ISSN No:-2456-2165

The Analysis of Community Participation in the Making of Infiltration Wells to Overcome Rainwater Inundation

(Case Study in The South Cipete Village, South Jakarta)

Agus Priyono Jendro
BPSDM Provinsi DKI Jakarta

Abstract:- This study aims to analyze the factors that cause community participation in making infiltration wells to overcome rainwater inundation. Data is collected using interview techniques and document review. The informants included community members, village heads, community leaders (RT/RW heads) and Administrators of the Indonesian Water Society (MAI). The results of the study show that from a community perspective there are internal causes (understanding, perception, awareness, mindset/mindset, attitudes of community behavior, willingness, ability and community compliance with obligations) and external factors (socialization / counseling from the government regional government, respect for community compliance, environmental conditions, community impacts, natural (upland / low) perspective, physical condition of house/place of residence, imposition of administrative sanctions and enforcement of laws/regulations on community violations) in making infiltration wells. Analysis of these causal factors shows that the level of community participation can change if each of the causal factors interacts with each other and has a causal relationship that occurs simultaneously, then can only have the effect of changing views/community establishment regarding infiltration wells. This study contributes to efforts to increase community participation in making infiltration wells through an understanding of the factors that cause low community participation.

***Keywords**: - Puddles, Participation, Infiltration Wells.*

I. INTRODUCTION

Until now, the city of Jakarta is still experiencing waterlogging and flooding problems every time it rains. Puddles can occur even if only due to local rain with a duration not too long. Puddles and floods are getting worse if there is continuous high intensity rainfall for several days which falls evenly in the upstream areas of the river, namely the Depok, Bogor, Puncak and Cianjur areas that flow into the sea through the city of Jakarta will cause massive flooding.

The occurrence of increasingly severe puddles indicates an increase in surface run-off as a result of changes in land use, namely the land surface which is increasingly covered by buildings. Increasing the flow of surface water is increasing, causing the drainage channel and river capacity to be exceeded, so that the handling of rainwater by using the current drainage infrastructure system (horizontal drainage system) is increasingly difficult to achieve to be able to resolve waterlogging and flood problems in Jakarta. Handling rainwater in Jakarta with vertical drainage systems, such as the use of infiltration wells has not been done intensely, still on a small scale and is intended to do water conservation rather than aimed at overcoming the problem of standing water. The program of using infiltration wells can work well to overcome the problem of flooding and inundation, if done widely. Therefore it is time to start increasing the use of infiltration wells in order to absorb as much rainwater into the soil as possible to minimize the flow of surface water so that the potential for waterlogging can be overcome. For this reason, it is necessary to involve the whole community in making infiltration wells.

The DKI Jakarta Provincial Government has issued Governor Regulation (Pergub) of DKI Jakarta Province Number 68 of 2005 which was amended by Pergub Number 20 of 2013 concerning Infiltration Wells. The policy was intended to optimize the construction of infiltration wells in the community. Making these infiltration wells is intended to accommodate, store and increase groundwater reserves and can reduce rainwater runoff into sewers and other water bodies, so as to reduce the incidence of waterlogging and flooding and at the same time can be utilized in the dry season (Article 2 20 of 2013). Making infiltration wells is an obligation for all residents of Jakarta, but the socialization of making and using infiltration wells has not been so intense. Making infiltration wells in public areas is the responsibility of the government, while the construction of infiltration wells in residential areas, offices, industrial areas, shopping malls and other property areas should be the obligation of the residents of the property.

The problem of inundation that occurs when rain is still faced by the city of Jakarta, recently at the end of January 2019, there were 16 flooded roads due to the high rainfall that occurred in DKI Jakarta. The sixteen puddles are scattered in Central Jakarta, North Jakarta, West Jakarta and South Jakarta. Three points of location for standing water are found in South Jakarta with a height of 10 to 20 cm, which is on Jl. MT Haryono in front of the Film Building and under the Pancoran and Jl. Tebet Timur Raya

at the point of knowing Cawang Station (Wildan, 2019). Especially in the Cipete Village area, waterlogging due to rain has long occurred in several places (Win Net News, 2016; Tobing, 2016; Khoemaeni, 2016; Ryan, 2017; Murtopo, 2018; Nuary, 2018; Setyaningsih, 2018). Several studies on infiltration wells have been carried out, for example Saleh (2011) focused on infiltration wells to reduce surface runoff and increase groundwater. Sianturi and Kadri (2014) conducted research related to community perceptions of infiltration wells, in Mampang Prapatan Subdistrict, South Jakarta. Kasali (2011: 25) emphasizes his studies on factors that influence people's perceptions in making infiltration wells, including cultural background, past experience, values adopted and through news that develops can influence the formation of perceptions in society.

