The Dredging Policy and Citizen Participation - the
An-Shun Plant Case

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Abstract

The purpose of this paper was to study the dredging policy of the Zu-Fa-Gan Canal for An-Shun Plant Case, which was related to remediation of polluted areas and the health of community citizens. It was to examine how policy formation, planning, and implementation could have effect on community citizen satisfaction. It was found that community citizens were not satisfied with the dredging policy of the canal. There were five reasons for the results. First, community citizens were not invited in the forming, planning, and implementing the policy. The dredging policy was forced to be changed after the protest from community citizens. Second, there was only dredging instead of dredging policy discussed in the process of policy making. In other words, there was no system thinking in making the dredging policy. It was because related activities and policy were not planned by government. Third, community citizens were not fully informed for the chemical pollution information. It might be because government didn’t want to give full information or to provide pollution education to the citizens. Fourth, it was found that citizen participation was not encouraged and was not recognized by local government. Fifth, there was only EPA of local and central governments working on the dredging policy of the canal. There was Self-Rescuing Association representing community citizens working on the related issues in this case. But the representation of the association in the community was questioned by the community. It was suggested that both city and central government should encourage citizen participation and/or build the mechanism of enhancing community participation including creating incentives for community participation. The voice of silent community citizens had to be encouraged such as the aged and young citizens in the community. But the premise was that pollution information related to the health of community citizens should be disclosed to the community. External help was also necessary to enhance the knowledge of the community in forming, planning, and implementing the dredging policy.

**Key words:** The Dredging Policy, Citizen Participation, An-Shun Plant, Zu-Fa-Gan Canal
Introduction

This paper is about the dredging policy and citizen participation of the An-Shun Plant case, which its background will be introduced in the followings, in the An-Nan District of Tainan City, Taiwan. The An-Shun Plant case indicated heavy chemical pollution and caused diseases in the nearby communities. The Zu-Fa-Gan Canal was one of highly polluted areas in and around the An-Shun Plant. The dredging policy of the Zu-Fa-Gan Canal was chosen because it was the most recent clearance policy in the An-Shun Plant case. The study of the dredging policy will have implication for the community development and policy makings for other pollution cases.

It requires system thinking in making the dredging policy, which would affect health and development of the communities (Senge, 1990). The An-Shun Plant is located in a designed national park, which is planned to be an ecological system for preserved species. The ecological system of the community might be affected if the dredging policy were not properly designed. Community citizens, who were directly influenced by the dredging policy, were the important stakeholders. The degree of citizen participation often implies the self-consciousness and ability of self-governance. The importance of this study is clear.

The An-Shun Plant case represented toxic pollution, which included mercury, dioxin, and pentachlorophenol, and affected three communities’ citizens in the An-Nan District. The three communities were Shan-Gon, Lu-Er, and Shih-Chao. The chemical pollution has been existed in the communities over 60 years according to the history of An-Shun Plant (The Taiwan Almanac, 2005). The case became infamous because of the citizens’ dioxin rate in their blood, which were tested around 2001, were higher than citizens from other areas in Tainan City. The information was given by a university professor who has been working on blood testing of dioxin rate in the three communities since 2001. 40 million US dollars’ budget (1.3 billion NT dollars) for 5 consecutive years was passed in 2005 as compensation because of the An-Shun Plant pollution in the communities.

The controversies were that the chemical pollution was still existed in and around the An-Shun Plant. The purpose of this paper was to examine the dredging policy of the An-Shun Plant Case. The major concern was the dredging policy of the Zu-Fa-Gan Canal. It has been challenged by community citizens that the chemical pollution was spread in their communities. There were urgent needs to dredge and/or clean the canal. First, there were fishing farms around the canal. Second, citizens were
afraid of being affected by the chemical pollution, which might cause cancers and/or other fatal diseases. Third, the experience of the dredge of Zu-Fa-Gan Canal could be used in dredging and/or cleaning the polluted reservoir, fishing farms, factory areas of the An-Shun Plant. In fact, the areas of pollution around the plant have been detected and confirmed by Environmental Protection Agency of central government.

The policy making process instead of techniques of the canal dredging was investigated in this paper although they were inter-related. The policy making process of the Zu-Fa-Gan Canal included the formulation, planning, and implementation of related governmental agencies and stakeholders. Government agencies included both local and central governments. Stakeholders included bureaucrats, environmentalists, citizens, and scholars. Community citizen participation was important factor in the policy making process since there were risks in remediation, including dredging, transportation, storages of the pollutants. The background of the An-Shun Plant was introduced before related theories and literatures were discussed.

Background of the study

The Zu-Fa-Gan canal was excavated around 1823 in Ching Dynasty.\(^1\) The canal has been polluted since 1938 in the Japanese colonial stage. It was because a chemical plant, which produced the Alkali-Chlorine, was established. However, the An-Shun Plant was formally built by Japanese businessmen in 1942.\(^2\) The purpose of the plant was to produce noxious gas for Japanese navy in World War II. The plant was taken over by Chinese government in 1945, the year that Japan was surrendered to China. Pentachlorophenol, used for weeding in agriculture, was produced by the plant between 1964 and 1976. The plant produced sodium hydroxide, hydrochloric acid, and liquefied chlorine in 1960s. In other words, the chemical pollution of the An-Shun Plant and the Zu-Fa-Gan canal includes mercury, dioxin, and pentachlorophenol.

