

ROMBLON STATE UNIVERSITY

RESEARCH JOURNAL

ISSN 2350-8183(PRINT)
ISSN 2619-7529(ONLINE)
VOLUME 3 NO.1
2021



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Romblon State University Research Journal is a refereed multi-disciplinary research journal that aims to provide a source of information in the areas of agriculture, natural resources and environment; social science, ethics, humanities and the arts; physical and biological sciences; business and management; engineering, information and communication technology; education; health and medical education; alternative medicine; institutional system and process assessment; and community baseline or impact studies. The objective of the journal is to help educators and decision-makers disseminate information and learn from each other's work.

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The Cracking Tradition: Heritage Tourism Potentials of Banton Island and the Challenges Inherent to Indigenous Practices and External Forces

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ABSTRACT

Cultural heritage reflects one's history, tradition, culture, and identity that made up a composite of a nation's pride. MIMAROPA's regional development plan noted the Province of Romblon with rich natural attraction and ecotourism potentials. Banton is an island municipality in the northern part of the province of Romblon known for its historical, cultural, and archaeological treasures. Using the emic and etic perspectives, this qualitative research presents Banton's gifts of history exhibited by archeological artifacts as the niche of heritage tourism and the fading tradition as a lost opportunity to present and future generations. It also discusses the culture, tradition, and practices best known to Bantoanons and the behavioral change influenced by government programs, technology, social media, and outmigration. Lastly, it presents an eye-opener proposition to counter the eroding culture through a holistic strategic planning through consensus building among members of the community.

Keywords: *Banton island, heritage tourism, cultural heritage, weaving tradition, indigenous practice*

INTRODUCTION

Being an archipelago situated approximately 1,300 km to the east of Vietnam across the South China Sea, and at the western edge of the Pacific Ocean, the Philippines has enjoyed relative autonomy from the intervening cultures of mainland Southeast Asia and East Asia. Islamic and Christian cultures brought in by traders and colonizers seeped into the island-country's cultural fabric from the 12th and the 16th centuries, respectively. The island-country is a setting for the creative energies of a multi-ethnic population relentlessly molding and remolding, redefining, and refining emerging cultures brought into these islands, discovering, and inventing new forms, and developing a

broad range of cultures that are vibrant and distinct (Respicio, 2014). At its center located within 122°17' east longitude and 12°33' north latitude is the Province of Romblon. Its main islands include Tablas - the largest, Sibuyan, and Romblon - the provincial capital. Romblon Province is politically subdivided into 17 municipalities. One of the smaller island-municipalities is Banton (Figure 1), lying on the northernmost part of the Romblon group of islands (MM Paz, unpublished thesis), situated approximately at 12°57' North and 122°6' East (PhilAtlas, 2021), and bounded on the north by Marinduque, Corcuera on the South, Sibuyan Sea on the east and the Municipality of Concepcion on the west (Socio-Economic Profile of Banton 2007, as cited in Orogo, 2007). It is a fifth-class municipality composed of 17 barangays, with a total land area of 32.48km², and according to the 2015 census, its population is 5,536 (PhilAtlas, 2021) making it one of the least populous municipalities in the province (Philippine Statistics Authority, 2016).

Banton Island is originally called "Bantuun" meaning rocky, from the word "bato" because it is considered the most rugged, stony, and rocky island in the country. This was transformed into "Banton" during the Spanish colonization from 1565 to 1898 and into Jones Island during the American Period from 1898 to 1942 (MM Paz, unpublished thesis). In 1959, the

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Received 28 October 2020; Accepted 06 July 2021; Available online 23 July 2021

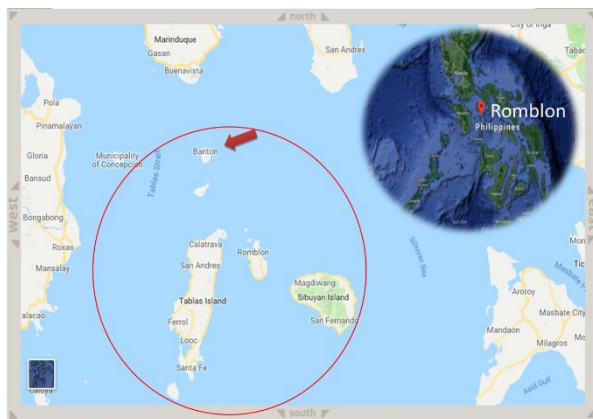


Figure 1. Map showing the location of Banton in the Province of Romblon.

original name was restored to Banton through the efforts of then Mayor Dionisio Fetalvero and then Congressman Jose D. Moreno (Orogo, 2007). Banton is known for its cultural landscape due to its historical, cultural, and archaeological value. Historically, it is the oldest settlement in the province, being inhabited centuries before the coming of the Spaniards. This can be verified from the Spanish accounts by de Loarca, 1582:77 mentioning the population of Banton in 1582 at 200, and that the people then practiced tattooing and beetlenut chewing or the “*nganga*” and had a trading relation with the Chinese which can be attested in the 15th century Chinese trading route wherein Banton was part of the trading system. (MM Paz, unpublished thesis). Banton became a pueblo or municipality in 1622. Records say that “the old Banton village was built on the slope of Bakoko hill, about 2km southwest of the present Banton town”. The old village was transferred to its present location in the 18th century when a stone church - the San Nicolas de Tolentino Parish Church, and a strong cotta - the limestone fort called Fuerza de San Jose, were constructed under the leadership of Fr. Agustin San Pedro, popularly known as El Padre Capitan, who was the parish priest of Banton during the Spanish colonial era (PIA, 2018). The construction was completed in 1644 and the fort effectively protected the town against Moro raids (PIA, 2018).

Further glimpse of Banton’s history and culture can be found thru the archeological evidence that were excavated in the three Guyangan Caves of Banton that are still intact and well preserved in the National Museum. These caves were first discovered in 1961 by members of the National Museum archeological team led by Alfred Evangelista, and followed with excavation activities until 1966 (Fietas, 2008). In two small caves with an elevation of 32m above sea level, the team witnessed two badly disturbed burial sites characterized by coffins mostly separated from their lids and cranial

and postcranial remains commingled and were found scattered on the ground. From one cave, the team was able to collect five hardwood coffins with serpent motif and modified skulls with a fragment of gold ornament inserted into each skull through the foramen magnum. Large fragments of 14th to 15th century Chinese and Siamese secondary burial jars with a reshaped skull and teeth filed to points were discovered in the other cave (MM Paz, unpublished thesis). Ornaments of gold, beads, and shell; coffin stand; and a fragment of woven abaca cloth believed to be a portion of a death blanket and the only archeological textile collection of the National Museum, were also recovered from Guyangan I and II (MM Paz, unpublished thesis).

The artifacts like the wooden coffins and skeletal remains found in 1936 in Guyangan Cave System are important cultural properties declared by the National Museum in March 2013. The estimated 400-year-old Banton cloth (*ikat* warp), the oldest existing textile in the Philippines and in the Southeast Asian region, is a very important link of the island’s withering weaving tradition. This paper highlights these pieces of evidence being a source of information that exists of Banton’s origin and early history, as the niche of Banton’s heritage tourism, and the fading tradition as a lost opportunity to present and future generations. Specifically, the study focuses on identifying the culture, tradition, and practices best known to Bantonians; assessing the behavioral change influenced by government programs, technology, social media, and outmigration; and presenting a holistic proposal as a challenge to revitalize Banton’s eroding culture and renew its pride.

METHODOLOGY

The study applied qualitative method in the conduct of field or site visits throughout the 17 barangays of Banton, interview with key informants, and gathering of printed and non-printed primary and secondary data, including those collected from the National Museum Library, and from their Ethnology Division as well as the Archeology Division. The researchers also employed research methods using emic and etic perspectives. These are usually used by anthropologists referring to two kinds of field research done, and viewpoints obtained. The emic or inside perspective is the subject’s point of view, the perspective that comes from within the culture where the project is situated. It investigates how local people think, how they perceive and categorize the world, their rules for behavior, what has meaning for them, and how they imagine and explain things. The etic is the outsider’s or the observer’s point of view, the perspective that they have of a project’s parameters. It shifts the focus from local observations, categories, explanations, and

interpretations to those of the researcher (Peters, 2018; Kottak, 2006). These two perspectives are used in conjunction with each other, as emic helps to understand local realities, and the etic helps to analyze them (Peters, 2018).

RESULTS AND DISCUSSION

Cranial Vault Modification Practice

Banton is a town that has long been identified as a valuable site for archeological study particularly the pre-Spanish burial practice in the region (Bautista et al., 2007, as cited in Orogo, 2007). As early as the 1920s, archeological work has been conducted in these islands resulting in the recovery of wooden coffins that had designs of a crocodile or lizard or a kneeling man, tradeware ceramics which were mostly Sung, Yuan, and Ming China wares and a few Sawankhalok and Sukhotai Thai wares that would date back to as late as the 13th to the early 14th centuries (MM Paz, unpublished thesis), gold ornaments and iron tools and weapons. There were also human skulls that have been intentionally deformed (Orogo & Bolunia, 2015) and modified in varying degrees with the anterior and posterior sides mostly flattened.

Intentional deformation means deliberately applying pressure to particular part and areas of the bone. A classic example of this is the “lotus feet” of Chinese women and the “long-necked” Karenni women of Thailand and Burma. Then a more widespread example is cranial vault modification wherein pressure is applied on specific areas of the head of an infant through pads and bindings. The result may be annular which is produced by bandages wrapped in a circular manner around the head; fronto-occipital flattening, caused by pads pressed on the frontal and occipital bones; and a trilobed cranial vault formed by bindings (Anderson, 1969, as cited in Tauro, 2015).

The above-mentioned forms of intentional skeletal modifications are ante-mortem, they are performed during the early life of an individual taking advantage of the plasticity of the human skull and unossified bones of the lower extremities, neck, and ribs (Tauro, 2015). This ante-mortem form of intentional cranial modification by applying pressure through the placement of pads and bindings on the vaults of infants was prevalent among various Caribbean, Latino, European, African American, Asian, and Native Americans during the Neolithic and Bronze Age and eventually abandoned in most regions of the world by the early to mid-20th century (Simmons et al., 1998, as cited in Tauro, 2015).

