INCORPORATING AND CONVERTING BIOGAS TECHNOLOGY INTO HOUSEHOLD SPACE

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ABSTRAK

Kemunculan teknologi biogas di Indonesia berkembang pesat setelah berkembangnya wacana mitigasi perubahan iklim oleh para ahli sains. Gas metan sebagai hasil dari kotoran hewan di Indonesia telah menarik perhatin para ahli teknologi untuk menerapkan teknologi yang tepat dan terjangkau di kalangan rumah tangga pedesaan, yakni biogas. Walaupun demikian, belakangan ini riset mengenai biogas jarang sekali membahas bagaimana teknologi memasak dapat berintegrasi ke dalam ruang rumah tangga. Dengan menggunakan teori domestikasi, artikel ini merupakan upaya untuk berbagi pengertian tertentu mengenai tahap-tahap sosial yang berbeda-beda antara satu dan lainnya dalam hal teknologi biogas yang hendak dipopulerkan ke dalam kehidupan rumah tangga.

Kata kunci : teknologi, mitigasi, biogas, teori domestikasi

ABSTRACT

The emergence of biogas technology in Indonesia is invasive after the rising of climate change mitigation discourse by scientists. Methane gas as results of animal wastage in Indonesia has withdrawn technologists to apply an appropriate yet affordable technology for rural household, namely biogas. However, nowadays research on biogas barely investigate how such cooking technology is made to be integrated in the household space. By using the domestication theory, this paper is an attempt to shed particular lights on distinctive social stages of biogas technology in being immersed into the life of household.

***Key Words**: technology, mitigation, biogas, domestication theory*

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PROBLEM STATEMENT

Household in many discourses is addressed as space where consumption of technology is exercised by the members and in the same vein technology such as television, cook stove, and rice cooker are fed in to satisfy their needs. Hence, to make them more capable of using such equipment, what they can do is *taming* it, and put more efforts to get it flawlessly adopted in the routines. Concerning this, Livingstone (2003) and Wilhite (2008) put up that taming such technology, namely domesticating, is processual efforts that engage knowledge-based learning, cultural practices, social norms and values. Looking closely at agentive approach, in which household is placed as decisive actor for the adopted technology, Carrier and Miller (1999) maintain the importance of research on domestication on technology shall be concentrated on household as they emphasize "household on the one hand plays very critical roles in shaping the dynamics of energy use in the society" (1999:24).

Against the backdrop above, this thesis deals with the question as to how biogas affects the social life and people's well being. Since the technology is not isolated from the social-cultural dimensions of the society, so their existence in the household is potentially influenced by the ways of socio-technical interaction between the technological artifact and the users. In relations to this, the significance of energy use in the household raises very critical questions, according to Winther (2005) about how it is arrived and adopted in the household by attuning the values and why it matters to the live of the respective household. Embarking from this perspective, the research will bring the light the social life of biogas technology from its arrival in the household to the ways it could immerse with the value of the society. As to gain the insights and information in this manner, semi structured interviews with households combined with participant observations by touring into the house are employed.

THEORETICAL APPROACH

Conceptually speaking Domes-tication denotes as a specific action to tame something odd. This term is usually used in animal husbandry to domesticate a wild animal that provides productivity to the local community. This term is also co-joint with the presentation of German born sociologist working with Norwegian Natural Science University (NTNU) of Trondheim Thomas Berker who notes that domestication involves diverse environment in which technology emerges in and such strange and wild technologies have to be harmonized with the condition of the household so that individuals reside in the household may adept and the most importance of making the technology integrated is to ensure that social structures, daily routines, and values of its users and their environment are capable of accepting the technology into the dwelling of the users (Berker et al, 2006:2). Before the technology is incorporated into the household, in some large extents, individual who barely deal with the specific technology and neither have firm familiarity with it tends to refuse to get the technology into his or her life. What future impacts it may have is that the technology would become obsolete if it is no use. From this perspective, it is very important to put the domestication of technology approach to refrain from such defect. The successful domestication of technology into household is to be shown through the changing perception of the users, which the technology is no longer regarded as "cold, lifeless, problematic" (Berker et al, 2006:3), but rather as functional apparatus and an artifact that reliable and trustworthy to the live of community. Concerning the importance of domestication of technology, different scholars may have conceptualization of their own but in essence they all have cross cutting

understanding that is beneficial to be taken into account. The placing of users in the front compound of domestication of technology gains reciprocal importance. According to Sørensen (2006), the importance of domestication of technology is at the end subject to the continuous use of the technology itself on the hand of the users. He points out the proposition claiming that users play an active and even decisive roles in the construction of patterns of use which derives from the deep meaning closely associated with technology (Sørensen, 2006: 45).

