FACULTY OF BUSINESS AND MANAGEMENT, UNIVERSITI TEKNOLOGI MARA, PERLIS BRANCH, ARAU CAMPUS.

INDUSTRIAL TRAINING REPORT MGT666

LEMBAGA AIR PERAK

DURATION: 1 MARCH 2021 – 13 AUGUST 2021

LEMBAGA AIR PERAK

IMPACTS OF CLIMATE CHANGE ON WATER CONSUMPTION IN PERAK, MALAYSIA

NAME	:	NUR DIYANA BINTI MOHAMAD PUZI
STUDENT ID	:	2019722777
PROGRAM	:	BACHELOR OF BUSINESS ADMINISTRATION (HONS) FINANCE (BA242)
ADVISOR NAME	:	MISS SHALIZA AZREEN MOHD ZULKIFLI

EXECUTIVE SUMMARY

This report contains of my reflection journal on my internship months, where it is 6 months internship period from 1ˢᵗ March 2021 till 13ᵗʰ August 2021. In this report I obliged to examine and monitor my industrial training company where this report to be begin with my latest resume under student's profile section that I have put all the necessary information that needed on the resume. This resume will be the latest edited resume to apply to work finding in future. As in the section of company's profile, I have talk about the background of the company, little hint of the history of the company. Also, about the mission, vision and the value that displayed on the official website, and the services that offer to water account customers. Next, to the section 3 of my reflection journal throughout the industrial training company I have mentioned the experience of working in doing hands-on job. In this section, I have described the intrinsic and extrinsic skills and value of facing the working period for 6 months

Next in analysis part, the main objective is to study the impact of climate change towards water consumption in Perak. In introduction has exposed on the danger of having this problem into many types of disaster event. The issue identification is the sustainability of ecosystem in this world is now endangered. The findings have found that some of the variables are positive significant related and no significant relationship.

Definitively, the listed of all the references on the industrial research report that assist to finish-up this report and provide an encouragement to the literature review and findings in research paper. Also, extra information to strengthen the understanding about the topic. As in appendices, I have included excel data of my research, for easy to refer on the real amount, pictures of my work done of the tasks given and receipt result of Turnitin.

TABLE OF CONTENT

PART 2: COMPANY'S PROFILE

2.1 Background of the Company

Lembaga Air Perak is the only water utilities company in Malaysia are government linked company. In the beginning, Lembaga Air Perak is a corporation body and was established according to the Lembaga Air Perak Enactment 1988 under the reason of offering water supply services at whole state of Perak. Therefore, Lembaga Air Perak came into force on 1st January 1990 as a water utility company in Perak and a sole license operator for Perak State Water Supply.

Prior to 1st January 1981, before Lembaga Air Perak were establish, the water supply services were primarily managed by Perak State of Public Works Department (JKR). Thus, all the activities that is concerns and associated to water supply in Perak are fall under the jurisdiction of Perak State of Public Works Department (JKR) which is led by a Superintendent Engineer to overview all the operation of water supply.

As of 1st January 1981, Department of Water Supply, Perak (JBA) has been established to take over all affairs on water supply from JKR. This event occurs to create a better maintenance of water supply in Perak. Thus, all the activities of water supply have been under the responsibility of JBA. Department of Water Supply, Perak (JBA) is led by the Director which is serve as Chief Executive for the department. The administration department have been divided into 9 administration centers and each center has their own Regional Manager. The regions consist of Kinta, Hilir Perak, Hulu Perak, Perak Tengah, Batang Padang, Larut Matang and Selama, Manjung Kerian, and Kuala Kangsar. This divided center continues till now with the name of Lembaga Air Perak, which supplies clean water to over 2.5 million people and has been the third largest water operator in Malaysia after Selangor and Johor.

Source from Corporate Profile 2016, Lembaga Air Perak.

2.2 Vision, Mission, and Values.

Lembaga Air Perak Vision is: -

"To supply clean water for the needs of all, including the population in urban and rural, as well as the requirements of commercial and industrial sectors."

The vision is interpreting that Lembaga Air Perak wants and target to supply sanitize water or in other word good water quality for all people that stay under Perak either to the people that stay in the city and rural areas, so that, people in Perak has no issue for not receiving water supply.

Lembaga Air Perak Mission is: -

We will accomplish our mission by being an efficient and responsible enterprise that is always striving.

- To be a leader in the water industry in Malaysia.
- To provide quality service to our customers.
- To operate the enterprise with the upmost concern for public health and safety as well as the environment.
- To give value to all stakeholders in the company.

Organisation value

To accomplish the mission and achieve the vision, we adhere to the following values:

- Teamwork and collaboration
- Understand and meet customer needs.
- The need to control waste, especially the loss of unproductive water to a reasonable level.
- The importance of appropriate information and time place for management and control at all levels.
- Optimal use of technology
- Clear and open communication
- Opportunities for professional development and self -improvement.
- Respect and care for the environment.

We realize that what we do is not just ordinary work but a privilege to serve the people by supplying the most necessities of life based on quality standards that guarantee their health and happiness.