Meanwhile, Daniel, Neolaka and Nasution (2012) conducted a research on public awareness in making rainwater infiltration wells. Sari, Tandjung and Mantra (1999) examined the factors that influence the level of community participation in making rainwater infiltration wells, especially the level of knowledge about making rainwater infiltration wells, the lower the level of knowledge, the lower the level of participation. Although several studies on infiltration wells have been carried out, no one has analyzed and differentiated internal causal factors and external causative factors from a community perspective.

This study aims to analyze more fully the causes of the low level of community participation in making infiltration wells to overcome rainwater inundation in South Cipete Village.

II. METHOD

Qualitative research with this case study method, establishes Cipete Selatan Village, South Jakarta as a research location with the consideration that the South Cipete area is an area that still has good potential for rainwater infiltration using infiltration wells. Geographically it consists of moderate hilly and lowland areas around/near the Krukut River flood plain. The average population is middle to upper income and some residents of the middle to lower income population. From the results of the observation it was obtained information that there were already community members who pioneered the use of infiltration wells to deal with rainwater inundation, but most of the community members were still low in participation in making infiltration wells. Data is collected using interview techniques and document review. The informants included community members, village heads, community leaders (RT/RW heads) and administrators of the Indonesian Water Society Organization (MAI).

The concept of community participation in the context of research here is the involvement or participation of the community directly and actively with their own strong ability and willingness and willing to be responsible for making and utilizing infiltration wells. Factors that cause high and low community participation are grouped into internal factors and external factors. Internal factors are factors that arise from the citizens themselves, while external factors are external factors that cause high and low participation of citizens. The analysis was carried out on the interaction between factors that caused the high and low participation of the community.

III. RESULTS AND DISCUSSION

A. Internal Causes

To get information about internal factors of community participation, interviews were conducted starting from one of the residents who already had the willingness and ability to make infiltration wells because they realized after knowing / understanding the benefits of infiltration wells that could absorb rainwater, so as not to cause puddles in their area . Besides that infiltration wells can also fill ground water in its place so that it can be used as a reserve of clean water during the dry season. From 1996, Fatchy Muhamad, the name of the residents began to pay attention to the problem of rainwater inundation. Starting from the residents' experience, every time there was always a puddle of water in the backyard of his house that could not flow out. After several years of observing to find a solution, then trying to make infiltration wells to deal with it, it turned out that the results were surprising that every time there was rain there was no more puddle in the backyard, despite heavy rain. As explained in the interview about the beginning of being interested in infiltration wells:

"Rainwater in the backyard is always flooded every time there is rain, because there are no channels outside. The solution was made of rainwater infiltration and it was successful, the water was not flooded even though the rain fell. Out of curiosity I began to have a curiosity to measure the amount of rainwater that fell with a measuring cup, then it became a hobby to pay attention to rainwater. "

For this success, then in 2002 Fatchy began to seriously explore infiltration wells. The explanation of the Fatchy is in line with Wiguna's report (2018), which wrote that one MAI member who made infiltration wells a few years ago in his yard had extraordinary benefits, including: his family did not need to subscribe to water from a drinking water company (PAM) to drinking water, daily necessities, including filling a swimming pool measuring 6m x 4m x 1.5m. Likewise, infiltration wells made in each house and several points in the townhouse area have created an area without any rainwater at all (zero run-off). Thus, infiltration wells provide benefits not only to reduce stagnant water but also to meet clean water needs.

As the opinion of Indriatmoko and Wahjono (in Daniel, Neolaka, and Nasution, 2012: 72), that the benefits of infiltration wells include increasing the amount of water that enters the soil and preventing excess runoff and flood water. Puddles due to local rain can actually be more easily overcome by absorbing as much rainwater into the ground as much as possible, can use infiltration wells, biopori or

ISSN No:-2456-2165

increase green open space. But until now there are still a few infiltration wells that have been made by residents of the Cipete Selatan sub-district.

While interviewing several other community members, overall it was found that there were still many people who did not make infiltration wells with several reasons that could be summarized as follows: 1) Many community members did not yet know the benefits of infiltration wells, because of their level of understanding low, causing low participation rates too; 2) Some residents have the perception that making infiltration wells is the responsibility of the government, so that they consider that there is no need to participate in making infiltration wells; 3) There are also community members who claim that the cost of making infiltration wells is expensive, which indicates that the ability of low-income residents causes their participation rates to be low; 4) They have a mindset that the only way to overcome rainwater is by flowing it into the drainage canal, it is unthinkable to absorb it into the ground, this mindset causes low levels of community participation; 5) It was also found that some residents who did not care about the condition of their environment whether there was or not had a pool or flood did not affect it, because they were already familiar with the condition. This shows that the attitude of citizens who do not care about their environmental conditions causes low participation rates; 6) Many capable citizens, including companies incorporated as building and building owners, and almost all community members who use groundwater/well water in Cipete Selatan Village do not make infiltration wells as required by Article 3 of Pergub No. 20 of 2013, but they did not heed the regulation.

