

The Thesis committee for Leticia Aparicio-Soriano
Certifies that this is the approved version of the following thesis:

**Water pollution and Indigenous identity: a perspective from a cooperative
water association called La Sociedad de Aguas La Guadalupana**

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor: _____
Charles R. Hale.

Martha Menchaca.

**Water pollution and Indigenous identity: a perspective from a cooperative
water association called La Sociedad de Aguas La Guadalupana**

by

Leticia Aparicio-Soriano, B.A.

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For
Margarita Soriano-Ambrosio
My mother

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SUPERVISOR: Charles R. Hale

Abstract

The water and land located in Tehuacán, Puebla, México, and its surrounding villages including San Francisco, Altepexi has provided individuals with food, jobs, and agricultural products. Currently, the descendants of these indigenous communities find their cultural, social and economical practices related to the daily use of water under threat of disappearance. A primary focus in this thesis is the pollution of water by the maquiladora industry, and pork and chicken processing. Community cooperative associations such as La Guadalupana work by administering the use of water in the villages. Scarcity and water pollution undermine one of their main sources of income to support their families. Furthermore, the health of members of the community, the peasant work activities related to water management, and the prevention of the population on their right to access to clean water are some of the social aspects that are targeted here. As a result, this thesis will explain the extent to which the autonomous Sociedad de Aguas La Guadalupana is playing a role in addressing the problem of water pollution, through a *campesino* way of organizing.

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Introduction

This thesis is the result of a research process that allowed me to apply my academic knowledge to a real community problem related to water pollution by industries in an indigenous territory. My central objective is to produce research that can relate the analysis of pollution to that of indigenous identity, through the process of activist scholarship. This thesis provided the opportunity to achieve this goal: field research experience to explore how my theoretically oriented classes relate to real life cases. This is important for me due to an interest in developing solutions to the many problems that indigenous communities face related to natural resources exploitation within their territories.

For this work, I proposed to analyze the social impact that industries cause due to aquifers pollution in an indigenous territory. Historically, Nahua indigenous peoples and community farmers in the Tehuacan Valley have used the aquifers for irrigation purposes. The focus of this work was to reveal how “La Sociedad de Aguas La Guadalupeana” negotiate the negative impacts on the social dynamics, and how they address the multiple problems created mainly by maquiladoras (assembly plants) such as water pollution. As a result the thesis consists of three chapters that describe and analyze testimonies and collected data, most of them during the summer of 2010, and in follow up research at the end of the semester of the same year. In addition, bibliography consultation has been carried out since the very beginning of the thesis design, march 2010, up to the end of this document, fall of 2011.

The first chapter of this work contains a brief description of water cooperatives in Tehuacán Valley, focusing on La Guadalupana, an indigenous water management cooperative. It shows their water management purposes, a review of their participatory processes within the cooperative, and the autonomous ways of organizing to manage a natural source such as water. This is followed by a statement of the purpose of this research, a presentation on the methodological and theoretical framework, as well as a review of the ethnographical data collected during field work. While I was drafting this thesis, I reflected about how to develop projects that are not epistemologically violent. This is related to an article called *Forged in Dialogue: Toward a Critically-Engaged Activist Research* written by Shannon Speed, in which it was discussed the ways scholarly knowledge is exclusionary, and the fact that most of the times a researcher benefits more from the research subject than the subject from the researchers. From personal experience doing fieldwork, I have received those opinions from community members related to researchers. They say most of the times the researchers only do interviews, take pictures, and make people waste their time because they never know how the information was used. I consider one of the possible solutions to this problem might be to emphasize participatory research projects. This would be an important opportunity also to promote a methodology designed by the researcher together with the community, which makes it participatory so that the knowledge community members and the researcher develop is reflected when they are producing their own advocacy actions and solving their own problems as well as in this research project was proposed.

The place in which the research project was conceived is also another aspect that I would like to problematize, before presenting the second chapter in this introduction. An academic stage in which this research was going to be held: a university in the United States. I took this into consideration after I read "De-Centering Latin American Studies" by Charlie R. Hale, Sonia E. Alvarez y Arturo Arias. A reading that presented a proposal related to the importance of creating more cooperative research between Latin American and North American institutions. The discussion is that the conditions between the US, and Latin American institutions are not the same. There are gaps related to the material resources in which much benefits/cannons are received on the U.S. side including: theoretical approaches, the facilities to publish, and even the language in which research is written influences its impact. As a conclusion it was found that the Euro-American academy enjoys much more power and ability to influence in all those areas. This situation broadened my decision to design the project that I was going to research. This project was thought, to some extent, to contribute to de-centering Latin American Studies by doing participatory research with Latin American institutions, in this case two Mexican ones: Sociedad Cooperativa de Aguas La Guadalupana, as well as, Human and Labor Rights Commission of the Tehuacán Valley, A.C. (CDHLVT) Besides the previous idea, I considered a more powerful academic space would impact, as a way of international pressure, to social injustices as well as human rights violations in my home region: San Francisco, Altepexi, which was the venue of the research.

People from these institutions were contacted, interviewed and some of them guided me to visit areas where water and land is being polluted, mainly by maquiladoras. I also attended some of La Guadalupana meetings as an observer, and we also had the opportunity to have workshops to build together this thesis design, as well as to listen to their view point about water pollution by industries. As part of the experience, in the second chapter of the thesis the problem and causes (maquiladoras, poultry factory and agribusiness) of water pollution is addressed. Furthermore in the final part of the chapter water pollution and its social impact through the lenses of La Guadalupana is described and analyzed. Here I take into consideration, within this chapter, what is going on with the role of governmental authorities in the case. Then we get to some of the main questions of the research: are irrigators from the cooperative getting organized to address or negotiate water pollution problem? Are they doing it as indigenous people? In this sense the third chapter contains analyzes of water pollution industries, and irrigators identity to address the problem. Indigenous Identity, in this part, is described and analyzed as the bases of what is going to be one of the foundations of the theoretical background that supports this thesis.

At the end of the thesis I observe that negative circumstances are affecting this community organization and the entire region on their social, political, environmental and cultural spheres. Industrialization within a stage of neoliberal reforms in Mexico are affecting indigenous communities. Consequently, what possibilities do the affected communities have to negotiate industrialization consequences within their territories? What are the implications of the

industrialization process in their lives? Would dialogue between community members, the government representatives and corporations protect water resources? Is indigenous identity a key element for negotiation? What are the implications for La Guadalupana and other irrigation associations if they do not have these negotiations? Conclusions on this study are proposing some reflections related to these questions.

The possibilities to research on indigenous issues by participatory approaches make me believe that I need to focus on possibilities to make structural changes. I consider in a long term this should be the aim, if that is the challenge, then this thesis had to be able to get the bases for working on projects that can contribute to make a social change. In consequence in the appendix part of the thesis, the proposals to address this problem of water pollution are presented. These statements were the result of some of the reflections held on meetings with people of La Guadalupana and CDHLVT. I may say that all the theoretical background that I got from research experience for thesis production will be not only in service of my benefit, but hopefully it will be on the benefit the community I collaborated with, in my home region and with the cooperative water association: La Sociedad de Aguas la Guadalupana.

Chapter I.

Context, theory and method

This chapter contains three parts. The first one focuses on the location of the study as well as its geographical and demographic characteristics. A brief description of its indigenous population is provided. In the second part a characterization of water resources within the region emphasizing on a qanat it is being exposed. Furthermore, La Guadalupana irrigator association organization dynamics will be described. Finally, I include both theoretical and methodological elements that supported the research of this thesis. The methodology that supported to get data is as an important element to include since this thesis is the result of a participatory research project.

1.1. Region of the Tehuacán Valley: location and population

The Tehuacán Valley is located in the south east of México in the State of Puebla. The west is surrounded by the mountains of the Sierra de Zapotitlán, and to the east by the Sierra Negra. According to Paleo-botanist Richard Mcneish (1972) about 9,000 years ago nomadic people settled in the valley, due in large part to the fertile soil and abundant supply of water. Around 4000 BC, the people of Tehuacán began cultivating crops and, they were the very first to cultivate corn (maize). Within the region there are 18 municipalities. In all of these municipalities the majority of the population is integrated by indigenous groups. Indigenous cultures continue to survive, such as the Nahuas, and Popolocas communities. However, in the

Tehuacán region, there has also been migration by mixtecos and mazatecos (among other indigenous people from other different ethnicities, mainly from south México), specifically consisted of young people. People from small rural communities in surrounding mountains have moved to this area to look for jobs in order to “escape poverty”.

1.2. San Francisco, Altepexi

The following is a brief description of the research venue. Altepexi is one of the 217 municipalities in the Mexican state of Puebla. It is located in the southeast part of the state, and within the Tehuacán Valley. According to the *Plan de Desarrollo Municipal de Altepexi, Puebla*, for the period 2009-2011, the name of the municipality comes from the Nahuatl voice "atl": water; "tepexitl, rock; and "c": in, is formed Tepexi-c atl, its meaning is "water on the rock".

The *Plan de Desarrollo Municipal de Altepexi, Puebla (2008-2011)* also determines that its surface is 63.78 square kilometers long, which places it on the 156 place in relation to the rest of the municipalities in the State. Hydrology data suggests that it belongs to the Papaloapan basin. To the north end is crossed by the Tehuacán river, which comes from the springs that are nearby Santa María del Monte in the Sierra of Zapotitlán; this river crosses the Tehuacán Valley and its one of the main bodies that form the Papaloapan. Altepexi is located in an area where there are streams and underground water systems, which makes water one of its main natural resources. According to the same official government data the medium height over sea level location is 1240 meters. The 2010 census of *Instituto Nacional*

de Estadística Geografía e Informática (INEGI) registered at the *Prontuario Municipal Puebla* (2005-2011), reported a population of 18,920 persons in this municipality; 9,109 male and 9,811 female. The population of this place consists of 6,198 minors and 10,197 adults, with 1,211 of them being 60 years or older. 13,529 inhabitants of the location in Altepexi, México live in indigenous households. 8,437 of the citizens that are 5 years and older, speak an indigenous language. The amount of people who only speak an indigenous language without having knowledge of the Spanish language is 37 people, while 8,162 as well speak Spanish.