2.3 Organizational structure.
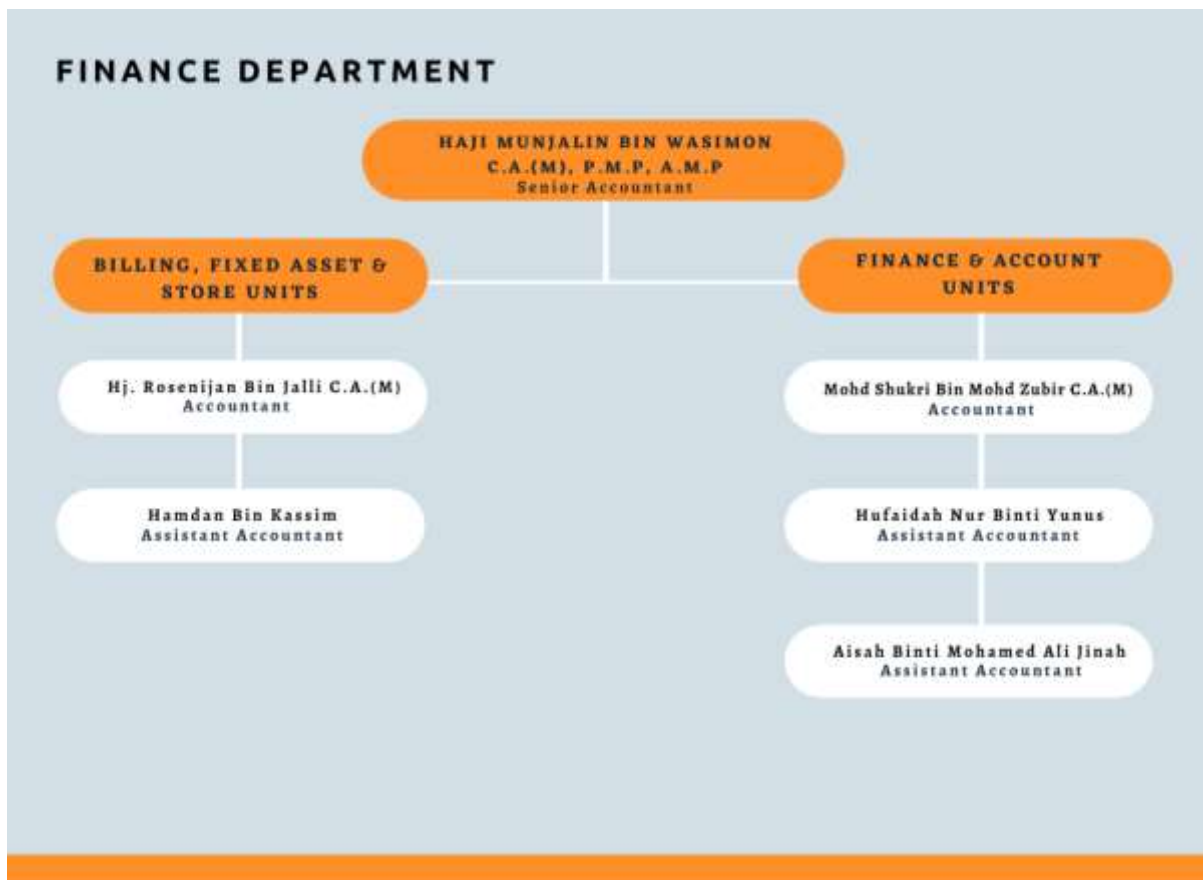
2.4 Services Offered.

Service provided by Lembaga Air Perak is receiving the payment of water bills through other media of transaction in which Lembaga Air Perak currently has 3 types of payment method that is payment by cash, payment by cheque, payment through Cash Deposit Machine (CDM), payment through application for instance Touch n go, Shoppe and the most popular is payment by online banking.

In addition, the water bill can be paid via other places such as POS Malaysia, in UTC Perak, and using kiosk machine other than focus on one head of the district service center. In POS Malaysia, they only accept payment for water bills only, in which the price of water consumption used by Tariff 11 - Domestic/Government, Tariff 21 – Industry/Business, Tariff 41 - House of Worship/ Charity Body and Tariff 81 – Bulk Houses (e.g., apartment). However, mostly domestic user which is household are the most popular using POS Malaysia as the media of water bills payment transaction. As for in UTC Perak, at present they only accept payment through cheque only and all type of payment can be done in LAP service

counter in UTC Perak. If the customer come to pay the payment through cash, the staff will guide them on how to use kiosk machine to pay the bills.

Furthermore, in Billing, Fixed Asset and Store Units also, have provide services on refund payment, where the customer have to fill in refund payment form, provide any needed document as a prove to proceed the refund payment process. Some of the cases that need to use these services is the overpaid on the amount of payment, for instance, the bills in June 2021 are RM200 but the customer paid RM2000, as the customer wrongly press extra zero when using online banking. The customer wants their money back with the balance of RM1800, hence, there occur the refund payment service. Other situation that needs to use this service is when customer wants to delete their account water, wrong payment of bill, such as customer want to pay electricity bills, but they have pressed water bills.