This condition indicates that the level of community compliance with regulations is very low, causing the level of participation in making infiltration wells is also low. Meanwhile from the search for documents owned by the Indonesian Society of Water Society (MAI), it was found that there were still many residents of the Cipete Selatan community who did not make infiltration wells to accommodate rainwater that fell in their yards, this condition could be seen from the way they directed rain gutters directly into the drainage channel. The results of the above research are in accordance with what was stated by several previous researchers, namely Ali (in Muhammad, 2015), saying that the local government actually made a good rule in Jakarta, namely when building houses must comply with basic building coefficients and also make infiltration wells, but public awareness in utilizing infiltration wells is still questionable. Likewise, Yoga (in Sofyanti, 2018) stated that the awareness of building water infiltration wells only came from the community and a few individuals. Only a few people have the awareness to make rainwater infiltration wells. The results of the Sianturi and Kadri research (2014) also show that if the level of community understanding is good, it will form a good perception of infiltration wells.

In the research here, it was also found that many residents were able but did not make catchment wells. This shows that someone's income or wealth does not guarantee the citizens with their own willingness to participate in making infiltration wells. This is in line with previous research conducted by Moeljono (1995, in Sari, Tandjung, & Mantra, 1999). It was stated that the community education factor and income or income of the people did not influence the active participation of the community in making rainwater infiltration wells, while the factors that had the big influence is the cost of making rainwater infiltration wells, meaning that the cheaper the cost of making infiltration wells, the higher the community participation in making infiltration wells.

The findings of the research here as outlined above can be summarized by several internal factors why community participation is very low, which includes: understanding, perception, awareness, mindset, attitudes toward the community, willingness, ability and community compliance with community obligations related to participation in making infiltration wells. It is these internal factors that simultaneously cause the level of community participation in making infiltration wells very low.

B. External Cause Factors

Furthermore, to obtain data and information about external factors, it is also done by interviewing and reviewing documents. The reason the residents did not make various infiltration wells was that there were community members who stated that they did not make infiltration wells because the area was not flooded, because from a natural perspective it was indeed a contoured / hilly area. Then when viewed from the physical condition of the house/place of residence, some residents said that they did not make infiltration wells, because they did not have an open yard. Meanwhile there was also an impact from the local community, namely the heads of RT / RW who still had the mindset that the only way to overcome the pool of water trapped in an area must be to use a conventional drainage channel. Local communities that still have a mindset like this can cause the level of citizen participation in making infiltration wells very low.

The environmental conditions in Cipete Selatan Village are shopping areas and most of the settlements are residents of the upper middle class. From several people interviewed, they explained that because of their different activities, they could not interact with each other, so they did not know each other's neighbors. Environmental conditions such as these, as is usually the case with other environmental conditions in other big cities, cause a very low level of concern among citizens, so that this condition causes the level of community participation in the construction of infiltration wells to be low.

The level of lack of understanding, different perceptions, low awareness and willingness of the community, based on the results of interviews with several communities showed that there was a lack of socialization or counseling from the government about the understanding and benefits of infiltration wells. Based on the search for documents in the kelurahan, it was found that in the 2019 budget year there was indeed no budget for the dissemination of infiltration wells. Another impact of the incessant dissemination of infiltration wells is that there are still many people in the community who cannot distinguish between biopores and infiltration wells. The condition of the incessant socialization from the government caused the level of community participation in South Cepete to be low. Meanwhile, for people who are obedient and even have strong will and interest in infiltration wells, there has never been a reward from the government, even if it is given an award even though it is only accepted by the Governor to listen to his experience and achievements in helping the government socialize the use infiltration wells, it turns out, according to residents' testimony, it can motivate them to be more active in developing and pursuing the benefits of infiltration wells. Moreover, if the award is in the form of tax relief or other relief, it will increase community participation in making infiltration wells.

