

Family Latrine Construction Models In Lowland Areas That Is Safe For The Environment For A Community Of Low Economy

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ABSTRACT: This study aims to design a family latrine construction model for the low economic community, in the lowlands in South Sulawesi Province that is safe for the environment. This type of research is survey research. The sample areas are Barru, Soppeng, and Wajo districts, selected by the purposive sampling method. Respondents in each region of 50 economically low households were selected by the purposive sampling method. Data collection was done by giving questionnaires to respondents. The analysis used was qualitative descriptive analysis. The results of the study show that the model of family latrines that is safe for the environment for the low economic community in the lowlands of South Sulawesi Province is as follows: (1) the construction of the fecal basin is made of a pair of water-resistant fine-dipped red stones or made of cylindrical precast concrete 2.5 meters including those that appear on the surface of the ground as high as 0.5 meters, with a size of 1 x 1.5 meters or a diameter of 1.2 meters, (2) the toilet floor is made of concrete cast, the toilet is a local toilet shaped goose neck, (3) the bathroom floor is made of ceramic or cement floor pairs, (4) the toilet wall is made of a pair of red stones in fine plaster, or made of zinc plates, or a local wooden board, (5) a roof frame using local wood and a cover, the roof is corrugated zinc, or a local wooden board, or split bamboo, and (6) the toilet cover door uses a local wooden frame coated with zinc plate, or the local wooden panel door.

KEYWORDS: *Lowland, family toilets, low economic community, and models.*

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I. INTRODUCTION

The Law of the Republic of Indonesia No.32 of 2009 concerning Environmental Protection and Management, in Article 1 paragraph 1, states that the environment is a unified entity with all objects, powers, circumstances and living things, including human beings and their influence continuity of life and welfare of humans and other living things. From Law No.32 of 2009, it can be understood that positive human behavior is a determinant of environmental sustainability and other living things. Therefore, the good and bad of the built environment of humans is very much determined by humans themselves. As well as providing family latrines that are good and safe for the environment.

Ahmadi (2012) basically states that the environment is: the unity of space in which there are natural resources, living things and other non-living things, including humans. Tandjung (1991), Soeriaatmadja (1997), Singh (2006), and Adnani (2011) divide the environment into three parts, namely: (1) biological environment, namely environmental elements that are biological in nature which can be a source of food and a source of disease, (2) the physical environment, namely the elements of the environment in the form of land, air, climate water which are basic human needs, and (3) the social environment, namely the environmental elements in the form of economic systems, customs community organizations and various human services to humans. Therefore, these three environmental components have a dependency on one another. The environment in which there is housing is a human built environment. One important aspect of housing is the availability of healthy family latrines.

Based on the previous descriptions, to keep the environment from experiencing a deterioration in quality, especially in the housing environment, a family toilet model is needed which can be applied and used by families to dispose of feces. The existence of a good and easily maintained latrine model allows all people in the housing area to watch it. One model that can be applied to weak economic communities in low-lying areas that do not reduce environmental quality, both abiotic environment, biotic environment, and social environment is a healthy family latrine construction model that uses local raw materials.

Surveys in September 2016 in Soppeng, Wajo and Sidrap Districts found community family latrines in the lowland area, no toilet, and no permeation. This condition pollutes the environment and is not safe for human health. In addition, latrines were also found that have makeshift walls, such as plastic walls attached to bamboo. The toilet floor is made of local wooden beams, which are perforated to squat away feces. Direct feces pour in the hole that has been dug as deep as approximately 1.5 meters with a length of 1.2 meters and a width

of 1 meter. Another condition that was found was removing faeces (stool) directly into the river. While in the area a lot of sand and gravel can be used as the main ingredients in making the construction of family latrines that are healthy and safe for the environment.

On the basis of all the descriptions previously stated, the purpose of this study was to (1) design a family latrine construction model, which consisted of: (a) fecal basin construction (b) permeation construction, (c) toilet floor and bathroom floor, and toilet, (d) toilet wall, (e) roof frame and cover, and (f) toilet wall, (2) knowing the material used or as a constructor of latrines, (3) finding steps to apply the latrine model designed.

Some of the theories underlying this research are as follows: Notoatmodjo (1997) states that: (1) feces that are not managed properly can affect human health; (2) feces cause a foul odor that causes flies to come, which are disease vectors; (3) faeces are a source of several infectious diseases, such as typhus, cholera, and dysentery, and (4) faeces can contaminate groundwater. Furthermore, Notoatmodjo (1997) explained that to prevent and reduce contamination of human waste on the environment, it is necessary to properly manage human sewage, which is to build family latrines with septic tank. Salvato and Beck (1994) state that family latrine buildings must meet health requirements, namely: (1) family latrines must be protected against heat and rain, (2) placed in locations that do not disturb the scenery and do not cause odor, and (3) there should be enough water to clean it. Furthermore Salvato and Beck (1994) explained that the requirements of family latrines must use ventilation so that there is air circulation and the septic tank must use a lid and air holes from the pipe so that the smell can be minimized.