1.3. Water resources in the region

Whiteford and Enge (1989) explain that some of the water in the Tehuacán Valley comes from springs known as *manantiales*, which flow out of the floor. The second source of water comes from streams, called *barrancas*, which appear after the rain. The third source of water are underground tunnels that supply water to a number of villages; this system is known as filtering gallery (*galerías filtrantes or qanats*) and it is perhaps the most important source of water to the people of the Tehuacán Valley. It consists in an ancient technology for tapping groundwater without large investments in electrical or gas-powered pumps. A fourth source of water is the *pozos profundos* or deep wells that have been created through modern technology. They are extremely expensive and most farmers can not afford them individually. As a result, these farmers have organized into cooperatives in order to pay collectively for their construction and maintenance. For authors Gene Wilken

and Whiteford (2011, May), the Tehuacán Valley has the most extensive and complex runoff water management system in Middle America.

1.4. What is a galeria?

A qanat or a filtrating gallery is a technique for capturing underground water and conveying it to the surface by gravity. The Tehuacán Valley *campesinos* (farmers) have developed this ancient technology for tapping groundwater without large investments in electrical or gas-powered pumps. However this effort means a significant human risk and sacrifice. The characterization of what a qanat is has certain diversity, but it consists essentially of an underground aqueduct (horizontal well or horizontal mine entrance) that penetrates in an aquifer and conducts the water to the surface by gravity. The qanat is both a capture and a conduction technique. The capture of water in the underground aqueduct can be produced by filtration of the walls or from a spring in the floor (or ceiling) of the aqueduct. As Palerm-Viqueira (1995) state:

The length of the underground aqueduct is related to the distance between the site of capture of water and its conduction to the surface by gravity. It is typical for the underground aqueduct to have regularly spaced well shafts, that are also used as entries for maintenance purposes, and which are usually visible in aerial photographs since each one is surrounded by the mounds of soil removed when digging it, as well as by the waste produced when it is cleaned (P.135).

Because of the depth of the groundwater is quite variable, the vertical shafts of the galerias range from three to seventy meters. According to George B. Cressey (1958), the essential idea is to excavate a gently sloping tunnel that extends upslope

until the water is tapped and water emerges at the downslope end. To give access to the tunnel, vertical shafts are dug at intervals of thirty to one hundred meters. Where the tunnel dips below the water table, it serves as an infiltration gallery and may have several branches to increase the inflow. The lower and the longer part is the conveyor channel.

According to Whiteford (1989) In order for galeria systems to function, the grade or slope of the terrain must not exceed 3 – 5 percent. Higher slopes result in excessive water speed, which is difficult to control and will erode and damage the canals. He also explains that, according to the U.S. Soil conservation Service, the ideal grade is 0.8 – 2.7 percent. The maximum grade of the Tehuacán Valley is well below that.

Jacinta Palerm-Viqueira (2004) research on *galerias filtrantes* shows that throughout the world, qanats are known as filtration galleries, foggara, fuqaras, water mines, and many other names. In Madrid as *viaje* or *viajes de agua* (a deformation of the Latin name *via aquae*). In México and Latin America they are called galerias filtrantes (filtrating galleries), and other names of local use: in Tehuacán (Puebla, México), *apantles* con *tragaluces*, or *pozería*. Palerm-Viqueira also explains that historically it is an ancient technique, invented somewhere in the Near East, nevertheless, an early colonial or even pre-hispanic origin has been assumed.

1.5. The qanats of the Tehuacán Valley: its origins

The Mexican qanats are not very well known, little is known about their presence, and even less regarding construction dates. Campos, F. et al. (2000), explain that the best known qanats in México are those in the Tehuacán Valley, where archaeological, ethnographic, and ethnohistorical investigation has been most concentrated. In the Tehuacán Valley, the qanats are used for irrigation, and the technology has been effective: there are galleries in construction and local farmers use and build them using simple tools. The qanats belong to water societies, whose partners are farmers, mostly peasants of the region. There are currently some 80 qanats in use. Seele, (1969) suggests that the first reports on qanats in the Tehuacán Valley are those of the Papaloapan Commission from 1954. The same researchers also explain that the few studies on Mexican qanats have speculated on the possibility that they have a pre-hispanic origin, like the puquios of Perú; or an early colonial introduction. The Valley of Tehuacán has been pointed out as the center of diffusion to the rest of México. These types of constructions are of great importance in the region. This system of water capture was used for the first time, in Tehuacán, by the Franciscan friars, soon after the conquest. However, in the case of the Tehuacán Valley qanats, two archaeologists Woodbury, R. B., and J. A., Neely (1972) found evidence against the constructions being pre-hispanic. Moreover, they found no direct evidence of the systems being older than the 19th century –oral history confirmed the archeological evidence: a local character, whose family worked with landowners of the area, stated that the first qanats in the Tehuacán Valley were built in 1850 or 1860. Henao (1980) who searched in

Tehuacán Valley archives, found 16th century papers on water disputes, but no mention on qanats until the 19th century, and gives 1886 as the date of construction of the first qanat located in the municipality of Ajalpan, Puebla, which is a community located next to Altepexi.

The history of *qanats* is part of the history of irrigated agriculture in México. Groups organized around *qanats* were originated to control floodwater. They are formed by owners of land that have the necessity to irrigate it by getting water from canals connected to floodgates. In this study, a *galeria* association was participating by being part of the design of the methodology, as well as giving interviews as part of this research. Their opinions and concerns will be analyzed throughout this work.

1.6. Water cooperatives in Tehuacán Valley: brief description

The galeria emerged during the period of capital expansion but they retained many of the traditional responsibilities, and principles of community organization. According to Enge and Whiteford (1989), farmers in this region have included an important dimension of capitalist corporate structure. Then, from the traditional principles of water organization evolved the democratic structure of the associations: the annual change of leadership, and the rotation of members. In addition, the system of shares, measures, *apantle* (canal) use, and other terminology was transferred from the community system to the *galeria* system. Part of the most important rules is the maintenance and cleaning of the canals, which is shared by members and it is an obligation. This shared responsibility is called *faena*. For instance, if any of the rules are not fulfilled, including the *faena*, fines are assessed.

A characteristic, which is taken from traditional spirituality within the community organization, changed to having a patron saint and celebrating catholic religious dates. Each *Sociedad* has a saint as a protector of the community. In this case, the Virgin of Guadalupe (in Nahuatl, the region's spoken language, she is referred to as - *Tonantzin Guadalupe*). The celebration includes a mass followed by fireworks, mariachi and/or *grupero* music, and dancing. Often, the celebration takes place by the galleria location, however members go to the home of the elected head of the festivities committee for a traditional meal, which includes dishes such as *mole* with turkey, and bean *tamales*.

1.7. La Guadalupeana, an indigenous water management cooperative: its organization and water management purposes.

Associations (*Sociedades*) are formed by a number of good friends and acquaintances, often relatives or neighbors, '*paisanos*' (country people), who decide to manage and distribute water of a well, a spring, or a galleria, and also whom to invite into the association. Membership is acquired mainly by inheritance, however some of the members got it after they bought water actions. With the approval of the whole organization anyone who follows membership rules become a new member. It often includes people with a range of incomes. However, there are some associations in which a conscious effort was made by the founders to include the poorest peasants. Membership of La Gudalupeana or of any galeria associations is not restricted to residents of the same community, but nowadays it provides benefits

to do so due to the fact that inequity for getting water and scarcity is making these cooperatives starting to have some restrictions for membership.

According to interviews conducted during the summer of 2010 and the data collected, Guadalupana irrigation association was founded in 1946. The current president of the cooperative board confirmed the date, when he pointed out the year it was legally registered as a cooperative, but he added that he remembered that when he was a child his grandfather was one of the pioneers organizing the group about 60 years ago to construct a galeria. Through the years there has been changes in the development of it, such as changes in the board of representatives, as well a change in the number of members, which in the first years increased from 40 to 60, then to 90, and finally to a hundred and twenty members. Nowadays, the number of members can not be increased anymore, due to a variety of factors that include: scarcity of water; peasants no longer being allowed by the government to build more wells; and the difficulties the galeria groups are experiencing with the current economic crisis which is preventing them from sharing the income with more people from the village, and just the top number of members they currently have. Its facilities that consist on a house from which they use one of their rooms (a medium size hall) to have their meetings are located in downtown Altepexi. According to interviews, about 60 years ago, they started to have their meetings at this place that one of the first organizers of the group offered to the *sociedad*, and until the current time they still do their works on it.

Within La Guadalupana cooperative, irrigators are involved in all collective decisions for their own appropriation resources, while in most bureaucratic systems

major decisions for an appropriation resource are made by officials who have little identification with the irrigator and the irrigation process. According to Yan (1992) irrigators organizations are more likely than government agencies to develop rules that suit their specific circumstances. Collective choice rules adopted by most irrigators are also more conducive to rule enforcement and accountability of officials than those adopted in government agencies. Yan identifies there are different types of governing systems for water irrigation, such as: 1) a national or regional government agency or enterprise, 2) a local government unit, 3) a communal enterprise or an irrigator's association, or 4) any other kind of organization such as a profit enterprise. According to this classification system, La Guadalupana in which the production resource is governed by an irrigator's association, this suggests that the distribution and appropriation of resources are governed by a communal enterprise.

Besides collective-choice arrangement, physical and community attributes also help to explain that community cases are characterized by higher incidences on rule conformance and good maintenance than the bureaucratic cases. Since government did not create the organization, farmers themselves have developed assigned rights and responsibilities among themselves. They are responsible for enforcing the rules they create and for resolving disputes among themselves. As a result, although La Guadalupana may benefit from support offered by external authorities, their existence and functioning does not entirely depend on these authorities. However, México has expanded its state power and the consequent national control of administrative activities consisting of the nationalization of water,

minerals, petroleum deposits, or land. México state has controlled natural sources in the name of rural development. As a result it increases the power of bureaucratic officials. Several key factors influence on how national policy is implemented on the local level. Generally, members of this collective organization resist incorporation into state programs, because incorporation places them at the bottom of a hierarchy. Furthermore, in México water belongs to the state. Yet, water captured by the chain wells in the Tehuacán Valley is owned privately by individuals that use it, sell it, rent it, and trade it. Obviously Guadalupana members are opposed to centralization of state authority.

