



Mitigation Practices of Local Water Districts (LWDs) in the Philippines during Covid-19 Pandemic

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ABSTRACT: This paper discussed the mitigation practices and challenges faced by Local Water Districts (LWDs) during the Covid-19 pandemic in terms of collection, consumption, water resource, human resource and accessibility of its services to continue promoting better service. The researchers applied phenomenological approach and utilized qualitative data gathering through digital forms and follow up interviews to the representative participants from the local water districts in the Philippines. This study is a joint effort in relation to the academe's function in terms of research to the industry. Its framework was anchored on the theory of change, vital to program success where managers can be better assured that their programs deliver the right activities toward the desired outcomes. Findings revealed that the LWDs have faced varied challenges where they fit their innovative practices. The use of technology is considered both a great help and challenge, depending on the category level of the water district. The researchers concluded that the LWDs focused on the welfare of their concessionaires, employees and upgraded their facilities, regardless of their financial capabilities. It was recommended that the management need to adapt technology, provide further innovative practices, and continue with information dissemination to the concessionaires.

KEYWORDS: Covid-19 Pandemic, Local Water Districts, Mitigation practices, Philippines.

I. INTRODUCTION

Water, sanitation and hygiene (WASH), the acronym used by the World Health Organization (WHO) plays a big role in the global health and welfare. In the study of Mara (2013), improved water supplies are needed to meet the target of both water and sanitation by 2.9 billion people in 2025. It is a common knowledge that both water and health are two precious resources linked to one another. Health is a sure way to alleviate poverty and water management is a powerful tool by individual and the global community in general, towards development. Adequate sanitation to protect health has been the recent call of the WHO, particularly during the time of pandemic.

According to the Center for Disease Control and Prevention (CDCP), COVID-19 is contagious and deadly, disproportionately affecting the elderly and those with chronic underlying diseases (Center for Disease Control and Prevention, 2020). That said, in March 2020, President Duterte has issued the proclamation No. 922 declaring the Philippines under the state of public health emergency and proclamation no. 929 that declared the nation as under the state of calamity due to corona virus disease 2019, otherwise known as COVID-19.

This paper is a joint effort in relation to the academe's function in terms of research to the industry. In the paper of Vea (2013), he cited examples on how the academe may help another industry. Accordingly, some scientific researches done by government agencies are intermediate in character and classified under both basic and applied researches. Despite the type of research, they have common objective which is to resolve issues on broad national concerns. During the pandemic, the health concern is not only an individual but global issue, related to one of the most important entities among others, the use of water.

This paper considered the standard definition of LWD as provided by the Local Water Utilities Administration (LWUA). It defines water district as a local corporate entity that operates and maintains a water supply system in one or more provincial cities or municipalities. It is established on a local option basis and classified as a government-owned and controlled corporation or GOCC. It is managed by a five-man Board of Directors through a General Manager.

Along the said area, the researchers aimed to present the challenges met by the local water districts in connection with the limited mobility caused by the above cited presidential declaration. Moreover, the paper traced the journey of the water providers and its management system in coping with the health and water crisis. The data covered nine months, from March 2021 when the



Philippines was placed under the state of calamity, until December 2020. This paper also considered the ideas of Obal & Gao (2020), who opined the importance of management practices and relationship to be aligned or flexible in disruptive times, such as the time of pandemic. Furthermore, this paper also aims to instill awareness on the needed support from various agencies to cater better water supply, delivery and use.

II. OBJECTIVES

This paper aimed to present the mitigation practices applied by the Local water Districts (LWDs) of the Philippines during pandemic. Specifically, this paper intended to: (1) Identify the challenges met by the LWDs during quarantine time in terms of collection, consumption, water resource, human resource and accessibility of its services; (2) classify appropriate management practices applied during quarantine period; and (3) recommend possible measures for continuous delivery of quality service.

III. METHODOLOGY

This paper applied phenomenological approach as appropriate in the data of the study. Hojman, & Asenjo, (2020) considered the use of time evolution of the parameters that produce the total structure of the pandemic. The phenomenological dynamic of COVID 19 was considered as adjustment parameters. This paper utilized qualitative data gathering through digital forms and follow up interviews to the representative participants from the local water districts in the Philippines. They were done to validate the written responses provided on the questionnaires. Thematic analysis was employed from the solicited responses. The responses came from water districts from the islands of Luzon, Visayas and Mindanao. The questionnaires in google forms were disseminated to the email addresses of the target participants with the help of the secretariat of the Philippine Association of Water Districts (PAWD).