Family latrines are buildings used to dispose and collect dirt or unclean humans waste commonly called latrines / toilets so that the dirt is stored in a certain place and does not cause or spread disease and pollute the neighborhood. Furthermore, it was explained that the house should have its own latrine which is one of the important things in the business of maintaining environmental health (MOH, 2002). Firmansyah (2009) states that latrines in rural Indonesia can be classified into 2 types, they are clay latrines and septic tank / goose neck latrines.

Furthermore Notoatmodjo (2007) stated that things that need to be considered are as follows: (1) the latrine building is protected from heat, rain, and is protected from view; (2) has a strong floor and a strong foothold; (3) placed in a location that does not disturb the view and does not cause odor; (4) provide cleaning tools such as water or cleaning paper; (5) the location of the latrine from the source of clean water is approximately 10 meters. Mubarak and Chayatin (2008) in principle state that improper disposal of stools is often associated with a lack of clean water supply. Conditions like this will have an impact on health, besides causing environmental pollution. Furthermore Mubarak and Chayatin (2008) stated that disposal of faeces in any place can cause transmission of various diseases. As for diseases transmitted through faeces among others are Amoebiasis, Cholera, Stigellosis, Poliomyelitis, and Typhus.

Environmental sanitation according to Supardi (1983), Entjang (1991) and Daud (2001) is an attempt to control people from all human physical factors that might cause adverse things to the physical development of health and the survival of human life. Physical, biological, social, and economic surveillance greatly affects human life. Sanitation is very important for the community, especially in the provision of clean water, sewage disposal, eradication of mosquitoes, flies, mice, and prevention of infectious diseases. Franceys and Reed (1992) stated that environmental sanitation is a system of shelter and disposal of human waste (septic tanks), liquid waste and disposing of garbage so as not to endanger individuals and society.

Based on the description that has been stated, it can be concluded that healthy family toilets are very necessary in every household to remove waste or human faeces. The existence of the latrine makes the occupants of the house and the surrounding community not to be contaminated with the odor caused by human waste. In addition, the environment as a whole does not experience a decline in quality-

II. RESEARCH METHODS

This type of research is survey research. The research location is the lowland region of South Sulawesi Province. The sample area was chosen by the purposive sampling method, namely Barru, Soppeng, and Wajo Regencies. Respondents in each region were 50 family heads, namely family heads belonging to the low economic community who were selected by the purposive sampling method. Thus the number of respondents was 150 heads of families from a low economic community.

Variables or concepts that were considered were: (1) the latrine construction model whose indicators are: (a) construction of faeces disposal, (b) toilet and toilet floors, (c) bathroom floors, (d) toilet walls, (e) frame of roof and roof cover, and (f) latrine doors; (2) local materials used in latrine construction, and (3) how to apply the latrine construction model. Data collection was done by giving questionnaires to respondents. Data analysis used was qualitative descriptive analysis. After summarizing the results of the analysis, then a model of the family latrine construction for the lowland area in South Sulawesi Province was made.

III. RESEARCH RESULTS AND DISCUSSION

A. Construction Model of the Low Economic Community Family Latrine in the Lowland Region of South Sulawesi Province

1. Construction of Faecal Shelter

The family latrine construction model is of a low economic community in the lowland area of South Sulawesi Province in the aspect of faecal shelter construction involving 150 respondents is a waterproof, watertight red plastered stone pair or construction of cylindrical precast concrete size: 2.5 M depth including those that appear on the ground as high as 0.5 M. For the red stone, pair length = 1.5 M and width = 1 M. For cylindrical precast concrete construction measuring 1.2 M. in diameter This construction, in terms of prices can be achieved by the low economic community and can done by people in the lowlands of South Sulawesi Province. The construction is quite efficient and safe for the environment.

2. Seepage Construction.

The family toilet model is a weak economic community in the lowland region of South Sulawesi Province on the permeation construction aspect, which analyzed from 150 respondents were split stone layers at the bottom of 25-30 cm thick, above a split stone layer given a layer of gravel 25-30 cm thick, above a layer of gravel is given a layer of sand as thick as 25-30 Cm, on top of the sand layer is given a seepage pipe wrapped in palm fiber, above the seepage pipe is given a layer of sand as thick as 25-30 Cm, on a layer of sand is given a layer of gravel 25-30 cm thick, and above gravel was piled up with ordinary soil until it was level with the surrounding soil surface. This seepage construction is placed on the side of the stool holding tank with a distance of 0.5-1 M. This construction is easy to do and affordable in terms of price by people in the lowlands of South Sulawesi Province, as well as safe for the environment.