Moreover, Lembaga Air Perak also has offered a service on industry in bulk payment. In bulk payment main concept is the group of water bills from all the premises of the company to be paid by one main account of the premises, for example, all Tesco water bills in Perak has been gathered and total the amount and Lembaga Air Perak will give the official letter or email to the headquarters.

PART 3: TRAINING'S REFLECTION

The duration of my industrial training is 24 weeks which started from 1st March until 13th August 2021. In Lembaga Air Perak, Department of Finance has been divided into two units which is Finance and Account Units which is mainly focus on bank voucher, ledger, journal, and others scope of work the more focus on finance and account. The other units are Billing, Fixed Asset and Store Units, the senior accountant Haji Munjalin has given me the internship position in this Units, this is the place that I have learn for 6 months. Lembaga Air Perak working days are from Monday to Friday and working hours from 8 a.m. until 5 p.m.

In my Units, they are more focus on the customer, also can be mentioned as customer service because all customers will be calling through our Unit office phone. The main scope of my Units is batching of water bills, discount and subsidy to the account, zakat, water bill payment, handling the inflow and outflow of the asset and storekeeping. The early months of my internship, I have learned that my supervisor always assign me one to another staff and learn what is their scope of work. I need to be always alert and keep asking question to the staff as in every time I need to submit my logbook, my supervisor En. Hj Rosenijan will always asking a lot of question on my understanding of the staff work. I can say that in first 3 months of my internship, my roles are to study and understanding the scope of work all the staff. However, I do get a task from the respective staff if they needed help and batching tasks is the most work that I do. Batching is one of the fussiest tasks, the reason is batching is the collection of receipt water bills from all region in Perak, I need to pull of the stapler, organize it, write it down one by one on the daily summary transaction on the district code and date, staple it back, organize it, the bundle of batching will be keep in the store and daily summary transaction will use to key in the total amount then filing it to the respective district file. Thus, batching is the tasks that are having a long work process and the cycle never end unless the counter is closed for more then 2 - 3 weeks. Beside batching, in the second phase 3 months of my internship, one of the staff are taking maternity leave. I have been assigned to be responsible on office administration work, such as updating official letter in and out on the respective file, distribute the official letter to the respective receiver, photostat quite a sum of documents, scanning etc.

The benefits of internship in Lembaga Air Perak are that I have gained from the company is they are giving RM 300 allowance for only 3 months, there has their own facilities such as canteen, *surau,* food pantry and meeting rooms in my Units.

PART 4: REGRESSION ANALYSIS

IMPACTS OF CLIMATE CHANGE ON WATER CONSUMPTION IN PERAK, MALAYSIA

4.1 Introduction

Water is particularly crucial as that the most basic requirements of all living. Our Earth are containing 74 percent of water surface, from there 97 percent of the water is the ocean and seas in which human cannot consume saltwater as it is a toxic towards human. Consequently, the remaining 3 percent is freshwater that sources from groundwater, river, streams are our water resources. From there, only 0.3 percent are accessible for us, human consumption (Baker et al., 2016). These proportion exceptionally little because the usage are involves for domestic and non-domestic user (Lembaga Air Perak, 2016). However, water is a renewable resource as there has few options that water can be renewable such as rain cycle, water conservation, and water can be recycled for instance in Malaysia they have Indah Water Consortium that recycle sewage water then discharged the clean water into river or sea called as Effluent process.

Climate change is the definition of the changes that happens over a long period that indicates changes either in the climate variability or average of climate. Usually, the variable to take note are the weather condition such as temperature and rainfalls of the study place (Riedy, 2016). Malaysia only has one season that is summer all year long, hence, Malaysian always have been faced quite a time in hot and rainy days. Rising climatical change has created many challenges related to water availability and are expected to trigger, particularly regarding of production and domestic uses (Mutsa & Nyamwanza, 2017).

The main idea of consumer water demand is the increase or decrease of demand during the fluctuation of temperature and rainfalls which can be affected to the human water consumption which can be due to the variety usage of water that can led to the rising amount of water metric cube. Azizul et al. (2015) state that in assessing water supply and water demand forecasting, it is essential to recognize the total domestic consumption per capita.

4.2 Issue Identification

Climate change is a global environmental topic that dominates most of challenging issues for mankind as it can give various impact towards a country. Past decade in 1860 has shown that our Earth surface temperature has been revealed that we have warming trends which record many places has the trend including our country Malaysia (Rahman & Haliza, 2009). Knowing that climate weather is the tragedy toward a place as it has been caused generally by human activities itself that contribute with act of open burning and greenhouse gases (Rahman & Haliza, 2018). Early in the year 2021, Peninsular Malaysia has experienced a significant heavy rains started from 2nd January 2021 that triggered flooding in five states Pahang, Johor, Kelantan and Selangor (IFRC Malaysia, 2021). Meanwhile, in 2019 Malaysia faced severe heat wave with highest temperature recorded at 38°c where alert has been given to drink a lot of water to keep being hydrated (Malaysian Metrological Department, 2019).