Prehistoric Filipino populations were also engaged in this practice including the early inhabitants of Banton Island as evidenced by the 35 crania recovered by National Museum in 1961 and 1966 on the

three burial caves in the Guyangan Complex. The youngest individual in the assemblage is two to five years old and antero-posterior flattening was evident, thus supporting the claim of earlier studies that the process was performed days after the child is born lasting for six months to one year and in some cases, until the 3rd to 5th year of a child’s life (Tauro, 2015).

The reasons why this practice had existed are still unknown and it could be a good subject for further archeological studies.

Secondary Burial Practice

The archeological exploration team of the National Museum was able to positively identify three rock shelters and one rock ledge in the Guyangan Caves which were all described as burial sites. The Guyangan burial site was already in use as early as A.D. 960-1644, even as early as the Sung Dynasty in China (Orogo, 2007). The burial cave can be reached by hiking to the top of the cliff on rocky trails then one descends through a rope to enter a low-ceilinged cave with limited space and full of coffins. The use of hardwood “mulawin” for the coffins, and the employment of the serpent motif carved at both end of the lids was common at Guyangan Caves I, II, and III. The lids were triangular in cross-section, and they appear to be roofs. The basin was hollowed-out from a whole tree trunk and provided with four perforated flanges, two on each side, through which pegs were inserted to the lid to seal the whole coffin. Considering the size of the carved-out wooden coffins averaging 36 inches in length and 12 inches in width, the mode of burial was secondary (MM Paz, unpublished thesis).

According to a study, it is considered a secondary burial wherein one year after the burial, the bones were exhumed and transferred to coffins by a *panagkutkutan* (Fietas, 2008). Secondary burial is defined as the reinterment of bones after the remains of an earlier burial have sufficiently decomposed. From one of the caves revealed mandible and other bones inside the incised pot that of a very young person. Chinese and Siamese secondary burial jars with reshaped skull and teeth filed to points were discovered in the other cave (Tauro, 2015). These sites represent a coffin burial existing side by side with jar-burial practice.

Secondary burial is a cultural tradition practiced giving reverence to the dead. The process includes bone washing (Halili, 2004). The woven abaca cloth with *ikat* designs recovered with the skeletal remains may be a part of a death blanket giving the impression that the bones were wrapped before re-interment like the practice of the Ifugaos in the Cordillera wherein exhumed bones are washed and then wrapped with specially woven blanket and placed under their houses after the *bogwa* or ritual in preparation for secondary burial (MM Paz, unpublished thesis). It was likely that

only the wealthy could undergo secondary burials because the accompanying ceremonies were lavish (Virtual Collection of Asian Masterpieces, 2013). Possibly, the Guyangan sites are burial ground for people of a higher social class, as various artifacts related to wealth and important possessions like gold ornaments, carnelian beads, bracelets, turtle shell combs, coconut shell, and a bamboo flute that were found in the burial site indicates this status (Fietas, 2008).

The Ikat Cloth

Cloth reveals stories engendered through weaving, through patterns, mnemonic devices, and display, through exchange and sharing, and through inheritance and inalienability of heritage textiles. They are not simply clothing or body covering – shawl or blanket – but they can reveal power relations, gender and social class that are formulated by and for the individual, the group, or the community, dynamically interacting with the physical-natural environment and the social forces of production.

The textile pieces found inside a wooden coffin in one of the burial sites in Banton Island are approximately dated 14th to 15th century. They are exemplary for the fine linen-material from bast fibers, and the small figurative and non-figurative designs produced in a warp tie-dye resist design technique. The non-figurative designs are set on black ground hemmed by fine white and black stripes. They consist of inverted S lines ending in volutes interspersed with rectangles of frayed short edges, and bands of contrapuntal triangles in faded black and red hues. The figurative designs are depictions of birds in pairs facing each other with their tail plumage depicted in curvilinear. They echo the stylized sarimanok figure in Maranao art and the phoenixes in East Asian art in similar confronted composition (Respicio, 2014).

The interplay of plain stripes and designed bands in the Banton cloths attests to the dexterity of the textile producer in the art and technology of weaving, dyeing, and *ikat* designing where interfaced designs are produced through the tying of certain parts of the warp yarns in a series of folds. The curvilinear forms, especially manifested in the inverted S and the profuse tail plumes of the birds, are festive expressions celebrating life – fertility and abundance of harvest. They are also thought to be representations of spirits and gods that are appeased and propitiated for good life or as vehicles of spirits traversing the mortal and the spiritual worlds (Respicio, 2014).

It can be said that fabrics are adjuncts to life cycle rituals. From birth, human beings are mantled with a

form of covering as newborns are swaddled in their new environment. During funeral ceremonies among many Filipino and Southeast Asian communities, textiles play a significant role, from dressing the corpse while lying – or sitting, as with some groups – in state to displaying shrouds as status symbols that are eventually used to wrap the dead. The Banton cloth has gained further significance when used in death rites, being regarded as the conveyor of the spirit or soul of the dead into the next world (Labrador, 2013).

Weaving Tradition

The retrieved pieces of Banton cloths from burial sites are yet the only existing early concrete evidence of warp *ikat* textile tradition in Southeast Asia. They are attestations of the age-old traditions in textile weaving, dyeing, and designing in the country, particularly tie-dye resist technique such as warp-*ikat* tie-dye resist. Tie-dye resist design technique is said to have originated in India, then brought to Yunnan, China via Myanmar, and popularized all throughout Southeast Asia, East Asia, and Central Asia (Respicio, 2014).

At present, the Bantonans can still showcase their skills in weaving from gathering and identification of the materials to be used and through the following process (Table 1), as described by Cuadra et al. (2018). The knotting methods of raffia strips, the *abugkoston*, the *aotoyon kag uyo*, the *puon* and the *pagbobotong*, are the basic components of the raffia textile. These are the finished desired thin and thick strips or threads that commence the interweaving of the weft and the warp. Weaving then follows with the *tiral* (footloom). A spinning wheel called the *siko-an* is used to produce the weft threads that are placed into the *talingyas* (shuttle), which is used in tightly sealing/binding the weave. A yard of thread allows the weaver to make 3 *talingyas*. After the threads are arranged in the *tiral* and has enough *talingyas*, the weaver can start weaving. They continue making *talingyas* as needed.

Diminishing Tradition

Women, particularly the master weavers, are the culture bearers. They are repositories of technology, skills and all knowledge related to the culture of textiles. Upon them rests the responsibility of passing on the tradition to younger generation who in turn need to be actively involved in community economic activities to imbibe the significance of the living culture and ensure the lively sustenance of a highly creative practice that is, weaving (Respicio, 2014).

Table 1. Weaving process of Bantoanons (Cuadra et al., 2018).

Weaving Process	Description
1. Gathering (<i>mapamuso</i>) and Cutting of the Newly Grown Sprout or Fronds	The weaver looks for a young <i>buri</i> tree, then the fronds are cut at the center of the <i>buri</i> trunk locally called <i>puso</i>
2. Stripping (<i>giddang</i>)	Once cut from the trunk, the <i>puso</i> is pleated into half to expose the smooth and soft inner leaves (frond) and is stripped and separated into pieces.
3. Separation of the Frond (<i>yughor</i>)	The stripped fronds are again thinly separated to produce the desired thin fibers. There are ways to strip the fronds, using the thumb, a small, pointed metal rod and using both thumb and foot when stretching the fibers.
4. Final Stripping (<i>yaksi</i>)*	The final stripping of the <i>puso</i> to produce the <i>raet</i> , the desired thin thread for final weaving.
5. Combing (<i>gisi-on/sinusuklay</i>)*	Combing the thin coarse strips (<i>raet</i>) to get rid of the unwanted fibers using a local comb. This depends on the weaver's desire to have a thick thread or thin thread. The extent of the thread is dependent on the comb's teeth.
6. Soaking (<i>ahuoman</i>)*	The thread is soaked in hot water to remove the sap (<i>dagta</i>) and is repeated 3 or more times until the water is clear. Once the water turned clear, soaking is performed in the threads, where a kilo of the threads is soaked in oxalic acid, a natural bleach, diluted in a plastic basin full of water. In doing this, the threads whiten.
7. Unsoaking (<i>haw-ason</i>)*	A day after, taking the soaked thread from the basin is performed.
8. Drying (<i>buyar</i>)	Drying of the stripped fronds takes about 4 days. These are laid along the streets or outside, under the heat of the sun. For raffia threads, about a day or two.
9. Scraping the Thorns	After the drying of the fronds, the sides of the <i>puso</i> are scraped especially the <i>tinikil/turok</i> (thorns) to avoid pricking the weaver's hand.
10. Smoothing	The strips of the fronds are then flattened to become <i>aliker</i> (smooth and shiny). This process is the last phase of stripping the fronds.
11. Combing (<i>ahosayon</i>) – for raffia thread*	Combing of the unwanted fibers again to ensure the smoothness of the smaller threads that was left behind in the first combing.
12. Knotting (<i>abugkason</i>)*	The knotting of the edge of the raffia thread to avoid twisting. This task is the last and final preparation prior to the weaving of the product.
13. Cutting of Strips (<i>lilas</i>)	The <i>buri</i> strips are cut into the desired size of a particular item. This is also in preparation for the dyeing of the strips in different colors to be applied to the bag, basket and mat that the weaver wanted to produce.
14. Combing of the knots (<i>aotoyon kag uyo</i>)*	The combing of the knotted raffia edges to further smoothen the edges and remove the unwanted strips.
15. Knotting of Several Threads (<i>puon</i>)*	The knotting of the several thin threads together to make it longer in preparation for the next step.
16. Knotting to Produce More Threads (<i>pagbobotong</i>)*	Knotting step to produce more <i>raet</i> (threads).
17. Separation of thick & thin threads (<i>itagak sa tikudan</i>)*	The separation of the thin (<i>tinrog</i>) and thick (<i>huyog</i>) strips to two baskets. After the weaver has separated the threads, they weigh each basket to determine how many yards they will be able to make. Ideally, if the weaver has reached 5 kilograms on each basket, they can start arranging the <i>tinrog in</i> to the <i>han-ay</i> (warp) and <i>oyas-oyas</i> (back beam). Once the <i>tinrog</i> has been arranged into the warp and into the back beam, they start assembling the warp into the loom called <i>likis</i> and start inserting threads in the <i>binting</i> (heddles) and <i>suyor</i> (reed).
18. Dyeing (<i>pagtitina</i>)	This process takes a day or two. Commercialized tint powder locally called <i>jobos</i> is mixed with hot water, stirred to produce the desired colors.
19. Weaving (<i>yayahon</i>)	This process is done to create a particular item, e.g., basket, mat and other items.
20. Cutting or Burning (<i>himuyboy</i>)	After making the finished product, the <i>yubo-yubo</i> (unwanted fibers), is either cut or burned.
21. Packing of Products (<i>panghaper</i>), Hauling (<i>ikakarga</i>), and Transporting and Delivery of the Products	This ends the weaving process.