In the end of 1981, it was reported that there were 12 out of 45 fish detected to be poisonous in the reservoir of the An-Shun Plant by PWPA(Prevention for Water Pollution Agency) of TPG(Taiwan Provincial Government).\(^3\) The information of finding toxic fish was shown on document number 7096 of PWPA on Dec. 30 of 1981. The document also indicated recipients of both the An-Shun Plant and the National

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\(^1\) The history was checked by an EPA officer from central government on May of 2007.


\(^3\) The PWPA was combined with other environmental organizations and was formed to be EPA of PG around 1988. But PG was downsized in 1998 and the PG’s EPA was combined with EPA of central government.
Enterprise Commission of the Ministry of Economic Affairs. The major toxic element was mercury. And the plant was ordered to be shut down by the Ministry of Economic Affairs in 1982. But no further actions were taken by governments such as cleaning and dredging the polluted areas and preventing the toxic fish to be eaten. The pentachlorophenol left by the An-Shun Plant was stored inside the plant. But it was exposed to rain and sunshine for a short time. The 5000 kilogram toxic pentachlorophenol was covered roughly to prevent spreading after the protest of the citizens and environmentalists. \(^4\) Governmental actions were not taken until the rate of dioxin in blood of citizens in 2001 was inspected. \(^5\)

In other words, those citizens who were unknown or had little knowledge of the toxic pollution kept on eating the toxic fish. For this reason, citizens lived near the polluted areas were tested to have higher rate of dioxin in their blood than other areas’ citizens in Tainan. And some of the community citizens had fatal diseases and died of cancers, which might be caused by the toxic pollution. \(^6\) One reason for the persistence of the toxic pollution was because many community citizens were impoverished. Some of them lived for life by selling and eating the toxic fish from the reservoir of the plant. Some of them just caught and ate the toxic fish. Some of the earned their living by operating fishing farms near the An-Shun Plant. Therefore, the three community citizens had not been willing to recognize the fish to be poisonous until the pollution information was leaked to the public around 2001.

Under the protest of the citizens and environmentalist, 40 million dollars for five consecutive years were funded by central government to take care of those affected citizens especially for those citizens with higher rate of dioxin in their blood in 2005. And 1814 NT dollars (about 60 US dollars) have been subsidized per month for each person who lived around the polluted areas. There have been some activities taken by governments such as dredging, compensation, social welfare programs, and buying polluted fish of the fishing farms. In fact, both central government and Tainan City Government had the responsibility on helping the three communities. It was because the An-Shun Plant was a state-owned enterprise from 1942 to 1993. And the pollution happened during these years.

But some problems such as the dredging policies were beyond the capacity of Tainan City Government. It was because Tainan City Government did not have enough knowledge, personnel, budgets, and capacity to work on the canal dredging.

Tainan City Government had to get help and support from central government. Central government, however, was lack of capacity of policy implementation. In other words, the collaboration between local and central governments are inevitable. In this paper, the dredging policy of the Zu-Fa-Gan Canal was examined. However, the dredging policy might affect the health, ecology, and development of the communities as mentioned above. Citizen participation is treated to be an important tool of monitoring government clearance activities. The purpose was to investigate the process of the policy making of dredging and citizen participation.

The research question was how the community can get consensus on the dredging policy. The Zu-Fa-Gan Canal of the An-Shun Plant case on the community provides us a classical case for studying the dredging policy making and community citizen participation. In fact, there have been lots of policies related to the An-Shun Plant case. For example, the closing policy of the An-Shun Plant in 1971, the 1.3 billion NT dollars’ compensation policy in 2005, the Medicare policy since 2004, the pollution clearance policy since 2005, the social policies in the community since 2005, and so on. The dredging policy was chosen to be the focus in this paper. There were three reasons for the choice. First, the dredging policy was related to the health of community citizens. Second, the dredging policy is the most recent developed policy in communities. Third, the communities had urgent needs of development policies since most toxic pollution was still around.

Conceptual Framework

The research questions in this paper are as following. What and how the dredging policies could satisfy community citizens? And how did citizen participation play the role in the relationships of the dredging policy and citizen satisfaction? The author wanted to know the way Zu-Fa-Gan Canal was dredged and its relationships with citizen participation. Citizens would have more needs if they had more knowledge and/or information of the dredging than before. Therefore, the dredging policy and the interactions with human beings were the concerns of this paper. The relationships were developed to be conceptual framework in figure 1. The independent variable was dredging policy, which include policy formation, planning, and implementation. These terms were inter-related although it indicated three different stages of policy making. The inter-relationships were described in Figure 1. And they could be defined broadly to include the history, techniques, and attitudes of stakeholders.
Citizen participation was designed as a moderator because it could affect policy effectiveness which included citizen satisfaction of dredging policy. Citizen participation includes concerns of the community citizens and concerns of the general public. The focus, in this paper, was on community citizens since they were directly affected by the dredging policy. Policy effectiveness indicates the community citizen satisfaction of the dredging policy. Satisfaction was defined as how community satisfied with the dredging policy. In fact, quality perception of the dredging policy was included in this study although it was not the focus of this paper. And it was related to the image of dredging policy. Quality perception, which could be part of citizen satisfaction, might not be easy to evaluate since it was belonged to techniques of environmental engineering. It required transparency and/or monitoring on the disclosure of the dredging. And the purpose was to ensure that the public, especially community citizens, were informed regarding to the dredging policy formation, planning, and implementation.

