Chamber of Salt Producers, 2010). From the same reference, local salt production has a significant impact in contributing to labor generation and poverty reduction because the said salt producing areas are able to provide 20% of the country's annual requirement.

Geographic Information System (GIS) represent a new, modern technology for analysis and spatial data processing. It is a system for managing spatial data and their associated attributes. In the strictest sense, it is a computer system capable of downloading, storing, analyzing and displaying geographic distribution. In a more general sense, it is a software tool for mapping and cartography which allows users to create interactive queries, analyze spatial information and edit data. GIS connects precisely located spatial data with tabular databases and thus provide the user to visualize their relationship. GIS connects layers containing various information on the position, which allows a better understanding of the space (Sladic et al., 2014).

GIS also combines location data with both quantitative and qualitative information about the location, allowing you to visualize, analyze, and report information through maps and charts. Using the technology, one can answer questions, conduct what-if scenarios, and visualize results. GIS is identified as a system used to manage infrastructure assets, natural resources and any objects as per requirement. It is easier to analyze and manage facility and asset data stored in GIS, making design, construction, and maintenance more efficient and profitable (Acharya et al., 2018).

In the agricultural setting, the most prominent applications of GIS modeling are for precision farming (Rowshon & Amin, 2010), land use and land cover change (Abino et al., 2015), delineation of potential sites (Muhammad et al., 2018), agricultural meteorology (Harmsen et al., 2004) and even natural resource management (Gebeyehu, 2019).

Descriptive statistical data such as frequency, percentage and use value will be utilized in summarizing the data gathered from the interviews and surveys.

6. Ano ang mga target na output ng proyekto? (Kung meron, tulad kung ito ay para sa isang produksyon sa teatro, isang nobela, o video documentary, o mga lesson plan, o iba pa.)
What are the intended outputs? (If any, e.g., a play production, novel, video documentary, lesson plans, others.)

1. GIS-generated mapping of salt importers, traders and producers (SITPs) in Western Pangasinan.
2. GIS-generated distribution of SITPs in Western Pangasinan
3. Frequency and percent distribution of
 - a. Production of non-iodized salt
 - b. Storage and packaging of non-iodized salt
 - c. Selling practices of non-iodized salt
 - d. Practice of iodizing salt
 - e. Purchasing practices of salt
 - f. Marketing and distribution of salt
 - g. Equipment used in salt iodization
 - h. Iodine levels during salt iodization
 - i. Report uses of iodized salt
- j. Packaging material used in re/packing iodized salt
- k. Storage, handling and distribution of iodized salt

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7. Ilarawan kung ano ang hangarin ng proyekto – ano ang kabuluhan nito o kung paano ito makatutulong; ano ang kontribusyon nito na bagong kaalaman o kaya'y kontribusyon sa sining at kultura ng Filipinas. *Describe intended outcomes—what is the significance of the study or its contribution to human knowledge and to Philippine culture and arts.*

1. To serve as database for all the operating SITPs in Western Pangasinan.
2. To serve as database on the quality monitoring of the service and deliveries of all SITPs in Western Pangasinan.

8. Magbigay ng timetable o iskedyul ng proyekto. *Timetable/Work Plan.*

Activities	Timeframe	Cost/ Fund	Sources of Funds
1. Communication with Local Authorities	January 2022	PhP 50,000.00	NCCA
2. Field interview and survey, GPS tracking	February – June 2022	PhP 250,000.00	NCCA
3. Survey data exported to QGIS and map generation	July – September 2022	PhP 150,000.00	NCCA