Theoretical Background

This paper is anchored on the theory of change as discussed by Serrat, (2017). The said theory is vital to program success where managers can be better assured that their programs are delivering the right activities for the desired outcomes. The creation of a theory of change hopes to come up with programs that are easier to sustain, bring to scale, and evaluate. The same theory was also utilized by the Max Foundation which integrated Max-WASH program founded in 2005 by La Pool couple who lost their son from a viral infection. The goal of the foundation is to safeguard the health particularly of children and women, against community viral health threats. One of the approaches is the community strengthening by allowing the members to be involved in the process. Hence, the aim is to solicit behavior change through raising awareness and education.

Alongside the theory of change, the WHO 's idea on strengthening health leadership and management was also considered in this paper. "Good leadership and management are about providing direction to, and gaining commitment from partners and staff, facilitating change and achieving better health services through efficient, creative and responsible deployment of people and other health resources" (WHO/EIP/health systems/2005.1). Furthermore, this paper delved on the management side of the water providers and how they have sustained the crisis during the quarantine period.

IV. RESULTS AND DISCUSSIONS

It is imperative that every unit or organization, despite its size must have a contingency plan to respond in a certain situation. This idea holds true in every local water district in the Philippines. This paper discussed the responses from 30 local water districts, divided into three groups, Luzon, Visayas and Mindanao. Furthermore, they are grouped into four categories.

The graphs below present the distribution of the water districts in terms of their locale, or from what island in the Philippines they come from. Likewise, the distribution of categories are also shown on the figure s below.

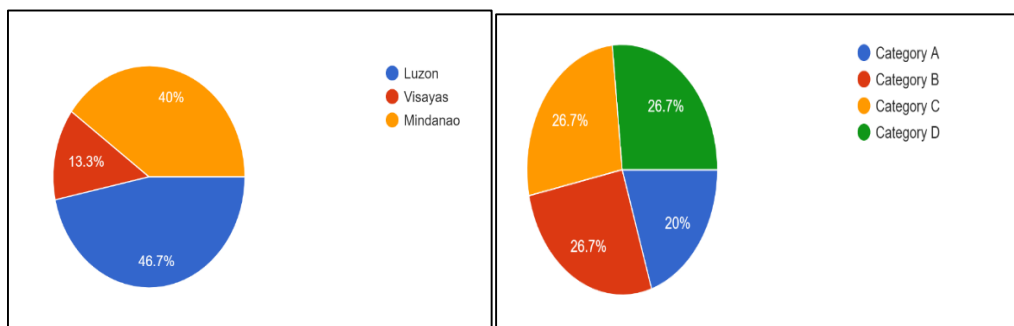


Fig 1.

Distribution of participants based on locale

Fig 2.

Distribution of participants based on Category

As presented on the graph, there were 30 participants from the water districts nationwide. There are 14 water district-participants or 46.7%, being the biggest among the three islands in the Philippines. It was followed by 12 water district-participants which is equivalent to 12% from Mindanao. There is 13.3% or four water district-participants from the island of Visayas.

The 30 participants are also grouped into categories. There are eight LWDs or 26.7% responses from each of the three categories. The 24 water districts belong to categories B, C and D while under the category A, only 20% or 6 local water districts provided their responses.

Originally, based on the Water District Manual on Categorization, from 1997 to 2011, water districts were classified into six categories, described as small, average, medium, big, large and very large. In 2011 however, the said manual was revised by the oversight committee on local water districts. The committee was comprised of the LWUA, Civil Service Commission (CSC), Department of Budget and Management (DBM) and the PAWD. The revision resulted to the reduction of the number of categories from six to four. The revised and current categories were based on the number of service connections and point rating. They are identified as A, B, C and D with the primary service objective to target increased number of concessionaires.

Furthermore, the categorization is a two-step process. The initial stage focused on the number of active service connections. The category A should have at least 30,000, category B with at least 10,000, category C with at least 3,000 and the category D are those districts below 3,000. Meanwhile, the second stage considers four factors. They include gross revenues, total assets, net income before interest and depreciation and staff productivity index. The last item based on categorization explains that the final category is the result of point-rating category compared with the service connection category, whichever is lower (www.lwua.gov.ph).

1. Challenges of the LWDs during pandemic

This paper considered four types of challenges that the local water districts met specifically during pandemic. They include challenges on collection, water resource, human resource, and challenges on the accessibility of services. Each type of challenge was discussed separately.

1.1 Challenges on Collection

The term collection refers to the payment made by concessionaires based on their actual consumption. It also includes income from new connections and other relevant services provided by the water districts.

