WATER MANAGEMENT IN INDONESIA

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Abstract

Until Now, Water famous as resources and capable to natural recirculation, water very required on environment. Management Data had been documented on statistic quantitative in Statistics Central Bureau. Water Management in every regional managed by PDAM to distribute and procurement for society, required for prays, consumption, utilize, sanitation, process engineering, plant growth, fishery activities, and swimming pools, and also beach sport club such as diving, snorkeling.et cetera.

Research Problem as arguments to identify so that optimalization among some variables within operation management theoretically use regression equation to determine relationship. Calculation, regarding water substantial (pH from 6 until 8.5 with good opinion) as a liquid consumer goods. Financial Payments with Water Value, and Capacity with Water Volume, and Customer, and also Human Resources who working in PDAM with indicator Water Personnel.

Water Treatment Technology with Fluid Mechanics substantial very important to determine water quantity, normally so that giving customer satisfaction. Sludge had been changes for Cleaning In Place. Measurement needed for Customer true payments. After calculation use Regression Equation, with results, going to provide information to explain knowledge problem in operation management and consumer behavior.t Test with t value 5.419 for 24 Data after data added by forecast until total 34 data, t Test with t Value 3.334(two tailed) for Customer Independent variable with zero significantly and greater than t Table = 3.182 very significantly. Simultan F Value 60.927. After calculated, determine profitabilities, also added until 34 Data, F Test 197.303 greater than F Table = 2.92

Keywords: *Water Value, Customer,Water Volume, Water Personnel.*

1. INTRODUCTION

Research about Water Management in Indonesia,overall description in Indonesia as same as possible with Province,because Water Institution use PDAM in all Province.Living in earth, Water percentage around 70 ,and quantity 1.368 million kilometers cubic.(Angel and Wolseley,1992). In other shape,such as vapour,ice,liquid, and snow.

The hydrological cycle exchanges widespread liquid among natural storage places.Over 69.9 percentage of the earth surface is include by water.This water unevenly distributed among aquatic environments,most is seawater,The oceans contain over 96.6% of the water in the biosphere,and the polar ice caps and glaciers contain and additional 2%.Less than 0.98% is freshwater in rivers,estuarias,and actively exchanged groundwater.The kind of water environments such as oceans, big rivers,and estuarias plus the atmosphere,ice,can be considered as natural storages within the hydrological cycle, places where water is stored for some period of time.The dynamic movement of big liquid among these reservoirs in a global exchange called the hydrological circulation.Still moment the hydrological cycle,water enters each reservoir either as precipitation or as surface or subsurface flow and exits either as evaporation or flow. West Java as a sample have got PDAM with water processing ,and need measurement by water customer, volume yield production from water treatment.PDAM as a Regional Water Supply Company required for supply because operation management for nature quality of water need some unit operation for filtering,unit operation for clarifying,unit operation for neutralizing and chemical treatment to control pH for Interval 7.0 until 8.5 unit measurement for drinkable.

Paradigm use when Presidensi G20 including Climate Change ,PandemicCovid19,and Digitalization Economics.Leadership Indonesia still involve credibilities and commitment.Climate Change cause drought risks which capable to decrease healthy and PandemicCovid19 risks.

First Phase ,Phenomena Phase to determine main problem, data from society whenever every new property developer had been built and develop for estate management,drain water activities usually followed by slurry and sometimes operating down time.More longer time for operating down time very disturb for sanitation,hygienic, and healthy people,until three years.Second Phase, Research Phase , data provided by Access for Journal after gap between expectation and reality, and determining Pandemic Covid19 to increase water usage in housing,

First problem for Independent Variable **Customer**, although Regional Water Supply Company provide more money received. Problem,because some people tend to stay at home for holiday activities and Work Form home,having implications to increase water usage.Avoid queueing more longer with car wash self activities.Customer is in Consumer behaviour concepts and object of Marketing Strategic,Conceptual Aspect some problems had been found,and need variable which relevance with theory for definitely.

Second problem for Independent Variable with indicator variable **water volume** to explains water usage because clean and sanitation people,all peripheral,and equipment. Problem with property budget increasing customer Water Regional Supply Company.

Third problem for, around human resources management.with indicator **water personnel.** Past Time, terms of employee description is mention by personnel management,and more easy to apply organization structure.The system organizational function now, with Human Resources Management,and in the future sometimes called by Human Capital Management with Series ,as same as Industrial Revolution 4.0 responsible for hiring,attracting,developing,rewarding and retaining talent people.

