Preserving local wisdom on water conservation through video documentary (case studies: Mekar Bakti Village, Panongan Regency, Tangerang)

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Abstract. The problem of clean water supply is connected to the growth of the human settlement. In the last 20 years, the area of Jabodetabek has grown to become the home of 30 million people. The massive growth changes many rural areas into urban, consequently including the Mekar Bakti village, Panongan regency, Tangerang, where modern development has entered and intervened. This massive change has created problems at the expense of losing local wisdom that is also subjected to clean water reservation and conservation system. The research then tried to use video documentary as a means to preserve the local wisdom of water conservation and as a campaign tool for the community of Mekar Bakti village to retain their already ethical values and systems on conserving clean water. The research conducted using the methods of Participatory Action Research combines with Design Thinking and video documentary methods. It will allow the researcher team to investigate along its quantitative sides as experimental innovations, as well as its qualitative sides as experience and appreciation of participatory endeavors. In a broader sense, the strategy can be used to preserve local wisdom as an exemplary practice aligns with modern development.

1. Introduction

The problem of clean water supply is connected to the growth of the human settlement. In the last 20 years, the area of Jabodetabek has grown to become the home of 30 million people. The massive growth changes many rural areas into urban, consequently including the Mekar Bakti village, Panongan regency, Tangerang, where modern development has entered and intervened. This massive change has created problems at the expense of losing local wisdom that is also subjected to clean water preservation and conservation system.

The research then tried to use video documentary [1] as a means to preserve the local wisdom of water conservation and as a campaign tool [2] for the community of Mekar Bakti village to retain their already ethical values and systems on preserving clean water. The research conducted using the methods of Participatory Action Research [3],[4],[5] combines with Design Thinking [6],[7],[8] and video documentary methods. The methods will allow the researcher team to investigate along its quantitative sides as experimental innovations, as well as its qualitative sides as experience and appreciation of participatory endeavors. In a broader sense, the strategy can be used to preserve local wisdom as an exemplary practice aligns with modern development.
The research-design-action was conducted approximately eight months by the students and lecturer from Visual Communication Design within the cinematography concentration and Interior Design, School of Design, Universitas Pelita Harapan, Karawaci, Tangerang. They engaged actively and collaboratively with Mekar Bakti village community. It is a demonstration on how design could empower and transform people by making social innovation, has a redemptive impact and, becomes light for others [9].

2. Method
The methods used for these research-design-action were:

1. A combination of Participatory Action Research [3],[4],[5] and Design Thinking [6],[7],[8], in which it will allow the researcher to shift dynamically between design activities (designing interventions, making prototypes, measuring impact and evaluation) and engagement activities with all the stakeholder (the users, the communities, partners, leaders, etc.) [10].

2. Documentary video making methods that emphasize and function as a raising awareness video campaign [1], that consist of pre-production stage (including: footage shooting strategy, script and equipment preparation according to the plan), footage shooting stage at the location, and post-production stage (including: video production 1-3: editing footage, animation, script, subtitle, sound, narrator, color gradation [2].

3. Pre-test and post-test intervention impact measurement [11],[12].

3. Results and discussions

3.1. Mekar Bakti village water spring, Panongan Regency, Tangerang: ‘Sumur Muncang’
One of the goals of sustainable development (Sustainable Development Goals) is to ensure availability and sustainable management of clean water and sanitation for all (SDG 06). Its other concern is to ensure sustainable consumption and production patterns (SDG 12). In the same time to achieve sustainable development, partnership should be strengthened (SDG 17) [13]. Considering these goals, this research-design-action was trying to find solution for the problem of clean water sustainability in the Mekar Bakti village through collaboration amongst all stakeholders. Hence, the community and the village government of Mekar Bakti were collaborating with the students and the lecturer from Visual Communication Design within the cinematography concentration and Interior Design, School of Design, Universitas Pelita Harapan, Karawaci, Tangerang.

The preliminary observation conducted by the research-design-action team showed that most of the community of Mekar Bakti village still use and consume water from water spring called Muncang well. The water spring was already there since the very beginning as far as the senior member of Mekar Bakti village could remember. The clean water from Muncang well is used for drinking, washing clothes, and even for cooking activities. Ironically the area that surrounds Muncang well is polluted by garbage dumping from an irresponsible community member of Mekar Bakti village. However, from initial interviews with the community, the team discovered that they have local knowledge on how to find and preserve water springs, especially the elders. The community also has an awareness that it is vital to protect and conserve Muncang well as their precious water spring.

![Figure 1. Muncang well and the garbage dump beside the water spring.](image-url)
3.2. Participatory Action Research – Design Thinking phase: Research-Design-Action

This research-design-action activities aim to generate awareness and local knowledge of the Mekar Bakti village community on water preservation through the making of a video documentary. The stages conducted are as follow:

3.2.1. Data collecting activities using Design Thinking (DT) and Participatory Action Research (PAR) phase called Discover – Look [3],[4],[5],[6],[7],[8].