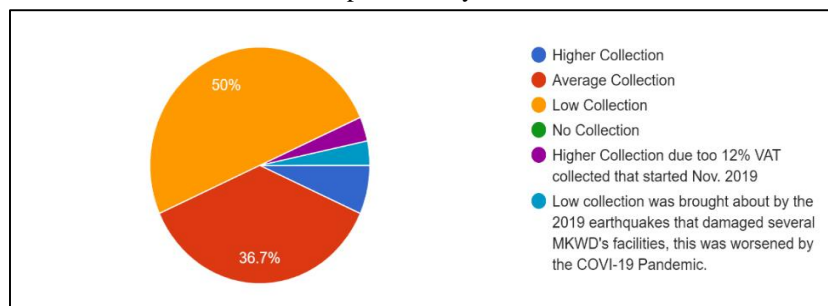


Fig 3. LWDs type of collection during pandemic (Apr-Dec, 2020)



The figure shows that most of the LWDs had low collection from April to December, 2020. Fifty percent or 15 water district participants claimed that they have low collection. On the other hand, there were 11 LWDs equivalent to 36.7% of the participants whose collection remains on the average.

Moreover, two water districts reasoned out that their low collection was affected by earthquake that damaged their facilities. Despite pandemic, another two districts had higher collection which was traced on the 12% Value Added Tax (VAT) which started in November, 2019. These two water districts, however, have shifted to private operation, hence they imposed the 12% VAT. All the other LWDs are considered non-profit Government Owned and Controlled Corporation (GOCC) which do not impose additional tax on their services.

The national government launched the *Bayanihan to Heal as One Act*, also known as the Bayanihan Act, officially designated as Republic Act No. 11469. It is a law enacted in March 2020 granting the President additional authority to combat the COVID-19 pandemic in the Philippines. It was reinforced with Republic act 11494 *Bayanihan to Recover as One Act* approved on September 11, 2020. The said law adheres to the general welfare of the Filipinos and to promote resiliency in various aspects including socio economic relief. With adherence to the said law, The LWDs in turn employed leniency on their policies, especially on the charging of penalties. That said, this explains why most of the LWDs faced the challenge of low collection.

The above cited facts were mentioned in the paper of Siar (2021) who discussed the implications of CoVid-19 to both people and businesses, which urged the government to innovate and build measures on resilience. The said idea also supports Cuenca’s (2020) review of the *Build Build Build Program* and its implication on the Philippine development plan for 2017-2022.

1.2 Challenges on Water Resource

Water resource specifically refers to the type of sources of water being supplied by the local water districts. The onset of pandemic specifically in the Philippines was in the month of March, 2020. It is considered a dry season where water sources like spring, pumping station and even bulk water supplies face depletion. The months of March, April and May are hot season, which coincided with further need of water use in observing hygiene and the imposed health protocols of the government through the (Inter-Agency Task Force (IATF).

It can be noted on the graph (figure 4) that 15 LWDs participants had higher consumption. Meanwhile, ten LWDs had the same or average consumption and 4 had low consumption. Only one considered that the reason of their low consumption is the refurbishment of 20% of production facilities in 2020. The idea of higher consumption and the use of water was discussed by Hannah, Lynch, Mao, Miller, Young, & Krause, (2020). Their study acknowledged the fact from United Nations International Children’s Emergency Fund (UNICEF) that millions of people lack access to the availability of water needed to wash or sanitize their hands. They further presented the ratio of households across 23 sites in 20 low-and middle- income countries who have problems on water access for handwashing.

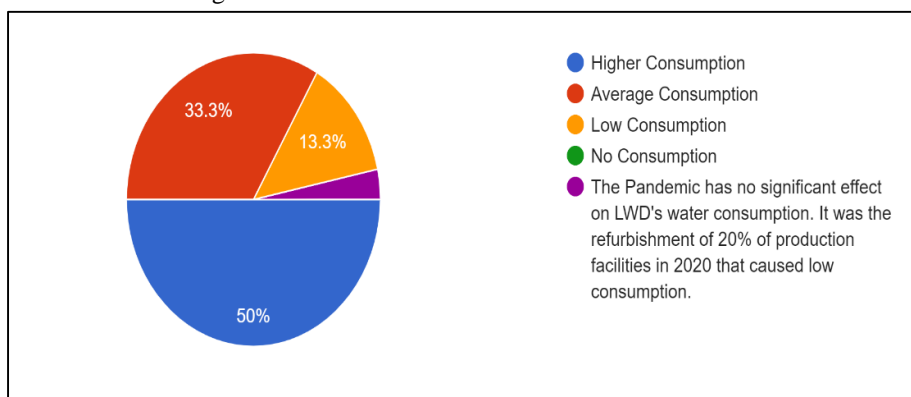


Fig 4. LWDs type of Consumption during pandemic

With the status of LWDs on water consumption, one of the challenges is the source of water. The graph below, (fig, 5) presents the survey on the 30 LWDs in the Philippines. It is good to note that there are 18 LWDs which has no change in their supply. Most of these LWDs fall under categories A and B because they have already established water facilities. There are five LWDs with increased water supply that can be traced back on their other water resources like water treatment facilities.

