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### 5 H V H D Q I F W K R G V

#### 5 HM DUFK REMFW

This study aims to identify challenges faced by water supply companies during the COVID-19 crisis and examine the managerial, organizational, and technological measures adopted to overcome these challenges. Focused on SAWACO Water Supply Corporation and its subsidiaries in Ho Chi Minh City, Vietnam, the study involves directors, managers, and both field and office staff. Data is collected through a mix of primary sources, including surveys and interviews with staff, and secondary sources such as journals, articles, textbooks, working papers, research reports, and annual reports related to crises, management, and company transformations. The study aims to provide concise insights into how water utilities manage crises, particularly amid the unique challenges posed by the COVID-19 pandemic.

### 0 HMRG

The research utilized a qualitative approach, with data gathered through in-depth interviews. Forty interviews were carried out, involving 20 employees, 10 managers, and 10 directors from SAWACO and its subsidiaries. Following the framework proposed by [6], the interviews ceased once data saturation was achieved after 40 participants, signifying no new insights were obtained. To further validate this, the researcher conducted an additional five interviews, confirming the absence of novel information.

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Data were collected over a three-week period in August 2023, with each interview lasting between 15 and 30 minutes. All interviews were recorded using a single recording device and subsequently transcribed verbatim. The study will adhere to ethical standards, ensuring participant anonymity and confidentiality. Prior to conducting interviews, the researcher will seek permission from interviewees to record the session, clarify the purpose of the interview, and provide the final recording for their confirmation. Any unclear or suspicious content will be addressed with the interviewee at the conclusion of the interview.

The semi-structured interviews encompassed various topics concerning the responses of employees, managers, and directors in water utilities, along with the challenges encountered and strategies employed during the Covid-19 pandemic. For instance, questions included, "Could you briefly outline your role/position?", "What difficulties did your company/department/personnel face during the pandemic?", "What advantages did the company possess in responding to the epidemic?", "What operational changes were implemented by the company during the pandemic?", "How was coordination and communication P DDDJHGDFURW/GIITHQV/SQW/HQWRUMDP/VGULQJ VHFUMLV' ' LGVH SDGGP LIF H SRVH DQ (RQ)WDDGQJ Z HNDQWVH/RU JDSV LQ VHF FRP SDQ V RSHUDMRQ/RU P DDDJHP HQV ) ROZ LQJ VHF SDGGP LIF KD/ VHF FRP SDQ VVHQJ VHQG RU LV LVWMD JUDSSDQJ Z LK VHF D'WUP DK' &RXG \ RX RI HU UFRP P HQGMRQ/ VR VHF FRP SDQ LI DQRVHU HSGP LIF Z HUH VR RFFXU 7KHV LQTXLWH/ DUH JURXGGHG LQ VHF RUIH/ RI FULV P DDDJHP HQV @DSDMRQ DGUFRYHU > @

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Interview data were meticulously collected from each organization and subsequently analyzed manually. The researcher conducted multiple readings, meticulously analyzing the interviews to identify recurring patterns, which were then organized into thematic categories. Phrases and words pertinent to the research were meticulously highlighted and selected for further examination. Noteworthy topics that emerged from the examination of interview data included: (a) the impact of the crisis, (b) measures implemented for operational continuity and employee welfare, and (c) the organization's resilience in recovering from the crisis.

To ensure the rigor and accuracy of the data, reliability and confirmability criteria were rigorously applied. Validity of the data was assessed through a triangulation strategy, involving input from water industry executives and experts. Additionally, semi-structured interviews, along with meticulous notetaking during interviews and data collection from water companies, were utilized to corroborate the findings. Initial study findings and

thematic analyses were presented to experts for feedback. Furthermore, key segments of the data were reviewed by water company managers who were not directly involved in the interviews. The evaluations and results gleaned from the interviews consistently aligned, affirming the reliability of the findings.

## 5 H V X O W

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#### 3.1.1 Construction and water supply

The COVID-19 pandemic has exerted a significant impact on the water supply industry, particularly in major urban centers. A primary concern revolves around the challenges encountered in repairing damaged water pipes, exacerbated by staffing issues due to the implementation of social distancing measures. Consequently, the company's projects have experienced delays.