Figure 1: Conceptual Framework of the Dredging Policy

Related theories and literatures

Chang & Others’(2004) study on Taiwan democracy had implications in this paper since citizen participation more or less reflected democratic institution. But the focus of this study was on case study, which was different from studying the democratic institution. For example, research data from Chang & Other’s democracy study was collected through big sample size of social survey. But this environmental study was focused on a chemical pollution case with a very small size of samples.
Tang & Others(2005) pointed out general problems of both Taiwan & China in Environmental Impact Assessment(EIA). They indicated that a lack of transparency and public participation had severely limited the effectiveness of EIA. There might be similar situations in this case study but it might not be challenged by community citizens and/or the public.

There was, in fact, no regulation and/or laws on mud clearance in Taiwan. This study might become the first research in the field of dredging policy. There were literatures in the field of dredging policy(Craft, 2006; Rabe, 1996). In the EPA website of U.S. Federal Government, dredging policy was national policy which covered harbors, oceans, lakes, and rivers. And dredging policies were treated to be national policy. Cross functions, levels, and departments’ dredging teams were often formed and directed by both Federal and local governments. There were also lots of literatures of citizen participation(Meadowcroft, 2004; Heikkila & Isett, 2007; Cooper, 1991; Warren, 1974). The meaning of dredging policy indicated the importance of policy instead of technique in dredging the Zu-Fa-Gan Canal. It was suggested that system thinking was necessary in forming, planning, and implementing the dredging policy.

As Senge(1990) proposed, system thinking was a concept used for integrating interrelated factors including inside and outside organizations. Inside factors included inter-department cooperation such as Department of EPA, Urban Planning, and Civic Engineering. Outside factors included community development, ecological system, law(environmental justice), regulations, and central government. In other words, there should be an integrated dredging policy which contained current and future development of the community and/or the Tainan City. Therefore, dredging policy also meant that a package of activities instead of technique only was necessary for dredging the Zu-Fa-Gan Canal. For example, environmental impact assessment, ecological investigation of the dredging, and the feeling of the community citizens were all needed in all three stages of dredging policy. Citizen participation was brought in the dredging policy for the sake of democracy and sustainable environment development(Meadowcroft, 2004).

Ideas and/or agendas came first before policies were developed as Kingdom(1984, 1995) mentioned in his book. And there were many factors or streams,

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7 http://www.epa.gov/owow/oceans/ndt/report.html was checked on April 25, 2008
8 http://www.epa.gov/owow/oceans/ndt/ was Checked on April 25, 2008
9 Tainan City Government was treated to be an organization.
inside and outside of government, influencing the dredging policies such as media, bureaucrats, politicians, environmentalists, technologists, regular citizens, community citizens, scholars, and so on. He further proposed policy window which was the match between problems (agenda) and solutions (policies). Therefore, it was interesting to investigate where the dredging policy came from. Or, who or what organizations initiated the dredging policy of the Zu-Fa-Gan Canal?

Tang & Others (2005) found that EIA in developing countries such as Taiwan and China tended to have top to down policy making. The situation was changed dramatically after democratization in Taiwan. Citizen participation was, in fact, increased in environmental management. However, there were still challenges for the environmental management of Taiwan such as the representation problems and the policy and/or management effectiveness. In Cooper’s (1991: 5) term, the concept of citizenship was needed. It implied that rights and obligations were not understood by citizens. From this concept, it was expected that the dredging policy was proposed by citizens. In other words, either top-down or bottom-up was not important as long as there were responsible administrators (Cooper, 1990).

But community citizens were often ignorant and/or lack of knowledge on environmental pollution. They needed help from experts and government administrators. Therefore, Cooper (1991: 134) proposed public administrator as virtuous citizen. It implied that knowledgeable public administrators should play aggressive role to help citizens to deal with the pollution problems. However, it was often that government bureaucrats (or administrators) were not willing to face the problems as Al Gore, former vice president of the U.S., proposed in the film of “Inconvenient Truth”. Or, bureaucracy was the problems as Wilson (1989) stated in his book. For example, bureaucrats might care more about turf instead of public interests. It might be because the context and/or the environmental pollution case was too complex to deal with for single department and/or unit.

Multi-level and multi-discipline government organizations were needed to cooperate to deal with the problems. It was, therefore, related to inter-governmental relationships and/or inter-governmental management (IGM). Marando & Florestano (1990) pointed out the problem oriented approach characteristics of IGM to be the discipline of public administration. Jensen (1977) also stated the importance of coordination among federal, state, and local governments. Rabe (1996) insisted the importance of fostering greater integration of environmental management of the Great Lake Basin. These all implied the necessity of integrating different governments...
and/or organizations resources.