Research results show that water from this cooperative is divided among the members in a third day rotation or cycle of irrigation turns. The members receive water during specific time periods every month, depending on the amount of time to which they are entitled. The minimal unit for the measurement of water is one hour of the total flow of a *galería* system. Hence, there are 24 irrigation periods or 720 hours. According to the secretary of the galleria, every month these steps are repeated as a cycle. The Vocal of the galleria explained that there are two kinds of allocation: a) *acciones*, which is a share distribution that represents the original investment in the associations. The sale of an *acción* results in a permanent change in the ownership of the portion of the flow; while b) *tandas* are the hourly distribution system within and outside the hourly distribution system. The *tanda* just involves the use of a number of hours of water during a particular cycle, not a permanent change of water ownership. Each member of the cooperative is called a *socio*. There are distinct classes of *socios*, based on the amount of water that they own: ordinary

socios and *socios mayores*. Cooperation within the *galeria* makes participation possible, because none of the agriculturalists can finance *galeria* construction alone, which is why as a group they share the risk and can pool enough money to complete the project.

During the interviews members shared their testimony, for instance, they told me the story of how the group was organized, as the legal president said:

“Since 1942 or 1943, men from that time started to have meetings and since those years up to now they still have them. The ones that started the group were more than forty years old each of them by those years. Some of them must have been born at the end of the 1800’s. The grandfather that was the founder of the group has already passed away. From all of them, just one is still alive. I think in that time he was one of the youngest. He is about 90 years old now”.

The grandfather of the same legal representative interviewed was the one that owned the house where the group of farmers started to meet since the beginning of the 40’s up to the present. According to the president of the *galeria* association it is said that they started as a group of thirty or forty people: “The founder invited many of his comrades. Nowadays all the new associates are children or grandchildren of the founders”. He added that some men that were specialists on finding water took the risk to look for water without any technology. They were or are called *poceros* (well makers), there still be a few of them. He also mentions that: “*poceros* took the risk to find water, nobody told them ‘here, there is the water’. They were lucky. There was a group called *La Candelaria* whose members tried to find it, but unfortunately they failed. During the construction of the *galeria* there were times when the works were stopped due to lack of money but all of use had to cooperate to restart the works”.

According to rules and purposes they explained:

“There are rules that as member you just can not break. Some members have tried to impose new rules and the *socios* make an extraordinary meeting to determine what kind of norms this person is breaking and then they assess a fee or if it is a heavy violation they may disburse his or her actions and we ask the member to abandon the cooperative to avoid further problems”.

He suggests that this is to avoid any alteration to the dynamics of the group. He also attributes their success as organized farmers to the strict follow of the norms. This member also considers that their organization has been a model for other water management groups, that have not followed their rules and they end up failing. During the interviews they agreed that their purposes are economical, because they use the water they administer to irrigate the crops from which they will get the products that will be sold in the market to get income for their families. However, the president of the gallery explains, that many years ago the fields production was very good, but nowadays it has decreased. That is why they have to share or rent the water. That is the reason they constructed Miravalles Springs (*Balneario Miravalles*), which is a place where there are located three pools that is a project that is part of the *galeria* association. They explained this is in order to get some income with the money they charge to people that go to swim, because the ticket to get to the pools is really cheap.

They have solidarity networks and they share each other the rights to use water, especially since some of them are not growing anything on their land due to the economical crisis, which is affecting farmer's investments on the plantations.

They also have a social mission to support some of the extended community maintenance works, such as the church construction, or donations to works on the community cemetery and other public places. That is also why in the latest years they built the Miravalles community pools and they have supported the works of a therapist on giving physical therapy to children with disabilities, and also not charging the entrance to these pools to the children parents or relatives when they take them to their therapies on water. He also explains that they have a strong solidarity network otherwise they would have not formed their organization:

“That has always been handled [solidarity] had it not been for that, nobody would have cultivated his or her land. If I had 3 hours or 6 hours of water *acciones*, I would not get food for a year with that. Having just two hectares, what am I going to harvest? Then we need to help each other, buying our own water internally. Among those who do not have [water] and those who cultivate the land. I mean that shows support. There are some who have other businesses, then so they do not plant. Then they sell the water to the ones that sow”.

The interviewed associates agree that the only benefit they get with water is that they have water to irrigate their crops and currently the income they get with the community pools:

“In those years talking about the 80’s, the 90’s it was like a mine. Because in the past as insecticides were not occupied, everything was natural. The entire crop was natural and there was more profit. That is no longer the case currently. Land were virgins, everything was good. From one hectare of tomatoes we could get up to 200 boxes. We used to get about 100 sacks of corn and now no longer, at most 60 or 70. But there are some people that just get at most 40. In the hot season they do not even get 40. Honestly now we are not great benefited farmers. You can ask about it whomever you want. That was the reason we put the pools to try to support ourselves, because the fields are not enough to work for a living. In the past the fields were kind of profitable!”

It was thought to operate a small bottling plant, but for lack of money they did not do it. Farmers stated that it also meant the cost of equipment and it could not be done. Some others agreed that they could rent the usage of water so they could get some income. According to this a cooperative member suggests:

“*Tandas* (amounts of water) are sold. There is solidarity among the peasantry. [Agriculture] no longer is very beneficial to the farmers, because insecticides are very expensive. Also when is hot season a lot of people can not buy water, then they can no longer cultivate. Why? It rises in price. Then if you have land but do not have water, then you can not plant. If you go to one of our *socios* and ask him for his water, of course he is going to charge you. And as it is not profitable anymore, sometimes they just do not use it. There are some farmers that are cultivating, they have they few money savings, they ask for more water, for more land, they are the ones that take the risk to invest but logically if they do not do it they will never have any profit”.

The problems that they have overcome all together are most of the times related to maintenance of the galeria, as well as administrative and legal ones on the permissions required to start new construction works such as canals to conduct water for irrigation, which are kilometers long across the Altepexi and Tehuacán Valley region. All the times to make decisions on how to solve those problems they have to hold a meeting, it might be one of the ones they have once a month or they may arrange and extraordinary one. By strictly following their rules, they overcome all together those problems.

1.8. Characterization of the research problem:

Indigenous people from the Valley of Tehuacán, Puebla and its surrounding villages including San Francisco, Altepexi, value and respect water as the main

source of life from earth. Water has irrigated farms since ancient times in this region, also named “la cuna del maiz” (the cradle of corn). The water and land located in that valley of southern Puebla has provided individuals with food, jobs, and agricultural products. Local peasants benefit through self-consumption, or through commercial distribution of their products. Furthermore this natural resource has a cultural value for Nahua indigenous communities who have inhabited this area for centuries, and who appreciate water for its economical and social value, but also highly respect it considering it a gift from earth.

Currently, the descendants of these indigenous communities find their traditional, cultural, and economical practices related to the daily use of water under threat of disappearance. According to the Circle of Blue, an NGO that has carried out research on this problem in the early 1990s, the Tehuacán region acquired the distinction of ranking among the ten most polluted metropolitan centers in the country. A primary factor in this evaluation is the pollution of water. This natural source is being polluted by the maquiladora industry, and the pig and chicken processing.

This precious liquid, recycled after industry use, is utilized to irrigate plantations and farmlands in San Diego Chalma, San Francisco, Altepexi, San Gabriel Chilac, as well as other villages. As it has being stated previously, the local climate is semiarid, and the livelihood of the region’s subsistence farmers is largely dependent on getting water from underground sources. Nearby pig and chicken farms belonging to major Mexican agribusiness companies satisfy their water needs by drilling expensive deep wells into underground aquifers affecting the many

peasants in the valley who are forced to face resulting water shortage. Furthermore, the pig and chicken industry farms in particular generate massive quantities of excrement that pollute rural water supplies, which threaten wildlife as well as human beings. Community cooperative associations such as La Guadalupana work by administering the use of water in the villages; scarcity and pollution undermine one of their main sources of income to support their families, by affecting the production of their lands. Furthermore, the health of members of the community, the peasant work activities related to water management, and the prevention of the population on their right to access to clean water are some of the social aspects that are targeted by the researched problem. As a result, this thesis will explain the extent to what the autonomous Sociedad de Aguas La Guadalupana is playing a role in addressing the problem of water pollution, through a *campesino* way of organizing that might be part of an indigenous identity resistance strategy. In this sense the questions to be answered are on the impact of recent explosion of pollution into aquifers, which have historically been used for irrigation practices by indigenous Nahua autonomous groups (*sociedades*) and their perspectives to address the problem. How does indigenous identity of Sociedad de Aguas La Guadalupana members play a role on making a call for organization, to address the problem of water pollution by industries? Furthermore a hypothesis for this thesis would be: Guadalupana autonomous organization plays an important role in developing a potential strategy to have any proposal for water pollution solutions. They might have potential to call for mobilization to stop water pollution.

1.9. Theoretical and methodological framework

Concepts of indigenous identity, autonomy, globalization and resistance are addressed during this thesis work. This study employed a participatory research methodology, combined with an ethnographic approach. To develop the framework, ethnography techniques were used, such as participatory observation, and structured and non-structured interviews to informants. The process included recorded observations (written notes and tape recordings) as well as ethical issues (privacy, anonymity, confidentiality, etc.). The participatory research process will lead the organization to address the social problems with the researcher, as Jason Corbun (2002) mentions in his piece on community research that the participatory process aims to engage community members as equal partners alongside scientists in problem definition, information collection, and data analysis-all geared toward locally relevant action for social change. Communities seeking environmental justice are speaking for themselves through a process of community-based participatory research.

Since one of the first steps of this research is to diagnose social problems related to water pollution with the affected community, it is important for this research and its methodology to involve the people who have struggled with the issues for several years. The other main objective of the research is to involve the community to address the issues and find the appropriate solutions, thus providing ownership. This kind of methodology has the elements to guide the research and advance towards the purpose of the study. Workshops were utilized for the purpose of focalization and proposing solutions of the social issues to water struggles.