* Additional process for raffia weaving

Nowadays, the weaving technology in Banton is slowly fading. It lies on three elderlies in their late 70s. The weavers could hardly sustain the weaving industry despite the enthusiasm and willingness as experts to hand down the tradition. Reasons include:

1. **Changes in values.** Several drivers are influencing the younger generations to wean from the traditional culture. Parents have changed their outlook pertaining to education. From traditional of teaching their children home-based skills, they now put more premium on the western educational system which they think is a way to alleviate their economic status.
2. **Government programs.** The Pantawid Pamilyang Pilipino Program (4Ps) – a human development measure for the national government that provides conditional cash grants to the poorest of the poor – is the main reason blamed by the elders why their children were not trained to work in the weaving industry. They are not compelled to labor and find income to sustain their needs or educational expenses since they are given support by the government. It is ironic how giving financial assistance can make families become dependent instead of enabling them to become dependent.
3. **Outmigration.** It is integrated in the Bantoanon culture that when their children finish college, they leave to find work someplace else. They have a customary practice of letting the mother's placenta, after giving birth, to just float into the sea to signify that when the infant becomes an adult, they will look for fertile land to thrive. This thus, gives less chance of passing on the weaving skill to the next generation.
4. **Technology and social media.** These modern technologies and gadgets have replaced the primitive foot looms as hobbies and pastime of the Bantoanons, and instead of using these technologies to develop what they have, the Bantoanons being industrious, they have become lax.
5. **Low price.** Weaving of buri-raffia cloth is now one of the poorest money getters of the household industries. The weavers, even though they say that they only weave when they receive orders whether in small or large quantities, and that frequency of orders has reduced, it is apparent that the real problem is the low price in buying their weaved product, in effect resulting in unstable income, thus, some weavers have resorted to other sources of income that is more beneficial and stable

compared to the weaving industry, e.g. copra making, having a sari-sari store, and since Bantoanons are basically educated, some worked in the local government units and others in the teaching profession.

6. **Lack of demand.** Why weave when there is no one to buy? Clearly, this needs a marketing strategy.

CONCLUSION

Banton is endowed with rich natural and cultural heritage that can be considered priceless and irreplaceable assets of humanity. The tools used by their early inhabitants; the prehistoric ornaments made from various kinds of materials; the artifacts related to burial customs of ancient ancestors; the piece of cloth evidencing the existence of an entire technology, and the remains of prehistoric man; these are artifacts that are unique and inherently significant in the development of culture. Alongside these physical artifacts are the intangible attributes of the Bantoanons that are inherited from past generations; the learned process of weaving; the knowledge, skills and creativity that inform and are developed by them; the products they create and the resources; and other social and natural aspects; which are all highly valuable and unique too. Therefore, members of the Bantoanon communities, government and non-government authorities must have commitment to preserve, protect and sustainably manage these legacies bestowed for the benefit of the present and future generations, as these can define who the Bantoanons are, establish and reinforce identity, make them distinct from other communities, and can keep their integrity as a people.

Furthermore, as a closely-knit group of people with a deep sense of their roots and identity, against the modern times when people may think traditions are archaic and no longer relevant, the Bantoanons should still connect with their cultural heritage and realize that when tradition fades, it's a lost opportunity to present and future generations. The World Tourism Organization (WTO) predicts that cultural heritage tourism will be one of the key tourism market segments in the future. This is evident in the rise in volume of tourists who seek adventure, culture, history, archeology and interaction with local people. The vivid past that left its mark in Banton can be what present-day visitors can discover. Thus, linking tourism with Banton's rich heritage and culture including the revival of ancient skills and practices should be stimulated, knowing that it can create jobs, new business opportunities, strengthen local economy, and even more, fuel the Bantoanon's and the Romblomanon's pride.

ACKNOWLEDGEMENT

We thank Argie Festin for his assistance and facilitation in Banton. We thank the people, the *barangay*, and municipal officials of Banton, and the council of elders of Banton indigenous community for allowing us to do the study. We thank Jeremy R. Barns, Director of the National Museum Library; Ms. Ma. Adora Nikki Asessor of the NM Ethnology Division; and Mr. Ivan Cultura of the NM Archeology Division in their assistance to access files, reports, and related sources on Banton Island. Our gratitude to the Romblon State University for funding this research work.

AUTHOR CONTRIBUTIONS

The authors confirm contribution to the paper as follows: study conception and design: G.M., B.M.; data collection: G.M., B.M., O.M.; analysis and interpretation of results: G.M., B.M., MS.F.; draft manuscript preparation and revision: G.M., B.M.

CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

- Cuadra, N.C., Flavier, M.A.P. & Megalbio, D.J.R. (2018). Field Report: Banton Island, May 17-29, 2018. Ethnology Division, National Museum
- Fietas, MA. (2008). A Glimpse of the Pre-Hispanic Banton. *Maghali.net: Pagrumrom sa Paghinale*. April 2008 Article Issue. <http://maghali.yagting.com/frontpage/columns.asp?colid=2&refid=13>
- Halili, M.C.N. (2004). *Philippine History*. Rex Bookstore, Inc., Manila.
- Kottak, C. (2006). *Mirror for Humanity*, McGraw-Hill, New York. ISBN 978-0-07-803490-9
- Labrador, AMT P. (2013). *Hibla ng Lahing Pilipino: The Artistry of Philippine Textiles*. National Museum, Manila. ISBN 987 971 567 021 0
- Orogo, A.B. (2007). A Preliminary Report on Archeological Exploration and Documentation of Cave and Rock shelter Sites Conducted at the Municipality of Banton, Romblon Province. Archeology Division, National Museum
- Orogo, A.B. & Bolunia, MJL A. (2015). The Archeology of the Romblon Group of Islands. *The 2015 International Sanrokan Conference on Bio-Cultural and Environmental Studies Field Report*. Archeology Division, National Museum
- Peters, B. (2018). *Qualitative Methods in Monitoring and Evaluation: The Emic and the Etic: Their Importance of Qualitative Evaluators*. <https://programs.online.american.edu/msme/resource/emic-and-etic>
- PhilAtlas. (2021). *Banton, Province of Romblon*. <https://www.philatlas.com/luzon/mimaropa/romblon/banton.html>
- Philippine Information Agency. (2018). *Romblon, Republic of the Philippines*. <https://pia.gov.ph/provinces/romblon>
- Philippine Statistics Authority. (2016). *Population of Region IV-B – MIMAROPA (Based on the 2015 Census of Population)*. <https://psa.gov.ph/content/population-region-iv-b-mimaropa-based-2015-census-population>
- Respicio, N.A. (2014). *Journey of A Thousand Shuttles: The Philippine Weave*. National Commission for Culture and the Arts (NCCA), Manila. ISBN 978-971-814-207-3.
- Tauro, M.P. (2015). Cranial Vault Modification Practiced Among the Early Inhabitants of Banton Island, Romblon: An Anthropological Perspective Abstract. *The 2015 International Sanrokan Conference on Bio-Cultural and Environmental Studies*. Anthropology Division, National Museum
- Virtual Collection of Asian Masterpieces. (2013). *Why this is A Masterpiece*. <http://masterpieces.asemus.museum/masterpiece/detail.nhn?objectId=11314>

Tiger Grass Pollen as a Potential Insulation Board Material

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ABSTRACT

Tiger Grass (*Thysanolaena maxima*) pollen is disregarded as a valuable agricultural waste; thus, this study investigates its potential and beneficial uses as an alternative building insulation material with arrowroot starch as binder. Samples were prepared in varying mix proportions by weight of the tiger grass pollen, water, and arrowroot starch as binding agent. Three different sample mixtures were prepared into particleboards with thickness ranges from 8 mm to 10 mm and air-dried for 10 days. These particle boards were tested for acoustics, thickness swelling, water absorption and thermal conductivity. Based on the tests conducted, mixtures B – 250 grams - tiger grass pollen and 125 grams - arrowroot starch which is equivalent to 50% of the tiger grass pollen weight; and mixture C: 250 grams - tiger grass pollen with 150 grams - arrowroot starch which is equivalent to 60% of the tiger grass pollen weight demonstrated acceptable results having met the allowable limit values or minimum standards set for the properties used.

Keywords: *tiger grass pollen, insulation material, particle board, building construction, civil engineering*

INTRODUCTION

Tiger grass (*Thysanolaena maxima*) is one of the most cultivated grasses locally grown in the Philippines and it looks like bamboo and sugarcane. Tiger grass has a variety of uses and it plays a valuable role as the main material for broom production. The bamboo-like stalks make strong handles and the dried flower panicles are tied together to make the broom parts. The fibers (panicles) of this plant are already proved its importance and life span because it is being used in handicraft production that is why this fiber performs certain strength that could resist loads applied into it.