Customer,in reality with condition logic mindset known variable with one tail side and also with unknown so that use two tail side whenever using determination in Regression Equation.Customer and also rarely mention with in terms marketing strategic as a Customer Satisfaction. Customer for water public consumption , increasing addition for housing people.Every settlement with the way of buying via property developer always identic as a Public Utilize Customer.

Regional Water Supply Company gained from measurement watermeter every month,until 20 days from first day every month.Discipline for payment water volume usage from customer achieve

measurement usage with implications Water Personnel financial performance for unknown variable(two tailed).

Research Problem. Following the Presidensi G20 paradigm, Pandemic Covid19 provide uncertainty about activities frequently, and need some people to stay at home,work for home with more longer time and requirement need payment for Water Value,and also avoid leakage.

Research Purpose, with topic Water Management in Indonesia,sample data area data gained West Java Province have got purpose to know influence between three independent variabel ,such as Customer , Water Personnel and Water Volume to Water Value.

2. LITERATURE REVIEW

2.1. Research.

Research is attempt to find systematically,and with the support of demonstrable fact,the answer to a question or the resolution of a problem.(Leedy,2017). Research can be described as organized effort to investigate a specific problem that needs a solution.(Sekaran,2017). Research is a systematic investigation to find answers to a problem(Burn,2017). Research refers to the systematic method consisting of the problem,formulating a hypothesis,collecting data,analyzing the facts and reaching certain conclusions either in the form of solutions towards the concerned problem or in certain generalizations for some theoretical formulation.(Kotari,2017).

2.2. Water Quantity Management.

Water allocation systems at a River Basin District level in Spain. Spain's 25 river basin management plans cover the allocation and reservation of water resources-water distributions within each district with the aim of meeting water requirements for current and future uses.This knowledge about object is critical not only for dealing with the socio economic aspects,but also for assessing the impact resulted by it,calculating accurately the environmental objectives in water bodies and,as the case might be,rationalising the application of exemptions to the compliance of such as reality.(OECD,2015).

The allocation and reservation of resources available for the foreseeable demands has been carried out based on the results of the balance obtained for the demands scenario established for the year 2021. The allocation and reservation of resources is considered measurement by Spain to address the water scarcity by procurement and manage water.(OECD,2015)

Cimanuk Watershed is one of the important aquatic sources in West Java Province.The damage that occurred in Cimanuk watershed affected the sustainability of water supply in West Java.The administrative area of Cimanuk watershed extends to 4 regencies,namely Garut Regency,Sumedang Regency, Majalengka Regency,and Indramayu Regency.The Cimanuk River itself hasa length of - 338 kilometers which can supply water needs of 2,2 billion meter qubic every year with the mainwater component usage for irrigation in agricultural areas. Explanation the reciprocal relationship in the concept of watershed management,the implementation of the Payment Environmental Services of PES mechanism is important,where water is one components that deserves by decision. Water prices based on scientific calculations,both quantitative and qualitative,determine feasibility value that will be given from the downstream community upstream as conservation prime movers to support the concept of fair environmental services. Calculation analysis is carried out in the form of valuations involving several methods,namely Contingency Valua Method,Value of Marginal Product Water,and Full Cost Pricing. This

research concludes the mechanism of money transactional for Environmental Services through water pricing policies can be an alternative source of funding to improve the condition of watershed.(Pambudi,2019).

2.3. Water Quality Service.

Water utility service is a fundamental service in town people.Aims to examine service quality of water utilizes service which are transport mass by the Regional Water Supply Company in the city of Makassar,Indonesia.The method used in this research is the quantitative method through a customer satisfaction survey.The research conducted in the Regional Water Supply Company of Makassar, in four regions.The study employs a stratified sampling method based on regions and number of population is 163,549 customers. The output show that the customers of water utility services have moderate satisfaction where technical services are far (Djaing,H.,et al,2020).