According to previous community work experiences this has been part of the techniques to get data in structured, and semi-structured interviews within the workshop. Corbun (2002), also explains that community workshops were held on how scientific studies are conducted, what constitutes valid data, and how studies can be designed using multiple methods that address the concerns of both community members and outside researchers (for example, community case studies and various quantitative approaches). Consistent with the principles of Participatory Research, the outside researchers come to these workshops as co-learners rather than teachers, grappling as equal partners with the ethical challenges of such inquiry and creating approaches that reflect both scientific and popular perspectives.

The planning of a final project for social change was designed with the community in a participatory way. This suggests that the word "expert" should not be conceptualized in binary terms such as expert-lay but rather as a fluid and heterogeneous concept where, depending on the question asked, scientists and community members can be equally expert. By explicitly recognizing community expertise, participatory research holds the potential for environmental justice communities to speak back to the often-hegemonic power of scientific expertise to define, analyze, and dictate solutions for those most at risk.

The participatory process also means utilizing a systematic cyclical method of planning, and taking action. Ignacy Sachs (1996) suggests that planning should be viewed essentially as a set of procedures to promote the societal debate on the 'project', to stimulate the social imagination by practicing 'variant thinking' to work out long-term strategies and to ascertain the scope of decisions to be taken at a given

moment in order to move in the desired direction. The rule of thumb is to postpone all the decisions that can wait.

Finally, an important step within this approach is evaluating (including self-evaluation) is a primordial part of this holistic approach since critical reflecting will consider the implication of having chosen a participatory methodology, critics to the process, within the community comments, reflections and observations of the community.

1.10. Ethnography through a participatory approach in Altepexi

The context of the research was framed by ethnographic data collection. Ethnographic description, as a complex “cultural technique” in sociology, was used to address social issues just like skills in participatory approach methodologies, transcription, or conducting an interview. As a solution to the problem of memory for a long time description has been used by putting into words that which is “silent.”

Primary sources of information were identified as "key informants". Within the Sociedad members, the leadership were localized as the ruling representative to narrate the story of how the group was created, what their purposes are, how they have been benefited from the organization, what problems they have faced together and how they have found solutions for such problems.

This part of the thesis is focused on the findings as a result of research by employing a participatory approach with the farmer’s cooperative. This research is focused on the problem of the pollution by industries of the water they administer; on

the collective reflection related to the problem and proposals or actions as recommendations to try to solve the problem.

To collect data and the point of view collectively through participatory research during the summer of 2010 there were meetings with members of *Sociedad cooperativa de aguas de galería* called La Guadalupana, which is placed in the Nahua region of Tehuacán, Puebla, México in the Village of San Francisco, Altepexi. For that purpose, five of their assemblies were attended in order to observe, to collect data and to start a collective reflection with 120 indigenous farmers, members of the organization. A social and an environmental problem related to water pollution were determined, the one that is described in this thesis, as well as others related to this one. Through ethnography, data was collected to identify people perceptions on water pollution and to know if they are organized by indigenous ways, not only to administer water, but also to confront the problem on water pollution. In each meeting there was a chance to reflect collectively with the researcher on some alternatives. With the purpose of working the problem of focalization and the reflection on alternatives through the water pollution problem there were four talks on the problem, and its explanation. At the end of each session there was a reflection through questions where the researcher was situated as a co-learner, not as an expert, sharing with peasants as comrades, ethic challenges with the purpose of developing all together popular and scientific proposals.

Within the cooperative members, leaders were focused as well as members of the board of directors and other members of the association that wanted to participate. All of them were interviewed. There were twenty structured and semi-

structured interviews that lasted approximately one hour, and a few of them that took longer, at least five hours. In case of long interviews, they turned to be a series of complaints.

According also to the methodology, there were interviews with administrative authorities of Sociedad de Aguas Guadalupeana. Questions were asked, such as: 'do you consider what is polluting water can be controlled?' or 'do you consider there are social problems because of water pollution?' and 'do you consider there is any solution for the social issues created by water pollution?'

The outside opinion, people who is implicated in the issues, such administrative of the municipality or authorities of the city hall on water control, were also part of the general framework, which was collected by interviews. The following were some of the questions that were asked: What do you consider is polluting water is a fact that can be controlled? Do you consider there are social problems because of pollution of water? What are those social issues? Do you consider there is any solution for them? Do you consider the participation of community is important to give solution to those problems? How would you include community participation on these issues?

Observation techniques were used during visits to at least two of the meetings "*Juntas de la Sociedad*", to observe the organizational dynamics. Permission was requested to group representatives for the participation in such meetings as observant. There were workshops with members of the organization to collect the information based on the previous questions. In this stage the participatory methodology with members of the community was used to identify

social problems related to water pollution as well as the possible solutions the group can provide.

One of the steps is the analysis of information to check primarily whether none, all, or some proportion of behaviors or events occur under distinct circumstances. Explanations will place particular social facts in reference to their environment. Further observations that can strengthen or weaken the preliminary data that was collected. Advanced concepts and evidence for their support and/or refutation were checked as well.

With the context, theory and methodology established, the bases of this study are situated to see what the importance is on water for this indigenous organization as well as the implications on water management within the organization and for their daily lives.

Chapter II.

Water pollution

The following chapter introduces current localized opinions regarding water contamination and the role that regional industries play in its surge. The main participant's of this section includes members of La Guadalupana. Yet also the opinions of local authorities (such as municipal authorities from Tehuacán, Puebla City) and activists (who highlight insider knowledge of the lack of remedies to curtail contamination) are also incorporated into this chapter.

2.1. Water Pollution in The Tehuacán Valley and its causes

The Tehuacán Valley supports numerous types of commerce, however agriculture dominates the economy. Much of the agriculture still utilizes centuries-old techniques, but in the last four decades the number of large and sophisticated agribusiness, specialized in raising vast numbers of chickens, pigs, cattle and other produce, has increased substantially. Not surprisingly, these businesses have put further stress on the underground water reserves. Mineral springs had been tapped for decades for large scale bottling; however, many local soft drink wells were bought by assembly plants and as a result this industry is disappearing. In consequence they are no longer considered a factor in excessive water consumption and pollution.

2.2. Maquiladoras

Maquiladora is a word that can be used to describe various factories. In the Tehuacán area the word maquiladora today refers to garment and textile production factories. The region was not always known for its factories. In fact, one policy that has played an important role on the creation of maquiladoras not only in Tehuacán, but throughout México has been the NAFTA agreement signed by Canada, U.S. and México in the mid 1990's. This agreement incited the production of hundreds of textile factories, which extended into the Tehuacán Valley due to the large influx of water (making it an important region for blue jean production). According to the Comisión de Derechos Humanos y Laborales del Valle de Tehuacán (CDHLVT), at the industry's height the city and surrounding areas were home to over 700 maquiladoras, which together created an environmental nightmare.

According to Barrios, M. and Santiago, R. (2004) Each factory requires huge amounts of underground water, dyes and chemicals to treat these jeans. Many factories have closed and moved to other countries where labor and taxes are cheaper. The polluted water from plants that still operate passes through Tehuacán city and the surrounding villages characterized by a bluish tint. Combined with deforestation and overgrazing, today Tehuacán is one of the driest regions in México.

According to research and to interviews of representatives of OSSAPAT (Organismo Operador de Servicios de Agua Potable y Alcantarillado) this Tehuacán City municipal body, responsible for providing potable water, has not published official figures on the quantity of water used by industries in Tehuacán. While there

is currently no precise information available from government or industry sources on how much water is being used by about 20 laundries operating in the Tehuacán Region, interviews with members of CDHLVT of the Tehuacán Valley indicate that the daily use of water by jean laundries is considerable.

Permission for jean laundries to drill new wells or to access water for the laundering process must be granted by the *Comisión Nacional del Agua* -National Water Commission- (CNA). According to an interview made by members of CDHLVT to a worker, who worked at the now-closed Grupo Navarra's Lava-plant laundry, the company received warnings when CNA inspectors were going to visit the factory, allowing it to hide the pumps used to extract the water from clandestine wells until the inspectors left.

2.3. Maquiladoras laundry

The following is a description of the laundering processes at maquiladoras. Information on chemicals used is based on interviews with members of the Human and Labor Rights Commission of the Tehuacán Valley. Most of the contaminated water comes mainly from laundering jeans and according to Barrios et. al. in *Blue Jeans, Blue Waters and Worker Rights* (2004) one of the most common [processes] is "stone washing" in which pumice stones are used to wear away the jean fabric to make it look older or second hand. Various enzymes are used beforehand to soften and weaken fabric. Another process, sometimes called "stone bleaching" involves stripping the indigo dye from the jeans with enormous amounts of chlorine or, more recently, with the enzyme laccase. In a process known as "sand blasting", jeans are

subjected to a silica bath in order to give the jeans a worn appearance.

The jeans are then sent for a final washing, in which large quantities of detergents are used. As a result of these processes the water that is discharged from the laundries contains residues of fabric dust, silica and pumice, and chemicals, such as, caustic soda, chlorine, sodium bisulphate, oxalic acid, peroxide, acetic acid, potassium permanganate, and hexmetaphosphate. According to direct observation and interviews with farmers all of these toxic chemicals pass through natural or constructed channels and end up in water used for corn and other vegetables irrigation (p.45)

An interview of a government official and copies of official chemical studies given for research purposes confirmed that the residual water discharged into the canal contains heavy metals, such as zinc, lead, copper, nickel, chrome, mercury, cadmium, and selenium. It is most likely that these contaminants came from the jean laundries, since the primary discharge from pork and chicken farms is biological waste.

2.4. “Clean Factories”

Although the The Federal Attorney for Environmental Protection (PROFEPA) has publicly admitted that jean laundries pollute more than any other companies in Tehuacán, worse than local pig farms or other industries, Barrios, M. and Santiago, R. (2004) suggest that very little is being done to control the contamination of the environment these companies cause. Despite the certifications of laundries by environmental auditors, the contamination created by these factories is impossible to hide. The conducted research has also documented, with pictures, the dumping of residual waste from laundries along canals. The unnaturally blue water of irrigation channels tells a different story of the impact of the jean laundries on this

increasingly scarce resource and on the people, such as indigenous communities, that depend upon it for their livelihoods. According to interviewed inhabitants from the region, the “*tratadoras*” or water treatment facilities are seldom operating, though they are working just when inspectors arrive to inspect the plants.