One of the most important challenges of future buildings is the reduction of energy consumptions in all their life phases - from construction to demolition. Through that, building insulations were developed and commonly realized using materials obtained from petrochemicals (mainly polystyrene) or from natural sources processed with high energy consumptions (glass

and rock wools). These materials cause significant detrimental effects on the environment mainly due to the production stage like use of non-renewable materials and fossil energy consumption, and to the disposal stage like problems in reusing or recycling the products at the end of their lives.

Due to other problems brought about by climate change, the use of thermal insulation materials sustains the comfortable temperatures in living environments or in building which became rampant in recent years. The use of thermal insulation is regarded as one of the most energy-efficient improvements and means of energy conservation in buildings. As the largest building component, it plays an important role in achieving buildings' energy efficiency. This will result in decreasing the cost of cooling as well as decreasing the pollution of the environment. Talking about energy consumption, both commercial and residential buildings spent almost half of primary energy resources and trend to increase in the future.

Particleboards are relatively new type of engineered wood product that are made from gluing together small chips, sawdust, saw shavings, recycled wood, agricultural residue, etc. Particleboard is a wood-based composite that is used for many applications such as furniture, flooring, panels, and the likes (S. Khosravi 2011, unpublished thesis). Particleboards consist of wood particles glued together at high temperature and pressure. The particles are separated based on size after they have been dried, the sizes of the particles are of great importance and will influence the properties of the final product. Normally, particleboards have three layers namely (a) core layer with coarser particles and a lower density, and (b) two surface layers with finer particles

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Received 28 October 2020; Accepted 06 July 2021; Available online 23 July 2021

and higher densities. The Australian Standard (AS/NZS 1859) gives limit values for certain mechanical and physical properties [Engineered Wood Products Association of Australasia (EWPA), 2008]. Table 1 shows the typical values of these properties (rather than limit values) presented in 3 thickness classes.

Table 1. Property Values for Standard Particleboard (EWPA, 2008)

Property	Unit	Thickness Class - mm		
		≤12	13 - 22	>23
Density	kg/m ³	660 - 700	660 - 680	600 - 660
Bending Strength (MOR)	MPa	18	15	14
Bending Stiffness (MOE)	MPa	2800	2600	2400
Internal Bond Strength	MPa	0.6	0.45	0.40
Surface Soundness	MPa	1.25	1.30	1.30
Screw Holding - Face	N	-	600	700
Screw Holding - Edge	N	-	700	750
Thickness Swell (24 Hr)	%	15	12	8
Formaldehyde E1 (Desiccator Method)	mg/l	1.0–1.5	1.0–1.5	1.0–1.5

Many research studies have experimented various alternative materials from agricultural wastes with emphasis on finding new materials for acoustic component panels and insulation particleboards (Faustino et al., 2012; Paiva et al., 2012; Charoenvai et al., 2013; Asrubali et al., 2015; Tanguank & Kumfu, 2011; Suleiman et al., 2013). These new alternative sustainable sound insulations building products have been at the center of society's concerns. For example, sound insulation products processed with natural materials such as cotton, cellulose, hemp, wool, clay, jute, sisal, kenaf, feather and coco or processed with recycled materials like wood, canvas, foam, bottle, jeans, rubber, polyester, acrylic, fiberglass, carpet, and cork are some solutions already established for sound insulation. Some other residual wastes such as newspaper, honeycomb, and polymeric waste were also tested to determine their technical potential. Thus, these green products or eco-products intend to be sustainable alternative to the traditional ones like glass or rock wool (Faustino et al., 2012). Particleboards made of agricultural wastes such as bagasse, cereal, straw, corn stalk, corn cobs, cotton stalks, rice husk, straws, sunflower hulls, and leaves oil were also tested for thermal insulation performance (Paiva et al., 2012). The main goal of using these agricultural wastes, aside from meeting the challenges of disposing such wastes, is to identify energy-saving building materials with low thermal conductivity to reduce heat transfer into the building (Charoenvai, 2013).

In addition, previous studies compared these unconventional and recycled insulation materials based on several properties such as density, thermal conductivity, specific heat, fire classification, and water vapor diffusion (Asrubali et al., 2015). Moreover, other properties such as acoustic absorption, acoustic insulation, including thickness were evaluated. Tests were also carried out to determine the physical properties (moisture content, thickness swelling and water absorption) and fire resistance of these alternative waste materials [(Tanguank & Kumfu 2011). Previous studies also evaluated not only the composition of the main alternative waste materials but also the type of binding ingredient or adhesive used (Charoenvai et al., 2013; Tanguank & Kumfu, 2011; Suleiman et al., 2013; Mouburik et al., 2010; Sulaiman et al., 2013; Elbadawi et al., 2015; and Abayomi et al., 2015). The type of bonding materials, particularly biodegradable and environmentally friendly binders are important to produce structurally strong, stable, and durable particleboards.

This study was conducted to be able to produce an economical and profit-oriented product. This study also aimed to produce durable particleboard as insulation materials for structural applications from locally sourced materials by using tiger grass pollen in conjunction with different natural binders. This is in effort to reduce the rate of importation of synthetic fibers and make locally made building materials available at a cheaper rate.

METHODOLOGY

Mix Proportion

Table 2 shows the three mix proportions used in the study. Every sample mixture has three samples indicating the amount (in grams) of the Tiger Grass pollen, arrowroot starch as binder, and water as the main ingredients for the mix.

Table 2. Mixing Proportion of the Particleboards

Mixture	No. of Sample	Amount of the Tiger Grass Pollen(g)	Amount of Arrowroot Starch(g)	Amount of Water Used for Binder
Mixture A	Sample 1	250	100	1 ½ cup
	Sample 2	250	100	1 ½ cup
	Sample 3	250	100	1 ½ cup
Mixture B	Sample 1	250	125	1 ¾ cup
	Sample 2	250	125	1 ¾ cup
	Sample 3	250	125	1 ¾ cup
Mixture C	Sample 1	250	150	2 cups
	Sample 2	250	150	2 cups
	Sample 3	250	150	2 cups

Testing of Acoustical Properties

The testing chamber was fabricated with the following dimensions: 0.7m x 0.6m for the base and 1.0m for its height with a volume of 0.42m³ to accord with the specimen area of 0.09m². The chamber is an enclosed space made of plywood and studs.

The specimen for each mixture were installed in the three faces of the chamber, three specimens for each face.

Determination of Peak Amplitude

Loudspeaker is outside the chamber at fixed point for all types of mixture with varying frequency and intensity of sound having the microphone probe inside the chamber. The microphone probe is connected to a magnetic tape recorder for data storage and future measurement or reference. The software used in determining the peak amplitude was Cool Edit Pro which the data are recorded, analyzed, and summarized.

Determination of Thickness Swelling, Water Absorption and Thermal Conductivity

The determination of 2-hour water absorption (WA) and thickness swelling (TS) tests were performed according to the American Society for Testing and Materials (ASTM) D-1037. After 2 hours, the uncoated/natural and coated samples with paint were taken out from the water and reweighed and re-measured for its thickness. The water absorption of each specimen was calculated by the weight difference. The water absorption and thickness swelling of each specimen were prepared with a surface dimension of 0.15m x 0.15m and calculated using Equations 1 and 2.

$$\text{Thickness Swelling (TS)} = \frac{t_f - t_i}{t_i} \times 100\% \quad (1)$$

Where:

t_i = initial thickness of the sample

t_f = final thickness of the sample

Thickness Swelling (TS) is expressed in percentage.

$$\text{Water Absorption (WA)} = \frac{w_f - w_i}{w_i} \times 100\% \quad (2)$$

Where:

w_i = initial weight (dry) of the sample

w_f = final weight (wet) of the sample

Water Absorption is expressed in percentage

The test for thermal conductivity was done in terms of moisture content (MC) and dry density of the samples. To calculate the thermal conductivity of each sample, the formula derived by Siau (1983) was applied (Ten Wolde et al., 1988). Thermal conductivity is being

computed to determine how much electric current or amount of heat the sample can receive before it yields following Equations 3, 4 and 5:

Get the moisture content of the sample (MC) with a formula of:

$$MC = \frac{W_w - W_d}{W_w} \times 100\% \quad (3)$$

Get the dry density of the sample (ρ) with a formula of:

$$\rho = \frac{W_{dry}}{V} \quad (4)$$

Solve for the thermal conductivity (k) with a formula of:

$$k = 0.509547 - 0.471983(a) \quad (5)$$

Where:

k = thermal conductivity of the sample

a = Porosity = $\sqrt{1 - 0.000667D - 0.00001MD}$

M = moisture content of the sample

D = dry density of the sample (kg/m³)

RESULTS AND DISCUSSION

Peak Amplitude Results

Table 3 shows the results of the peak amplitude per mixture. Comparing the result of the three mixtures, Mixture C has the lowest peak amplitude of -15.68 dB which means the intensity of sound being absorbed is low while Mixture A recorded the highest peak amplitude of -14.01 dB which means there is no effect in the intensity of sound being absorbed as it compares to the peak amplitude recorded by the empty room which is -14.08 dB. Mixture B recorded peak amplitude of -15.31 dB.

Thickness Swelling

The determination of two-hour thickness swelling (TS) test was performed according to ASTM D-1037. After two hours, the specimens which are uncoated/natural and coated with paint were taken out of the water for the measurement of its thickness. The thickness of each specimen was calculated by the thickness difference. The thickness swelling of each specimen was prepared with a surface dimension of 0.15m x 0.15m. Table 4 shows the results for the three mixtures, comparing uncoated or natural and coated with paint before and after soaking.

The thickness of the samples that ranges from 8mm to 10 mm subjected for testing were considered as thin particleboard according to Australian Standard AS/NZS 1859 (EWPA, 2008). The thickness of the particleboard under thin category ranges from 0 to 12mm thick. Table 4 shows the thickness swelling of the uncoated/natural and coated with paint samples.

Table 3. Peak amplitude values for the different test mixtures.

