Review of Environmental Health Risk Assessment (EHRA) to Achieve the Target of Universal Access 2020 Focusing on Domestic Waste Water Sector

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Abstract. Development of urban city is commonly followed by steady growth of economic condition, population density, and negative impact of environmental condition. Reduction quality of environmental condition stimulates the occurrence of environmental degradation within society. Low quality of waste water system, management of garbage, limitation of green areas, and low concern of society toward climate change are example of environmental issues that need to be solved by the government as soon as possible. The succession in achieving aims of Millennium Development Goals (MDGs) is continued by Sustainable Development Goals (SDGs) program from 2015 to 2030. SDGs have numerous action plans in achieving its goals for instance Environmental Health Risk Assessment (EHRA) for waste water system in Blitar. Research methods that use in the present study are as follow (i) Field study named Environmental Health Risk Assessment (EHRA), and (ii) data collection, entry data, data cleaning, data processing and data analysis. The present study concludes numerous results achievement for waste water access are follow: very high (180 districts or 72.58 %), high (26 districts or 10.48 %), medium (28 districts or 11.29 %), low (14 districts or 5.65 %). It can be concluded that the achievement for SDGs for waste water system has been achieved more actively in investments or asset sharing of airports in the region.

1. Introduction
Waste water can be determined as water disposal that comes from industrial, residential, restaurant, stationary, commerce, apartment, and dormitory. Numerous forms of waste water are dirt matter, urine, bathroom waste, and kitchen leftover. The number of these waste are increasing time by time since it is influenced by the increasing of population density coupled with its activities. When the number of waste water is not balance with environmental capability in absorbing the waste, it creates natural damage of the environment. Moreover, environmental damage can decrease health level of
human who live within this environment. Therefore, proper actions need to be conducted in order to prevent degradation of environmental damage and health level of human.

Waste water channel system is a structural channel system that has function to decrease or dispose waste water from industrial and residential. This system commonly uses close channel by enhancing tube to distribute waste water from interceptor tank to drainage channel or main channel in which waste water will be recycled.

Sanitation issues become national concern which not only experience by people who live in east part of Indonesia and pedestrian areas but also in urban areas. Study conducted by Basic Human Services (BHS) portray people behaviour in washing their hand as follow: (i) after defecation (12%), (ii) after cleaning baby dirt (9%), (iii) before meals (14%), (iv) before feeding baby (7%), and (v) before preparing meals (6%) [1]. Furthermore, more than 11,5 billions of household in Indonesia or 18.88 % do not possess private toilet to conduct defection or in other words, those people are conducting defection in open/public areas [2][3]. It is supported by research which stated that access of water and basic sanitation in Indonesia still low [4].

Study mentioned above show that development of sanitation will increase numerous aspects such as social, health, and economic mainly in developing country [5]. That waste water disposal is determined by each house hold which based on the regulation that enact by the government [6]. Commonly, household is utilising off-site disposal system such as condominial [7][8][9]-[10] or on-site disposal system such as VIP toilet, closet, and ecological sanitation (eco-san) toilet [11]-[12].

Environmental Health Risk Assessment (EHRA) need to be conducted in order to achieve Sustainable Development goals (SDGs) target which is Universal Access 2020. The present study is an example of EHRA utilisation for waste water sector in Blitar.

2. Research Methods

2.1. Field Study

First method uses in the present study is field study in which it is conducted by analysing primary data taken from study of Environmental Health Risk Assessment (EHRA). The primary data contains of information about availability of sanitation services for household within districts or regions. The stage is analysis of secondary data which collected from numerous environment institution.

2.2. Population dan Sample

Equation below is used to determine the number of respondents:

\[ n = \left( \frac{Z_{\alpha/2}}{SE} \right)^2 \]

Description:
- \( N \) = number of sample j
- \( Z_{\alpha/2} \) = value of standard or normal distribution which connected with confidence degree (1-\( \alpha \))
- \( \bar{f} \) = deviation standard of population.
- \( SE \) = allowed sampling error.