*Expressing his perspective, a construction worker stated, "While the preventive measures against disease have been instrumental in safeguarding my health, my colleagues and I have encountered several challenges during our work. Wearing protective gear and masks during construction not only makes us uncomfortable but also diminishes our productivity."*

Furthermore, unresolved issues with the pipelines have led to employees facing negative feedback from customers, causing the customer service department to receive complaints related to pipeline issues.

#### 3.1.2 Psychology and health

Additionally, workers are also grappling with psychological and health issues during this period. The complex nature of the epidemic has led to confusion and has taken a toll on the morale of both officials and employees. The COVID-19 pandemic has presented challenges across all fronts for companies and workers alike, necessitating measures to mitigate its impact.

*One employee expressed, "I feel extremely concerned about my health and that of my family, as the epidemic has claimed numerous lives. This has made it challenging for me to concentrate and work effectively."*

*Sharing a similar sentiment, a manager disclosed, "Our company tragically lost an employee to the epidemic, which has left us deeply worried and saddened."*

#### 3.1.3 Finance

Fortunately, the crisis did not cause a significant financial impact on SAWACO and its subsidiaries. The main reason is because water is an essential product and everyone uses it, so the company's business activities are not stagnant. Furthermore, revenue increased significantly as people stayed home and used more water, ensuring a stable revenue stream for the company.

*Company leaders shared: "We are very lucky because the product we provide is water - an essential product that everyone uses, so we do not face many financial difficulties during the epidemic season."*

Overall, SAWACO and its subsidiaries have effectively managed the financial impacts of the crisis by taking advantage of the essential nature of water supply services, making positive contributions to the community.

*A director said: "The water supply company is currently not growing significantly in the number of customers because this number has stabilized or only increased slightly. Therefore, efforts are being made to enhance the company's reputation in the perception of customers."*

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### 3.2.1 Change working methods

During the COVID-19 pandemic, SAWACO prioritized addressing operational challenges by switching from working in person to working online. This transformation mainly applies to office departments. For field work and water supply activities, the company has implemented shift scheduling to reduce the risk of exposure and transmission.

*A person who went directly to the field during the epidemic season shared: "Ten employees will work at the company for two weeks, then personnel will be rotated."*

Field workers will stay and live on the company campus, and meals will be provided by the company. In case of illness, they will be immediately quarantined, and replacement will ensure smooth operations.

*A manager said: "I worked at the company for two weeks, the company provided us with protective equipment, hand sanitizer and food during our time working at the company. Every time a new employee comes in for a shift, we are given a health check to avoid infecting everyone."*

To ensure smooth operations during the pandemic, weekly meetings were held between the board of directors and managers. Employees and managers will work and exchange information daily. Emergency information will be updated during emergency meetings. For partners, leaders will arrange a meeting time based on the company's operating situation. All meetings are conducted online to avoid problems related to disease spread.

*The company director shared: "Every week we hold internal meetings to update and announce the week's tasks, helping us capture information and disseminate work within the company effectively."*

During the pandemic, water use in businesses decreased significantly due to business and service shutdowns, while water use in households increased significantly. Furthermore, water companies have difficulty recording water meter readings due to social distancing orders. With technological advances, companies can record water meter readings for certain households using smartphones. Additionally, water companies partner with services such as e-banking or water bill collection services to enable online water bill payments. For households without smartphones, water companies must use measures to estimate water consumption. This leads to significant differences in meter readings.

*A director said: "We have increased the application of technology in water bill collection to minimize the amount of revenue lost due to not collecting water bills. We have provided QR codes for customers, as well as created support websites for customers to pay water bills online. We also actively promote water payment, notify water indexes and incidents online through the media and our website."*

### 3.2.2 Support measures

However, remote workers face challenges due to lack of necessary tools, difficulty in communication, and adapting to new technology. To solve this problem, the company has equipped remote employees with tools such as computers and phones. The internal focus is to maintain online status and resolve calls promptly to avoid delays. For important documents that require a handwritten signature, a professional team will collect and deliver them to the company. In addition, the IT department also makes video tutorials on technology applications to help employees work online effectively.

An older employee shared: "I receive a lot of support from the IT department in using technology applications at work and connecting with people."

Companies also took various measures to support employees affected by the epidemic, such as providing medicine, medical equipment, and food to those infected. In addition, the company also ensures to pay employees in full and on time so they can work with peace of mind.