This paper chiefly focuses on how the biogas is integrated in the society and seeks to understand how it bring social changes on the household life. As to address this objective, incorporation and conversion concepts in the domestication of technology is chosen, as it provides systematic comprehensive model for the ways household technology

Incorporation

As technological artifact is situated in the home, which is not isolated from the pre-existing practices of household activities, the ways household users negotiate and seek alternatives to make the newly adopted technology integrated at home is considerably important. This description deals with how the technological artifacts is habituated in the household, following Berg (2006) it is termed as 'incorporation' in the domestication, which is defined as examination of "how technology is integrated in the routines of everyday life". This is asserted by Blechar (2005) that incorporation encompasses the process in which the technology becomes the part of our routines of everyday life.

Other experts concentrates the incorporation on the stage in which technological artifact require specific adjustment of practices that the users have long been doing as habituation-for example, the users allocates times and special designated place to ensure the technological artifact is benign for their routines. In connection with this, Hyness and Rommes (2006) maintains, during incorporation, in order to become functional a technological artifact has to settle in a place that is integral with routines of daily life. The everyday life is importance in scrutinizing how the technology affects the changes of the spheres in the household. It is actually conjoint with argument of Lie and Sørensen (2002) that reiterates the technology potentially affect all spheres of life as work, home and leisure. Furthermore, everyday life is asserted as something that is not solely associated to the specific sphere of life, but following Lie and Sørensen (2002) it also involves daily activities performed by the family members.

By doing investigation of the ways technology can co-shape with the daily life, we may understand a situation on the degree which individuals could execute a control over their lives (Lie and Sørensen, 2002). Should the household be able to adjust their pre-existing practices and routine with the arrival of the technological artifact, technological artifact has equally found its 'place' in the daily life and perpetuate no potential problems. The entry point of successful usage of technological artifact is rooted from the household's capability in making practical adjustment of their pre-existing behavior to enable the artifact merges the household space.

Conversion

The use of technological artifact and its acceptance in the society may associate to the social standing of household in the local values. The interactivity with community members and how they view the technology users, to some limited extent, could be influenced with technological artifact, which gives their life more meaning and social standing among other community members. Such manner in domestication concept is termed as "conversion". Berg (2006) maintains that by looking from the 'conversion', this concept deals with the

social changes that resurface in the household after the technology is widely known in the community and it also concerns the way the household members try to adjust the technology to their own values and societal view.

Furthermore, throughout the conversion some changing practices of household in utilizing the pre-existing artifact and already adopted artifact can be obvious and in this manner household users can unfold some benefit that the technological artifact brings and continuously used as means for supporting the household as sustainable equipments. The benefits that users reap from the technological artifact may vary according to the level of basic needs and also other variables that they uptake. Departing from this, the 'interpretative flexibility' that enables users to have distinctive experience that differ them from other users' of technological artifact.

FINDINGS

Biogas is required to be incorporated in the lives of family especially into their established routines. To look at how this process takes place, this chapter provides discussion on the change of regularities that the households perform to make biogas technology well immersed in their routine. Household's experience of the ways biogas could be integrated and make further changes in the family is also scrutinized.

Integrating Biogas into Everyday Life

Biogas technology would become seamless into the family life if it is already harmonized and synchronized with the routines and also pre-existing habit that family members have long preserved. The changes in spatial reorganization of home as well as time arrangement shows that the users' construct about world has change, followed with transformation of life.

TheArrival of Food Preparation and TimeArrangement in the Family Life.