The driving factor for community participation from the other external side came from the local kelurahan apparatus which already had a good mindset about handling waterlogging problems in their area, namely by using infiltration wells rather than by conventionally channeling rainwater into the drainage canal. In one case of inundation that occurred inside a housing complex behind the village office, because there was no drainage channel to the outside of the complex, the kelurahan did not allow residents to request the complex to deal with rainwater by flowing it into the canal in front of the village office, but suggesting many times to the community members to absorb rainwater into the ground using infiltration wells, as quoted from the interview with Cipete Selatan Village Head:

"The participation of residents is still low and must be reminded together to make infiltration wells. Initially, if the flood was wrong, the kelurahan. It was explained many times, even more, after tens of times just realized. I always chat about every opportunity to go to the community service area, the Mosquito Nest Eradication (PSN) event, RT, RW, LMK, FKDM and others.' "

Residents of the community in the complex finally want to carry out the construction of infiltration wells for each house in one infiltration well as many as 25 houses. After the infiltration well was made by the community members, it turned out to work well, so that the pool of rainwater did not happen again without having to make a line into the canal in front of the Village Office. In this case the external causal factor in the form of a good role from the local government at the kelurahan level will cause the level of community participation to be good too. The kelurahan itself has given an example by actively participating in the production of 4 infiltration wells and making 60 points of biopori, so that every rain falls there is no longer a pool of water in the Cipete Selatan Village office yard.

The low level of compliance of the community towards the provisions of the regulations was found in the field because of the lack of law enforcement, both in the form of prosecution with imposition of sanctions in accordance with the provisions and administrative sanctions by officers from the authorized institutions. This indicates that the external causes of lack of law/regulation enforcement caused the level of community compliance with regulations related to infiltration wells making it still low, so that the level of community participation in making infiltration wells was also low. This is in line with Yoga (in Sofyanti, 2018) which states that there are actually rules every time a citizen submits a Building Construction Permit (IMB) is obliged to make an infiltration well, but because there is no firm action so that the regulation is gradually forgotten. The kelurahan stated that the implementation of the provisions for making infiltration wells in the process of awarding IMB had already been carried out, but enforcement of regulations in the field was still not firm, only in the form of appeals, not yet in the form of strict sanctions both administrative sanctions and legal sanctions.

Local governments should facilitate the making of communal infiltration wells for residential building owners who do not have land for making infiltration wells (Article 4 of DKI Jakarta Provincial Governor Regulation No. 20 of 2013 concerning Infiltration Wells). But in fact in the Cipete Selatan Village there has never been a program for making communal infiltration wells carried out by the DKI Jakarta Provincial Government. This was justified by Cipete Selatan Village Chief: "During the three and a half years I served in Cipete Selatan there has never been an Infiltration Wells Production Program from the Department of Industry and Energy." Article 4 will cause low community participation. Actually the construction of communal infiltration wells by the government can also be used as a way to give an example to the community to encourage them to participate in the construction of infiltration wells.

From the results of the research and discussion as described above can be summarized external causes include: socialization/counseling from the government, the role of local government, respect for community compliance, environmental conditions, the impact of the community, natural (high/low) perspective, physical condition home/place of residence, imposition of administrative sanctions and enforcement of laws/regulations against community violations.

Further analysis of the factors that cause community participation both internally and externally shows that to be able to change the level of community participation in making infiltration wells, the interaction of each component of the causal factors is needed both in one group and between groups of internal and external factors. If there are citizens who have the ability but there is no will and vice

versa if there is a will but there is no ability, there will be no change in the level of participation. Residents who have good perceptions and understanding of infiltration wells may not be able to participate if they do not have financial capacity. A good role from the kelurahan apparatus, but if it is not supported by all parties, including the support of the community members themselves, then community participation is still difficult to improve. Therefore, each of these causative factors must interact with each other and have a causal relationship which if it occurs simultaneously/together; it can only have an impact on changing people's views/establishment about infiltration wells.

IV. CONCLUSION

Based on the results of the research and discussion above, it can be concluded that the level of community participation in the South Cipete Urban Village in making infiltration wells is still low. This is caused by internal factors and external factors. Internal factors, including: understanding, perception, awareness, mindset, attitudes of community behavior, willingness, ability and community compliance with obligations. External factors include: socialization/counseling from the government, the role of local government, rewards for community compliance, environmental conditions, community impacts, natural (upland/low) perspectives, physical condition of houses / residences, administrative sanctions and enforcement of laws/regulations against community violations. Analysis of these causal factors shows that the level of community participation can change if each of the causal factors interacts with each other and has a causal relationship that occurs simultaneously, then can only have the effect of changing views/community establishment regarding infiltration wells. This study contributes to efforts to increase community participation in making infiltration wells through an understanding of the factors that cause low community participation.