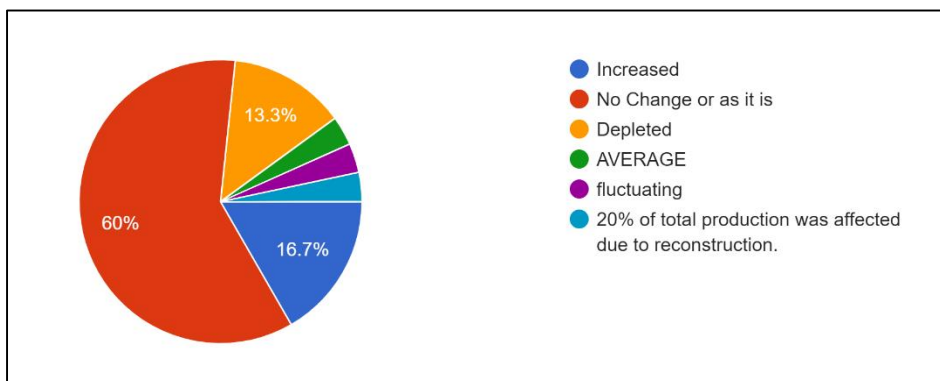


Fig 5. LWDs status of water source/supply during pandemic

On the other hand, four LWDs were significantly challenged with the depletion of their sources. One LWD has average supply, and one has fluctuating supply while another considered that 20% of total production was affected due to reconstruction of their water source. The data also show that water source should be on top of the concerns of the community. That said, the study of Britto, Maiello, & Quintslr (2019) revealed that access to potable water is considered one of the human rights and should be on top priority on an international stage. Moreover, a recent cross-sectional study in India by Bauza, Sclar, Bisoyi., Majorin., Ghugey, & Clasen, (2021) confirmed that there are challenges on water, sanitation, and hygiene practices during the COVID-19 pandemic. It is the same with the study of Nwobodo, & Chukwu (2020) which focused on factors of water supply in rural communities during the Covid era. They concluded that volume of water use for personal hygiene significantly affected the supply.

1.3 Challenges on Human Resource

In this paper, human resource refers to the manpower services that the local water districts have. It covers the idea of the personnel support in the office and staff assigned in the field.

Shown on the graph (Fig. 6) is the status of the 30 local water districts during pandemic with regard to their manpower resources. There were 14 local water districts equivalent to 46.7 % of the participant water districts that did not have any hiring. Despite pandemic, there were 11 or 36.7% of the participant water district which hired additional personnel. Meanwhile, there is one water district who had retrenchment.

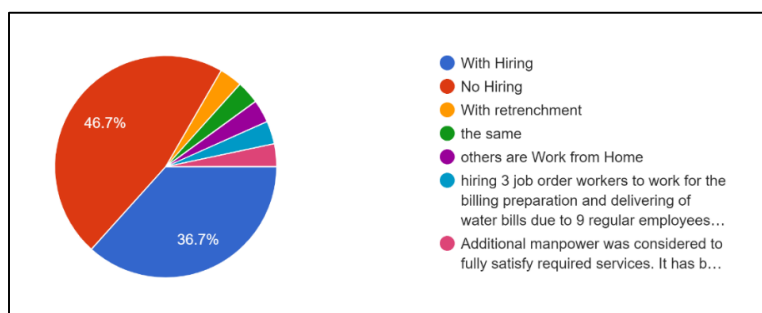


Fig 6. Status of LWDs manpower resources during pandemic

Other water districts shifted to work from home scheme, hence retained the status of no hiring. The management took advantage of the technology to continue the operation and delivery of service of the employees while at their respective homes. When asked for the justification of hiring amidst pandemic, it was traced back to the need of additional personnel to work on the preparation and delivery of bills when several regular employees were under quarantine. These water districts are under the categories C and D that digitized system and technology such as internet and telephone services were not applicable to reach their concessionaires. Based on follow up interviews, the main reason, however, is the lack of funding. There are LWDs under categories C and D with available technology in their areas yet cannot afford to finance the installation. Moreover, another water district revealed that not enough budget can accommodate the job orders, thus the retrenchment.