The length of hours spent by each of household seems to be different since it is dependent cooking activities they do every morning (04.00-09.00), afternoon (11.00:15.00), and evening (17.00-17.00). Each of household considers the maximum duration of biogas volume for cooking. With normal feeding like once every 3 days, the biogas may last usually for 5 days to a week as long as the users utilized it for 6-7 hours per day for maximum. The interviews uncovers that general households can anticipate not to use the biogas excessively. This indicates that they acknowledge the limitation of gas volume, as it will be quickly over if they cook more than 6-7 hours per day. However, every family experiences is distinctive each other in term of type of the food menu. Normalization as such indicates that the users discern, though biogas is renewable but it has timely limitation in usage and capacity.

Most households also prepare dishes on biogas stove for farming labors who assists them for harvesting of paddy and it is considered sufficient as main fuel resource, since it does not need to much energy compared to LPG stove. User realizes that the operating biogas technology is unlike using LPG stove, because biogas stove is much dependent on the stock of methane gas after regularly feeding it with cow dung. Since biogas stove has almost nearly similar type as LPG stove with rotating switcher to control the flame, they reveal no difficulties in adjusting the flame along cooking activities. From this experience, it is found that the way they use biogas stove is also inspired by the synonymous use of previous cooking technology. As all users have benefitted LPG stove since long while, significant difference in working with biogas stove was rarely figured out.

The arrival of biogas stove in kitchen does not mean the users have left their customs of using other stoves that they have utilized for cooking chores. Even though the users still keep their previously used stoves but they used it for different purposes. For instance, household with cows must feed the livestock regularly with 5 liter of rice chaff every morning before the husband departing to workplace, while the wife prepared the breakfast dishes on biogas stove. LPG stoves were still on use to accelerate the cooking of rice chaff and regarded it as quicker than using biogas in some extent. He emphasizes, "If I used biogas for my cow, I will be late to reach the office as I must wait the rice chaff well-cooked for more than 30 minutes. So, biogas has limitation in its use, but we prioritize it for only making breakfast because our breakfast menu is simpler and just to simmer the dishes we had cooked last night or yesterday" (Interview with SD).

Consumption pattern from one household to another shows some differences, which are also shaped by the farming activity that they had been recently doing. For household whose farming labor more than one, biogas is considered inadequate to cook. For instance, household with 3 farming labors for their paddy field from morning to afternoon, so it is necessary to have extra stoves and thus LPG stove was chosen. Although there are only two children in the family, he considers that cooking on biogas was not sufficient for preparing breakfast, as he must make extra food for the labors. His assertion actually confirms that volume of biogas is much relied on the length of cooking than the menu. Regarding this stuff he recalled, "…my two growing children aged 3 and 12 only need very simple menu, but the construction workers do not. We shall serve them with more variety of dishes as they work until afternoon, while my wife is still at work and not able to cook for them" (Interview with TG). From this experience, external consumption that does not relate to the domestic consumption of family also influences the household energy use and it is something to do with what agricultural activities they have in that month or certain period of time.

Time Adjustment, and Reorganizing Space in Family.