According to World Wildlife (WWF), there has been deterioration in wetland as early in 1900. Wetland is important not only to human for rice cultivation, filtrating water, flood control, amongst others, but also to animal as their habitat. Pollution and commercial use of land also connected to damage ecosystem where this created a chain reaction to the nature, hence climate change. One of the main impact of climate change is increase in temperature, which is likely to affect evaporation and atmospheric water storage, which is it possibly has an effect on the changing of human usage of water (Wang et al., 2014). Countless scientists have claim that the impacts of climate change can be quite destructive towards natural and human system (Riedy, 2016). Hence, the sustainability of ecosystem in this world is now endangered. Thus, this partly explains on why this issue draws so much attention to scholars and practitioner.

Therefore, this research is dedicated to study the impact of climate change towards water consumption in Malaysia specifically state of Perak from 2010 to 2019. The independent variables used in this research are temperature, rainfalls, domestic and non-domestic water demand as guidelines to achieve the objective of study.

4.3 Research Objective and Questions

4.3.1 Research Objective

The general objective for this research paper is to study the impact of climate change towards water consumption in Perak.

Specific Objectives: -

i. To examine the relationship between the temperature, rainfalls, domestic and non-domestic water demand on water consumption in Perak.

ii. To find the most significant variable(s) affecting water consumption in Perak.

4.3.1 Research Questions

This study target to fill the research gap on how climate change will be able to contribute to giving the impact with water consumption. Therefore, the two research questions are developed, as follows:

i. What is the relationship between temperature, rainfalls, domestic and non-domestic water demand on water consumption in Perak?

ii. What is the most significant factor that affect water consumption in Perak?

4.4 Scope of Study

This study focuses on the impact of climate change towards water consumption in state of Perak based on the 5 regions (Central Region 1 consist of (Kinta & Kampar), Central Region 2 (Manjung & Perak Tengah), Western Region (Larut, Matang & Selama, & Kerian), Northern Region (Kuala Kangsar & Hulu Perak) and Southern Region (Batang Padang, Hilir Perak, Muallim, & Bagan Datuk). Using panel data for 10 years from 2010 until 2019, the study uses variables like temperature, rainfalls, domestic and non-domestic water demand as independent variables and water consumption as dependant variable. All data is extracted from World Weather Online and Lembaga Air Perak Annual Report and Water billing system.

4.5 Literature Review

4.5.1 Temperature

The fluctuation of weather, the temperature has probable to have a significant factor toward water consumption. This is because increasing temperature give an outcome towards human water consumption as they use water a lot when the temperature risen. The results of the analyses revealed that climatic conditions and water use are positive significant relationship as there has change in evaporation due to the change in temperature (Wang et al., 2014). To be align with past research, Haque et al. (2015) mentioned that temperature was a positive significant variable in climate variable category on explaining water consumption where the consumption would be higher if temperature rises. However, according to Roy and Haider (2017), the temperature has been found to be negative significant on the water consumption.

4.5.2 Rainfalls

Rainfalls have a link to water consumption if it can measure rainfalls through the collection method such as water dams. When rainfalls increase the water resources will increase as rainfalls is one of the natural resources, however, rainfalls water cannot be considered as clean water as the water has been infused with bacteria, this can be referred after people shower with rains they need to shower again with clean water, if not they will be caught cold. According to Centers for Disease Control and Prevention, they have state that rainwater carries various sorts of toxins as its carry parasites, bacteria, chemicals, and viruses, hence it can lead to a disease. Past studies results postulated no significant relationship between rainfalls and the tendency of water consumption in which there has other factor to be considered (Rahman & Haliza, 2018) and Wang et al., 2017)

4.5.3 Domestic water demand

Domestic water demand refers to water used for indoor and outdoor of household. (Wang et al., 2017). Through a hot and humid day people will use quite a lot of water to keep the water level in body at the right level, watering their garden, people will shower more than in cool cloudy days and increase in using cloth refer to need to wash it. Previously, study has shown positive significant relationship between domestic water demand and water consumption as there has been a growing populations in domestic user (Zuraini et al., 2019).

4.5.4 Non-Domestic water demand

Non-domestic consumption refers to industrial, commercial, and public uses of water (Zuraini et al., 2019). A research conducted by Roy and Haider (2017) suggested water consumption has a positive significant relationship to the manufacturing sector in Bangladesh. Besides, in Hebei Province has shown the influences of manufacturing buildings on water consumption are positive significant relationship as the researcher has proven that Hebei Province sensitivity on manufacturing restructuring differs significantly between other sectors, for instance, mineral and energy, water supply, agriculture, and construction. (Wei & Sun, 2021)

4.6 Research Methodology

The objective of research is to study the impact of temperature, rainfalls, domestic water demand and non-domestic water demand on the water consumption. It also uses panel data from 2010 till 2019 with 50 observations of secondary data extracted from annual report and water billing system in Lembaga Air Perak, and online weather world website.