Environmental pollution was a public issue. Public participation was often required to ensure the satisfaction of the dredging policy. Community citizens and civic organizations were needed to become partnership of government. Policy networks and network management became necessary (Lafferty, 2004: 11; Klijn, 1997). Agenda 21 described ‘broad public participation in decision-making’ as a ‘fundamental prerequisite’ (UN 1993: 219). McNAIR & Others (1983) stated that “Citizen participants help to meet federal and state requirements, yet they are a nuisance and a potential threat to program stability.” Nevertheless, citizen participation was necessary in democratic society since the purpose of citizen participation was to ensure the responsiveness of governments (Warren, 1974). In addition, Heikkila & Isett (2007) insisted the use of both performance management and citizen participation to increase government accountability and effectiveness. It implied the importance of citizen participation in the policy making process.

Parr & Lampe (1996) proposed the importance of empowering citizens to participate the community development related policies. And they insisted on that all units of government should know the importance of citizen involvements. For the An-Shun Plant case, it was expected and encouraged that all related policies should encourage citizen participation. Warner (1997) suggested consensus participation instead of popular participation for protected areas planning. It implies the importance of negotiating and getting consensus among stakeholders. Meadowcroft (2004) stated that stakeholder meeting was important in environmental policy making. It might not be difficult to define the stakeholders of the dredging policy. But there were ethical problems if there were few community citizens participated in the decision making of dredging policy. And, especially, many would have concerns on the representation of the participants. It might be challenged whether the participants could represent the community and/or the public.

Smith (1992: 116-117) indicated that there were both political and technical problems in the water pollution policy. And there must be laws and regulations when dealing with the pollution problems. It implied that there were both political and technical problems in the dredging policy. For the political problems, politicians, including the Mayor, legislators, and councilors might focus on political interests or their own interests instead of public interests. By the same token, there were also administrative or bureaucratic problems in forming, planning, and implementing the dredging policy. One of the problems was existed in the conflicts of interests or
problems between bureaucracy and democracy. It was expected that the design of bureaucracy should reflect public interests in a democratic system. But democracy itself was often the problems as Tang & Tang (2005) indicated.

Research Method

Regarding to the research method, in depth interview was used in this research. The dredging policy stakeholder such as bureaucrats, community leaders, environmentalists, and the related scholars were interviewed. The purpose was to get information of the decision making process of the dredging policy. Research questions were focused on the decision making process of the dredging policy. For the reason of research ethics, the names of the interviewees were not shown in this paper. Research results may have implications and suggestions for the dredging policy and for other polices of future development of the communities.

The general background of the An-Shun Plant case has been introduced above. Related literatures and theories were also being reviewed in the previous section. The research findings would be presented in the followings. 9 policy stakeholders including three government employees, two leaders of the three affected communities, a medical doctor, a university teacher, and an environmentalist were interviewed from 2006 to 2008 as Table 1 shows. The interviews were lasted for two years because it was difficult to set up the time to interview for various reasons such as the interviewing willingness and having tight schedules. Second hand data such as news and reports would be used in this paper.

Interviewee A has been an environmentalist, who participate the An-Shun Plant case for more than 8 years. He brought the environmental pollution of the An-Shun Plant case into public. He was interviewed because of his knowledge and had a lot of participation and observation in the processes of compensation policies. B1 is the leader of Self-Rescuing Association, which was a civilian organization in the communities and often spoke out representing the communities. B2, who had formal position through popular votes, is the leader of one community. C1, C2, and C3 were all government officers. C2 was from central government but both C1 and C3 were from Tainan City Government.

The interviewing questions were all open ended. The interviewees were asked to describe the process of the decision making of dredging policies. And what they did in the policy making processes. The interviewees were further asked to answer who
participated in the decision making. Their response and answers were shown on the research findings in next section. In addition, a research team, including the author and the other five professors, finished an interviewing survey in the community. The questionnaire was designed by five professors and was finalized by discussion. And the questions were translated into Taiwanese for interviewing. Some of the research findings will be used and analyzed in the followings. The population was 4618 and the total households were 1383. 302 community citizens were randomly selected through the address of the registered households. The address and household information was gathered from Tainan City Government.¹⁰

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<th>Coded name</th>
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<th>Meeting Places</th>
<th>Date</th>
<th>Age(about)</th>
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</tr>
<tr>
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<td>Ma-Chu Temple</td>
<td>1/17/2007</td>
<td>55</td>
</tr>
<tr>
<td>B2</td>
<td>Community leader</td>
<td>Ma-Chu Temple</td>
<td>9/18/2007</td>
<td>56</td>
</tr>
<tr>
<td>C1</td>
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<td>University Office</td>
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Research findings and analysis

Table 2, 3, & 4 were all from EPA of central government. According to the report

of the EPA, the second part of the Zu-Fa-Gan Canal was seriously polluted in its mud as Table 3 & 4 showed. The tested sample was fish in Table 2 & 3. And the tested sample was mud in Table 4. The yellow colored column of Table 2 & 3 indicated how the toxic residues of sample fish and fish organs were over safety standard. It was shown that the second part was more serious than the first part of the canal. In Table 4, the first column indicates tested areas, which were all in the second part of the canal. The yellow and red colored columns indicated that it passed the standard and would have hurt on the health of human beings. And these reports were finished EPA in 2005.