3. Construction of latrines and used toilets.

The family latrine model of the weak economic community in the lowland area of South Sulawesi Province in the aspect of construction of the latrine floor and toilet that was analyzed was analyzed from 150 respondents were cast concrete pairs covered with simple ceramic goose neck toilet or cement floor. Simple tile floors, goose neck toilet prices can still be affordable by the weak economic community in the lowlands of South Sulawesi Province. Likewise local materials, namely: tidal sand, local cramps, and red stones are available quite a lot and the price is affordable. Ceramic floors and cement flooring like this do not store waste water on the toilet floor. Thus the toilet floor is always clean and odorless.

4. Bathroom Floor Construction.

The family latrine model of the poor in the low-lying areas of South Sulawesi Province in the analyzed aspects of bathroom floor construction from 150 respondents was a simple red-coated red stone floor or covered with cement floor.

The bathroom floor with a pair of red stone coated with simple ceramic or cemented floor, the price can still be affordable by the weak economic community in the lowlands of South Sulawesi Province. Likewise, local materials, namely tidal sand and red stones are available quite a lot and the price is affordable. Simple kramik or local cramps and cement are still available quite a lot and can be reached by the weak economic community. Ceramic lantai and cement floor floors like this do not store waste water on the toilet floor. Thus the toilet floor is always clean and odorless.

5. Construction of Existing Water Tubs in the Bathroom

The family latrine model of the poor in the lowland areas of South Sulawesi Province in the aspect of the water bath construction in the bathroom analyzed from 150 respondents is a simple dichemic red stone pair or a waterproof watertight red plastered stone pair. The construction of a water bath in the bathroom with a simple red dichemic stone pair and a waterproof watertight red plastered stone pair, is a water reservoir that is easy to clean. This kind of construction can be reached by weak economic communities in the lowlands of South Sulawesi Province. Likewise, local materials, namely tidal sand and red rock are available quite a lot and the price is affordable by the weak economic community. Simple or locally made kerikik and cement are also available quite a lot and can be reached by the weak economic community.

6. Latrine Wall Construction.

The walls of the family latrine model of the poor in the lowland areas of South Sulawesi analysed from 150 respondents consisted of fine plastered red stone, or local wooden zinc wall frames, or local wooden plank walls. Latrine wall construction with finely plastered red stone, or local wood frame zinc walls, and local wooden plank walls is durable and easy to maintain. This kind of construction can still be achieved by the poor in the lowlands of South Sulawesi Province. Likewise, local materials, namely tidal sand, red rock and local

wood are easily available and the price is affordable by the low economic community.

7. Construction of a latrine toilet frame.

The roof truss of the family latrine model of the poor in the lowland areas of South Sulawesi Province analyzed from 150 respondents is local wood or second grade wood. Construction of roof frames made of local wood or second-grade wood can be done easily by the people in the low-lying areas. Local wood materials and second-class timber are widely available and the price is affordable by the low economic community in the lowlands of South Sulawesi Province.

8. Latrine Roof Cover Construction.

The roof cover of the family latrine model of the poor in the lowland areas of South Sulawesi Province analyzed from 150 respondents was zinc, or split bamboo, or local wood. Roof construction made of zinc, or local wood, and or split bamboo can be done easily by the people in the lowlands. Local wood materials, zinc and bamboo are widely available and the price can be affordable by the weak economic community in the lowlands of South Sulawesi Province. Roof cover construction like this if done well will last a long time and is easy to maintain.

9. Construction of latrine doors (WC).

The construction of the latrine door of the family latrine model of the poor in the lowland area of South Sulawesi Province analyzed from 150 respondents was consisted of local wood frame zinc plate, or the local wooden board panel door. The construction of local wooden frame doors coated with zinc plates and / or the doors of local wood planks, can be done easily by the people in the lowland areas. Local wood materials and zinc plates are widely available and the price is affordable by the low economic community in the lowlands of South Sulawesi Province. Door construction like this if done well will last a long time and is easy to maintain.

B. Local Materials Used or Become Composers of Latrine Construction Models.

1. Local Materials Used for Construction of Faecal Tubs.

Local materials used or the model for family latrines is in a low economic community in the lowland area of South Sulawesi Province were sand, gravel, red stone and cement. The price of the constituent materials is affordable by the low economic community and is widely available in the lowland areas in South Sulawesi Province.