The regression model for this study is adapted from Zandi (2015) is as follows:

$$lnWC_{it} = \beta_0 + \beta_1 TEM_{it} + \beta_2 RF_{it} + \beta_3 lnDWD_{it} + \beta_4 lnNDWD_{it} + \varepsilon_{it}$$

Where,

WC = Water Consumption

TEM = Temperature

RF = Rainfalls

DWD = Domestic Water Demand

$NDWD$ = Non-Domestic Water Demand

$\beta_0, \beta_1, \beta_2, \beta_3 \beta_4,$ =   Coefficients

ln =   logarithm

i =   cross section

t =   time

ε =   Error term

Table 1: List of Variables

Variables	Proxy	Unit
Water Consumption	Water Consumption	Metric cube
Temperature	Mean maximum of monthly temperature	Celsius
Rainfalls	Average rainfalls	Millimeter
Domestic Water Demand	Water demand of household activities.	Metric cube
Non-Domestic Water Demand	Water demand of industry activities	Metric cube

4.6.1 Hypothesis

$H_1 =$ There is no significant relationship between temperature and water consumption.

$H_2 =$ There is no significant relationship between rainfalls and water consumption.

$H_3 =$ There is no significant relationship between domestic water demand and water consumption.

$H_4 =$ There is no significant relationship between non-domestic water demand and water consumption.

4.7 Findings and Analysis

In order to decide on the best suitable panel data estimator, there are three offered options: pooled ordinary least squares (POLS), fixed effects (FE), and random effects (RE) models. As stated in Table 2, the outcomes of F-test (P-value < 0.0000), BP-LM test (P-value < 1.0000) and Hausman test (P-value < 0.0000) recommend that fixed effects (FE) are the selected appropriate model estimator.

Table 2: Panel Specification Tests

Models	P-values of the tests			
	F-test	BP-LM	Hausman	Technique
Model 1	0.0000	1.0000	0.0000	Fixed Effect

Several diagnostic assessments were tests out to verify for the existence of multicollinearity, heteroskedasticity and serial correlation problems, thus, the command is performed. As displayed in the Table 3, diagnostic test outcomes revealed there has the existence of heteroskedasticity (P-value < 0.0000) problems and serial correlation (p-value < 0.0115) problems. To resolve this problem, according to the recommendation through Hoechle (2007), corrective method has been undertaken using Fixed effects (within) regression with cluster option.

Table 3: Diagnostic Tests for Static Model

| Model | P-values of the tests | | | Strategy |
	VIF	H	SC	
Model 1	4.17	0.0000	0.0115	Fixed effects (within) regression with cluster option

As presented in table 4, the regression outcome recommended the model corresponds to the data completely at 0.000. The adjusted R^2 of 0.99 suggests that all independent variables explain water consumption at 99 percent. The other 1 percent is explained by other variables that have not been included in the model.

Furthermore, for variable domestic water demand and non-domestic water demand, they show statistically positive significant relationship with water consumption at 0.000 and 0.000 respectively. Therefore, it is agreed to reject null hypothesis and accept alternate hypothesis. For every 1 percent increase in domestic water demand, it will increase 21.26 percent in water consumption. Next, for non-domestic water demand, every 1 percent increase in non-domestic water demand, it will increase 11.80 percent in water consumption. Meanwhile, the outcome of regression shows that temperature and rainfall have no significant relationship with water consumption. Thus, for these variables, it is failed to reject the null hypothesis. Then, the most significant variable affecting water consumption is domestic water demand as the t-stat result is 28.80 followed by non-domestic water demand 19.74.

The model of this study after the test is as follows:

$lnWC = 5.52 + (0.33)\ TEM_{it} + (0.79)\ RF_{it} + 21.26\ lnDWD_{it} + 11.80\ lnNDWD_{it} + \varepsilon_{it}$

14

Table 4: Regression Results

	Fixed Effect
TEM (C)	-0.0009
	(-0.33)
RF (mm)	-0.0000
	(-0.79)
DWD (M3)	0.7332***
	(21.26)
NDWD (M3)	0.2405***
	(11.80)
Constant	0.4883***
	(5.52)
N	50.0000
r2	0.99
p	0.0000
chi2	12887.8001

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Notes: Figures in parenthesis are t-statistic.

5.0 Discussion

Based on the estimated result, temperature have no significant relationship over water consumption. This outcome is supported by research by Roy & Haider (2017), and Wei & Sun, (2021) which also found the same result. Even with the instability of climate condition, temperature appears to have no impact on water consumption. The main reason the relationship is not significant is the fluctuation of temperature do not give big impact on human water consumption, but it might be affected on other sector that consume more water during the fluctuate of temperature as example on agriculture industry which include activities such as farming, growing plants or flower, might be able to give significant result between agricultural sector and water consumption. This situation can explain that there has no effect of temperature on human water consumption due to low comparison than other variable that not included in this study.

Moreover, in rainfalls variable have no significant relationship over water consumption as this result is supported by past scholar Rahman (2018). Predominantly, one of the causes of this variable is rainwater, as its harmful to consume directly without passing through water treatment plant. Rainwater is not safe to use as drinking water, cooking, or bathing as this type of water consist of toxic, germs that might not be kill by only boiling it. Thus, this describe that increase or decrease of rainfalls will not affected water consumption as it is a dangerous towards human.