Amplitude Value	Empty Room		Mixture C		Mixture B		Mixture A	
	Left	Right	Left	Right	Left	Right	Left	Right
Min Sample Value:	-7513	-6401	-6336	-5389	-5537	-4713	-7332	-6261
Max Sample Value:	7630	6481	6154	5244	6571	5621	7674	6528
Peak Amplitude (dB)	-12.66	-14.08	-14.27	-15.68	-13.96	-15.31	-12.61	-14.01
Minimum RMS Power (dB)	-32.79	-34.19	-33.83	-35.2	-34.89	-36.27	-35.03	-36.39
Maximum RMS Power (dB)	-15.74	-17.13	-21.62	-23.01	-21.51	-22.9	-20.51	-21.9
Average RMS Power (dB)	-24.71	-26.1	-29.4	-30.78	-29.92	-31.3	-28.91	-30.29
Total RMS Power (dB)	-24.26	-25.65	-29.12	-30.5	-29.75	-31.13	-28.59	-29.97
Actual Bit Depth (Bit)	16	16	16	16	16	16	16	16

Table 4. Thickness Swelling (TS) of the Uncoated/Natural and Coated with Paint

Mixture	No. of Samples	Thickness Swelling (TS) in Percentage (%)			
		Uncoated/ Natural	Coated with Paint	Average	
				Uncoated/ Natural	Coated with Paint
Mixture A	Sample 1	13	38	12	25
	Sample 2	11	33		
	Sample 3	11	0		
Mixture B	Sample 1	11	11	11	11
	Sample 2	11	11		
	Sample 3	11	11		
Mixture C	Sample 1	0	22	3	17
	Sample 2	0	10		
	Sample 3	10	20		

Table 5. Water Absorption (WA) of the Uncoated/Natural and Coated with Paint

Mixture	No. of Samples	Water Absorption (WA) in Percentage (%)			
		Uncoated/ Natural	Coated with Paint	Average	
				Uncoated/ Natural	Coated with Paint
Mixture A	Sample 1	220	153	204	148
	Sample 2	200	122		
	Sample 3	191	169		
Mixture B	Sample 1	100	133	111	119
	Sample 2	100	88		
	Sample 3	133	135		
Mixture C	Sample 1	146	88	140	107
	Sample 2	160	144		
	Sample 3	113	90		

Table 6. Thermal Conductivity of the Samples

Mixture	No. of Sample	Weight Wet (g)	Weight Dry (g)	Dry Density Kg/m ³	Moisture Content %	Porosity (a)	Thermal Conductivity W/m-K
Mixture A	Sample 1	125	50	277.78	60	0.9026	0.078
	Sample 2	300	75	370.37	75	0.8351	0.111
	Sample 3	137.5	68.75	339.51	50	0.8986	0.080
Mixture B	Sample 1	187.5	75	370.37	60	0.7285	0.1626
	Sample 2	150	75	370.37	50	0.7535	0.1505
	Sample 3	150	75	370.37	50	0.7535	0.1505
Mixture C	Sample 1	150	81.25	401.23	45.83	0.8884	0.085
	Sample 2	137.5	75	333.33	45.45	0.9089	0.075
	Sample 3	162.5	93.75	416.67	42.31	0.8921	0.083

The percentage of thickness swelling of the uncoated/natural samples attained a value which ranges from 0% to 13% and did not exceed the maximum percentage of thickness swelling which is 15% according to Australian Standard AS/NZS 1859 (EWPAA, 2008). On the other hand, coated with paint samples revealed that only Mixture B samples acquired a percentage of 11% which did not exceed the standard maximum value of thickness swelling.

Water Absorption

The determination of two-hour water absorption (WA) test was performed according to ASTM D-1037. After two hours, the specimens which are uncoated/natural and coated with paint were taken out from the water and reweighed them. The water absorption of each specimen was calculated by the weight difference. The water absorption of each specimen was prepared with a surface dimension of 0.15m x 0.15m.

The percentages of water absorption of uncoated/natural and coated with paint samples are shown in Table 5. For uncoated/natural sample, Mixture A showed the highest water absorption of 220% and Mixture B revealed the lowest water absorption of 100%. For samples coated with paint, Mixture A still got the highest water absorption of 169% and Mixture C attained the lowest water absorption of 88%. By getting the average percentages of water absorption for uncoated/natural and coated with paint sample, Mixture B showed the lowest value water absorption of 115% and it is considered as good particleboard.

Thermal Conductivity

The test was done in terms of moisture content (MC) and dry density of the samples. The surface dimension of the sample used was 0.15m x 0.15m. Thermal conductivity is being computed to determine how much electric current or amount of heat the sample can receive before it yields. As shown in Table 6, the calculated value for Mixture C fairly met the AS/NZC 1859 standards - 0.075 W/m-K (EWPAA, 2008).

CONCLUSION

This preliminary investigation was conducted to establish the potentials of Tiger Grass pollen as an alternative building insulation material. Based on the findings, Tiger Grass pollen can replace the synthetic fiber in the production of particleboards. With the tests carried out for acoustic properties, thickness swelling, water absorption, and thermal conductivity, Mixtures B and C, having the proportion of 250g of Tiger Grass pollen and 125g of arrowroot starch as binder, and 250g of Tiger Grass pollen and 150g of arrowroot starch, respectively, showed favorable properties compared with standard particleboard. Thus, it proved that this disregarded agricultural waste combined with arrowroot starch has a promising potential as an environmentally- and eco-friendly substitute for thermal insulation product. To improve its durability and resistance to external factors such heat/fire and fungi, it is recommended to conduct more tests to address these issues before a widespread use of Tiger Grass pollen as the primary ingredient in particleboard production.

ACKNOWLEDGEMENT

The methods and data presented were the results of the undergraduate thesis under the supervisions of Engr. Reynaldo P. Ramos, PhD. The thesis entitled “Thermal and Acoustic Properties of Tiger Grass Pollen Insulation Material with ArrowRoot Starch as Binder” was submitted by the following final year civil engineering students, namely: Casidsid, Jona Val T.; Fesarillo, Charmaine F.; Fornea, Donna F.; Gado, Koen Kate S.; Gonzales, Mary Joy R.; Pastor, Sahra Mae F.

AUTHOR CONTRIBUTIONS

The conduct of the study was done by the final year civil engineering students, headed by Engr. Jona Val T. Casidsid. Engr. Casidsid administered the entire preparation and testing tiger grass pollen insulation material. Dr. Reynaldo P. Ramos, supervised the

conduct of the study and he organized the content of the paper and he did the final revision of the technical paper, highlighting the major findings of the study.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- Abayomi, O., Temitope, O., Olawale, A. & Oyelayo, O. (2015). Recycling of Rice Husk into a Locally-Made Water-Resistant Particle Board. *International Journal of Novel Research in Engineering and Science*, 2 (1). 21-30.
- American Society for Testing and Materials (2020). *Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*. <https://www.astm.org/Standards/D1037.htm>
- Asrubali, F., D'Alessandro, F. & Schiavoni, S. (2015). A review of unconventional sustainable building insulation materials. *Sustainable Materials and Technologies*, 4. 1-17.
- Charoenvai, S. (2013). *New insulating material: Binderless particleboard from durian peel* in Chang, Al Bahar & Zhao (eds). *Advances in Civil Engineering and Building Materials*. Taylor & Francis Group, London.
- Elbadawi, M., Osman, Z., Paridah, T., Nasroun, T. & Kantiner, W. (2015). Mechanical and Physical Properties of Particleboards made from Ailanthus wood and UF resin fortified by Acacias Tannins Blend. *Journal of Material and Environmental Science*, 6 (4). 1016-1021.
- Engineered Wood Products Association of Australasia (2008). *Facts about Particleboard and MDF*. Queensland: Australian Wood Panels Association Incorporated.
- Faustino, J., Pereira, L., S. Soares, S., Cruz, D., Paiva, A., Varum, H., Ferreira, J. & J. Pinto (2012). Impact sound insulation technique using corn cob particle board. *Construction and Building Materials*, 32. 153-159.
- Mouburik, A., Allal, A., A. Pizzi, A., Charrier, F., & Charrier, B. (2010). Preparation and Mechanical Characterization of Particleboard Made from Maritime Pine and Glued with Bio-Adhesives Based on Cornstarch and Tannins. *Moderas Cencia Y Tecnologia*, 12(3). 189-192.
- Paiva, A. & S. Pereira, D. Cruz, H. Varum and Pinto, J. (2012). A contribution to the thermal insulation performance characterization of corn cob particleboards. *Energy and Buildings*, 45. 274-279.
- Sulaiman, N., Hasmim, R., Amini, M., Sulaiman, O. & Hiziroghu, S. (2013). Evaluation of the Properties of Particleboard Made Using Oil Palm Starch Modified with Epichlorohydrin, *BioResources*, 8 (1). 283-301.
- Suleiman, L., Aigbodion, V., Shuaibu, L., & M. Shangalo, M. (2013). Development of Eco-friendly Particleboard Composites Using Rice Husk Particles and Gum Arabic. *Journal of Materials Science and Engineering with Advanced Technology*, 7 (1). 75-91.
- Tanguank, S. & Kumfu, S. (2011). Particle Boards from Papyrus Fibers as Thermal Insulation. *Journal of Applied Sciences*, 11 (14). doi: 10.3923/jas.2011.2640.2645.
- Ten Wolde, A., McNatt, J., & Krahn, L. (1988). *Thermal Properties of Wood and Wood Panel Products for Use in Buildings*. Oak Bridge National Laboratory.

Characterizing the Government's Preventive Measure in Combating COVID-19 Pandemic in the Philippines: A Content Analysis

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ABSTRACT

By and large, COVID-19 pandemic is an unprecedented circumstance that impacted millions of people around the globe. This is a new strain of coronavirus that targets one's lower respiratory tract and most likely to infect those who are immunosuppressed. Thus, this qualitative paper answers the question, *What characterizes the preventive measures of the government to combat COVID-19 in the Philippines?* The research design employed was content analysis with news articles in three major dailies in the country as its corpora of data. From the cool and warm analyses of the field text, four measures emerged, labeled as 'preventive nodes' namely: *communication node* which refers to government's way of disseminating the needed information and coming up with an alternative in saving the lives of many while vaccines are still on progress; *accommodation node* which pertains to supplementary efforts from the government in addressing health, social and economic concerns brought by COVID-19; *assessment node* which relates to the issues that have to be improved both of government and its people; and *impact node* which refers to government's way of reporting the cases that may indicate the result of their measure. It was concluded that these nodes may promote a sense of awareness and provide knowledge to the public, alleviate financial constraints, hunger, and unemployment, come up with a better response and arrive at informed decisions in taking actions to impede this crisis.