To increase community participation in making infiltration wells, an approach to the community is recommended, both in terms of internal and external causal factors of the community. The most important internal factor to be addressed immediately is to give the community a good understanding and good perception so that it automatically has the awareness and willingness to make infiltration wells. For this reason, it is necessary to increase the role of the DKI Jakarta Provincial Government and the ranks below to be more vigorous in providing information to the public about the knowledge and benefits of infiltration wells. Along with these efforts the government can also motivate the community by giving rewards for citizens who are willing to make infiltration wells and sanction for capable citizens but do not want to carry out the obligation to make infiltration wells. In addition, the government is also advised not to give permission for new applicants to make boreholes for extracting ground water if they do not make infiltration wells. Local village officials who already have a good mindset about handling rainwater by absorbing rainwater into the ground using infiltration wells and biopores, to be supported by all parties involved to provide socialization to the community so that the community mindset changes, so that infiltration ponds are built to overcome rainwater becomes a mindset that can be entrenched.

REFERENCES

[1]. Daniel, James, Amos Neolaka, and Nira Nasution. 2012. *Public Awareness in Making Rainwater Infiltration Wells* (Study in RW.02 Kebon Jeruk Urban Village, West Jakarta). Tower Journal of the Department of Civil Engineering FT. JUN. Volume VII No.1 - January 2012

[2]. Kasali, Rhenald. 2003. *Public Relations Management*. Jakarta: Graffiti.
Khoemaeni, Syamsul Anwar. 2016. Flood Conditions in a Number of Points in South Jakarta. https://news.okezone.com/read/2016/08/28/338/1474817/kondisi-banjir-sejumlah-titik-di-jakarta-selatan/ Accessed February 14, 2019.

[3]. Muhammad, Djibril. 2015. *The Importance of Infiltration Wells for Jakarta Residents*. https://nasional.republika.co.id/ Accessed February 20, 2015.

[4]. Murtopo. 2018. *Heavy Rain Spots South Jakarta, This Is a Flooded Area*. http://wartakota.tribunnews.com/2018/11/28/hujan-deras-guyur-jakarta-selatan-ini-wwil-yang-tergenang/ Accessed February 14, 2019.

[5]. Nuary, Guruh. Wednesday, November 28 2018. After Heavy Rain, Lalin JL Fatmawati Hospital Flooded. https://m.detik.com/news/berita/d-4321122/usai-hujan-deras-lalin-jl-rs-fatmawati-tergenang# / Accessed February 14, 2019.

[6]. Ryan. 2017. Cipete Village Head Reported the existence of 17 Waterlogging Points to Sandiaga Uno. https://breakingnews.co.id/read/lurah-cipete-laporan-adanya-17-titik-genangan-air-kepada-sandiaga-uno / Accessed February 14, 2019.

[7]. Saleh, Chairul. 2011. Study of Surface Runoff Management Using Infiltration Wells (Case Study in Perumnas Region Made in Lamongan Regency). Civil Engineering Media, Volume 9, Number 2, August 2011: 116 – 124

[8]. Sari, Sri Adelia, Shalihudin Djalal Tandjung, and Ida Bagus Mantra. 1999, January. Knowledge, Attitudes, and Community Participation in Making Rainwater Infiltration Wells (Case Study in Minomartani and Pakembinangun Villages, Sleman Regency. Teknosains Journal, vol. 12 (1), pp. 63-76.

[9]. Setyaningsih, Wuri. (2018). 20 Joint Officers Deployed to Overcome Inundation on Jl Raya Fatmawati. http://m.beritajakarta.id/read/64432/20-petugas-gabungan-dikerahkan-atasi-genangan-di-jl-raya-fatmawati/ Accessed February 14, 2019.

[10]. Sianturi, Ephraem Widjojo and Trihono Kadri. 2014. Community Perception in Application of Infiltration Wells (Case Study in Mampang Prapatan Sub-District, DKI Jakarta Province) Trisakti University Civil Journal Jakarta. Vol. 14, No. 1, March 2014: p. 14-21.

[11]. Sofyanti, Astri. 2018. The Water Infiltration Wells Program in IPR is Only a Campaign. https://news.trubus.id/ Accessed February 20, 2018.
[12]. Tobing, Aldi Geri Lumban (2016). Puddles in Cipete Selatan Start to Recede. http://m.beritajakarta.id/read/29453/Gegang-Air-di-Cipete-Selatan-Mulai-Surut/ Accessed February 14, 2019.
[13]. Wiguna, Imam. 2018. Saving Water at Home to Prevent Floods. https://www.kompasiana.com/ Accessed, February 1, 2019. Wildan, Muhammad. 2019. Location of 16 Waterlogging Points in Jakarta Today. https://jakarta.bisnis.com/read/ 20190125/77 / 882421 / Accessed February 16, 2019.