The mentioned challenges on human resources are deemed related to the study of Draghici (2020) who discussed the changes and challenges of human system management during and after the pandemic. The study mentioned the condition of the work force during pandemic and what could be the adjustments and tasks during the new normal. This is how the researcher commented on challenges on human resources and management.

The changes in the working environment are probably beyond ones' prediction. For employees who are still working, human resource managers are trying to keep them productive, motivated, engaged and connected – all factors that are moving targets in the new normal (Draghici ,2020 p. 469).

Moreover, the study of Zhong, Li, Ding, & Liao (2021) explored the risk management on emerging human resource issues during covid-19 across 13 industries. The researchers identified “nine major emerging HR issues including employee wellbeing, a flexible workforce, remote work, job loss, human capital, training and development, leaders, performance and communication” (Zhong, Li, Ding, & Liao, 2021 p. 222).

1.4 Challenges on the Accessibility of its Services

The accessibility of services refers to how the local water districts continue to reach out their concessionaires despite the limited mobility, lockdown and various types of community quarantines imposed in their areas. The graph (fig. 7 shows the status of the accessibility of the local water districts during pandemic.

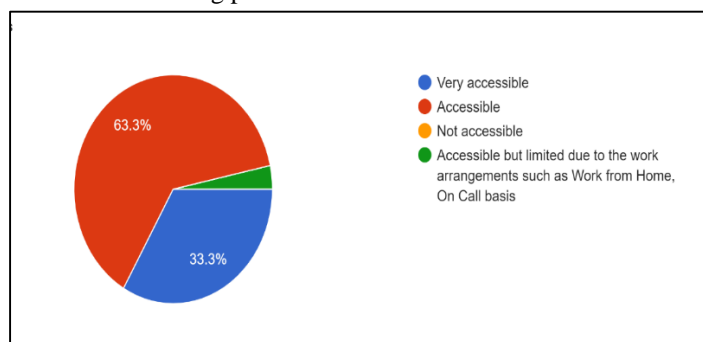


Fig 7. Status of LWDs accessibility of its services during pandemic

Based on the survey and interview conducted to the participant water districts, 19 of them assured that their services are *accessible* despite the pandemic. Ten of them responded that they consider their services *very accessible*. Only one responded with limited accessibility due to the work arrangements of personnel.

It can be explained that these LWDs considered innovative strategies such as the use of technology. Those in categories A and B offered digital or online bills payment while others developed and implemented text billing inquiry and sent bill statements through short messaging system (SMS). There are also others which utilized social media platforms to disseminate information, announcement, and contact tracing.

Although the LWDs continued to provide service, one of the challenges, however, is the suspension of regular testing of water samples for bacteriological test. It was posed as a problem to other water districts, particularly on categories C and D since there was no available transportation and they do not have company service vehicles, either. During the interview, others lamented on the process of procuring documents needed as travel pass. Furthermore, they also identified problems on the submission of documents that need approval and signature of officials. To name some, these transactions include liquidation reports to the Commission on Audit (COA), environment permits from Department of Environment and Natural Resources (DENR), documents for submission to the Department of Budget and Management (DBM), and to request permits from the Philippine Drug Enforcement Agency (PDEA) to utilize chemicals in the water treatment operation.

The above discussed issues are related the idea of Shi, Jang, Keyes, & Dicke (2020) who studied continuity of nonprofit service and response during pandemic. They considered that sectors may innovate services adaptable to the challenges. In like manner, Desye (2021) recommended that countries need to expand their investment in water, sanitation, and hygiene (WASH) services as an important mechanism in mitigating the COVID-19 pandemic.



2. Management innovative practices during Covid-19 Pandemic

Every organization needs to assure good management practices for sustainability and better delivery of service. The innovative practices during quarantine period brought by the covid-19 pandemic of the LWDs are categorized into three. They are the *practices intended for the concessionaires, the practices to promote welfare of the employees and the innovations done in their facilities* to continue their service despite pandemic. Furthermore, each group has identified themes which are presented on the next table.

Table 1. Themes of LWDs’ management practices

• Concessionaires	• Employees	• Facilities
1. Leniency or consideration on policy	1. Strict compliance to health protocols	1. Provision of health-related facility
2. Innovative Practice on billing and payment	2. Implementation of Skeletal force/ Work from Home (WFH) Scheme	2. Purchase of in-house test kits
3. Implementation of health protocols	3. Digitalized processes	3. Advancement of Facilities on Technology
4. Extended Services	4. Allocation of compensation and additional support	
5. Use of social media to reach out to the concessionaires.	5. Ease of transportation and transactions	
	6. Inclusion of reserve and health fund in budget planning	

2.1 Innovative Management Practices for Concessionaires

The innovative management practices of the LWD participants intended for the concessionaires have five themes. They are presented according to rank based on the number of LWD which innovated the practice. The *leniency or consideration on penalty* is the top among the themes. Most LWDs allowed deferred and installment/staggered payment of water bills through the policy approved by the Board of Directors. They also suspended disconnection of delinquent connections and in general, they imposed the “no disconnection and no penalty policy”.