By analysing the results, it is concluded that domestic and non-domestic water demand have positive significant relationship with water consumption. This finding is concurred by Wang et al., (2017). It shows that the demand on water always have a direct relation towards each other as human always need water and the population always grow bigger and larger as time goes by. This also can signify that with the increase of water demand, implicitly it means domestic will increase too. That is one of the reason domestic water demand variables have significantly positive relationship. As for non-domestic water demand, when the demand is increasing the water consumption will increase too, so, it is relevant that this has positive relationship as the two variables are walking side by side.

6.0 Recommendation

To begin with the first recommendation is maintaining the relationship of domestic water demand variable as that is the most significant among the others variable. This show that, water demand and water consumption are moving together, thus, government need to analyse and focus on the demand as that will be the indicator to the water consumption.

In addition, it is advised for future researcher to add other variables that could possibly influence water consumption, for instance water efficient product, water resources, and drinking water. By doing further research on this topic, it could produce more meaningful results.

7.0 Conclusion

The objective of this research is to study the impact of climate change towards water consumption in Perak by using panel data of 10-year (2010 − 2019) data with 5 regional sections in Perak. Based on the estimated results, domestic and non-domestic water demand has positive significant relationship on water consumption, while temperature and rainfall both show significant relationship. Despite of the insignificant effect of temperature and rainfalls, it is recommended that future researcher to find more variable that will give influence on the impact on the climate change to provide a significant relationship results, so that can be compare and refer on the exact reason to get significant relationship on this variable.

7.1 Significance

7.1.1 Government

This study could help to identify the potential factors that affect water consumption and assist the government to be informed as far as water consumption is concerned.

7.1.2 Organisation

This study could help organization to be aware about the influence of climate conditions towards water that they are responsible to supply in each state to always be prepared due to climate change.

7.1.3 University

University and students could make use of this study as their reference for future research to find new variables that affect water consumption. Moreover, this study would provide them the latest information about water consumption.

REFERANCE

Alizadeh, B., & Hitchmough, J. (2018). A review of urban landscape adaptation to the challenge of climate change. 17. https://doi.org/10.1108/IJCCSM-10-2017-0179

Azizul, B., Rawshan, A. B., Nithiyananthan, N., & Pereira, J. J. (2015). Water Consumption Patterns in Greater Kuala Lumpur: Potential for Reduction. 9. https://doi.org/10.3233/AJW-150001

Baker, B., Aldridge, C., & Omer, A. (2016). Water: Availability and use. Mississippi State University Extension, 2016, p3011. https://www.researchgate.net/publication/324226678_Water_Availability_and_use

Diyana, N., Zulfa, H., & Ahmad Kamal Nurfatin, I. (2020). Water Demand Estimation Based On Land Use In Urban City. 6. https://www.ijstr.org/final-print/jun2020/Water-Demand-Estimation-Based-On-Land-Use-In-Urban-City.pdf

Fiorillo, D., Kapelan, Z., Xenochristou, M., De Paola, F., & Giugni, M. (2021). Assessing the Impact of Climate Change on Future Water Demand using Weather Data. Water Resources Management, 35(5), 1449–1462. https://doi.org/10.1007/s11269-021-02789-4

Haque PhD, M., Rahman, A., Goonetilleke, A., Hagare, D., & Kibria, G. (2015). Impact of Climate Change on Urban Water Demand in Future Decades: An Australian Case Study. https://www.researchgate.net/publication/280384516_Impact_of_Climate_Change_on_Urban_Water_Demand_in_Future_Decades_An_Australian_Case_Study

Haque, M. M., Egodawatta, P., Rahman, A., & Goonetilleke, A. (2015). Assessing the significance of climate and community factors on urban water demand. International Journal of Sustainable Built Environment, 4(2), 222–230. https://doi.org/https://doi.org/10.1016/j.ijsbe.2015.11.001

IFRC Malaysia. (2021). Operation Update Report Malaysia: Floods. https://adore.ifrc.org

Lembaga Air Perak. (2019). ANNUAL REPORT 2018, LEMBAGA AIR PERAK. https://www.lap.com.my/v4/images/Laporan_Tahunan/Laporan_Tahunan_2018.pdf

Lembaga Air Perak. (2016). CORPORATE PROFILE, PERAK WATER BOARD. https://www.lap.com.my/v4/images/pdf/corporateprofile2016.pdf

Malaysian Metrological Department. (2019). Annual Report MET 2019. https://www.met.gov.my/content/pdf/penerbitan/laporantahunan/laporantahunan2019.pdf

Mutsa, A., & Nyamwanza. (2017). Local institutional adaptation for sustainable water management under increasing climatic variability and change. 19. https://doi.org/10.1108/IJCCSM-03-2017-0078

Parandvash, G. H., & Chang, H. (2016). Analysis of long-term climate change on per capita water demand in urban versus suburban areas in the Portland metropolitan area, USA. JournalofHydrology,538,574–586. https://doi.org/https://doi.org/10.1016/j.jhydrol.2016.04.035

Rahman, A., & Haliza. (2009). Global Climate Change and its Effects on Human Habitat and Environment in Malaysia. Malaysian Journal of Environmental Management., 10, 19–42.