- **Community engagement:** The team should engage with at least eight members of the community that represent and closely related to the problems that need to be solved. In this study case, the team engaged with 10 members of Mekar Bakti village RW 03, Panongan, Tangerang that represent senior members, youth members, mothers, formal leader (regent, regent staffs, etc.): *Mpo Enah, Mpo Yana, Mpo Tasmirah, Mpo Marwinah, Mpo Napsiah, Mpo Sawi, Mpo Eni* (mothers and senior members), *Rian* (youth members) *Mr. Maradona and Mr Karna* (regent staffs and older members). All of the informants are an active user of *Muncang* well, live nearby the water spring, and has a concern about it. The discussions with them revealed that *Muncang* well as water spring for the village had been there since the very beginning, according to the oldest member of the community could remember. The water spring is always used and managed by the community member from generation to generation. Although later on community members dug and built their private groundwater reservation, *Muncang* well is still being used. The location of the water spring is next to *embung*, a traditional rainwater catcher pool. The *embung* is mostly used to water their plantation when they were still a farmer and also to farm fish now. The water spring is also used extensively during dry season until now, especially when houses there experiencing groundwater aridity. The community members also expressed that the water from *Muncang* well is used for many basic needs, such as drinking, cooking, and washing their clothes. Many of them said that they drank the water without also boiled it up first, or even if they boiled it, they would do it for the maximum of 4 to 5 minutes. They already do this for generations and also because they still believe that water coming from *Muncang* well is always clean. The community being interviewed always said that they have memories of how refreshing the water was and how clean the environment that surrounds the water spring in the old days. The elders said that houses were not allowed to build near *Muncang* well. Thus, grey water from the houses will not pollute the water spring. The black water from human excretion was separated by the *embung* and usually was at least 30 m from the water spring. Unfortunately as the population of Mekar Bakti village is growing and many people are coming from other areas, the regulation could no longer be applied. Although there are still few houses near *Muncang* well, the larger threat is the garbage pollution in the vacant lot between the water spring and the *embung* caused by irresponsible community member or people from outside of the village.

![Figure 2. The Community member of RW 03 Mekar Bakti village.](image-url)
The problem escalated as there is no consensus between the community member on who should be responsible for preserving Muncang well and take care of the area surrounds it. The discussion also revealed that the community member did not seem aware that the garbage can and is polluting the clean water produced by Muncang well.

- **Talk to experts**: the team should gain insights from experts regarding the problem. Thus in this matter, the group went to a specific water testing laboratory belongs to the state-owned water company (PAM Jaya) to examine the water taken from Muncang well. Astoundingly the results showed that the water is still in an excellent condition to consume, and only need to be boiled around 5 minutes. There are also minimum indications showing that the water is polluted. However, the possibility of having the water spring to be contaminated is abundant, especially if the garbage dump is not cleaned and allocated elsewhere. It could be heightened the risk enormously if the garbage is still being dump there. Thus the findings showed that the community needs immediately to act if they wanted to preserve their water spring. Another expert that had been interviewed by the team is a community initiator called Design as Generator (DAG – www.dagedubrag.org). DAG has a program called Nabung Aer that focused on generating community awareness about the importance of preserving and conserving water. It discussed innovative as well as practical ideas how to save water, especially rainwater. It also discussed on how to make the community move and make the program sustainable, thus making it as a community movement.

- **Immerse in context**: The team should immersed in a similar situation and tried to gain insights. In this case, the team investigates how a system of collaborating known as gotong-royong helped to build innovative ideas of providing a healthy sanitation system for community members in Sendang Kulon village, Babakan, Tangerang called Arisan MCK. The team also did analogous research, where they have to investigate something that is not directly related to the issues but can give valuable insights. The team studied how scavenger works and found something useful from garbage.

3.2.2. After gathering comprehensive data from various perspectives, as shown above, the second phase of using combination methods of PAR-DT was called Ideation – Think phase. In this phase the team should try to make sense of all the data they gathered, by clustering the findings from the Discover-Look phase into themes, made it as concepts and finally formulated a problem statement, known as the ‘How Might We’ (HMW) questions [3],[4],[5],[6],[7],[8]. The HMW question produced in this case is: ‘How might we generate awareness and local knowledge of the Mekar Bakti village community on how they preserve their precious water spring, in particular Muncang well?"

3.2.3. The next phase was getting into the action, in which to make the prototype as a tangible solution that answers the HMW question. This third phase in the PAR-DT combination was called Prototype – Act [3],[4],[5],[6],[7],[8]. In the village water spring preservation case, the team saw that the most effective ways to generate awareness and local knowledge will be best in the form of campaign video documentary. Thus the prototype produced intensively around one month by the team, with two times iterations and getting feedback processes from the community of Mekar Bakti village. The first process of the pre-production phase is to make the script. This process is one of the most important in the case of Mekar Bakti village water spring preservation. Findings from previous phases shown that the water spring is still suitable for the community consumption although in high risk of getting polluted by irresponsible act of garbage dumping recklessly. At the same time the community did not see that their water spring needs to be preserve as such high priority.
Figure 3. Taking footage process according to the script agreed by all the stakeholder.