Population that use in the present study is household based on census conducted in 2015 around 1.145.396 persons consist of 573.707 male and 571.689 female citizens with sexual ratio around 100.35 %. In other words it can be said that within 100 female citizens there are 100-101 male citizens with deviation standard \( \bar{f} \) around 0.564, meanwhile confidence degree (1-\( \bar{f} \)) around 97%, and sampling error (SE) around 3%. Sample for the present study around 9920 respondents or 40 respondents for each district[13]. Calculation of sampling within EHRA is using equation as follow[14]:

\[ n = \left( \frac{Z_{\alpha/2}}{SE} \right)^2 \]

...
n = \left( \frac{Z_{0.05}}{SE} \right)^2 = \left( \frac{Z_{0.025}}{SE} \right)^2 = \left( \frac{(2.17)(0.564)}{0.03} \right)^2 = 9920

Respondents in the present are housewife or daughter (married) around 18 to 60 years old with total number of respondents are 400 respondents. Meanwhile, number of neighbours that use as sample are 8 neighbourhood in which there are 5 neighbourhood in each neighbours chosen as the sample. Therefore, the total respondents for each district is 40 household.

3. RESULTS AND DISCUSSION

3.1. General Description of Research Location:
Research is conducted in Blitar which consists of 220 villages and 28 districts within 22 regions. Blitar is located in south of the equator located at 111°40' - 112°10' Easy Longitude and 7°58' - 8°9'11'' South Longitude.

3.2. Description of Achievement
There are four achievement indicators that measured in the present study which are: clean water, waste water, waste, and drainage. Classification of achievement is clustered as follow: score 1 (low), score 2 (medium), score 3 (high), and score 4 (very high).

Calculation of achievement is gained by counting respondents answer in each variable and research indicator in which all results will be scored in order to determine minimum and maximum score coupled with to determine range score in defining the limitation. Result of the study is presented in table 1 as follow:

| Achievement of Clean Water |
|-----------------------------|
| Table 1. Villages Achievement Based on SDGs in Drinking Water and Sanitation Sector |

|                | Drinking Water | Solid Waste | Domestic Waste Water | Drainage |
|----------------|----------------|-------------|----------------------|----------|
| Low            | 29             | 22          | 30                   | 25       |
| Medium         | 20             | 26          | 27                   | 30       |
| High           | 13             | 10          | 17                   | 16       |
| Very High      | 186            | 190         | 174                  | 177      |

Achievement of Clean Water
Table 1 shows that Blitar has 13 districts which possess low access of clean water, 186 districts determined as districts that possess very high access for clean water, 29 districts determined as districts that possess high access for clean water and 20 districts achieved medium score for clean water access. This achievement can be determined as good since 98.70% of districts in Blitar able to access fresh water. Degradation level of environmental health causes numerous diseases. That issues within development of water access and fruitfulness of sanitation program depend on various aspects such as economics, organization, technic, and politics [15].

Achievement of Waste Water
Issues concerning people behaviour related to clean and healthy life are commonly about defecation in open areas or public areas. This behaviour stimulates endemic disease in which it is mainly caused by imbalance economical condition within the society. Study conducted in 2009 stated that development program concerning waste water management is less prioritised in numerous areas in Indonesia [16]. Moreover, the present study concludes that waste water management system can be determined as good since there are 17 districts determined as low score. Meanwhile, there are 174 districts determined as very high score, 30 districts achieved medium score and 17 districts determined as very high risk area. It is determined as good since 95.45% districts in Blitar possess domestic waste water access.

Achievement of Garbage Disposal
Various studies show that garbage disposal is less prioritised compared to other waste management such as air and water pollutions. Meanwhile, the present study shows that Blitar able to achieve as good region since only 10 districts scored low access of garbage disposal management. Moreover, there are 190 districts scored as very high access, 22 districts scored as high access and 26 districts scored as medium access. This achievement can be determined as good since 98.05% districts in Blitar possess access of garbage disposal.

Achievement of Drainage
The present study shows that Blitar achieve good scored concerning access of drainage since it is only 16 districts scored as low access, 177 districts scored as very high access, 25 district scored as high access meanwhile 30 districts scored as medium access. Moreover, this achievement can be determined as good since 97.40% of districts in Blitar have drainage access.

4. Conclusion
Based on the present study, the achievements of Blitar are as follow:
1. Very high : 180 districts or 72.58%,
2. High : 26 districts or 10.48%,
3. Medium : 28 districts or 11.29%,
4. Low : 14 districts or 5.65%

Based on the result above, it can be advised that:
1. Result of the present study can be used as reference to manage and solve sanitation issues in Blitar,
2. High priority in solving sanitation issues can be given to 13 districts that achieved low score

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