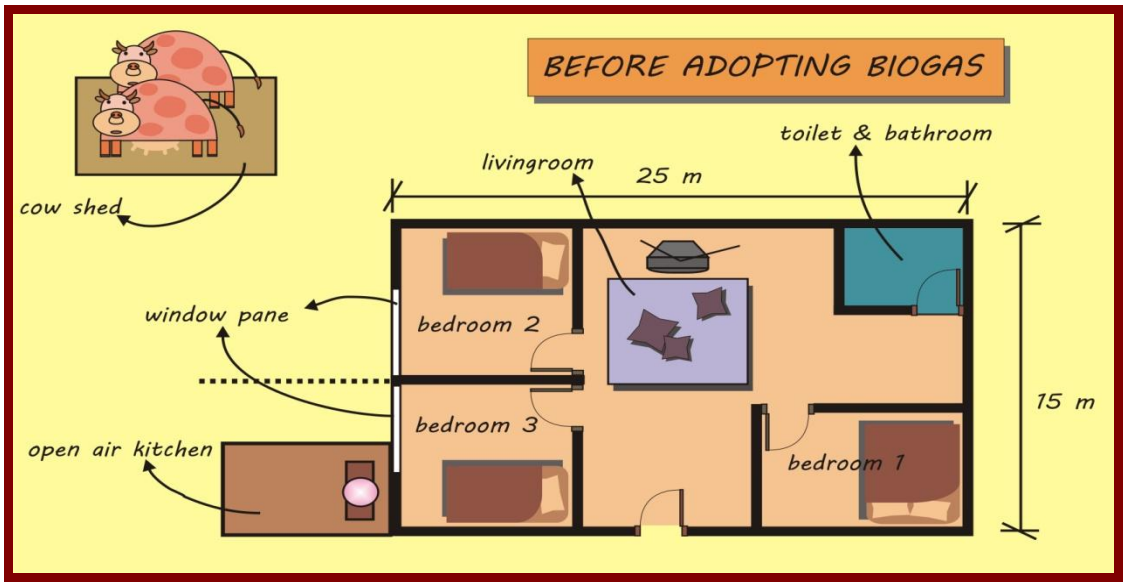
The transition to biogas stove is relatively smooth but it does not guarantee that users can shift to using biogas without leaving the previous ways of cooking on the former equipment like LPG. Concerning to this, Winther (2008) argues, habit of using former cooking equipment may lead users to have certain period in which they experience experimental practices that makes them understand distinctive real using thing. For new adopters of biogas, the changes of habit become embedded aspect in their daily routines. It also happens to some of the households who have migrated from LPG gas stove users to biogas-stove users. Before using the biogas stoves, the household users, especially the ones who have been busy working with cooking activities like women feel much easier working on LPG gas stove as they just turning right the "ON" button and then the flame of blue gas will appear instantly so that the cooking process is ready after a while. Unlike LPG stove, biogas stove is designed distinctively with care and to turn on flame of the fire users must lit the burner cup first and wait for few minutes before it is ready for cooking. By design it is created with the setting-up for user safety. Beforehand, users should also check the manometer to check the remaining gas so that they could allocate how much time for cooking. From the interviews, it is revealed that all of the users should allocate little longer time to do so before proceeding to the cooking. The length of time is varied one household to another, but it was mostly from 2 to 5 minutes. Additionally, the housewives must check the manometer frequently before making food. In the first month they felt hesitated and quite reluctant to do so, perhaps it had been their

first time, but after second month they get accustomed to it.

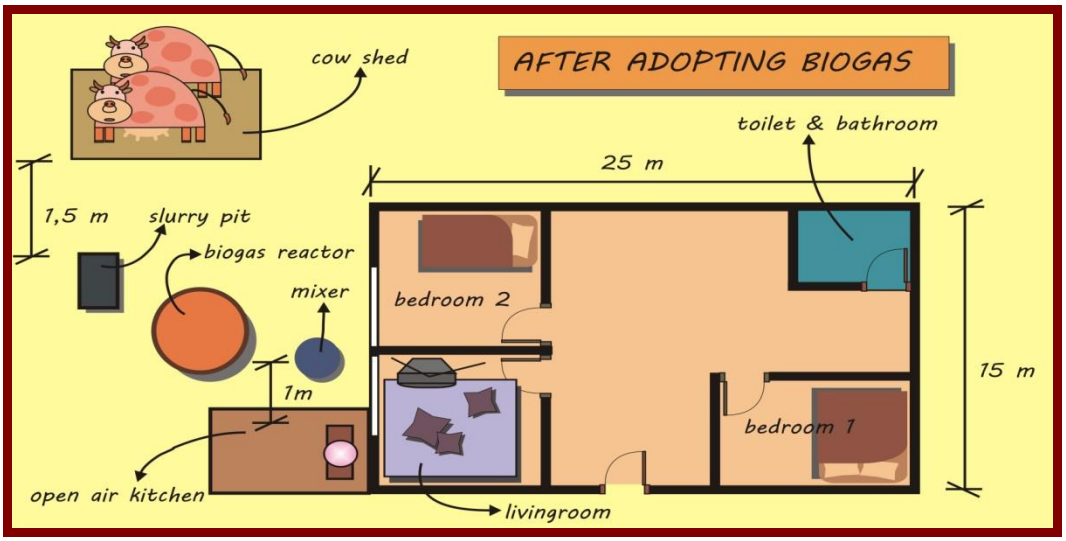
Given this new biogas technology, a household users especially housewives are in highly demand of capability to understanding some of technical knowledge regarding to the daily use of biogas, such as to how determine whether the gas volume is sufficient and what parameter or indication on the manometer which signifies that the gas is still available. The technical knowledge of reading the manometer was mostly obtained from direct instruction of their husbands. Husband, in the knowledge mastery, may possibly have better knowledge because they retrieved first-hand information and knowledge. In spite of the gap of knowledge between wife and husband, but willingness of women to learn after biogas adopted indicated that they want to appropriate it into the daily routine of cooking for the family members.