2.5. Water pollution and social impact through the lenses of La Guadalupana

Through this stage of data collection, some of the farmers recognized they knew about the water pollution problem, some others did not know about it (at least they did not know many of the concepts around contamination, though they knew their water was no longer clean). Were irrigators from the cooperative getting organized to solve the problem? They recognized that they might not be acting to oppose maquiladora and agribusiness the pollution effects, perhaps because they lacked knowledge of the effects the pollution generated, such as sicknesses. Some individuals commented that the reason for inaction (the community not organizing to fighting for clean water rights) might be due to the fear of political persecution. Other members agreed authorities were not doing their jobs to stop or control water pollution by industries. Some *socios* argue that this situation goes beyond them since maquiladoras and agribusiness have so much more economical power and perhaps support from government.

Does *Altepexana Sociedad de Aguas La Guadalupana* care about the problem of water pollution? This is of great concern to them, since the water they manage bears on their economic interests. They take care of it, since the water for irrigation that they manage is affected. They show awareness of the situation but

they also recognize there are reasons that prevent them from mobilizing against the problem, such as, economic crises, political violence, and persecution by caciques and corporations. Perhaps because of these dynamics they are paralyzed in the face of environmental problems which they know affect them, but toward which they feel insufficiently powerful and inadequately organized.

Thus cooperatives such as Guadalupana are economically and politically threatened. They perceive that water they administer is also threatened by pollution, though they say it is clean, at least before it emerges from the galeria. They trust this qanat is one of the few from which people can still drink without the risk of getting sick. However, they know their aquifers are in constant danger of being polluted in the underground.

Some farmers, on the other hand, hold different opinions: they think their water is already polluted, and they refer to gastrointestinal sicknesses in the area; they tell stories of how people that drink this water have died, and note that deaths have occurred since the 90's when they recorded a great cholera epidemic which caused hundreds of deaths. Because of the epidemic, members of the organization contemplated making a serious chemical study. The legal representative of the association and also a member of the group say that:

“Thirty years ago men that went to work in the fields used to take a little container with them to just take water from puddles they found on their way. It was for drinking, it was clean... from twenty years ago up to now water has been polluted really badly.”

A member of the Sociedad described water contamination in the region and highlighted a large increase in the amount of garbage in the water. He mentioned

items such as plastic bags, shoes, clothing became are more frequently found in the water canals. He further stated that people in the general area seem unable to change this reality. I posed the question: Do the members of the cooperative address the contamination as a problem to resolve? He stated that members have tried to have open dialogues with neighbors and people from the area, (especially the ones that live nearby irrigation canals) yet they would need more economical assistance to cover kilometers of canals with concrete to protect water from pollution. Furthermore, they would like to build more canals and develop better infrastructure to take care of water and maximize its use for irrigation.

“The same members help each other to take care of the water. When we irrigate the crops we go to watch the irrigation process. Sometimes the butchers come and dispose of their waste in the water. They throw the bulls waste into the canals. So, there is blood in the water while we are irrigating tomatoes. Sometimes we see the butchers and we ask them not to do it because the water is clean. Then we have kept the water the most clean we can. I consider that is the cleanest water we have in the area, that is why we take care of it. People from *colonias* (neighborhoods) that live near the canals are also throwing away garbage in them. I ask them not to do it, because one day it will be over, so they also will not have the chance to take it. Here at our meeting we agreed that we have to cover the water completely by constructing tunnels to conduct it. Our water is polluted and it is the cleanest we have here”.

The legal representative says that he agrees to having a serious chemical test of water to find out whether or not they clean water:

“Some years ago we had a chemical test of the water, but we need to update it because I am sure at every moment there are waste discharges and we are still happily drinking from it, thinking it is clean.”

Is there a concern of the *socios* related to water pollution by industries? They talk about the issue of having small industry laundries in the village, and big ones in

the region, but they recognize that, although they are at some kilometers away, this might affect the underground water or canals where water is conducted. They also recognize there might be serious health problems since they are consuming products that were irrigated with that water. Have they done something concrete related to water pollution by industries? Not yet, but they are interested. Members explain that industries have a lot of power so they argue in this case they would need support from government authorities. Furthermore, some state this situation is beyond them.

2.6. Local governmental and non-governmental authorities and their role in this matter

From the previous testimony we can observe that the installation of *maquila* factories in the area are creating ecological effects; however, authorities have to clarify this information. They have not done it, either through negligence or through corruption when economic or political interests perhaps encourage the negligence.

Related to authorities' actions one of the members argues:

“There has not been [dialogue with the corporations]. Not even the authorities have considered doing it. Currently assembly plants that are being installed, but not even authorities know how many of them there are. There are big ones or maybe very small ones, but even those small ones employ maybe five or ten people. There, they are. Well, those 10 persons will use water, maybe to go to the restroom. If they are seventy persons, there is more use of water, and so on. That means more of it [pollution]. That is a concern for ourselves, for our home [metaphorically speaking] but also for the authorities”.

About his opinion on having a chemical test on the water of the qanat they administer the member added:

“They (members of the Ministry of Health) get [samples] but they never tell us the results. We want results in a written document. Because we depend on that (water). We want to know if there is any probability to have a risk of epidemic or any other bad thing. Then, for example, we would tell them: you gave us that document that shows our water is not polluted, and then if there would be any sickness or disease we could ask why so many people died? If our water was supposed to be cleaned...They are constantly monitoring, because they come, but they never give us results. Those results would be a very important document to show the ones that are visiting us it is clean, and it would also be useful as protection of our irrigators, our *campesinos* (peasants) and our families. The water that is coming out from underground, we see it is clean. I like to drink it, and I drink a lot of that water. I take some of it [from the qanat] and bring it home in some small gallons. We really do not know if it is polluted. So if it is contaminated, what are we going to do? Maybe the *sociedad* could buy some machine to purify it. I think we actually have not gone deeply into the subject. I cannot confirm by myself if it is contaminated. But for sure, water analyses have to be done.”

Finally this *socio* argues that authorities have the obligation to make some maquiladoras follow standards and rules to make sure people of the region are benefited and water is being protected. The member states:

“[The maquiladoras] demand use of water. Here in Altepexi, there are no big maquiladoras; they are in different places [within the region] for example, in Cuayucatepec, where there are very big maquiladoras. People told me that they opened a new maquiladora in our town. That is a problem for authorities. Through their legal representative, they should ask them: ‘oh, so you want to open a *maquila*,’ oh I see, a *maquila*, and where do you think you are going to get water to use? And if it is a laundry, where do you think you are going to discharge it? Local authorities do not have their own census. Here, there is no exact data to know how many people there are, how many industries there are, in order to know how many factories there are and to measure how we are being affected or benefited. That is in order to know if people of this town are healthy. Nowadays, I have heard of something they call: *calidad de vida* (quality life)”.

Interviews from Altepexi government authorities were not held since the political atmosphere in town was tense at the time the research was conducted, due to government elections. However the following are data collected in interviews to

government authorities from Tehuacán municipality, local activists as well as research from a local newspaper. Water pollution is not a problem confined to Altepexi, but it is a regional issue that, Guadalupe *socios* and activists state it affects people from all the Tehuacán Valley.

2.7. A lack of a water treatment plant

A water treatment plant is really important in this matter. Implementation has been “intended” for the last fifteen years, but so far has not happened. According to members of OSSAPAT, this has not been carried out for lack of funds, and to avoid a debt to the public. This promised project has been postponed and delegated from one municipal administration to another, whenever the administration of each municipal president ends. Apparently there is no such project, as we wondered at the Institute for *Access to Public Information* (IFAI). It is not registered in their database. According to the same official from OSSAPAT, this project is located in archives of the municipal council. After it was asked if the IFAI has a record of it, he reported that there is no such project. Finally he states that it is difficult to obtain the records of the water treatment plant, then it reflects that there is no project anywhere, and after hesitating he said that the company that designed it has the plans. In a second interview, the only concrete data provided was a map showing the location of “plans” to install. Currently, a deposit of cars seized by Municipal Transit Office occupies the site designated for the water treatment plant.

During the summer of 2010, in an interview conducted by *El Mundo de Tehuacán*, a local newspaper, the Public Works Director of the city argues that this

commitment will again be the responsibility of the new municipal administration which will take office in February 2011 and he states: "If we have no money, how will we make such a work?" "The promise to carry out this construction of the wastewater treatment plant has been used only for electoral supporters in political campaigns, and has only been just that: a "promise," as one of the members of Human and Labor Rights Commission of the Tehuacán Valley states. Currently according to a local newspaper note from June 23, 2011, there was an embezzlement or *desvio de fondos*, made by the previous municipal president. According to journalist De la Cruz (Aug. 2010) the published information states:

"The disappearance was proved of the resource that would serve to build the wastewater treatment plant for an amount exceeding 51 million pesos. The fund was declared in a bipartisan manner by the administration of Edmundo Salgado before the bank BBVA Bancomer; however, according the construction company "Odis Adversa S.A de C.V," the money was never delivered".

The cited note would seem to point toward proof of corruption from authorities.

2.8. A lack of a water treatment plant, excessive use of fertilizers and chemical in agricultural soils of the region

The director general of the non government organization Alternativas, an environmental organization that has developed a water recovery project in the region of study, says that the Tehuacán valley has a high contamination in the soils caused by high use in agriculture of pesticides, which was widespread and

promoted by the Mexican government since the 80's. Farmers are conditioned to expect support for agriculture in exchange for the use of pesticides, based on the argument that the pesticides would be useful for the large-scale production that is required of them. The situation actually changed the soil, which "is tired and burnt out." Currently fields produce only half or less, compared to the production they used to get about 30 years ago. This issue was confirmed in interviews with farmers in the area. In this sense, the use of pesticides contaminated the soil and crops, and it continues to poison the water flowing through them. The same representative concluded:

“The Tehuacán Valley and the villages that surround it have their soil, air and water highly contaminated. They are contaminated by pesticides, waste and odor from factory farms, waste from the laundry, and discharges from the cities which do not have adequate drainage.”