The second theme is considered related to the first theme, however, focused specifically on the *innovative practice pertaining to billing and payment*, rather than penalty. With the series of imposed community quarantines nationwide, the LWDs implemented online payment, aside from the traditional manual collection. They partnered with collecting agents and offer online collection through different portals such as GCASH, ECPay, and LBP Bizlink. The water districts also used short messaging system (SMS) or send bill statements through text messages to their concessionaires.

The *implementation of health protocol* landed as third in rank among the five themes. The LWDs adhered to strictly implement the health protocols based on the IATF guidelines. The wearing of face masks, use of alcohol for disinfection, observance of social distancing and washing of hands are posted as reminders in the front doors and vicinity of the water districts. To properly observe social distancing in small spaces, they installed roofed queuing areas with chairs and floor markers outside of the building. One LWD built a customer comfort room with separate cubicles for male and female.

Moreover, *extended services* and *use of social media to reach out to the concessionaires* are the last two themes of LWDs’ innovative management practices. Some water districts opted to provide water truck delivery in far flung service areas. They also implement rotational water supply to ensure the continuous supply of the water districts with problems on the source of water. The use of social media platform to reach out to the concessionaires is an avenue for information dissemination as well as contact tracing. The water districts activated FB page and assigned personnel to cater the concerns of their concessionaires.

It can be inferred that the five themes on innovative management practices intended for the concessionaires are focused on how the LWDs may help continue their safe and quality service in providing water supply amid pandemic. The consideration of staggered payment and no penalty policy are helpful in both financial and health aspects. In addition, the compliance to the health protocols,



provision of extended services and innovation of social media as means of communication also validated the fact that LWDs are responsive to their respective visions and missions.

The innovative management practices intended for the welfare of the concessionaires are likewise applied in the study of VanderWerf, Bernard, Barta, Berg, Collins, Dowdy & Wibberly (2021). Their paper focused on pandemic action plan policy and regulatory summary specifically on the implementation of health services. They studied on how to make health care service more efficient and more convenient during pandemic. The provision of policies on tele health and its regulation are the same with the LWDs' management innovations to provide service to their concessionaires.

2.2 Innovative Management Practices for the Employees

There are six themes under the LWDs' innovative practices for the employees. They are ranked based on the frequency of response under each theme. The management adjusted the work scheme of the employees but prioritized their health concerns. The first theme is the *strict compliance to the health protocols*. Aside from wearing of face masks, social distancing and sanitizing the hands through washing with soap or water or with alcohol, thermal scanning upon entry is also practiced. Most of the water districts closed the office and opened only their windows covered with plastic sheets and the teller and desk personnel wear gloves. They also schedule a day to disinfect their offices at least once a week. Another innovative practice related to the theme on health protocol is the additional office policies on the prohibition of unnecessary gathering, sharing of food and utensils. It is noteworthy to mention that some water districts can provide their office employees supplies from gloves, face masks, face shields, and alcohol. For those who work in the field, they supplied washable personal protective equipment (PPE) and hazmat suits. In addition, vitamins were also supplied to all employees to boost their immune system. This is true to all water districts regardless of categories where they belong.

The second theme refers to the innovation on the implementation of *skeletal and work-from-home (WFH) scheme*. The management adopted alternative work arrangements based on CSC rules and allowed 50 % of their office staffs to continue working from their homes. Other water districts implemented shorter hours and categorized the staff by teams. There is a schedule set per group or teams when they will report for work in the office. Another innovation is the training of at least 75% of the employees to perform different roles, from field to office works. The water districts who belong to categories C and D needed to assure that every employee knows about plumbing, meter reading & bill tending, water meter accuracy testing, working as cashier, and customer service at the front desk. The main intention is to provide continuity of service even with the new work scheme and lesser staff available on site and in the office.

With the new work arrangements, the LWDs considered the application of technology, hence the third theme is the *digitalized processes*. The management shifted to online or virtual meetings, not only of the employees' but also of the board of directors' meetings. There are also online trainings and submission of documents are allowed to be done online, through electronic mails (e-mails) to limit physical interactions. Various platforms were utilized like Zoom and Google meet. Messenger groups were also created for easy communication through group chats between the management and staff, aside from the traditional call and text communications.