2.4. Quality of Service to Customer Satisfaction.

The purpose of this study is : to determine the quality of service to customer satisfaction on Regional Water Supply Company Tirta Tuah Continent East Kutai Sengatta Branch.Based on the research results include several variables X_1 Tangible, X_2 Reliability,X_3 Responsivennes,X_4 Assurance,X_5 Empathy. Measuring the level of customer satisfaction with service quality models developed by Parasuraman.Zeithaml,and Berry(1990)include five dimensions.Tangible,Reliability,Responsivennes ,Assurance,and Empathy.The output measure customer satisfaction with the method of service quality,shows are not satisfied(50.20%).Where responsiveness aspect provides the most influence on customer satisfaction levels compared with other variables 0.708.Thus the hypothesis states that the variable quality of life Tangible,Assurance,Responsiveness,Reliability,and Empathy shows output not satisfied(50.20%),based on the analysis of SPSS aspects Responsivennes the greatest influence on customer satisfaction.(Mulyana,H.,Ruliana,T.,Suroso,A., 2013).

3. RESEARCH METHOD

Research Methods may be understood as all those methods that are used for conduction of research.Research methods,the researchers use in performing research operations,In other words,all those methods which are used by researcher during studying his research problem are termed as research methods.(Dowson,2017).

3.1. Regression Equation.

Research quantitative use Regression Equation : Water Management in Indonesia,
Sample : West Java Province

$U = a + H_1B_1 + H_2B_{2+} H_3B_{3+e}$

U = Dependent variable

a = H_0 = Constanta

H_n = Regression Coefficient

B_n = Independent Variable

Secondary data from Statistics Central Bureau ,access 2021 =

3.2. Research Data.

34 Data for Input Program SPSS :

Table 1. Regression Equation Data

No	Water Value (Rp. …. Juta)	Customer	Water Personnel	Water Volume(x1000 m^3)
1	114910	550206	5513	15335
2	115877	580130	5487	189613
3	122335	660398	6117	206324
4	154252	672833	6005	21805
5	188739	721948	6213	298578
6	211431	665884	5269	194764
7	227535	700349	5392	192163
8	310917	741123	5628	204942
9	293939	778064	5677	187521
10	351018	759361	5743	26004
11	383610	866607	5953	186065
12	412529	723960	5551	174576
13	423027	639852	4638	146082
14	610170	813527	5745	194312
15	699472	1259973	6037	216473
16	880318	1386562	6019	251548
17	1037426	1140474	6442	273701
18	1194834	1189249	6551	303721
19	1369395	1411853	6343	247968
20	1566182	1364622	6540	312993
21	1574895	1278987	6680	338706
22	1864975	1456191	7160	367688
23	2047823	1623594	7670	395581
24	1988278	1831042	7170	384202
25	1967025	1636942	7333	382490
26	2001042	1697193	7391	387424
27	1985448	1721726	7298	384705
28	1984505	1685287	7341	384873
29	1990332	1701602	7343	385667
30	1986762	1702872	7343	385082
31	1987200	1696587	7327	385207
32	1988098	1700354	7337	385319
33	1987353	1699938	7336	385203
34	1987550	1698960	7333	385243

Source : Statistics Central Bureau(2021)

Data before forecast : 24 Data (until 2019)

Table 2. t Test 24 Data

Model t Test		Value	Sig
1 (Constant)	=	-1.496	0.150
Water Personnel	=	0.119	0.906
Water Volume	=	1.442	0.165

Customer	=	5.419	0.000

Source: (SPSS 24, 2021)

Table 3. F Test 24 Data

F Test	Value	Sig
	60.927	0.000[b]

Source: (SPSS 24,2021)

Data after forecast by Simple Moving Average : Total 34 data

Table 4. t Test 34 Data

Model	t Test		Value	Sig
1	(Constant)	=	-2.195	0.036
	Water Personnel	=	0.308	0.760
	Water Volume	=	1.780	0.085
	Customer	=	6.670	0.000

Source: (SPSS 24,2021)

Table 5. t Test 34 Data

F Test	Value	Sig
	197.303	0.000

Source : (SPSS 24,2021)

Table 6. Degree of Freedom

No.	Data	Regression df	Residual
1	24	3	20
2	34	3	30

Source : (SPSS 24 , 2021)

3.3. Hypothesis.

Quantitative Research identic with Hypothesis Research.Hypothesis is conjectural statement about within two variables or more.(Kerlinger,F.N, 2017). Hypothesis is a proposition that is stated in testable form and predicts a particular relationship two(or more) variables.(Bailey,K.D.,2017). Hypothesis can defined as as a logically conjectured relationship between two or more variables expresses in the form of testable statements.(Sekaran,U.,2017).Hypothesis are tentative answers to research problems.(Nachmias,N.,2017).