2. Local Materials Used for Seepage Construction

Local materials used or compilers of the family latrine model of the low economic community in the lowland areas of South Sulawesi Province were gravel, sand and palm fiber. Composite construction materials, the price is affordable by the low economic community and is available in many low-lying areas in South Sulawesi Province.

3. Local Materials Used for Construction of Latrine Toilets.

Local material used or became the compilers of the family latrine model of the low economic community in the lowland areas of South Sulawesi Province. The constituent materials for the construction of the latrine floor is affordable by the low economic community and is widely available in the low-lying areas of South Sulawesi Province.

4. Local Materials Used For Bathroom Floor Construction

Local materials used or compiler models of construction of the floor of family latrines of the low economic communities in the lowlands of South Sulawesi Province were red stones, gravel, and sand. The price of the constituent materials for the construction of the latrine floor is affordable by the low economic community and is widely available in the low-lying areas of South Sulawesi Province.

5. Local Materials Used for Construction of Water Tubs in Bathrooms.

Local materials used or compilers of the family latrines model of the low economic community in the lowland areas of South Sulawesi Province were local cramps, red stones, gravel and sand. The constituent materials for this water bath construction, was affordable by the low economic community and is widely available in the lowland areas in South Sulawesi Province.

6. Local Materials Used for Construction of Latrine Walls.

Local materials used or compilers of the family latrine model of the low economic community in the lowland areas of South Sulawesi were sand, red stone, sand, zinc beams and local wooden boards. The price of

constituent materials for the construction of the latrine wall by the low economic community was affordable and is widely available in the low-lying areas of South Sulawesi Province.

7. Local materials used for construction of latrines.

The local materials used or the model of the roof truss of the family latrines is in a low economic community in the lowlands of South Sulawesi was local wood and second grade wood. The price of the constituent materials for the roof truss construction was affordable by the low economic community and is widely available in the lowland areas in South Sulawesi Province.

8. Local Materials Used for Construction of Latrine Roof Coverings.

Local materials used or compilers of the family latrine model in the construction of the latrine roof cover by the low economic community in the lowland areas of South Sulawesi Province were zinc, or local wood, and or split bamboo. The price of the constituent materials for the roof cover construction of the latrine, was affordable by the low economic community and is widely available in the low-lying areas in South Sulawesi Province.

9. Local Materials Used for Construction of Latrine Doors

Local materials used or compilers of the family latrine model in the construction of the latrine door of the low economic community in the lowland areas of South Sulawesi Province was local wood frame zinc plate, and or local wooden board panel doors. The price of the constituent materials for the construction of the latrine door was affordable by the people of the low economic community and is widely available in the low-lying areas of South Sulawesi Province.

C. The steps in applying the family latrine model to the low economic community in the lowland areas of South Sulawesi Province

The first step is to install the latrine midline. The second step is to provide an explanation of the purpose and benefits of the latrine. The third step is to provide an explanation of the negative effects of faeces that are dumped carelessly on human health and the environment. The fourth step is to provide an explanation of the local materials used or who are the people of the construction. And the fifth step is to provide a pilot model of the application of latrines to low economic communities in the lowlands of South Sulawesi Province.

IV. CONCLUSION

1. The family latrine model for the low economic community in the lowland areas of South Sulawesi Province consist of: (a) the construction of the faecal basin consisting of a pair of plastered red stone that is smooth and watertight and cylindrical precast concrete, (b) the permeation construction is installed on the side of the stool, (c) the toilet floor is made of concrete, the bathroom floor is a pair of stone covered with local ceramics or cemented floor, locally made goose neck toilet, (d) the toilet wall is made of finely plastered red stone pairs, or zinc walls, and or local wooden walls, (e) the roof frame uses local wood, the roof cover is zinc, or split bamboo, and or local wood, and (f) the toilet door is made of local wood coated with zinc plates or local wood partitions.

2. Materials used: (a) construction of stool from a pair of bricks (b) permeation construction is split stone, gravel, sand, 5 or 6 inch pipe diameter, and palm fiber, (c) the toilet floor is sand, gravel, cement, bathroom floors, (d) water tank from a pair of bricks, or ceramic (e) latrine wall material is a pair of brick or zinc or local wood, (f) roof truss is local wood, roof cover is local wood or zinc and or split bamboo, (g) the toilet door is local wood or zinc plate.

3. To apply the latrine model that was found, the steps taken were as follows: (a) introducing the latrine model, (b) giving an explanation of the purpose and benefits of the latrine, (c) giving an explanation of the effects of stool being disposed of anywhere, (d) introducing and explaining the local material used, and (e) providing a pilot model of latrines for low economic families in the lowlands of South Sulawesi Province.

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