It was reported on June 14 of 2005 that the Zu-Fa-Gan Canal was tested to be polluted by dioxin (United Daily News, 2005). From another news report, the Zu-Fa-Gan Canal was tested to have high dioxin rate in the mud (Chu, 2005). But the dredging policy was not formed until 2006. From the news report, it was planed by Environmental Protection Agency of Tainan City Government that the highly polluted 170 meters of Zu-Fa-Gan Canal, which was called the second part of the canal, would be dredged first. But the Self-Rescuing Association, whose background would be discussed later in this section, from the community opposed the decision and declared to organize community citizens to protest the decision. Later the EPA of central government approved additional funds for dredging the other part of the Zu-Fa-Gan Canal (Lin, 2006; Wang, 2006).

Based on the question asked by the research team, “Did government tell community citizens the pollution information?” It was found that 40% of the community citizens agreed that government told community citizens the pollution information as showed in Table 5. It might be because the other 60% community citizens didn’t care very much about the pollution and/or community affairs. Or, it could be that the important information didn’t go through these citizens. However, citizen participation would be limited if most community citizens were unknown or were not serious about the pollution information. Therefore, community citizen participation of the dredging policy formation was limited. As B2 told the author, “community citizens were not invited by governments to discuss how to deal with the pollution in the Zu-Fa-Gan Canal.”

There was at least one year for government to plan to dredge the Zu-Fa-Gan Canal. But there were no other plans and/or activities were formed except that the 170 meters’ dredging plan of the second part of the canal was planned. As B2 stated, “we were told by EPA of Tainan City Government that 170 meter’s dredging decision was
made without citizen participation.” The additional fund for dredging the Zu-Fa-Gan Canal was for the dredging of the first part of the canal according to interviewee D3’s description. It was clear that no environmental impact assessment was conducted except the mud test of the Zu-Fa-Gan Canal. And there was only EPA of local and central governments dealing with the dredging policy. It meant that there was no system thinking for government to plan the dredging policy. And the decision of dredging the first part of the Canal was because of the pressure from the community citizens such as the Self-Recuing Group. Therefore, the citizen satisfaction of the dredging policy was questioned.

But why and when the Zu-Fa-Gan Canal dredging policy was formed? From the news report, it was after the test of the EPA of central government and it was found that there was high scale of dioxin pollution in the mud of the canal in 2005. The interviewee A stated that “the Zu-Fa-Gan Canal pollution was exposed to the media and had pressures on government. Therefore, local and central government were willing to extend the dredging of the first part of the canal. I worked very hard with the community leader to give pressure on government. And I knew that governments were not willing to deal with the pollution problems unless the pollution was exposed to the public through media.” It implied the initiation or formation of the dredging policy was outside of government.

But there did have government officers who worked hard on the dredging policy in central government. As interviewee C2 stated, “I have tried my best to collect history data of the Zu-Fa-Gan Canal. And I found that the canal was used by bamboo ship 200 years ago in the library of Academia Sinica. The mud pollution, therefore, should not be deeper than two meters because of the use of bamboo pole.” It implied that there showed responsibilities and accountabilities of bureaucrats. But interviewee B1 said that “we did find polluted mud under 3 meters. Therefore, I argued with the EPA officers of Tainan City Government. We got compromise to dredge the canal based on the depth of polluted mud.” The reason that interviewee B1 argued with the local EPA officer instead of the central government EPA officer was because central government was responsible for policy formation but local government was responsible for policy implementation.

In addition, interviewee B1 complained that “government officers from city government were not willing to dredge the first part of the canal. I argued with them that the polluted mud would flow to the cleaned second part of the canal if the first part of the canal was not dredging simultaneously.” It implied that it was the
environmentalist and community leaders instead of government initiated the dredging policy. But, still, the whole package of dredging policy was not formed. The focus of the dredging was only on the Zu-Fa-Gan Canal instead of the relationships with other polluted areas. And the community development was not planned. It meant that knowledge from other fields such as ecology and urban planning experts was not invited in the formation and planning of the dredging policy. It indicated that the dredging policy was only on the consideration of environmental engineering.

It was found that the community citizen participation was limited although there were Self-Rescuing Association members participating in the process of making dredging policy. The author found that the Self-Rescuing Association did have contribution on the dredging policy as mentioned above. The most important reason was that the elected community leaders and the leaders of the Self-Rescuing Association had conflict in the beginning of the formation of the association in 2005, when the 1.3 billion dollars’ compensation was passed. Wu(2005) described that the Self-Rescuing Association could not be established owing to the boycott of the elected community leaders. It was because they had clashes on the distribution of board members. Lin(2005) pointed out that the three elected community leaders announced publicly to retreat from the Self-Rescuing Association to express their angeriness.

Therefore, the representation of the Self-Rescuing Association was questioned. In fact, the Self-Rescuing Association was not recognized by the communities although there was no other civic association from the three communities working for community development policies. More than 70% of the community citizens were not aware of the operation of the Self-Rescuing Association as table 6 indicated. In addition, the community citizens expressed unsatisfied with the performance of the association. There were 36.1% of the citizens unsatisfied with its performance although there were 26.5% citizens satisfied with the performance of the association as table 7 showed. And there were 36.4% of the citizens who did not know how to respond to the question. Compared with the previous question, it could be that over 70% citizens were unsatisfied with the performance of the association.