In most of rural are women has conventionally been given authority to cater home and decorating the housing furniture, though the landholding is under the ownership of husband. Compared to men, women posses much more concerned the interior of the house and are concerned about the aesthetical matter. Though it cannot be generalized, it gains importance to explore how women are much more having deep attention to the domestic space. One of the wives expresses a discontent for her husband decision to place the biogas stove in the kitchen, which locates in their home. As she recalled, "Well, my husband told me he wanted to drill the wall so that the pipeline of gas stove can be put inside, but that is necessary because it will delimit the aesthetic of the home. I think there is no women who want the wall of the house get perforated and of course our house will lose its aesthetics. It was a big no for it..." (Interview with SS).

Besides that, a family often has specially designated area at home for gathering and chatting that is considered important space for living. The distinctive arrangement after biogas adopted by the family implies different meaning. For further illustration, I made an example from the observation of household of WJ. The sketch on figure A illustrates the organization of the room before adopting biogas, while the second sketch on figure B exhibits reorganized space indicated with the changed position of living room near the kitchen.



(A) Before Adopting Biogas



(B) After Adopting Biogas

As displayed on the sketch as in figure B, the family used to getting together in the living room located in the large corridor build outside and it was the place for dining and having chit-chat when all family member spent the warmth evening at home. By purpose the glass window built on the bedroom 2 and 3 as it allowed them to watchdog the cow. Since cows can be sold in the traditional market to gain profit, cow thievery occurred quite frequent and this compels all family members to stay vigilance, so that all family members who sleep in both rooms can observe the cow anytime at night and would then feel secure.

Life Transformation and Improved Wellbeing.

For the household biogas brings advantage and improvement of life. However, since the social setting of families and their needs are diverse, positive impacts may be perceived differently.

Feeling of Safety

Operation wise, the gas extracted from the mixture of cow dung and water will be kept on the upper part of the dome in the biogas reactor and through connecting pipeline it is channeled to the biogas stove in the kitchen. The user must rotate the tap controller to flow the gas output to the gas stove before cooking is started. Since the pressure is low, the flame is not aggressively ignited unlike on the LPG gas stove. The likelihood of explosion of LPG gas compared to biogas may occur due to its high pressure. The case of gas explosion in Indonesia has inflicted the society with higher risk of perception among the user. However, the biogas usage in the village informed me with much better perception of risk compared to the LPG, a housewife affirmed with her knowledge that it is because the gas of biogas is accumulated in very low pressure compared to LPG.

In addition to that, majority of housewife who had previous experience with LPG gas kerosene and had migrated to biogas expressed their common relief that biogas entails no risk because it is technically designed with low pressure. Before biogas became the cooking instrument at home, housewives often spent longer time to wait in the kitchen because they were quite concerned if something dangerous prevailed incidentally to their LPG stove (Interview with SN;

Interview with NS; Interview with TN). Such anxiety was holding them back from other household tasks that would have to be finished quickly, but after migrating to biogas, they were able to carry out other activities like watering the plant at home, accompanying the children studying, reading newspaper at the living room, enjoying some of favorable book of their own while waiting the food cooked on biogas stove. On the other hands, women were no need to be stick with the food in the kitchen doing nothing. Through this safety perception, it is proved that biogas allows women in involving themselves in family life and can have quality of time with their children.

The perception of zero risk is also signified with diminished fear of using biogas stove when parent asked their children to turn on biogas stove. During my visit to SK's house for interviews, he demanded his daughter to boil hot water for my coffee, though she's aged 10 years old. Responding to the risk of biogas he argued that the stove is relatively save for children as long as the parent can teach them how to operate it thoroughly and conduct parental advisory to ensure the children is capable enough of using it without company (Interview with SK).