Most of the water districts *provided compensation and additional support* to their employees, which is the fourth theme. Those who belong to categories A and B granted hazard pay to their employees who worked during enhanced community quarantine (ECQ). Some LWDs in the categories C and D could not afford the grant of such additional pay because of lack of funds.

Some LWDs provided vehicle support to their commuting employees in going to and from the office. They also paid couriers to take their payments to suppliers, pick up purchased and deliver their documents. These responses belong to the fifth theme which is *Ease of transportation and transactions*. The said innovations are usually practiced by those in category A and some from category B and D. They could afford the expenses on the transportation and delivery services unlike those in category D.

The sixth and last theme is the *inclusion of reserve and health fund in budget planning*. Some water districts have included the budget for the procurement of covid vaccines and budget for their infrastructure for isolation facility or containment center. Some have allocated a reserve fund for salaries equivalent to the 10% of the monthly gross receipts.

The above cited management innovations on the *inclusion of reserve and health fund in budget planning* are mostly true to the water districts in categories A and B. They can afford to allocate budget for the construction of their own isolation facility and budget to purchase vaccines if the IATF policy would allow. Meanwhile, the innovation to allocate a reserve fund are applicable



to the other categories to assure sustainability of operation and their funds would not be hampered due to the crisis brought by the pandemic.

The study of Howe, Chauhan, Soderberg, & Buckley (2020) on their study on the paradigm shift of companies during pandemic is relevant to the presented innovative management practices of LWDs to their employees. The cited study presented the long- term effect caused by the drastic changes brought by covid-19. Moreover, the innovative practices also find ally in the paper of Assaad & El-adaway (2021) on their study of best practices and impacts on the guidelines for responding to covid-19 pandemic.

2.3 Innovative Management Practices related to Facilities

There are three themes that surfaced under the innovative management practices pertaining to facilities of the LWDs during the pandemic. They are presented based on the number of responses where the themes were generated.

The first theme is *health related facility* where the management innovated to install facilities like lavatory at the façade. The employees and concessionaires need to wash their hands before they get inside the office. Most of the LWDs installed barrier inside the payment section that served as sneeze guard in the cashier or teller window. Moreover, other LWDs ensured delivery of water service through rehabilitation of pipes in the quarantine facility. In addition, those who could afford provided own quarantine facility of their employees.

It is important to consider the quality of water that the LWDs provide, hence the second theme is *the purchase of in-house test kits*. During pandemic, there were concerns on transportation to bring water sample for testing to, thus, some water districts opted to purchase their own physical and chemical test kits. Every water district needs to test their water regularly but not all have easy access to the DOH accredited laboratories where bacteriological and microbiological tests could be done.

The last theme is the *installation of technology* which main purpose to is cater access of files or data through remote access. Some LWDs hired IT personnel to digitize their files and allow access from the office. This action paved the way for the employees who were on the WFH scheme to continue their work with ease. This allowed continuous business transactions with minimal health risks.

The three identified themes under the innovative management practices of the LWDs with respect on their facilities during the pandemic finds ally in the study of Ali (2021). The paper focused on the model of working from home facilities during pandemic situation. It is the same with the study of Putri, A. V., & Irwansyah, I. (2020) who delved on the communication patterns and media technology roles.

3. Recommended possible measures to continuously render quality service

The LWD participants in this paper also considered some recommended possible measures to continuously provide better and quality service. These are apart from the innovations made during pandemic, intended for the benefit of the concessionaires, employees, and their facilities. There are six themes arrive at, which includes recognition of LWDs as a significant entity, use or adoption of technology, adherence to health protocols, awareness campaign and active social responsibility, proper employee management and efficient budget planning. These themes are presented on table 2 arranged according to rank based on the number of responses per theme.

Table 2. Themes on recommended possible measures to continuously deliver quality service

• Themes on LWDs' possible measures	• Sample responses
1. Recognition of LWD as a significant entity	<ul style="list-style-type: none"> • -Include water district as front liners, and part of any program conducted by the government. • -The water district should have linkage to the LGU programs.' • -The regulatory agencies should help and allow LWDs to have easy access on their reserve funds, so that employees may receive remunerations on time and the agency can operate normally even during crisis. • -There could be a common written mitigating practices and must be part of the "water safety plan"