However, it was necessary to encourage community citizens to participate in the community affairs. But, from the author’s observation, there seemed difficulties for the community participation. First, the 1.3 billion compensations instead of dredging and/or development policies became the major concerns of the community citizens. The dredging policy and its impacts might not directly affect most community citizens. Second, the community citizens were mostly aged people. Community citizens had
lack of knowledge and/or information of the dredging policy. Third, the community citizens had little knowledge of the toxic chemicals and their impacts. And they were unwilling to learn the basic knowledge of effect of the toxic pollution. Fourth, Most citizens were impoverished. They had no time to learn and to participate in the policy decision making. In other words, most citizens had no ideas and little interests in participating and forming the community development policies.

B2 state that “government officers didn’t tell us much about the toxic information and its impact on the health of the citizens. We knew that our education was not high enough to understand its impact. But government has the responsibility to tell us all the related information. We felt very sad about that government didn’t tell us all the truth. And the young community citizens were unable to participate in the community affairs since they had to work for living.” It seemed that government didn’t like to expose the sensitive information to the citizens. And the voice of young community citizens was not heard. D1 stated that “I found many cases of infertility women from the community. These women might be the victims of the pollution. Therefore, any information related to pollution was very sensitive to them.” D2 said that “all information related to individual citizens were very sensitive and was needed to be strictly regulated unless there were orders from the court. Otherwise, it was unethical for us to give out the sensitive personal information.”

Therefore, it might be reasonable for bureaucrats to be conservative on pollution information including their policy makings. However, there were also some situations which were beyond the capacity of governments due to the constraints of budget, personnel, and expertise. For example, local government was not able to pay the huge amount of compensation and removing(or cleaning) all the toxic pollution. In addition, correspondents and/or environmentalists might intervene in the community development policies during the formation and designing stages. This implied the complexities of dredging policy formation, plan, and implementation.

C3 stated that “we worked very hard to ask for funding from EPA of central government to satisfy the needs of community citizens. And EPA officers were all very kind and helpful to give us the necessary money to fund the first part of the Zu-Fa-Gan Canal. They helped us to find the necessary laws although the first part of the canal was originally planned. In addition, we didn’t have enough staff to work on the project. I myself was the only undertaking officer in our department. I knew that any information was very sensitive in the community. Therefore, we were all very careful about the information.” It was fair to say that bureaucrats had to follow laws.
and orders. They had to be very careful in dealing with sensitive problems.

D3 state that “the Zu-Fa-Gan Canal dredging had been delayed for two years. We made a lot of effort to communicate with community citizens to get consensus. It was because we got a research project from City Government to deal with the canal dredging. And we got consensus with community citizens. In fact, they were the community leaders.” The statements indicated the difficulty of policy implementation. And it could also be explained that communication was necessary in all stages of policy making. And the communication included not only community citizens but also bureaucrats. It was often that there were difficulties of coordinating different departments of governments. C1 stated that “there were bureaucratic problems since both central and Tainan City governments had the responsibility of dealing with the dredging policy. EPA, Urban Planning, Civic Engineering, Health, Culture, and Social Works were all related department of the dredging policy. But these departments may not cooperate with each other effectively.”

For example, the contracting out of the Zu-Fa-Gan Canal was regulated by the Procurement Law of Taiwan. The policy effectiveness of the canal dredging might be questioned. It was because there might still be rumors and/or different explanation for the contract. Additionally, there were activities and/or behaviors were not regulated by laws. Another example was that the Soil and Groundwater Pollution Remediation Act was passed on Jan. 2 of 2000. But the mud clearance of the canal was not regulated. In other words, the mud clearance of the Zu-Fa-Gan Canal might be challenged due to the vagueness of the laws. In addition, the technical part of the dredging policy might have further social, economic, and ecological impacts on community development. These made the dredging policy more complex. And these were also related to technical problems which are discussed in the followings.

For the role of central government bureaucrats, they usually did not play important role in dealing with the implementation problems of the An-Shun Plant although they had the responsibility of proposing regulations and rules of dealing with the environmental problems. But, still, local government often needed help from central government. First, policy formation was often the responsibility of central government while policy implementation was the responsibility of local government. C2 told the author that Tainan City Government played the leading role in this case. It meant that the city government had been playing the leading role in the community

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11 EPA officer from central government told the author that it was difficult and complex to regulate mud under water. There seems to be rare to have the mud regulation in other countries of the world.
development policy. Second, the An-Shun Plant, which was located in Southern Taiwan, was far away from the central government, which was located in Northern Taiwan. But it seemed that the An-Shun Plant problems were only regulated and cared by EPA in central government. The responsibilities of regulating and helping the city government and the community were left to the EPA from central government only from the author’s observations. But, it was obviously beyond the capacity of EPA.

By using another dredging policy for comparison, the dredging policy of Lu-Er-Mon River\textsuperscript{12} was changed after being challenged by environmentalists and media. It was criticized that only downriver was cleared without clearing upriver, which high degree of pollution was possessed in the mud of the river.\textsuperscript{13} Based on the past experiences of communicating with government officer, the community leaders, including elected leaders and opinion leaders, had known how to challenge the Lu-Er-Mon River dredging policy. And Tainan City Government officers accepted the opinions of the community to dredge the full river. Regarding to the Zu-Fa-Gan Canal dredging policy, the dredging was contracted out by Tainan City Government to Li-Din Engineering Company. But there were a lot of communication problems at the beginning of forming the dredging policy. The author was able to observe the interaction in a conference room on June 1, 2007.