Keywords: *content analysis, COVID-19, pandemic, Philippine government, preventive measures*

INTRODUCTION

Millions of people around the globe have been impacted by the emergence of the COVID-19 pandemic. Originally abbreviated as 2019nCoV by World Health Organization (WHO), this new strain of virus identified by the Chinese Center for Disease Control and Prevention (CDC), originated in Wuhan, Hubei Province, China in December 2019 and targets the lower respiratory tract of patients with pneumonia. Coronavirus is a similar trend to severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS). This infectious disease was regarded as an international health concern and

subsequently, WHO officially declared COVID-19 as a global pandemic in March 2020. Its susceptibility appears to be associated with personal profiles through exposure to the virus. This includes age, biological sex, and other health conditions and most likely to infect older adult with chronic comorbidities or who are immunosuppressed (Chen et. al., 2020; Adhikari et. al., 2020). In the latest guidelines from Chinese health authorities, three main transmission routes for this virus were described: 1) droplets transmission; 2) contact transmission; and 3) aerosol transmission (Adhikari et. al., 2020; National Health Commission of People's Republic of China, 2020). Further, a recent study conducted claimed asymptomatic transmission (Bai et. al., 2020) but any such study could be limited by errors in self-reported symptoms or contact with other cases (Harapan et. al., 2020). An infected patient may suffer from symptoms like fever, dry cough, chest pain, fatigue, difficulty in breathing and myalgia.

However, upon knowing these facts, the most important question that needs an urgent answer is what and how can this pandemic be cured as there is still no specific antiviral treatment for COVID-19. Many

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infected countries manage to contain the virus by giving non-pharmaceutical measures. Prevention is, by far, the best practice in the hope to eradicate the impact of this virus considering the lack of effective treatment and this recommends isolation and supportive care including oxygen therapy, fluid management, and antibiotics treatment for secondary bacterial infections (Gennaro et.al., 2020; Harapan et. al., 2020). With the vast and growing number of affected people in just a short period of time, it overwhelms countries that may end up being unable to provide health care, maintain the society of their community or keeping the function of the economy (Nicomedes & Avila, 2020). In the words of Miller (2006), “this could cause the disruption of the world economy, decline of stock markets, scarcity of supplies, worsening political instability, and governments losing hundreds of billions of revenues.”

The world needs a careful planning and informed decisions. Thus, it must be taken collectively with quick emergency responses to battle against the common enemy – the new corona virus. When measures are uncontrolled, it will lead to the rapid increase in the number of cases, reach the peak earlier and require more capacity healthcare systems to respond so all country leaders are encouraged to proactively take strategic actions as soon as possible to lower the cases (Qian et. al., 2020; Djalante et. al., 2020). It is in this trying time that the government should come up with a well-orchestrated plan while the potential vaccines are still in progress. In the case of the Philippines where the first suspected case was reported on January 22, 2020, and 633 suspected cases were tallied as of March 1 (Edrada et. al., 2020), the government formulated a resolution to organize COVID-19 Inter-Agency Task Force for the Management of Emerging Infectious Diseases that would respond to concerns brought by this global pandemic. Moreover, a bill was passed known as Republic Act No. 11469 or “Bayanihan to Heal as One Act” which provides the President an extension of powers to promote and protect the collective interests of all Filipinos (Official Gazette, 2020). The Philippines ranks 43rd on countries having the greatest number of cases as it hits more than 10,000 cases as of May 2020 (Statista, 2020).

This paper aims to qualitatively investigate the preventive measures implemented by Philippine government and its agencies through the use of content analysis with news articles published from March 17 until April 21, 2020 by three major dailies in the country as its corpora of data. The findings of this study may be beneficial in improving the government's actions as this study examines their existing practices in addressing the needs of Filipino people during this pandemic. Furthermore, this may also contribute in coming up with a well-coordinated and comprehensive plan and policy to respond and combat COVID-19.

METHODOLOGY

Research Design

Content analysis was employed in this paper as its research design. Qualitative content analysis is the examination of various nonliving material or cultural texts as a means of gaining insight into a social world, ideologies, or dominant worldviews (Wright, 2017). Despite that, what can be gained from this study is just a synthetic knowledge, the purpose of content analysis is to reveal the emerging trends and patterns of behavior in the texts. Since this study deals with corpora of data, this design was specifically used to characterize the preventive measures of the Philippine government in addressing the problems of COVID-19.

Data Measures

To unfold the emerging themes, news articles in web content were used as a corpus of data coming from the three major daily newspapers in the country: 1) Philippine Daily Inquirer (PDI); 2) Manila Bulletin (MB); and 3) Philippine Star (PS). Using their own news generators in their websites with a keyword, *preventive measures of government in the Philippines against COVID-19*, led to 308 potential news articles. To taper down the overwhelming number of potential articles, inclusion criteria was set such as the *Timeline* (articles published from March 17, the day which the lockdown started until April 21), *Section* (Purely focused on news, other sections like feature, opinion, business, editorial, lifestyle etc. were excluded), and the *Region* which only focused on Luzon). Applying the criteria resulted in 12 qualified news articles that served as the extended text: 5 articles from *PDI*, 2 from *MB* and 5 from *PS*.

Mode of Analysis

The reading and rereading of field text were employed to get the sense of the whole. Using a structural analysis or dendogram as an analytical tool emerged the pattern of behavior underlying in the text. The extended text was subjected to cool analyses by extracting the significant statements from the corpus. After condensing the meaning units, codes were formulated to identify connections between meaning units and applied warm analyses by scrutinizing text for similarities and differences from which categories are derived (Ryan & Bernard, 2003). Subsequently, categories further yielded to development of themes that qualitatively describe the layer of experience. Validation of the dendogram was utilized through a *member checking procedure* in which the correspondence made by the researcher with another person involved in the data analysis to achieve truthfulness and trustworthiness of the data (de Guzman, 2020). Furthermore, to arrive at the openness

towards the text, processes such as *Bridling* (Dahlberg, 2008) or becoming patient and actively waiting for a theme to show up and *Bracketing* (Tufford & Newman, 2010) or removing the biases and prejudices in analyzing the corpus were observed.

RESULTS AND DISCUSSION

From the cool and warm analyses of the field text, the government's *Wind Vane of Prevention Nodes on Fighting COVID-19* unfolded. Interestingly, wind vane depicts a direction or node that the Philippine government may land in responding to this pandemic.

As seen in the simulacrum, the vane consists of four nodes namely: communication node which refers to government's way of disseminating the needed crucial information and coming up with an alternative to be able to save the lives of many while vaccines are still in the works; accommodation node which pertains to contingency and auxiliary efforts from the government in addressing the health, social and economic concerns brought by COVID-19; assessment node which relates to the issues that have to be improved both of government and its people; and impact node which refers to government's way of reporting the cases that may indicate the result of their measure. The extent to which the government curb the impact of this virus depends on great measures namely: promoting the new normal; coming up with an alternative; forming a well-coordinated plan; upholding humanity towards the vulnerable; improving current measures; and tallying the cases.

Communication Node

It is interesting to note in this study how does the Philippine government flatten the curve of COVID-19 without the presence of vaccine. With this, a conveyance of information was realized as a measure by promoting the new normal in living in the community, particularly, reminding its people to observe and adhere to behavioral etiquettes or health protocols. This includes physical distancing or keeping one meter away from each other, wearing of masks in public places, the practice of proper handwashing and sanitizing and other non-medicinal measures. As reported in a news article, "*Even if ECQ is gradually lifted, Galvez said measures such as physical and social distancing must remain since they are part of the "new norm."*" Stated in another report, "*We cannot live in a way like we used to. We can see that even in mass transport, we need to have social distancing. We might need to put markers just to ensure that social distancing and the new norms that we will create are observed.*"

The gathered articles revealed that the declaration of strict implementation on quarantine directive in a community, urging people to follow was

evident through restricting human movement, putting a halt or police checkpoints in a certain area and even limiting the flocking of large group. As written in some reports, "*Initially, BuCor suspended visitation rights for one week, starting March 11, after President Rodrigo Duterte declared a state of public health emergency as cases of COVID-19 in the country continue to increase.*" In other article, "*As per Manila Barangay Bureau information office, all barangays under Zone 4 are under 'lockdown' as a preventive measure against COVID-19. In other words, people from other barangays are no longer allowed to enter that zone.*"

Also included in this node which can be seen in articles is introducing the alternative testing method known as 'antibodies rapid testing' aside from what has been currently using – the Polymerase chain reaction (PCR) tests. This breakthrough (as it was developed by local scientists in the country) presents another way of testing probable infected patients with a fast result and can cater 'mass testing' as another measure to contain the virus and improve the country's health management. As seen in a report, "*While he said the PCR test could detect the virus on the first day of illness, the rapid antibody test can detect antibodies about five days on.*" This is even supported by another report, "*Dr. Dominga "Minguita" Padilla said these test kits detect either of two unique antibodies in a COVID-19 patient. The presence of these "soldiers," or the body's natural defenses, was an accurate indicator that the person was positive for the virus that causes COVID-19, the severe acute respiratory disease, she said.*"

Doing benchmarks from other countries as to handling this health situation was also regarded as an alternative measure based on the data. As read in an article, "*Tayag said the rapid antibody test was popular in China and Korea and was their "secret" to how they were able to conduct massive testing.*" In addition, requiring everyone's full cooperation was believed to be of big help against COVID-19. As penned in a report, "*National Task Force (NTF) COVID-19 chief implementer Secretary Carlito Galvez Jr. said the discipline and cooperation of everybody are the "key" to keep the infection rate low.*" All these actions mentioned above were perceived as a non-pharmaceutical measure through the promise of communication.