No More Reliance on Firewood and Environmental Consciousness.

Although firewood is ample resource in the village but when rainy season comes, it can easily get wet and moist so would not be burnable for cooking. This problem also existed for the household who much relied on it and thus compelled them to figure out another sources. Biogas as the chosen effective option for that household because they can now cook without worries when rain comes and by doing that they can save at least IDR.50.000 to 100.000 per month from not purchasing the firewood at local market (Interview with SD).

Household who had previously been with firewood can consumed it more than 20 kg every month and this was indeed costly and made them dependent on it for years. Moreover, they also encountered the problem with the ash, which often turned unhealthy for lung. Even though medical evident has not been undertaken to assess what diseases that they have, but during interviews some housewives disclosed their experiences of having frequent cough when cooking on firewood. Given this fact, cooking on firewood has been obviously health-wrecking thing for the household, especially women. The issue of deforestation causing minor flood in the rural areas is not yet largely recognized by most of the household users, but some of them have been aware of the current issue on it.

Biogas use, on the other hands, has gotten them exposed to the various environmental problems, like devastating methane gas that could devastate the atmosphere. This newly emergent understanding came to their cognition through the socialization and interaction with diverse actors who are engaged in the biogas project. A user I interviewed explore on this concern:
"Biogas has brought new knowledge that we as villagers might do not realize, such as possibility of flood because the trees which used to protecting our nature has rapidly declined. So by using biogas is part of practicing the moral values and showing our responsibility to the nature. This is small step that bring wider change. I hope" (Interview with SN).

Shifting to the biogas, accordingly, lends positive influences to the life of household, not only reducing the health risk due to the combustion of firewood which in the later phase it can put the women into vulnerable groups, but also altered the perception on environmental sustainability.

Savings for Funding Education and The Shift of Gender Role in Family

Children education is fundamental aspects for human growth and with the use of

biogas the household can have more money to be saved to finance schooling of their children. For the household who do not work on farming, monthly saving are allocated for the payment of educational purpose as in SS' experience. After migrating to biogas, his family can save up to IDR 150.000, which the money allocation is to buy books for his growing daughter who is studying at the university in Yogyakarta (Interview with SS). That amount of money was equal with monthly expense for purchasing LPG gas tube to cook for 5 family members (2 parents and 3 daughters). As the biogas of this household was always routinely fed up, so they never had gas shortage every day. With satisfactory expression SS also conveyed that he never took bath with warmth water before having biogas previously because it would considerably increase the family spending on LPG gas tube. By cooking on biogas he can have more time to take bath with warmth water boiled on biogas stove almost every day which he was not used to it.

Meanwhile for those households who managed their farming, using biogas can help them also by saving from the monthly spending, especially during harvesting time around June to August. Roughly the saving that every household made was various but generally it was around IDR. 200.000 throughout harvesting time, as they needed to serve food and beverages for 5 farming labor for cultivating the land. An assertion of housewife whose husband worked on their paddy fields made me aware of how biogas can bring life transformation into them. She underpinned that after biogas incorporated in the household cooking, she could pay both of her children tuition fees (Interview with TA). In the mid of expensive tuition fee of secondary education in Indonesia, biogas is tremendously helpful for her. Aside of that, the emergence of biogas has also brought a positive change in child-rearing responsibility between she and her husband. Her husband preferred to wake up an hour earlier than she was in the morning to boiled the water and prepare breakfast for both children as he knew that every day she had to reach the school early morning on 7 a.m. for teaching. The commitment of her husband to checking the biogas plant every early morning awakened his responsibility for ameliorating her duty as housewives because he wanted to help his wife with child-rearing task. The husband, TG was very happy and very willing to take care of his daughter which never been done before. Since that he could realize that helping the wife in working with household work can build emotional relation with his little daughter.

Conversion: From Technology to Social Status and Political Opportunity

As defined in the domestication of technology approach, conversion deals with the household once more to outside world and the way household members try to align the technology to the societal values and socio-cultural opportunity that is offered by the technology after the technology is exposed to the community members at large (Berg, 2006). Aside of that, consumption of things through household technology is a way to create sense of themselves through relationships with people around (Campbell, 1999). Embarking from this conceptualization, the instances of how biogas technology could produce social-cultural opportunity is valuable to present.