2.9. Inadequate drainage (sewage) system

Lack of adequate drainage infrastructure for middle-scale cities and surrounding towns of Tehuacán (currently considered small Indian cities by the National Commission for the Development of Indigenous Pueblos/CDI) for 60 years without substantial change, seriously affects its inhabitants. In an interview with the manager of OSSAPAT on operating services in Tehuacán, he acknowledges that there is no drainage adequate to the needs of a city that has grown to almost double its size in the last 15 years. This condition creates a drainage system that was not designed to keep discharges out of natural watercourses. That causes that we find canals, where natural water from wells and galerias for irrigation circulate, that now

are also used as drainage channels. Again we encounter the problem of sewage discharges. Black water that contains contamination generated by laundries, which is used to irrigate farmland in the Tehuacán Valley.

During the summer of 2010, when field research was conducted for this project, this situation of inadequate drainage infrastructure was clearly realized; we even faced floods in the streets of the place (severe enough that they led us to postpone interviews or field trips). Locals complained. There were several articles being published about it in a local newspaper. For instance on August 6, 2010, De la Luz, S. reported inhabitants of a *colonia* complained that for 15 days the drainage in their area had broken down. During this time water kept emerging, blue in color from the denim laundry and smelling unbearably of chemicals. All this, despite the report given. According to residents the authorities had so far not attended to the issue.

The situation of inadequate drainage in the municipality was observed as well by a member of La Guadalupana cooperative. In a long talk with him, he pointed that for such a population size in Altepexi, its drainage is still designed for a smaller number of people, such as for a small ranch, but this village has actually become a municipality.

2.10. Related to sicknesses

During the investigation local activists were contacted, among them a physician, who is also a coordinator from a local group that is a branch of an international human rights organization: Amnesty International. He said that he was

aware of what happened with the problem of water pollution, but he also said there was no serious investigation of what diseases are caused by water pollution. However he believes that the growing number of known diseases, such as anencephaly, hydrocephalus, various cancers, skin diseases or gastrointestinal problems that people suffer in Tehuacán, are caused by pollution in the valley. He adds that if there are statistics from the Health Department, these are jealously guarded by their local branch, given the political implications that they would unleash.

In an interview with the neurologist in charge of Public Medicine in the agency for Family Development (*Desarrollo Integral de la Familia* –DIF-) in Altepexi municipality government, information was obtained, through a census he conducted in this population, that 850 children were disabled. When he compared this number with data from other nearby towns, such as Ajalpan or San Gabriel Chilac, he concluded that Altepexi has the highest percentage of people affected. It was asked if it somehow had something to do with the problem of water pollution, to which he responded that it very likely does. It is worth mentioning that the specialist provides therapies for children from indigenous and peasant families. For the therapies he is aloud to use for free the facilities of community pools “Balneario Miravalles” that is a project that belongs to La Guadalupeana cooperative.

Concluding this chapter we can see that there is contamination that comes from industries such as maquiladoras and chicken and pork industries, but according to the study there is also pollution from agribusiness. Some of the members of La Guadalupeana reflected on pollution generated by people, moreover

the result of current lifestyles that have existed for the last 30 years. Municipal authorities perceive it as a fact that nature can manage by itself and that levels of metal pollution that maquiladoras generate are not over official standards. We can observe, perhaps, negligence by those authorities, suggested by some interviewed activists since they give a picture of what the problem and its consequences have been and also highlight the absence of solutions.

Chapter III.

Indigenous/campesino identity and the water pollution problem

In this chapter I problematize issues on indigenous identity and their abilities to build capacity in a culture of neo-liberal reform. Indigenous lifestyles and ways of managing natural resources have been undermined by industry activities on their territories in an era of neo-liberalism. Neo-liberalism situates indigenous communities within negative environmental and political circumstances, which in most cases are beyond their control. However, there are acts of resistance that might not be clearly visible to external forces that are impacting them. Such acts of resistance might be strategies that would contribute to address issues on water pollution within their territory.

3.1. Indigenous and *campesino* identity

Water has been very important to the economy in Altepexi. The questions of who owns water, who controls it to make it productive, and who benefits from this labor; as well as how industries have impacted this natural resource, and if the cooperative has tried to negotiate this impact on the water, are not only statements on natural resources management, and environment. They are also questions related to identity.

Altepexi, where the Guadalupeana cooperative is located, is a place where there are macrocultures in constant contact, the first brought together by colonialism and later kept together by Mexican nationalism. Currently the culture of

globalization is also impacting identity within the region. As a result there is a continual construction of culture and which is particularly evident, and important, but, how does this impact indigenous identity for the people of La Guadalupeana and Altepexi?

Until the arrival of Europeans, there were no “Indians.” The concept is a European invention, which as Jonathan Hill (1996) states:

“Is part of a broader process symbolically removing “indigenous” (American) peoples from their histories and reducing them to stereotypic symbols of isolation and alienation from the colonial and independent states of the Americas (p. 9)”.

In this sense, within México a way of local government during the colonial period was the *República de Indios* (Indian Polity), which in its broadest sense referred to the entire Indian sector of society in Spanish America. Throughout the next 230 years of colonial rule, the Indian sector was contained in exclusively Indian towns, while the main trait used to distinguish a *pueblo de indios* from its mixed-race or Spanish counterpart was precisely its government by a *República de Indios*. Linked to this statement, Tehuacán, Puebla, was also a *Ciudad de Indios* by the colonial times.

After the colonial period and from their very inception during the wars of Independence in North and South America, the founders of liberal states perceived indigenous peoples as potentials equals only if they could be educated and brought into direct relations with European descent. According to Jonathan Hill (1996), the European concept of nation-state placed indigenous peoples into a

double bind. On the one hand, the liberal state promised civil and legal equality to all citizens within its borders. On the other hand, the rationalist, assimilationist, and older colonial policy of granting collective land rights to indigenous peoples as well as to the continuation of indigenous modes of economic production and social organization that had survived into or emerged during the colonial period. As a result the rise of independent states failed to create a political space for indigenous peoples to prosper as citizens within the jurisdiction of state sovereignty and as ethnic groups who were culturally and linguistically different. Urban and Sherezer (1992) suggest that cultural differentiation among ethnic groups is not “potentially threatening to the sovereign jurisdiction of the state”(p.12). Rather, the assertion of cultural differences threatens to reveal ethnocentric, racist beliefs and practices upon which conquest states were historically founded and thus to open up the possibility for a “nation-state” in which conquered and conquering ethnic groups enjoy equal rights without the threat of ethnocide or cultural assimilation into the dominant ethnic group.

In the case of the Tehuacán Valley indigenous peoples, Whiteford, et al. (1989) found that they were surrounded by mestizo-owned haciendas, mestizo or Spanish merchants settled in communities during the late nineteenth century. They were part of a social and economic network based in the city of Tehuacán. Despite extensive trade relationships between the Indians and the Spanish merchant families, the groups regarded one another with suspicion and rarely intermarried. During the revolutionary period, most of the Spanish and the mestizo families moved to the city of Tehuacán for their own protection. Their stores and warehouses were

often burned and looted. Once the Revolution was over the mestizos did not return to the Indian towns. During the 1930's the haciendas were broken up and the indigenous populations regained control of much of the valley. But during the 1960's mestizos based in Tehuacán again began to accumulate land and water resources in the valley to establish agribusiness.

According to Jung, Courtney (2003) in order to survive, in Latin America and mainly in México, the rise of the indigenous subject position has been intimately linked to the demise of the peasant as the privileged interlocutor of the corporatist-state. Furthermore, he argues that the Mexican Revolution is the foundational moment of modern México, establishing the link between the government and the peasant—by whom and on whose behalf the revolution was fought. President Lázaro Cardenas reinforced the rural base of the government by identifying the peasant as one of the three pillars of support that sustained the ruling party (along with workers and the middle classes). Until the last decade of the twentieth century, Mexico's rural peoples (where we locate most of indigenous peoples) identified consistently as peasants in their attempt to position themselves as political actors with access to state power. According to one of the youngest interviewed members of the *sociedad*, she has heard that *socios* identify themselves within the organization besides *Altepexanos* (people from Altepexi) also as *campesinos*:

“In talks we have had in our periodical meetings I have heard that most of us identify as *campesinos*. When the Zapatista movement rised it became popular the word indigenous, we discussed about it, but most of the times I have heard the phrase: we are *campesinos*, we are *Altepexanos*”.

In this sense, individuals do not automatically occupy positions from which they can make claims on the state, but carving out a political subject position, or locating oneself within a preexisting position, is a basic condition of political agency. In *Keepers of Water and Earth*, Whiteford et. al. (1989) comments on Altepeixi peoples indigenous identity:

The ideology of unity is strong and often reinforced in speeches and conversation. The Indian identity is important, although in many ways they are not culturally different from non-Indian Mexicans. The history they recount is one of pride and unwillingness to accept subordination. Regardless of social class position, they are proud that they Indians, control de valley. They are proud of their historical roots, their ability to speak their own language, and their struggle for control of the land and water. It is this perspective that gives the population a consciousness of unity, despite internal conflicts. This is the web that binds members of la sociedad within their own organization and the extended community.

3.2. Water pollution by industries and irrigators identity

As we can see at this point, the people of the Tehuacán Valley identify themselves as *campesinos* (peasants), however they are eager as well to lose their indigenous identity. Whiteford et. al., (1989) state: “It is often pointed out that they are all campesinas (people of the country whose life is tied in one way or another to agriculture). Equally important they regard themselves as Indian”. That is what they argued more than twenty years ago. His data collection was made at the end of the 70’s. This thesis research is also guided by a question related to identity and in some sort it agrees with his statement. However, from his investigation and the current one more than thirty years have passed. Since then, a new wave of industrialization, such as poultry factories and maquiladoras, expanded along the Tehuacán Valley. This situation has impacted not only in the environment, but also

on the social and political organization, as well as culture and identity of indigenous people.