Therefore the script decided to be focus on: (1) Story gathers from Mekar Bakti village elders, especially on how they found and managed water springs. Eventually the account will narrow into Muncang well. (2) Interviews with the community member on how they use clean water from Muncang well for their daily needs. (3) Cleanliness problems of Muncang well surrounding area. (4) Information of harmful pollution towards the water spring caused by the irresponsible garbage dumping in the surrounding area. (4) Appeal and invitation from the community leaders of Mekar Bakti village to preserve Muncang well and be responsible for the cleanliness of the surrounding area. With the script agreed upon stakeholders, the team then started to take footage that took around three weeks. The post-production phase follows for another three weeks. The team edited the footage, inserting animation and subtitle, refining the script as the videos’ final narration, injecting narrator, sound, and music, as well as doing color gradation for the video final version.

Figure 4. The post-production process of making a documentary video.

3.3. Pre-Test and Post-Test: Measuring the impact
As the prototype making in progress, simultaneously the team instigated pre-test and post-test. The tests were conduct to measure the impact of the video documentary as a design intervention. It compared the awareness and knowledge level of the community before and after being exposed by the video [11],[12]. Both tests were conduct by using and distributing a questionnaire to community members.

The team took the pre-test before the community members watched the documentary video, and the results are as follow:

- 90% of the community members use the clean water from Muncang well for their daily consumption (70% claimed to use it occasionally, while 20% use it more regularly).
• When the community members using the clean water for drinking consumption, 60% claimed that they boiled the water first before, while 40% claimed that it is not crucial to cook it (10% claimed that they drink the water undiluted).
• From the 60% community members claimed that they boiled it first, 60% said that they cook the water until it is boiled, while the rest said that they only have to boil it for 5-10 minutes.
• The community members use the water for: washing the clothes (38.1%), shower (28.6%), drinking consumption (14.3%), and for cooking (19%).
• 40% of the community members aware that the area surrounds Muncang well are not clean, while the other 60% said that it was still considered decent.
• Ironically, 70% of the community members admitted that they were responsible for dumping garbage recklessly in the surrounding area of Muncang well.
• Thus consequently, 70% of the community members expressed disbelief that the garbage could be harmful and polluting their water spring Muncang well. The community thought that the trash is on the land surface and would be impossible to reach and poisoned the sources of their water spring that is far below and inside the ground. Therefore it is, understandably, that 60% of the community members did not know the health consequences caused by the polluted water.
• In more positive notes, 60% of the community members claimed that they care and want to take part in preserving their water spring, the Muncang well.

![Figure 5. Pre-test results.](image)

The team took the post-test after the community members watched the documentary video. The post-test results are as follow:

• 83.3% of the community members now realized that the situation of Muncang well surrounding area is not in a clean state, let alone in good condition (from only 40% shown in the pre-test results).
• 66.7% of the community members agreed that it is imperative to keep the surrounding areas of Muncang well clean, while the other 33.3% said it is important (0% of saying not important). 100% of the community members said that they care and will take an active part of preserving their water spring, the Muncang well (from 60% shown in the pre-test results).
• On the awareness of healthy ways to consume the water from Muncang well, the post-test results are: (a) 83.3% of the community members now deemed that boiling the water properly before consuming it is very important (from 60% shown it is important and only 40% shown it is not necessary had to be boiled, as the pre-test results indicated).
83.3% of the community members now known the deteriorating health consequences from consuming undiluted water. Thus it shows a significant increase of awareness and knowledge from the community whereas the pre-test results shown only 40% knows the consequences. The pre-test results also showed that 70% of the community members expressed their disbelief that the garbage could be harmful and polluting their water spring Muncang well.

![Figure 6. Post-test results.](image)

4. Conclusions
These research-design-action activities showed that the community members indeed have an awareness and concern to take care of their precious water spring, the Muncang well. It also showed there were many community members that just realize the problem Muncang well faced. The community members just comprehend the harmful health consequences that could happen if Muncang well was polluted by the irresponsible garbage dumping. In this case, if we investigate the comparison of pre-test and post-test results, the strategy of using documentary video to generate awareness and as a campaign tool proven to be effective.

However, it is undoubtedly needed to be examining further because there are lots of questions that arose after the design intervention and its impact measuring. For instance do the community members of Mekar Bakti village resume their awareness into action? Do the community members make their move towards making the surrounding area of Muncang well to be clean and well preserved? The frequency of screening the documentary video by Mekar Bakti village leaders to all the community members now deemed necessary as to build a collective awareness and a consensus on how the action in maintaining and preserving Muncang well. Thus, the knowledge and the response will become comprehensively inter-related and sustainable.

In a broader sense the strategy of making a documentary video that concurrently acted also as campaign tools can be used to preserve other local wisdom align with modern development. It can be seen as an exemplary practice that generating awareness and action instantaneously that will empower and transform all the stakeholder involved.

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