D3 told that “Li-Din Engineering Company got the project of planning the Zu-Fa-Gan Canal dredging from EPA of Tainan City Government in 2005. The total budget was 20 million NT dollars (about 0.67 million US dollars). But the company didn’t send their best engineers to work on this project. In addition, there were communication problems between the engineers of the company and community citizens. The project didn’t work smoothly at the beginning of the project. The EPA of Tainan City Government, therefore, asked researchers of the Environment Research Center of NCKU (National Cheng Kung University) to intervene in communication between the company and the citizens. And the project was decided to begin in October of 2007 under the agreements of citizens and the company.”

From the above statements, it seemed that city government didn’t want to be involved in the dredging policy. Maybe they wanted to be away from conflicts with community citizens. However, city government still had the responsibility of regulating and/or monitoring the dredging policy. In fact, there was no consensus on

\textsuperscript{12} The Lu-Er-Mon River, which was also near the community, had been dredged before 2007 as B1 told the author. The river was dredged for the purpose of Dragon Boat Competition instead of health issue.

communication of the dredging policy between community citizens and the representatives of the company at the beginning according to the author’s observation. For example, the participants, including representatives from the company and the An-Shun Plant, community leaders, and researchers from Environment Research Center of NCKU were all together in a conference room to discuss the way to clean the mire of the river. But there were no results owing to communication problems. There were three reasons for the situations. First, community citizens had no trust on the company owing to the past experiences on the Lu-Er-Mon River clearance from the author’s observation. Second, the Li-Din Company didn’t care very much about the feeling of the community. It might be because they were private company and they only focused on engineering part of the project. Third, community citizens need more education than before especially when they face the serious chemical pollution in their community.

Conclusion

Regarding to the dredging policy of the Zu-Fa-Gan Canal as mentioned above, community citizens were not asked to participate in the all stages of the dredging policy making at the beginning. It was not until the community citizens found problems existed in ways of clearing the canal through media and the environmentalist. Community citizens were allowed to participate in the policy making. In fact, both local and central government did not encourage citizen participation at the beginning of the dredging the canal. Government bureaucrats were forced to accept citizen participation in the dredging policy formation.

In other words, community citizen participation did happen in the dredging policy making process. But there were some problems. First, community citizens were not fully notified for the pollution information was not fully. Second, the participation was limited. There did have self-management group, which was called Self-Rescuing Association, from the community and working for the community affairs. But its representation was challenged. Third, there was lack of departmental cooperation in dealing with the dredging policy both in city government and in central government.

Interests of the community were sacrificed owing to lack of participation of the community citizens (and leaders) and the ignorance of the case developments of community citizens. Additionally, the problems of community representation and

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14 The author organized a community leaders’ conference on June 1 of 2007 but the purpose was not for discussing the clearance policy. The clearance of Zu-Fa-Gan Canal was discussed in a short time but with no consensus.
participation might weaken the role of community in policy decision making. For example, the way of clearing the canal might determine the costs and effectiveness of the project. There might be conflict of interests among the company, city government, and the citizens. The company might choose the cheapest way but left some toxic chemicals in clearing the canal. City government had the responsibility of monitoring the company. Community citizens might want to use a strict standard to evaluate the clearance effectiveness. But the role of the community might not be strong enough in negotiating and communicating with other stakeholders. Another problem was that community interests might not be protected without full information and participation.

In the An-Shun Plant case, there were few engineering background environmentalists, who participated in the decision making of community development policies. For example, the most famous environmentalist, Huang-Cheng Huang, did have Ph.D. degree of chemistry in the An-Shun Plant Case. But the community needed more fields including social and natural sciences than just chemistry to monitor the implementation of the dredging policy. The philosophy behind this was that citizens, bureaucrats, environmentalists, and engineers ought to have sensitivities on the impacts of dredging policy. But it seemed that the institutional arrangements did not have the incentives to attract the participation of experts from different fields in the policy decision making.

In other words, the community leaders’ satisfaction was not equal to community citizen satisfaction. Effectiveness of the dredging policy would be questioned if there had had no community citizens’ satisfaction. Owing to lack of public(city citizens) concerns, environmental justice of the An-Shun Plant case and/or the dredging policy of the Zu-Fa-Gan Canal might be challenged. For the political problems, it was found that city councilors were not trusted by community citizens. For example, community leaders’ denied to invite councilors to attend the community meeting organized by the author on June 17 of 2007. The community citizens felt that city councilors would not be able to help the community to solve the problems but rather to make worse for the community. For the technical problems, it was undertaken by the NCKU research teams, which also promised the EPA of Tainan City Government to play the role of volunteer expert in the dredging policy decision making. It was suggested that city government were still required to play role in the decision making and monitoring the dredging policy implementation since city government must have responsibility for the policy as mentioned above.