Furthermore, companies also cooperate with other partners to receive additional support. Because water is an essential product, problems related to water loss must be resolved quickly. To solve these problems, water supply companies have cooperated with local authorities to apply for permits to work directly at the company and on site during the social distancing period. Additionally, the company's labor union worked with medical facilities and food stores to provide medical equipment, medicine, and food to infected employees.

An employee who was infected with Covid-19 shared: "I received a lot of support from the company, especially medicine and food during my illness. Leaders must also show concern for their employees and motivate them during difficult times. Employees must maintain a high sense of responsibility and work hard."

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After the pandemic period, water companies have had a rapid recovery. Many interviewees attributed this rapid recovery to the implementation of information technology measures in the organization's operations. Furthermore, water is an essential product, so the recovery process does not require much time and effort because most people need to use water and the financial aspect is not seriously affected. Importantly, effective crisis management during the pandemic minimized loss of life, enhanced corporate reputation, and prevented chaos within the organization.

A leader said: "Because the product we provide is clean water, this is an essential and exclusive product, so we do not face many difficulties due to economic impacts like other companies. I think this is a strong point and also a key point that helps us manage the epidemic crisis better."

In addition, water utilities saw an opportunity in quickly adopting advances in information technology. As a result, these companies have developed technology-based policies to manage water networks and interact with customers. One leader mentioned that after the pandemic, the water supply company recovered quickly and exceeded its set targets. In addition, the company also outlined new strategies to promote technology application and automate network operations. While this may result in a reduction in the workforce, it is considered necessary currently and is important to have more resources and be more proactive in the face of crises in the future.

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### & R Q F O X V L R Q

During the COVID-19 pandemic, water utilities implemented effective strategies to mitigate its impact, some of which continue to deliver benefits. Information technology plays an important role in facilitating work and minimizing the spread of disease during social distancing. Support from the organization and improving employee morale help employees be more motivated to work and work more effectively. Inter-institutional and international cooperation becomes important as crises spread beyond individual companies. Company leaders emphasized coordinating with the government to apply for field survey permits and establish links with the supply chain of essential goods. Collaboration is seen as a strong support for crisis response and recovery, as it provides essential resources to organizations during these times. These lessons provide valuable insights into future crises, improving flexibility and efficiency in crisis management for water utilities to protect employees and communities.

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F D X V G E A W H & 2 9 , ' S D G G P I F ' H M O O D M R Q D G G : D M U 7 U H D F H Q / 2 2 2
6. & 5 % R G G 6 D P S O H V J H I R U T X D M M Y H U H H D U F K 4 X D M M Y H 0 D U N H V 6 H H D U F K V o l .  
1 9 1 R S S
7. : 7 & R P E V & U M V P D Q J H P H Q / D G G F R P P X Q L F D M R Q / , Q M M M I R U S X E O F U H D M R Q /  
4
8. + : U F H U 0 6 0 H O Q J H U 2 U J D Q J D M R Q D O U H M O H Q F H 1 R G S U R I V R U J D Q J D M R Q M J  
U H S R Q H V R F K D Q J H : R U N 5 4
9. : ) & D V R 5 0 R Q M D D U J H + R Z 7 H F K R O R \ , V & K D Q J L Q : R U N D G G 2 U J D Q J D M R Q /  
\$ G Q X D G 5 H Y L Z R I 2 U J D Q J D M R Q D O B V F K R O R \ D G G 2 U J D Q J D M R Q D O / H D M Y R U B
10. 0 \* N H U G E N V + / U V K L V \$ W D 0 - , % D U H W 2 U J D Q J D M R Q & U M V D V R S S R U M Q L W  
G L V K S M R Q D G G H J S R X U H ( [ S O B U L Q J H P H U J H Q / V H S R Q H V R F U M V W U R X J K G J L M D O  
W F K R O R \ , Q V o l . 3 1 S S ( Q H Y L H U
11. . < R X Q J 2 U J D Q J D M R Q D O U H M O H Q F H D G G H P S O A H H Z R U N U R O H S H U R U P D Q F H D I W U D  
F U M V V M D M R Q H J S O B U L Q J W H H I H F W R I R U J D Q J D M R Q D O U H M O H Q F H R Q L Q M O D O F U M V  
F R P P X Q L F D M R Q - R X U O O R I 3 X E O F 5 H D M R Q / 5 H H D U F K 3 2