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| 2. Use or adoption of technology | <ul style="list-style-type: none">• -The system of the LWDs must be digitized.• -There should be stronger internet connectivity for employees who are under the WFH scheme.• -Provide alternative mode of payment, online payment even on post pandemic times.• -Shift to virtual seminars or conferences |
| 3. Adherence to health protocols | <ul style="list-style-type: none">• -Continuous implementation of health protocols.• -there should be better coordination among enforcers, health experts and the agency head.• --Provide health and safety programs and policies, including weekly office disinfection and schedule of vaccination. |
| 4. Awareness campaign and active social responsibility. | <ul style="list-style-type: none">• -Conduct of more webinars by accredited LWDs regional training centers.• -Informative presentation through various type of media accessible by the concessionaires. |
| 5. Proper employee management | <ul style="list-style-type: none">• -Always consider policies on employees' morale.• -Train every employee to be able to undertake the responsibilities of their co-employees when need arises.• -Promote and facilitate personal preventive practices |
| 6. Efficient budget planning | <ul style="list-style-type: none">• -Always have ample cash back up.• -Stock up essential materials as preparation against slow and process of procurement.• -Allocate enough budget for IT equipment, internet connectivity and other technology related expenses. |

Among the six themes that surfaced from the responses, it is the recognition of LWD as a significant entity that most of the participants chose. It is a common knowledge that water is one of the community's basic needs, with or without pandemic.

During this health crisis when everybody needs more water for sanitation, they believed they could have been a part of the Inter agency Task Force (IATF). It was originally created in 2014 through Executive Order No. 168, intended for the management of emerging infectious diseases in the Philippines. Along with this theme, they also recommended that the regulatory agencies could have allowed the LWDs to have bigger emergency funds and easy access for the continuous normal operation amidst pandemic times. Other recommendations include, that the LWDs could have a common mitigating practice, written under the "water safety plan" and the LWDs should have access, and linkage with the LGU's programs.

The use or adoption of technology emerged as the second theme. All the LWDs agreed that technology such as digitization of their system from billing to collection and even in the operational management, kept them afloat during the new normal.

Of the mentioned recommended practices related to the adoption of technology, it is the alternative mode of payment that most of the research participants considered. They believed that it prohibits the exposure of those in the field assigned to billing and collection of payment. It also protects their concessionaires by giving them options to be notified of their bills and paid for them at the security of their houses. Moreover, they recommended that the system be digitized and could be accessed by the employees at home. There are, however some LWDs which have problems on their internet providers and strength of bandwidths on their areas which posed as problems to those employees who need to be on a work from home scheme.

The third and fourth themes are adherence to health protocols and awareness campaign and social responsibility. These two were recommended with the idea that when the LWDs followed the basic health guidelines or protocols, it could be enough to combat the virus. Alongside, when they implement and help promote awareness campaign of helping the community, it would also mark their role in the society. Furthermore, the fifth and sixth themes were proper employee management and efficient budget planning. It therefore lies on the management of human resources and financial aspects that the LWDs may continue to serve its purpose despite the health crisis.



The six themes would imply that the LWDs sought considerations from the authorized officials in their community as well as the regulatory agencies. The main purpose was to consider their needs so that they may provide full service to the community. The themes of the recommended possible measures of the LWDs also aimed to continuously deliver quality service during the post-covid context. The discussed ideas find ally in the paper of Katz, Jung, & Callorda, (2020) which assessed the role of digitization in mitigating damages brought by the Covid-19 pandemic. The study presented that digital infrastructure may help combat the negative effect on the economy of various countries. Likewise, the idea on resilient water-food-energy systems as discussed by Daher, Hamie, Pappas,, Nahidul- Karim, & Thomas (2021) also suggests recognition of the important factors towards understanding the impact of pandemic.

V. CONCLUSIONS

The LWDs in the Philippines have faced varied challenges in terms of collection, water resource, human resource, and accessibility of its services. Although it was regardless of category where the LWDs belong, it can be concluded that those in the smaller groups that were mostly hit. Regardless of the island where the LWDs were situated, they all shared the same sentiments on the results of limited mobility. The management practices were dependent on the location of the LWD and the available resources. Most of those in the big categories were in the urban areas, hence the digitization and adoption of technology did not pose a problem. In terms of their recommended possible measures to continuously deliver quality service in the post pandemic setting, they all agreed that the agency could be given recognition as an entity which is a vital part of the community. In addition, adoption of technology helped in their adherence to the basic health protocols without posing as a hindrance in the delivery of their services to the concessionaires.

VI. RECOMMENDATIONS

The researchers recommend that every agency may instill awareness of mitigating measures against any crisis. There could be a common ground of preparation with the involvement also of all the concerned agencies related to utilities like electric and water providers. Proper coordination with the local communities could also lessen the negative impact brought by the pandemic. Moreover, it can be suggested that the adopted technology and digitization employed during the new normal be continuously improved and applied in the post-pandemic period.

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