By studying the dredging policy of the An-Shun Plant case, it was found that
citizen participation was not encouraged and was not widely recognized by government. In other words, community citizen participation, including the representation and number of citizens, had to be emphasized in the An-Shun Plant Case. Both city and central government should encourage citizen participation and/or build the mechanism of enhancing community participation including creating incentives for young people participation in the community. In addition, for the voice of silent community citizens had to be encouraged such as the aged in the community. But it needed to be further studied by experts from the fields of humanity and history. It was also suggested that incentives were needed to be created for community citizens to focus on community development policies since it was the future and the hope of the community.
References


Lin. W.M.(2005). Three Elected Community Leaders Were Retreated from the


Table 2: The second part of the Zu-Fa-Gan Canal

<table>
<thead>
<tr>
<th>Types of fish</th>
<th>Dioxin(pg-TEQ/g • Weight in wet)</th>
<th>Mercury(mg/kg • Weight in wet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscles of <em>mouthbreeder</em></td>
<td>0.97</td>
<td>0.05</td>
</tr>
<tr>
<td>Organs of <em>mouthbreeder</em></td>
<td>17.2</td>
<td>0.21</td>
</tr>
<tr>
<td>Muscles of <em>mugilmacrolepisa</em></td>
<td>1.11</td>
<td>0.02</td>
</tr>
<tr>
<td>Organs of <em>mugilmacrolepisa</em></td>
<td>8.25</td>
<td>0.05</td>
</tr>
<tr>
<td>Eggs of <em>mugilmacrolepisa</em></td>
<td>13.3</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td><em>Metapenaeus monoceros</em> ( <em>Fabricius</em> )</td>
<td>8.78</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Table 3: The first part of the Zu-Fa-Gan Canal

<table>
<thead>
<tr>
<th>Types of fish</th>
<th>Dioxin(pg-TEQ/g • Weight in wet)</th>
<th>Mercury(mg/kg • Weight in wet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscles of <em>mouthbreeder</em></td>
<td>0.78</td>
<td>0.06</td>
</tr>
<tr>
<td>Organs of <em>mouthbreeder</em></td>
<td>1.70</td>
<td>0.40</td>
</tr>
<tr>
<td>Muscles of <em>mugilmacrolepisa</em></td>
<td>3.44</td>
<td>0.09</td>
</tr>
<tr>
<td>Organs of <em>mugilmacrolepisa</em></td>
<td>3.04</td>
<td>0.05</td>
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<tr>
<td>Eggs of <em>mugilmacrolepisa</em></td>
<td>5.34</td>
<td>0.24</td>
</tr>
<tr>
<td><em>Metapenaeus monoceros</em> ( <em>Fabricius</em> )</td>
<td>9.06</td>
<td>&lt;0.02</td>
</tr>
</tbody>
</table>

Source: The Testing Division of EPA, Taiwan, 2005
<table>
<thead>
<tr>
<th>Tested Area</th>
<th>Deept h(cm)</th>
<th>Mercury (mg/kg)</th>
<th>Dioxin(ng-I-TE Q/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W332</td>
<td>0-15</td>
<td>50.5</td>
<td>101,000</td>
</tr>
<tr>
<td></td>
<td>15-30</td>
<td>26.4</td>
<td>40,800</td>
</tr>
<tr>
<td>W204</td>
<td>0-15</td>
<td>21.1</td>
<td>780</td>
</tr>
<tr>
<td></td>
<td>15-30</td>
<td>4.94</td>
<td>3,290</td>
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<tr>
<td>W333</td>
<td>0-15</td>
<td>19.2</td>
<td>2,500</td>
</tr>
<tr>
<td></td>
<td>15-30</td>
<td>12.5</td>
<td>1,080</td>
</tr>
<tr>
<td>W334</td>
<td>0-15</td>
<td>39.8</td>
<td>2,400</td>
</tr>
<tr>
<td></td>
<td>15-30</td>
<td>16.9</td>
<td>1,350</td>
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Table 5: Did government tell community citizens the pollution information?

<table>
<thead>
<tr>
<th></th>
<th>Frequencies</th>
<th>Percentage</th>
<th>Accumulated Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very agree</td>
<td>11</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Agree</td>
<td>109</td>
<td>36.1</td>
<td>39.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>126</td>
<td>41.7</td>
<td>81.5</td>
</tr>
<tr>
<td>Very disagree</td>
<td>24</td>
<td>7.9</td>
<td>89.4</td>
</tr>
<tr>
<td>I don’t know</td>
<td>32</td>
<td>10.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>302</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Were you clear about the operation of the Self-Rescuing Association

<table>
<thead>
<tr>
<th></th>
<th>Frequencies</th>
<th>Percentage</th>
<th>Accumulated Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very clear</td>
<td>6</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Clear</td>
<td>43</td>
<td>14.2</td>
<td>16.2</td>
</tr>
<tr>
<td>Unclear</td>
<td>160</td>
<td>53.0</td>
<td>69.2</td>
</tr>
<tr>
<td>Very unclear</td>
<td>73</td>
<td>24.2</td>
<td>93.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>20</td>
<td>6.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>302</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Were you satisfied with the operation of the Self-Rescuing Association

<table>
<thead>
<tr>
<th></th>
<th>Frequencies</th>
<th>Percentage</th>
<th>Accumulated Percentage</th>
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<tr>
<td>Very satisfied</td>
<td>3</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Satisfied</td>
<td>80</td>
<td>26.5</td>
<td>27.5</td>
</tr>
<tr>
<td>Unsatisfied</td>
<td>78</td>
<td>25.8</td>
<td>53.3</td>
</tr>
<tr>
<td>Very unsatisfied</td>
<td>31</td>
<td>10.3</td>
<td>63.6</td>
</tr>
<tr>
<td>Unknown</td>
<td>110</td>
<td>36.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>302</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>