In particular, under neo-liberal reform in México, recognition of cultural differences has become much more difficult for indigenous peoples. This means Harvey, D. (2005) suggests, that while promoting on the premise that human well-being can best be advanced by liberating individual choice, and entrepreneurial freedoms and skills, neo-liberalism has also entailed much 'creative destruction' for particular groups of humanity. It is a system where privatization has become the answer to the legitimization crises of state authority over natural and public resources. Michael Mascarenhas (2007) suggests that data analysis indicates that this new style of ecological and economic colonialism is particularly discriminatory against indigenous peoples because of historical and material conditions that have created social, environmental and political circumstances that undermine indigenous peoples ability to build capacity in a culture of neo-liberalism. According to this statement, a member from Guadalupana says that:

"There are sometimes in which we do not know about such word as contamination... we [members of the cooperative] more or less understand what pollution is, but... What is going to happen to the ones that just ignore it? They really do not know about these words. So, they ask, what is that (concept of pollution) thing? This is just like one of my mothers anecdotes. About 30 years ago my mother used to ask little children not to say *grocerias* (vulgar words) and the little children asked what a *groceria* is. Ha, ha [laughing]. They did not know what a *groceria* was. Currently that happens with contamination... What is such word of contamination? And I explain them: look, we have a little plant and it absorbs all that (pollution)... where those it (pollution) go? To the product. We eat it. Then what happens? I get a sickness."

Despite negative environmental and political circumstances Mascarenhas suggests that there is an intrinsic and complex relationship between indigenous people and natural sources such as water:

In acknowledging the importance of water to their social, cultural, economic and ecological well-being, indigenous peoples remain mindful of the many and interconnected ways that water will continue to shape their future, as it has their past.

In this sense a socio of Guadalupana, declares:

“Without water we are worthless. What makes us move is a matter of water. It is the main reason to live here and in the surrounding towns. We do not care if there is an assembly plant here. Our kind of factory is water. Our towns are moved by water. Without it we are worthless. [Water] is to live”.

Having control over the management of water resources in a manner that recognizes indigenous peoples meanings of life, while also ensuring that water is safe to drink and protected from sources of contamination, both now and in the future, is vital not only to these peoples health and welfare, but also to the preservation of their cultural identity. According to an interview on water pollution and health issues, one of the members of the sociedad suggests that:

“Because of the dirty water many people got sick of cholera by the year 89. In this village it happened to people in the campo (field), while they were working. Poor of them! they did not have transportation to come back to the town as soon as the sickness was advancing... We used to ask them: ‘what is wrong with you?’ And they just said: I am feeling really sick. Some of them could make it to get medical care, some others could not make it and they just died in the fields. The cholera sickness advanced really fast! We did not believe that sickness could reach us. We imagined that only happened in far away countries and that it would never happen to us. One of my brothers went to the hospital, and he saw a lot of people sick of cholera. There were no beds for them. They were lying in the corridors”.

Related to this issue, and connected to their cultural identity and water practices, legal representative of the sociedad suggests that:

“Los *señores* (elders) from past times used to give thanks to god for being alive. They gave thanks for having water and for all the products that were got from it. Nowadays... we do not care about it anymore... we just do not care. People from past years, as soon as the sun rised they gave thanks, and they used to say a new day had just begun, then ‘lets work’. Currently young people do not believe in that. They say that way (behavior) does not exist anymore... ‘What is such a thing called nature?’ They ask.”

In accordance to the previous statement, Berruecos (2008) argues that globalization, through the *maquila* manufacturing plants, has changed a traditionally indigenous community into something of a wasteland—a wasteland where further poverty, crime, and drug abuse have resulted.

In addition, the same cooperative member added: “It is really bad that people do not care about polluting water. They just do not care. They (assembly plants) just want to make profit and do not care if people die”. Thus, as these statements demonstrate, water supplies are increasingly coming under attack from the policies and practices of ecological relations under neo-liberalism.

It is clear that whether by industries conscious design or institutional government agencies neglect indigenous peoples face some of the worst environmental devastation. In this respect the prosperity of neo-liberalism has been predicated on specific forms of unsustainable production that disproportionately impacts indigenous or peasant’s communities, and also their cultural identities.

3.3. Indigenous identity and its transformation

As we can see, industrial structures affect the lifestyles of a *campesino*/Indian community. This transformation has been faced by these communities with accelerated changes and unpredictable consequences. During interviews there

were opinions related to the changes the village has had by its connection to the contemporary era of industrialization. People from La Guadalupeana can notice how cultural practices have changed, and how they have contributed to environmental pollution. A leader from the *sociedad* suggests that:

“By 1978, there were not that many industries. There was nothing of that. There was the industry of yarn and fabrics, and all the discharges went to the San Lorenzo canal. We already knew it was polluted [the canal was exclusively used for it]. Some years ago there were no plastic bags. Today, to buy something, everything is packed with plastic bags. In the past, we used to go to the market, but everything was packed with corn (*mazorca*) leaves. People used *cazuelas de barro* (mud containers) to carry the meals they bought at the market. Well, now, people use plastics. It would be advisable that we again used baskets, paper, and *hoja de mazorca* (corn leaves) to carry and pack market stuff. Here we have lots of *mazorca*. It is abundant. In the past cheese, for example, was covered with two *mazorca* leaves. The molds (*moldes*) to make cheese were made out of wood, nowadays they are not anymore, they are PVC plastic”.

Analyzing previous statements the member states that particular, neoliberal reforms in México have served to exacerbate historical disparities in the health, environmental pollution, and well-being of indigenous people in southern Puebla because it systematically has diminished opportunities for recognition of environmental injustices. The question is: how do Guadalupeana members understand (neo-liberal) changes and its repercussions on water for irrigation within their territory? Trying to find possible answers to this issue, and according to the interview made to one of the moral leaders of the town, and member of *sociedad* Guadalupeana, he states that:

“It might be more profitable for me to sell water rights to an enterprise, because they are paying me more, but a corporation is concerned about the quantity of water; besides that, an *empresa* (enterprise) has more economical power than us. If there are private corporations managing water, benefits for *campesinos* (peasants) would diminish. Because currently the owner of water

is benefited, besides that, more people are benefited from that water, the ones that work for *campo* (the fields). There would not be benefit anymore for *segundas* o *terceras* personas (second or third parties) There is for sure an impact. Making a reflection on this situation, this small cooperative has a lot of impact on other peoples life, such as our families, our irrigators, and our *campesinos*".

It can be observed from this testimony that they are realizing the consequences of water usage from corporations, but moreover this person is also considering the consequences of water privatization. However it is reflected that they are still resisting to selling water rights to enterprises. In opposition to the idea of passiveness that is being linked to "the nature of indigenous people", and its linkage to any response to the issue on the impact on water resources, Murguia, S. (2008) suggests:

"As indigenous peoples have remained targets for mistreatment, their acts of resistance will continue to problematize such suppressive efforts—in a word, resistance. Instead of standing by passively, the indigene has demonstrated countless acts of opposition over several centuries".

Indigenous people have experimented resistance in many, if not in all, areas of their lives: culture, politics, social organization, etc. Nowadays this is found in their daily struggles for survival as acts of resistance. One of those struggles is the opposition to neoliberal projects within their territories that are being coveted.

Tauli-Corpuz (2006) suggests that:

Much resistance has been economic opposition to neoliberal policies that range from natural resource extraction to international controls, monetary policies, and "development" that is counterproductive to strong indigenous communities.

Guadalupana members daily lives have been impacted by industries in opposition within their organization some acts of resistance have emerged. For instance in accordance to the previous idea, a *socio* stated:

“The first Sunday of each month we attend a meeting at eight am. Now we are using the new summer time (daylight saving changes), but in the Sociedad La Gudalupana time is not changed. We respect the old schedule for irrigation, for our meetings, for our job related to fields and water. For having any meeting that is the only schedule. The *socios* already have an schedule for irrigation, and if they make any change... Actually they did it at the beginning of this government policy, but there were many problems. It caused such a mess!”

Then the *socio* added: “The ones that work in the fields do not change their schedule. When for them its 10, for us it is 9 o'clock. I have my watch. I do not change its time, because I work by following it on my crop. I have my special watch”.

As indigenous opposition continues to combat state hegemony, the manner in which resistance is conducted rarely receives much attention. However, Pat Lauderdale states on “Indigenous Peoples in the Face of Globalization”, that integrity and dignity are upheld during resistance movements. Lauderdale’s work demonstrates how each of the various indigenous struggles adheres to an underlying code of cultural ethics that holds the groups to a process of cultivating a relationship with nature. This relationship is inextricably tied to the kinship structure of indigenous peoples. As Lauderdale (2008) explains:

One important issue concerns the kinship structure of many indigenous cultures. Ideas emerging from this structure are not used as a simple social technique or as a punitive moral standard for a nation. The ideas include a respect for diversity rather than mere tolerance, and a critical examination of fundamental concepts such as individual responsibility, group rights, time, and nature.

The same member added: “My time, their time. What is what has increased? The amount of work. To overlap more and more work, then we do not have enough time to think about our wife and children”.

Indigenous peoples importance for nature is transcendental for their cultural dynamics. That means, to respect nature, learn from it, and be true to it as a real phenomenon—as opposed to taking nature for granted or viewing it as a mere consequence of modernity or progress. Of course, these relationships are tempered by the trappings of modernity, especially within the high-income, core countries of the world. In this way an interviewed member stated that:

“The summer time has affected us a lot, but that was an order given from the superior government. It was given without any consultation to the peoples, considering if there would be inconveniences. Now we see, on the long run, it has affected us, because there was never consultation. They might say: ‘why are we going to consult them?’ They consider we are not going to understand them ever. Of course we understand them, and we observe reality. Reality is in daily facts”.

This testimony reflects what Abu-Saad & Champagne (2006) explains, that the boundaries of knowledge that is at the heart of indigenous resistance to cultural domination, as well as hegemonic control over them by the powerful nation-states attempting to force them into internal colonial relationships of subordination and suppression.

Finally according to research on their identity history the indigenous population in the region has had an ideology of resource sharing within the community. As the region became increasingly incorporated into the wage-labor system at the beginning of the twentieth century and then into the capitalist market system during the 30’s, resulting in an ideology changed to the one of individual

accumulation. Yet vestiges of the traditional ideology remain. It is commonly held that people of the community should have the first access to irrigation water, whether it is sold or distributed through share-cropping.