Accommodation node

It is in this trying time that the people need a relief support and supplementary effort to survive. Specifically, those who are in the periphery are an unwilling victim. This is when accommodation node

transpires. The government, more so the President, must come up with a well-coordinated plan to respond to the challenges of this pandemic. The gathered news articles contained some of government's arrangement that will address the social and economic issues brought by this global concern. This covers its contingency plan, ensuring economic boost and business continuity amidst the crisis, and considering the source of fund to utilize. Specific points were seen including budget realignment and ensuring food security. As reported, *"the government now has greater means to supplement, expand, improve, and intensify existing COVID-19 responses and preventive measures and to further mitigate the social, economic, and financial impact of COVID-19 on all Filipinos."* This was also seen in another report, *"In the same memo, the President authorized the Secretary of the DOLE to authorize alternative working arrangements in the private sector."* Written in other news, *"The DBM Secretary must also consider any unutilized or unreleased balance in the special purpose funds of agencies excluding state corporations; allocate cash, funds, investments, including unutilized or unreleased subsidies and transfers, held by any national government agency in order to address the COVID-19 emergency."*

Remarkably, it was found out that the orchestration of this plan will be possible through the President's extension of power in order to translate this into reality and be in-charge of curbing the crisis. As what the report said, *"In view of the enactment of RA No. 11469 on 24 March 2020, which granted President powers and authorities necessary to carry out urgent measures to meet the COVID-19 national health emergency recommendations on any further action that the President may need to take."* This also is visible in another report shown, *"Whatever recommendations to be presented, ultimately, it will be President Duterte who will decide," he said, adding that regardless of the post-quarantine scenario to be implemented"*.

It is also in this node that those who are in the hot zones or the vulnerable are being protected such as the frontliners, underprivileged class and even those infected persons who are deprived of liberty or jail inmates. Thus, upon reading the news, their welfare and their status quo are highly considered in this difficult time. As seen in some reports, *"In the same memo, the Philippine Health Insurance Corporation (Philhealth) has been directed to cover the cost of treatment for COVID-19 patients under the National Health Insurance Program as well as shoulder all medical expenses of public and private health workers in case of exposure to COVID-19 or any work-related injury or disease."* Also, what the other report stated, *"The Board of Pardons and Parole is formulating interim guidelines for the expeditious release of PDLs who are*

already of old age, sickly or are suffering from terminal illnesses, or with serious disabilities, as well as those eligible for parole or executive clemency, in order to decongest penal facilities," the report said. "

Assessment node

Out of the current problem, an assessment comes into picture. This is where you determine the areas to be improved through evaluation and recognize the issues that may become problematic. Upon reading the news articles, some of the problems were identified, both from government and its people. One of these is the resistance on the side of the government to try a new measure. As reported, *"Health Secretary Francisco Duque III on Saturday rejected rapid testing,"* Following another report, *"Duque urged those who continue to push for the use of rapid test kits to "read up more," given that there were already questions about their reliability."* Additionally, a resistance from the people to follow the quarantine directive and observe behavioral etiquette has also been reported from the gathered data. As written in an article, *"Meanwhile, hundreds reportedly trooped to a public market in Quezon City recently to buy food and other groceries while apparently failing to observe social distancing."* Also revealed in another report, *"The task force chief particularly pointed out the supposed rising COVID-19 cases in the capital city of Manila, Quezon City, and San Juan City because the lockdown is not being enforced "faithfully."*

It should also be noted that even the government's existing practices may have a room for improvement. Hence, it must be assessed too to achieve better result. As shown in an article, *"For now, our priority is symptomatics: those with severe cases, vulnerable groups (including) elderly persons, (those with) pre-existing conditions, pregnant, and even our health care workers who are already showing symptoms,"*. As appeared in other news, *"Padilla said the DOH advisory for persons experiencing "mild symptoms" to isolate themselves as a preventive measure does not work as effectively as rapid testing."*

Impact node

Reporting the tally about how many people were already infected or doing statistical effort at least was reflected in some articles. This node may serve as a measure to aid the government in taking actions to mitigate the COVID-19 pandemic by knowing the impact of their measures. As written in a report, *"As of 12 noon March 19, the Philippines has recorded 217 cases of COVID-19. Of the number, 17 died while eight recovered from the disease."* In other news, *"It is clear to us that the number of COVID-19 cases have not yet decreased" Ho said. "We expect that the number of confirmed cases in the country will continue to rise as*

we test more people," she added." Seen in another article, *"As of Monday, the Philippines has 4,932 confirmed cases with 315 deaths and 242 recoveries, according to the Department of Health."*

Discussion

Indeed, what the qualitative approach can do should not be underestimated as it gives a closer look in discovering the underlying theme in multiple layers of experience. Preventive measures against COVID-19 are undeniably important as there is still no vaccine rolled out in the market. In this study, it is worth mentioning that the preventive nodes revealed in this study may give the readers a direction to combat the virus as well as responding to the challenges of it despite the absence of the cure.

As purported in this study, the power of communication is seen as a measure of impeding the spread of the virus by disseminating crucial information and promoting the new norm of living. Since there are no vaccines available now, prevention is, by far, the most effective way to reduce the COVID-19 impact and the best prevention is to avoid exposure to the virus (Adhikari et. al., 2020). That is why the Philippine government specifically, the Department of Health (DOH) is making an effort to launch a campaign against the pandemic which is supported by the WHO and conduct a series of media briefings from time to time. According to WHO-Philippines (2020) website, they are with DOH on sharing latest updates, giving technical advice, strengthening laboratory capacities to run many tests and planning and messaging to communicate the risks and engage the public regarding this matter. A variety of materials has been released, promoting the "new normal". Some of these include wearing facemasks when going out, maintaining physical distance and making proper handwashing as a habit. These actions have been shown to successfully delay the transmission of the virus and as seen in China and South Korea, has led to containment of the virus (Maier & Brockman, 2020; Baye, 2020). Putting a community under quarantine and temporary closing of malls, establishments, churches, schools, and other public places to limit human movement were also done as directed and announced by the government.

Hence, in this global crisis, it is worth mentioning that the role of communication is highly relevant and needed as it creates awareness and knowledge, the two important keys for prevention. It should also be noted that being unaware and having a lack of knowledge may lead to the event of getting infected, or worse, death. As supported by Seeger (2006), central and local government must develop an integrated risk communication strategy that allow people to be informed to minimize irrational behaviors. Djalante et. al. (2020) argues, the limitation of technical

knowledge and tools impedes the effectiveness of the initiatives. In their analysis on Indonesia's current responses to COVID-19, public misinformation and lack of communication among government levels triggered a misleading interpretation through social media tools like herbal medication can beat viruses quickly and some activities such as sunbathing have been implemented by some government entities. Indeed, educating the minds of people by giving important information will save the lives of many. People's unawareness requires health authorities to apply different means to disseminate information and educate people about applying protective measures (Amen et al., 2020).

In the light of COVID-19 scare, it is undeniably true that this pandemic has been bringing not just health issues but also social and economic concerns and with this, the government has developed a plan to accommodate and respond to the needs of those who were impacted by this crisis. Gennaro et. al., (2020) posits that COVID-19 outbreak is proving to be an unprecedented disaster, especially in the most afflicted countries including China, Italy, and USA in all aspects, especially health, social and economic. In addition, in the worst-case scenario of the COVID-19, most countries will be unprepared, with low resources allocated for affording the viral emergency and the consequences will be catastrophic. With the suspension of several business operations, many Filipinos who belong to working class and those who earn on a daily basis have temporarily lost their jobs. Furthermore, this implies that people may face financial constraints. Therefore, the President, together with the concerned agencies came up with an intervention, asking for an extension of powers in addressing this challenge by giving supplemental efforts and incentives to the community. Such effort was seen through Department of Social Work and Development's (DSWD) *Social Amelioration Program* where Filipino families were given cash aids to suffice the needs amidst the pandemic. It is true enough that hunger and unemployment, as another prevalent issue in this time of pandemic require a crafting of well-coordinated plan to respond to these problems. Djalante et. al. (2020) suggests that community-based responses may help to alleviate pressure to local governments to provide relief responses. Also, urgently mandating local governments from their own special task force to accelerate responses and to achieve coordinated and coherent responses, involving key government departments, especially health is important. Because of the creation of Philippine government's Inter-Agency COVID-19 Task Force which aims to give relief support and protection to affected Filipinos, particularly in the periphery, it can ease the financial burden they have on their shoulders.

Subsequently, since there are specific workers who risk their lives in fighting this battle, protecting the welfare of those who are in the vulnerable sector including frontliners and law enforcers was also realized as part of accommodation node. Moreover, as stated in the findings, there are reported cases in jails which led to consideration of releasing the infected persons deprived of liberty. Indeed, it is at this time that the status quo must be recognized by upholding the virtue of compassion and humanity. As Okoye (2020) asserts, in reducing the impact of COVID-19, healthcare resources should be directed at vulnerable groups. Thus, this will assist healthcare workers to guide high-risk groups, predict and control the rate of disease progression. By arriving at a strategic response, those who work in the hot zones can be safeguarded and will still have a chance to serve and protect more lives. Similar to what Khan (2020) argues, the strategy includes community-based approach where planner, employers and community organizers can take strategy to protect vulnerable groups and the community against COVID-19 infection.