Rahman, A., & Haliza. (2018). CLIMATE CHANGE SCENARIOS IN MALAYSIA: ENGAGING THE PUBLIC. 1, 55–77. https://www.researchgate.net/publication/329642223_CLIMATE_CHANGE_SCENARIOS_IN_MALAYSIA_ENGAGING_THE_PUBLIC

Riedy, C. (2016). Climate Change. https://www.researchgate.net/publication/311301385

Rosalam, S., Farhana, A. L., & Chel-Ken, C. (2020). THE OUTLOOK OF RURAL WATER SUPPLY IN DEVELOPING COUNTRY: REVIEW ON SABAH, MALAYSIA. 2. http://borneoscience.ums.edu.my/?p=2228

Roy, A., & Ziaul, H. M. (2017). Stern review on the economics of climate change: implications for Bangladesh. https://doi.org/10.1108/IJCCSM-04-2017-0089

Seung Kyu, L., & Truong An, D. (2020). Extreme rainfall trends over the Mekong Delta under the impacts of climate change. https://doi.org/10.1108/IJCCSM-04-2020-0032

Wang, X., Jian-yun, Z., Shahid, S., Guan, E., Wu, Y., Gao, J., & He, R. (2014). Adaptation to climate change impacts on water demand. Mitigation and Adaptation Strategies for Global Change, 21. https://doi.org/10.1007/s11027-014-9571-6

Wang, X., Zhang, J., Shahid, S., Yu, L., Xie, C., Wang, B., & Zhang, X. (2017). Domestic water demand forecasting in the Yellow River basin under changing environment. 10. https://doi.org/10.1108/IJCCSM-03-2017-0067

Wei, Y., & Sun, B. (2021). Optimizing Water Use Structures in Resource-Based Water-Deficient Regions Using Water Resources Input–Output Analysis: A Case Study in Hebei Province, China. https://www.mdpi.com/2071-1050/13/7/3939/htm.

Zuraini, A., Jaharudin, P., Noorhaslinda, K. A. R., Roseliza, M. A., & Haslina, M. (2019). Factors Affecting Water Demand: Macro Evidence in Malaysia. https://doi.org/http://dx.doi.org/10.17576/JEM-2019-5301-2

APPENDICES

	A	B	C	D	E	F	G
1	REGION	YEAR	LOG VC (M3)	TEM (C)	RF (mm)	LOG DWD (M3)	LOG NDWD (M3)
2	CENTRAL 1	2010	8.050	29.83	470.90	7.901	7.492
3	CENTRAL 1	2011	8.056	30.50	353.90	7.905	7.504
4	CENTRAL 1	2012	8.078	30.58	411.00	7.923	7.535
5	CENTRAL 1	2013	8.088	30.92	362.68	7.931	7.547
6	CENTRAL 1	2014	8.097	31.25	316.05	7.941	7.555
7	CENTRAL 1	2015	8.101	32.67	106.27	7.940	7.571
8	CENTRAL 1	2016	8.124	33.33	89.34	7.961	7.597
9	CENTRAL 1	2017	8.115	31.58	213.57	7.957	7.576
10	CENTRAL 1	2018	8.119	31.17	277.82	7.962	7.580
11	CENTRAL 1	2019	8.131	30.58	353.50	7.973	7.589
12	CENTRAL 2	2010	7.673	30.42	317.58	7.438	7.267
13	CENTRAL 2	2011	7.678	31.00	421.23	7.448	7.263
14	CENTRAL 2	2012	7.700	31.33	400.21	7.528	7.178
15	CENTRAL 2	2013	7.727	31.33	405.73	7.542	7.237
16	CENTRAL 2	2014	7.745	31.58	313.99	7.563	7.255
17	CENTRAL 2	2015	7.761	31.00	185.40	7.579	7.286
18	CENTRAL 2	2016	7.768	31.33	146.05	7.596	7.275
19	CENTRAL 2	2017	7.768	30.33	200.95	7.595	7.277
20	CENTRAL 2	2018	7.785	30.25	190.79	7.604	7.308
21	CENTRAL 2	2019	7.797	30.00	188.73	7.621	7.310
22	WESTERN	2010	7.740	31.25	300.03	7.607	7.139
23	WESTERN	2011	7.739	31.83	311.37	7.599	7.157
24	WESTERN	2012	7.755	32.33	303.54	7.618	7.168
25	WESTERN	2013	7.764	32.50	271.90	7.625	7.182
26	WESTERN	2014	7.771	32.67	224.70	7.626	7.206
27	WESTERN	2015	7.792	32.67	100.26	7.637	7.257
28	WESTERN	2016	7.816	33.08	78.73	7.650	7.304
29	WESTERN	2017	7.818	32.17	128.66	7.647	7.318
30	WESTERN	2018	7.828	32.25	148.06	7.654	7.336
31	WESTERN	2019	7.838	32.00	214.10	7.659	7.355
32	NORTHERN	2010	7.386	31.33	298.87	7.321	6.498
33	NORTHERN	2011	7.392	32.25	197.27	7.326	6.512
34	NORTHERN	2012	7.407	32.75	200.92	7.340	6.533
35	NORTHERN	2013	7.419	32.75	180.00	7.354	6.520
36	NORTHERN	2014	7.429	33.00	154.60	7.362	6.541
37	NORTHERN	2015	7.437	34.08	81.08	7.372	6.535
38	NORTHERN	2016	7.464	34.83	54.57	7.398	6.569
39	NORTHERN	2017	7.465	33.42	102.70	7.397	6.584
40	NORTHERN	2018	7.473	32.92	149.81	7.405	6.596
41	NORTHERN	2019	7.471	32.75	222.68	7.405	6.583
42	SOUTHERN	2010	7.599	30.42	525.28	7.499	6.856
43	SOUTHERN	2011	7.611	31.08	481.18	7.504	6.898
44	SOUTHERN	2012	7.632	31.50	486.90	7.524	6.928
45	SOUTHERN	2013	7.651	31.83	433.19	7.539	6.961
46	SOUTHERN	2014	7.668	31.92	397.48	7.556	6.987
47	SOUTHERN	2015	7.675	31.50	520.57	7.570	6.990
48	SOUTHERN	2016	7.694	32.17	375.51	7.593	6.996
49	SOUTHERN	2017	7.696	31.00	637.44	7.592	7.007
50	SOUTHERN	2018	7.705	30.75	581.79	7.603	7.014
51	SOUTHERN	2019	7.721	31.08	458.29	7.611	7.058