People other than biogas users viewed biogas as modern goods and symbolized material possession as well as the wealth of the owners. Perhaps thought as such raised because biogas involved big amount of money to afford the construction materials. Through the view of the non-users perspective, the new perception on how biogas can leverage social status of the households can be understood. When I addressed the question on what the impact of actual modernity that is brought to the household by biogas, most of the non-user informants' statement revealed, biogas has signified distinction of social effluence that

other villagers do not have. As cow in Javanese family embodies cultural intrinsic meaning as the symbol of high status, so when this kind of family adopted biogas their social standing on the eyes of other villagers are seen higher compared to those who live with only cattle. Furthermore, the households with biogas were often viewed as those with wealthier capability as they can spend extra money for technological needs, while other villagers still used it for financing their children education.

Besides that, this shifting social status after adoption biogas has open new opportunities for the respective households to have access to village information regarding to the cooperation with other external bodies like governmental organization. It is because those households have reached equal privilege, which notably distinguished them from the common villagers. SK for instance, unlike other villagers he was simply encouraged and more aggressive to propose a development project from the village chief after adopting biogas. Not only that, he become more confident because of that privilege which put himself in the candidature list of the member Village Parliament in 2011 (Interview with MJ). In some large extent, this leads me to very intriguing interpretation about how the possession of renewable energy appliances is intertwined with new political opportunities. Referred to the SK' story, the capability he has in being involved in the local politics can be viewed biogas adoption has collectively promulgated the emergent of political acceptance.

From the above experiences, biogas as technological artifact has been able to provide space for political participation. Looking at this case, Wilhite and Lutzenhiser (1999) associate this with the status making generated by the ownership of certain technology. Their analysis elaborates, the process of using goods and other objects for purposes of status display may bring the users into socio-political sphere where it makes the user would perform higher social mobility. On the other words, one's social standing in the community is displayed through cultural appropriate arrangements of technological artifacts that allow the individual to be differentiated from persons of "other sorts". In the same vein, Winther (2005) also put additional emphasis associated to the experience above as "personal advantage". It means, social prestige would be inevitable created after individual gain personal advantage of certain technology by purchasing the appliances to sustain their socio-economic standing and distinct them from general population in the village.

Spatial position of biogas allowed inclusive interaction between users and also non- users, especially this relationship can be observed in users who hold important leadership in their area. The sketch as exhibited on the figure 5.3 denotes the strategic position of biogas plant with community hall located in TG's housing complex.