Looking in a different dimension, the government's actions in mitigating this crisis should undergo an assessment in order to strengthen their measures. Findings showed that there is a resistance from both the government and its people, and these were identified as the areas to be improved. It should be noted that one's openness and willingness to adhere to government's directive may result in a better outcome. While the government is exerting their effort to flatten the COVID-19 curve, some residents were reported to being not compliant in a way that the quarantine directive is not being followed. It was already stated in this paper that the prevention is, so far, the best practice to avoid the virus. The adherence of people to the preventive and control measures is very crucial to ensure the mitigation of the spread of an epidemic, and this is greatly affected by the people's level of knowledge, attitude, and practices towards COVID-19 pandemic (Ajilore et al., 2017; Amen et al., 2020). The extent to which the growing infected cases of COVID-19 will be curtailed depends on the people's behavior and compliance. Saurabh & Ranjan (2020) claims, it is obvious that implementation of quarantine for avoiding the transmission of virus at community level will be only effective when there is adherence to comply. On the other hand, findings revealed that as to government's room for improvement, there has been reluctance and hesitance to try a new different method that would cater more people to get tested. Being receptive to new ideas is as important as openness and willingness. DOH's existing practices must be further assessed so that it can determine the parameters to refine particularly, their way of conducting the tests, in delivering a better health management. Countries that

acted quickly and implemented preventive measures with aggressive testing, isolation and contact tracing were able to contain the virus well without lockdowns (Lee et al., 2020; Baye, 2020). As issued by WHO (2020), ramping up production tests and increasing availability should be undertaken by the governments to cope with the pandemic. Therefore, realizing the shortcomings of both the government and the residents through a careful evaluation may stop the number of cases to pile up.

Lastly, reporting the cases of those infected, recovered and died also manifested in the findings section of this paper. This was realized as a preventive node in a sense that doing a statistical inference may help the government in taking their actions towards impeding the crisis. Knowing the tally may serve as a baseline in giving informed decisions in battling COVID-19 outbreak. Wang et. al. (2020) emphasizes the importance of doing the statistical analysis by stating that the quick release of confirmed cases data of Centers for Disease Control and Prevention enables them to explore epidemiological characteristics and to understand more the situation and characteristics of the epidemic. Additionally, a reported data is urgently needed to conduct risk assessments, inform policies related to containment of COVID-19 and may play a vital role in demonstrating the impact to support requests for funding relief from the government (Naidich et. al. 2020; Anderson et al., 2020). Moreover, data transparency through tallying the cases may give a notion whether the government has been effective with their intervention or their responses to COVID-19 are most likely to be unsuccessful. In the analysis of Djalante et. al. (2020) on Indonesian government's preventive measure, there was a lack of data transparency reported and such misinformation impedes the government's future responses, indicating the possibility that their government's efforts were not enough.

CONCLUSION

This qualitative paper attempts to characterize the preventive measures of the Philippine government through naturalist's approach, using content analysis as the research design. The findings successfully emerged the four preventive nodes in combating and responding to the challenges of COVID-19. These include *communication node*, *accommodation node*, *assessment node* and *impact node*. Clearly, in the absence of the vaccine, government's communication strategy of promoting the "new normal" may give a sense of awareness and provides knowledge to the public which can truly help the government in preventing the spread of the virus. Also, the supplemental effort and coordinated plans of the President, together with

concerned agencies may alleviate many Filipino families' financial hardships, hunger and unemployment due to the impact of the crisis, as company, schools and business operations were temporarily suspended. Furthermore, the government should pinpoint the problems and evaluate the aspects of their measure that need to be assessed in order to come up with a better response in suppressing COVID-19 catastrophe. Another way to assist the government in arriving at informed decisions in taking epidemiological actions towards this pandemic is making statistical inferences. This study advances the implication of government's preventive measure, guided with current and relevant literatures that may help them in crafting a holistic plan towards the mitigation of this unprecedented circumstance. However, the revealed findings cannot generalize the measures that the government has been implementing because the inclusion criteria in gathering the data were limited including the time frame and the place it only focused. Nonetheless, this paper gave us a closer look on government's path on which direction it may take, hence, the preventive nodes.

REFERENCES

- Adhikari, S.P., Meng, S., Wu, Y.J., Mao, Y.P., Ye, R.X., Wang, Q.Z. & Zhou, H. (2020). Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus (COVID-19) during the early outbreak period: a scoping review. *Infectious Disease of Poverty*, 9 (29). [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)
- Ajilore, K., Atakiti, I. & Onyenakey, K. (2020). College students' knowledge, attitudes and adherence to public service announcements on Ebola in Nigeria: suggestions for improving future Ebola prevention education programmes. *Health Education Journal*, 76, 648-60.
- Akhmetzhanov, A., Mizumoto, K., Jung, S., Linton, N., Otori, R. & Nishiura, H. (2020). *Estimation of the actual incidence of coronavirus disease (COVID-19) in emergent hotspots: The example of Hokkaido, Japan during February-March 2020*. <https://doi.org/10.1101/2020.04.24.20077800>.
- Amen, K., Mahmood, K., Shabu, S., & Shabila, N. (2020). Exploring perspectives on COVID-19 behavior and control measures. *Journal of Risk Research*, DOI: 10.1080/13669877.2021.1936607
- Anderson, R.M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?. *The Lancet*, 395, 931-934. doi:10.1016/S0140-6736(20)30567-5
- Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D.Y., Chen, L. & Wang, M. (2020). *Presumed Asymptomatic Carrier Transmission of COVID-19*. JAMA 2020.
- Baye, K. (2020). COVID-19 prevention measures in Ethiopia: Current realities and prospects. *Research Report of the International Food Policy Research Institute*. Retrieved at <https://www.researchgate.net/publication/341321826>
- Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y., Qiu, Y., Wang, J. & Zhang, L. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. <https://doi.org/10.1186/s40249-020-00646-x>
- Dahlberg, K. (2006). The essences - the search for meaning structures in phenomenological analysis of life world phenomena. *International Journal of Qualitative Studies on Health & Well-being*, 1(1), 11-19.
- De Guzman, A. (2020). *Doing Qualitative Research in Education and Social Sciences*: University of Santo Tomas, Espana, Manila.
- Djalante, R., Lassa, J., Setiamarga, D., Mahfud, C., Sudjatma, A., Indrawan, M. & Surtiari, I. (2020). Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020. *Progress in Disaster Science*, 6, 1-9. doi:10.1016/j.pdisas.2020.100091
- Edrada, E.M., Lopez, E.B., Villarama, J.B., Salva Vilaarama, E.P., Dagoc, B.F., Smith, C. & Solante, R.M. (2020). First COVID-19 Infections in the Philippines: A Case Report. *Tropical Medicine and Health*, 48 (1). doi:10.1186/s41182-020-00203-0
- Gennaro, F.D., Pizzol, D., Marotta, C., Antunes, M., Racabulto, V., Veronese, N., & Smith, L. (2020). Coronavirus Diseases (COVID-19) Current Status and Future Perspectives: A Narrative Review. *International Journal of Environmental Research and Public Health*. doi:10.3390/ijerph17082690
- Harapan, H., Itoh, N., Yufika, A., Winardi, W., Keam, Te, H. . . . Mudatsir, M. (2020). A literature review. *Journal of Infection and Public Health*. doi:10.1016/j.jiph.2020.03.019
- Khan, T.M. (2020). Preventive and Control Measures of COVID-19 Patients: A Review. *Bangladesh Journal of Infectious Diseases*. 7(1), 41-44. <https://doi.org/10.3329/bjid.v7i0.46800>
- Lee, V.J., Chiew, C.J. & Khong, W.X. (2020). Interrupting transmission of COVID-19:

- Lessons from containment efforts in Singapore. *Journal of Travel Medicine*. doi: 10.1093/jtm/taaa039
- Maier, B.F., & Brockman, D. (2020). Effective containment explains sub-exponential growth in recent confirmed COVID-19 cases in China. doi:10.1126/science.abb4557
- Miller, D.A. (2006). *Pandemics*: Lucent Books.
- Naidich, J., Boltyenkov, A., Wang, J., Chusid, J., Hughes, D. & Sanelli, P. (2020). Impact of the Coronavirus Disease2019 (COVID-19)Q1Pandemic on Imaging Case Volumes. *Journal of the American College of Radiology*. <https://doi.org/10.1016/j.jacr.2020.05.004>
- Nicomedes, C.J., & Avila, R.M. (2020). *An analysis of the panic of Filipinos During COVID-19 Pandemic in the Philippines*. doi: 10.13140/RG.2.2.17355.54565
- Okoye, J. (2020). Attitudinal, regional and sex related vulnerabilities to COVID-19: Considerations for early flattening of curve in Nigeria. *Medical Journal of the Islamic Republic of Iran (MJIRI)*. Retrieved at <https://www.researchgate.net/publication/341767350>
- Qian, X. Ren, R., Wang, Y., Guo, Y., Fang, J. & Han, T.-R. (2020). Fighting against the common enemy of COVID-19: a practice of building a community with a shared future for mankind. *Infectious Diseases of Poverty*, 9(1). doi: 10.1186/s40249-020-00650-1
- Official Gazette of the Republic of the Philippines. *Republic Act Number 11469*. <https://www.officialgazette.gov.ph/2020/03/24/republic-act-no-11469/>
- Ryan, G. & Bernard, H. (2003). Techniques to identify themes. *Field Methods*, 15 (1), 85-109.
- Saurabh, K. & Ranjan, S. (2020). Compliance and psychological impact of quarantine in children and adolescents due to COVID-19 pandemic. *The Indian of Pediatrics*. <http://doi.org/10.1007/s12098-02-03347-3>.
- Seeger, M. (2006). Best practices in crisis communication: An expert panel process. *Journal of Applied Communication Research*, 34(3), 232-244.
- Statista (2020). *Coronavirus cases worldwide*. <https://www.statista.com/statistics/1043366/number-of-coronavirus-2019ncov-cases-worldwide-by-country/>
- Tuffond, L. & Newman, P. (2010). Bracketing in qualitative research. *Qualitative Social Work*, 11(1), 80-96.
- Wang, P., Lu, J., Yanyu, J., Zhu, M., Lingling, W. & Chen, S. (2020). Statistical and network analysis of 1212 COVID-19 patients in Henan, China. *International Journal of Infectious Diseases*, 95, 391-398.
- Wright, K. O. (2017). Content Analysis, Qualitative. *The International Encyclopedia of Communication Research Methods*, 1–9.



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