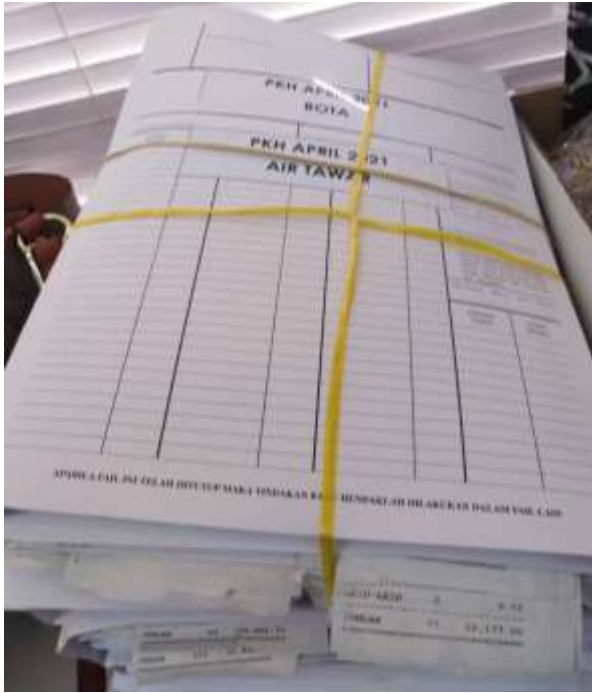Figure 1: Collected Data

Figure 2: Fixed Effect Model Results

Figure 3: Batching.

Figure 4: Filing Daily Summary Transaction
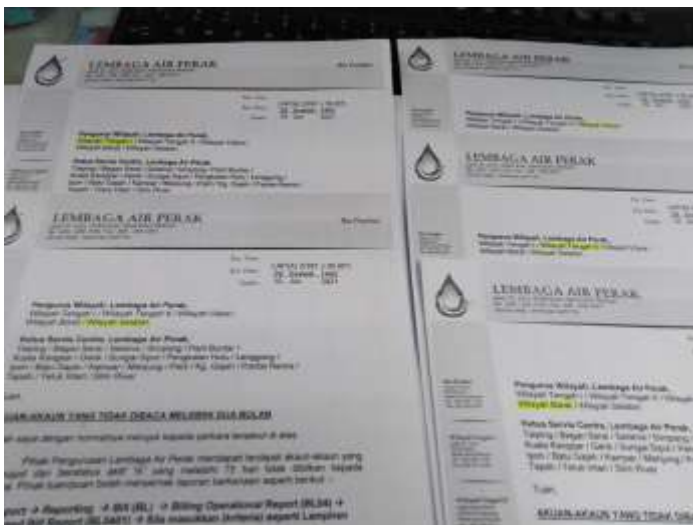
Figure 5: Distribute official letter

INDUSTRIAL TRAINING REPORT MGT666

10%	5%	2%	8%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universiti Teknologi MARA Student Paper	8%
2	www.coursehero.com Internet Source	1%
3	Achmad Ghozali, Rossana Margaret Kadar Yanti. "The analysis of clean water demand for land use optimization based on water resource balance in Balikpapan city", AIP Publishing, 2017 Publication	1%
4	utpedia.utp.edu.my Internet Source	<1%
5	Submitted to Management & Science University Student Paper	<1%
6	Submitted to University of Malaya Student Paper	<1%
7	www.tandfonline.com Internet Source	<1%

Figure 6: Turnitin Result