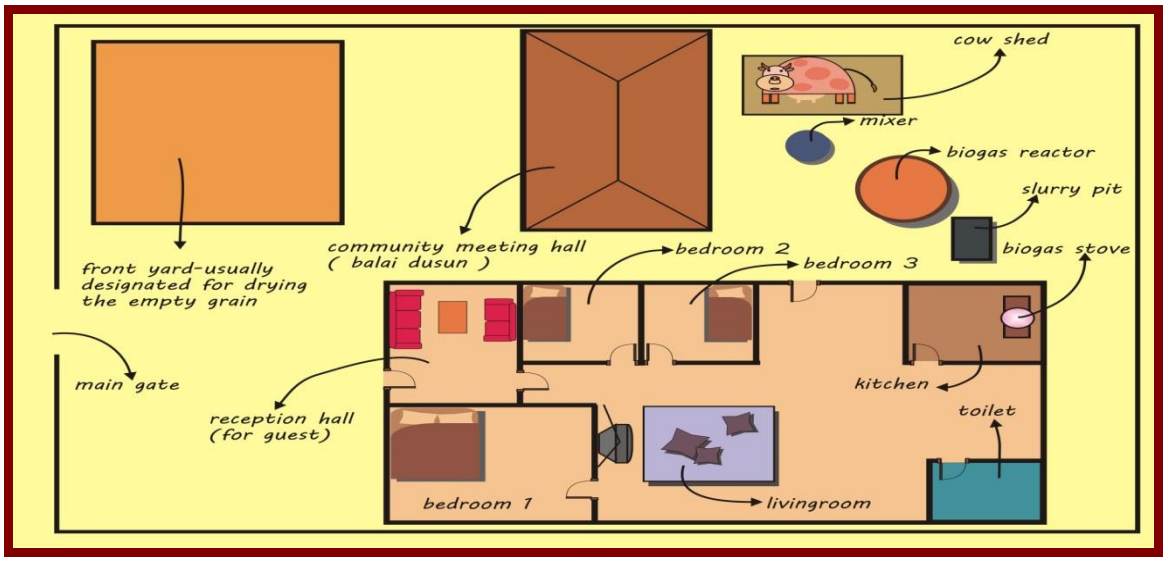


Figure 5.3 Positioning of Biogas Plant with Community Hall

His leadership roles as head of sub-village ascribed him to run a monthly community meeting is regular activity that is carried out at the community hall, attended by mostly by household leaders to talk about current problems in the society. After the meeting ends, TG always pleased the attendees to see the biogas situated just 5 meter from the place and it spark interaction among them that renders a cultural meaning. The attendees who were involved in the interaction may view him as power holder because his biogas symbolizes modern artifact, which is affordable for all laypeople. However this phenomenon implied positive loops as the ownership of biogas can open him to an accesses to being engaged with external expert from Indonesian universities for advancing the organic paddy fields of his sub-village (Interview with TG and Interview with SB).

Douglas (in Winther, 2008:170) responds the case above by relating it to the social space where visitors are received is the face of the house, which speaks composedly and depicts the rest of property of the owner. By doing so, the user also wants to show off to visitors that he possesses certain social power and authority, which is embedded in the political position that he bears. How the user display biogas technology may be conceived as 'cultural text' and by saying so, space could be considered as not real object and economic conditions, but rather certain ideological representation of the real (Winther, 2008). Material possession relates to the ideas of social taste. By advocating Bourdieu's perspective Campbell (1995) asserts that material possession stressing the importance of the individual possession of symbolic and cultural capital, which it is also the way to display the 'taste'.

DISCUSSION

The findings above have discussed intensively about the diverse efforts performed by users household to flawlessly enable the integration of biogas technology into their routines and create a seamless connection to it. Resources as well as knowledge deployment to allow biogas technology involves institutional co-shaping that consists of social actors and technological artifacts themselves. As Bell (1991) writes, the technology is, to some extents, the instrumental ordering of human experience within the logic of different means. As social

actors matters in the integration of technology, the discussion may touch down onto the mechanisms of institutional surround persisting to form certain path for it. Despite there is no detailed empirical investigation to follow for making scientific assertion how it takes place, Berker et al (2006) analyze that the technological artifact, wider culture, and its positioning within the public and private space are accumulative to generate further situation in which technology bears social power to leverage the social positioning of its users. It can be instanced from the finding in the case when biogas technology can 'help' the users to have political bargaining position in the village.

On the other hands, the process of incorporation also is not exclusive from the pre-existing consumption practices, which has been established and culturally embodied within the household. The finding confirms consumption scholars assertion that the energy practices may not be confined from the religious and cultural practices of the society (Wilhite and Lutzenhiser, 1999; Campbell, 1995), which also put more social on its usage. In addition to the social loading in the energy usage, transitioning to a new habit is a social indication that incorporation also involves negotiation with former values and prompts household to alter their behavior accordingly. If the biogas user could not re-align their formerly practiced habit with the technical use of such technology, there is probability to turn back into their previously used equipment with huge portion of usage, and hence it will lead to social bonding, which can be explained as phenomenon where the individuals follow a certain behavior that cause higher carbon emission from the use of fossil fuel-based appliances.

At the end, the discussion can summarize that biogas is applicable to the sphere of everyday technology, this means that instead of trying to map 'pure' action with 'pure' causes and intentions, it is worthwhile to follow the establishment of condition that enable the reciprocal influence between and users to take place (Lehtohnen, 2003).

FINAL REMARKS

Biogas technology in this analysis brings subtle impact on the changing of social interaction represented in the household's routines and followed with the reorganizing of the space situated within home and outdoor. The extensive benefits of using biogas perceive by users is not abrupt but it could happen after the users deeply comprehend the functions and capabilities of the technology facilitated by diverse social dimension.

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