U_{24} Data = -1.496 + **5.419 B_1** + 0.119 B_2 + 1.442 B_3 + e
U_{34} Data = -2.195 + **6.667 B_1** + 0.308 B_2 + 1.780 B_3 + e

H_1 Quantity Water Personnel influence Money Received by Regional Water Supply Company with Water Value Variable.
H_2 Quantity Water Volume influence Money Received by Regional Water Supply Company with Water Value Variable.

H_3 Quantity Customer influence Money Received by Regional Water Supply Company with Water Value Variable.

Data had been documented by 0.050 economic interval confidence with sig 0.000 for 24 data from Statistic Central Bureau and 34 data after forecast with simple moving average. If logic analysis from known data, only Customer as an independent variable, with 24 data influence significantly,and 34 and also influence between independent variable to dependent variable.

t Value with t Test for unknown logic analysis , to explain interactive between independent variable to dependent variable treatment for 24 data so that need two tailed test and **no interactive or influencing** between Customer as an Independent variable to Water Value as dependent variable, because 50% result two tailed test , t Table = 3.182 greater than t Counted 2.7095.

t Value with t Test for unknown logic analysis,to explain interactive between independent variable to dependent variable treatment for 34 data after forecast with simple moving average so that need two tailed test and **positive influencing** between Customer as an Independent variable to Water Value as dependent variable,because 50 % result two tailed test, t Counted = 3.334 greater than 3.182.

F Value with F Test for 24 Data (3,20,5%). F Counted = 60.927 because 0.000 less than 0.050.Null Hypotheses had not been received, interpretation = Influencing simultaneously between independent variable and dependent variable,because F Counted = 60.927 greater than F Table : 3.10

F Value with F Test for 34 Data after forecast (3,30,5%). F Counted = 197.303 because 0.000 less than 0.050. Null Hypothesis hadn't been received,interpretation = Influencing simultaneously between independent variable and dependent variable,because F Counted = 197.303 greater than F Table : 2.92

4. RESULTS AND DISCUSSION

Results analyzes how the hypothesis did.Research results analyzes about more than whether the hypothesis won,probably could have determined whether the hypothesis was supported just from reading the article's title,just like reader could tell whether whom team won merely from reading the head line.It means,the discussion relates the results to the real world,conceptual and future research. Whereas the results section analyzes the results in relationship to the hypothesis.

Water for Daily Activities with Payment every month, had been organized by Regional Water Supply Company, Name : PDAM. Three variables involve :

a. Water Value. It means, contribution with unit measurement cross 1000 meter cubic,Preliminery calculation,Water Value with water volume usage every one house,and one house every one customer.
b. Water Volume, every month RWSC employee check volume meter and calculation.Quantity flow rate from water as a phenomena flow mass, fluid mechanics streams.
c. Water Personnel,as a human resources,because sig greater than 0.05 tend to analysis for less than 0.05.
d. Customer, as an independent variable from 24 (until 2019) until 34 forecast data with Significant variable.

Hypothesis based on Customer Satisfaction Analysis, every Regency or Municipal with Regional Water Supply Company ,some times property developer company with commitment using flowrate clean water domestic usually having relationship between Water usage with Customers quantity. In other words,in the other and or future research,relationship between customer satisfaction influenced by sophisticated technology, agriculture areal drainage, and global warming.

CONCLUSION

Conclusions are the results of research that illustrates the opinions of researcher.Conclusions written in paragraph. Coordination in Regional Government about Water Treatment installation,pipeline project installation, Clarifier Tank,Mixing Tank ,and all process with CIP(Cleaning in Place)processing, influence regarding customer satisfaction. Water with flow rate more speed will bring some particles and sludge after rainy days,and floods after higher flowrate rain,when maximize valve at on switching.Valve,if more slowly will be getting limpid flowrate.

Whenever every housing still new establishment, only some people with new jobs every Customer sometimes still afraid because sediment still exist and sometimes flowrate off.regulation not interesting,but approximately after seven years all surface in water tank more clearly. Although Customer independent variables unknown and known, logic research mechanism have got influencing increase income Water Regional Supply Company significantly,by 24 data until 2019 and continuous to 34 data by *forecasting method***.**

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