According to Whiteford, et al. (1989), shared identity is one of the major forces unifying the indigenous population of the Tehuacán Valley, despite its stratification. The identity has been forged by persistent threats and attacks from people valley inhabitants perceive to be outsiders. The Spanish, and later the mestizos, up to now, have been stealing their land and water. This has also had a great impact on their cultural practice on water management, and on culture identity dynamics of their daily life. In this research as well as the study conducted for this thesis about it is noticed that the Indian identity in the Altepexi town is denied. An explanation is that they are forced to define their own identity in terms of forces of neoliberal dynamics imposed on the region, historically before neoliberal reform but mainly after it, during the last thirty years.

Concluding this chapter it can be stated that environmental problems such as water pollution could be negotiated by Altepexi people by *campesino*/indigenous identity resistance acts. On the other hand, each of the periods, colonial and the present, neo-liberalism has imposed dynamics on their organizations and their cultural practices to manage their natural resources as well as on their cultural identities. As a result acts of resistance or any negotiation to issues of water pollution with enterprises have been undermined due to current neoliberal reforms. In this case, is it possible for government authorities and industries representatives to engage in dialogue with people affected in order to get any negotiation to take

control of these negative impacts on water and on *campesino*/indigenous cultural identity? Is mobilization an option for La Guadalupana and other *sociedades*? Moreover, as one of the members suggested, do indigenous peoples have to be consulted before any industry activity could be established within their territory to analyze negative repercussions? In case of negative impact, may they give or not consent to maquiladoras and agribusiness to start activities?

Analytical conclusions

I can conclude the thesis reiterating that a participatory approach to research requires methodology to collect and analyze data together with the involved communities in their home environment. In circumstances of environmental injustices it has the potential to promote actions for social change. A second advantage of this methodology is that it promotes the participation of the researcher within the local organization, situating him/her with members of the community to exchange scientific and popular knowledge. As a result, in this study I promote the recognition of indigenous knowledge, which is often unrecognized and undervalued by scientific Euro-american academic knowledge. However a disadvantage might be the time required for a participatory approach; It takes more than a summer and a winter to not only acquire data on environmental injustices but also to develop concrete actions for social change with community members. For this research project, I consider it helped to gain trust from the *sociedad* that I am from Altepeixi, and that I already knew some of the people from Guadalupana cooperative since some of them are my neighbors. These established connections with the community allowed me to develop support within the community to conduct the research. Perhaps a researcher without these connections within the community might have had more difficulties researching for two or three months. Although, I know there are other implications along with being part of the community being researched, I consider I felt confident while I was researching, because members of La Guadalupana accepted and welcomed the idea of developing this project by participating and responding with positive comments. By communicating with community members and ensuring both sides researcher and La Guadalupana members had opportunity to express opinions and make proposal within this project.

In terms of the issue studied, even though specially some *maquiladoras* have closed due to the economic crises, water in the Valley of Tehuacán continues to be polluted by the ones that are still operating as well as by agribusiness. Contaminants are seriously impacting on natural water resources. Since it is the same water *campesinos* (peasants) use to irrigate their crops there might be a

significant risk for human life due to the large quantities of dyes and chemicals found in the local water. According to doctors the impact on water is not only an environmental problem but it seems to be linked to serious health problems to residents of Altepexi and the Tehuacán Valley. There is not a study on the health consequences related to water pollution or contamination of the land and air. According to specialists there might be an important risk due to heavy metals, and other chemicals that discharges from maquiladoras and agribusiness contain, since this water is also used for irrigation of crops later consumed by community members. Although in Altepexi there are not big maquiladora laundries operating there are big laundries in the region. As Guadalupana *socios* stated: an independent chemical study of the water sources in their *galeria* is needed to confirm the pollution of the water. We recommend that these chemical studies be conducted by an organization independent of the government and the industries to avoid biases.

This research also shows that maquiladoras and poultry industries are not following national and international standards to protect the environment. *Comisión Nacional del Agua* has to prevent this situation by enforcing them to follow such rules. Thus, there might be negligence on the way they conduct their job. A lack of action by local, regional and national government authorities to prevent and to force compliance with rules is present, to enforce rules requiring these industries to operate water treatment plants. Even though the research was located in Altepexi this is not a problem exclusively to this community. A water treatment plant for Tehuacán city would be an option to prevent water pollution. However the treatment plant project has been postponed for at least fifteen years by Tehuacán government. Discharges from Tehuacán City have the probability to affect underground water sources that might get to *galeria* tunnels not only from Guadalupana, but also from other water irrigators associations. The treatment plant project seems to be part not only of the parties campaign promises before political elections, but also part of acts of corruption related to diversion of funds that are supposedly for the construction of the plant, as it was addressed in this thesis.

These aquifers are at constant risk of getting completely contaminated or bought by a bottling company, or become a source of future disputes between farmers. There is also a latent threat that their water level definitely gets undermined or dry, as it has happened to other water cooperatives in the region, which for that reason have been dissolved. Water shortage would lead to the breakdown of these organizations, which would result on the division of its members. This would be also caused by government when preventing farmers to continue scratching wells and permissions for doing it are only given to transnational corporations, such as the maquiladoras and their laundries.

Therefore, cooperative societies as the one described in this project would disappear. Likewise, it would be ended the manifestation of a social organization that reflects the characteristics of ownership, sale and rental of a natural resource. It is threaten the existence of an elaborate system of administrative decentralization, which has led users to access a better life for themselves and their families. As a result it would be prevented a set of historical and political relations as well as a mechanism of cohesion and cultural integration of individuals with their community and environment. Therefore, it ends with the possibility of an exercise of autonomy and independence.

This is an issue that has regional repercussions. Any action to prevent pollution would positively impact not just the affected area, but on the entire region. According to studies presented in this thesis an important element for indigenous mobilization against environmental injustices are acts of resistance. The organization's members have resisted against government intrusion through the existence of the cooperative organized under the indigenous identity of its members. Autonomy to manage their water and land is itself an act of resistance. Within the way they organize as *campesino*/indigenous cooperative there are indigenous practices that are acts of resistance. Such acts of resistance might not have been noticed by government and corporations because of the lack of a dialogue with government authorities and industry representatives to stop the issue of water pollution Furthermore there is no mobilization as a consequence of this problem. Farmers that participated in this research showed they care about the water

contamination since it affects their economic activities; however, they mentioned they have dialogued neighbors or owners of small businesses on ending water pollution. They have not dialogued with government authorities nor with representatives of the corporations. If there is no response and action from authorities, community organizations (an alliance of water management cooperatives) all united might have the potential for organizing mobilization against water pollution. However it would be also need awareness, work and organization, before mobilization is seen by Guadalupeana cooperative and also by the extended community that it is affected. It also seems mobilization is taking longer to happen due *cacicazgos*, industries interests and government supporting them. Repression to any action is a fact that is found in the region according to local activists.

Finally I hope this study contributes to make visible this case of negative environmental, political and cultural circumstances where La Guadalupeana, Altepexi and a whole region are being affected. This thesis has been written when natural resources among indigenous territories are threatened by national and transnational corporate interest. This is not an isolated case since water is being exploited and polluted by national and transnational corporations throughout the world and in particular in indigenous territories. This thesis adds to a series of case studies in which natural resources exploitation in indigenous territories are taking place without any consultation and consent of communities, violating their right not only to the access to clean water but also to be part of the planning and benefits of any project of “industrial development” within their lands. An alliance of organized water management cooperatives may result in a mobilization that would be added to the mobilization cases that are happening throughout Latin America on places where indigenous peoples are getting organized to be recognized, respected, included, consulted but even more defending their territories and cultures from been plundered.

Appendix

Recommendations

For the long-term this project has the objective of generating ideas for finding answers to situations that affect *campesino*/indigenous communities not only in relation to the environment, but also to social, cultural and health issues relating to processes of industrialization. Due to the participatory approach used throughout this study, results must lead to actions for social change. In this appendix, we propose recommendations for further actions. . These proposals and the conclusions already stated were generated from opinions voiced during meetings with members of La Guadalupana. Therefore, in this part of the thesis the following recommendations are issued for the organization that participated in the study, and the community of Altepexi, for local and national government authorities, as well as for owners/representatives of corporations.

- It is necessary to strengthen the indigenous/peasant identity within cooperatives in these associations. From these there is a chance of community and peasant, organization with autonomy in its administration. Such organizations would be strong enough to achieve positive changes not only within themselves but also for the wider community.
- Members of La Guadalupana expressed interest in spreading the data identified during the investigation in public places within the community such as auditoriums, plazas, atriums, schools, churches, etc. The previous

recommendation is intended to generate awareness among members of the entire community.

- Establish a water treatment plant for Tehuacán City to treat mainly maquiladora discharges. Authorities must make sure this treatment plant starts to operate as soon as possible rather than wait 15 years as current plans state.
- *Comisión Nacional del Agua* authorities as well as industry owners and representatives must make sure maquiladora laundries and agribusiness follow standards to protect water sources by ensuring laundries properly treat waste water from the maquiladoras .
- Promote changes in legislation to protect water as a human right and not manage water sources as a commodity. Ensure that rights of the local population to access clean water for the development of human life are protected by the law. Economic interests cannot be protected over the human right to water.
- Comply with the law that indigenous peoples have to be consulted and that they must give their consent prior to industrial development in their territories.
- Ensure that global brands in fashion, especially denim apparel manufacturers follow codes of conduct in environmental protection in the regions where the clothing items are produced.
- Enforce global brands of fashion to change their patterns of sales and advertising, so that in the near future no longer "toxic" jeans are manufactured.

- Due the toxicity of discharges government authorities (through *Comisión Nacional del Agua*) should promote an independent study of local water sources to monitor , chemicals that are introduced to water sources and ensure that they do not exceed permitted levels established in environmental health standards.
- Prohibit use of polluted water for plantations that will feed the population.
- Government authorities should promote studies of the chemical components of the water that are independent from government agencies and the maquiladoras to determine whether there is a relationship between contaminated water and diseases presented by the local population.
- Government authorities should promote dialogue and negotiation between the people affected and the industries. Such dialogue should reach agreements on compensation for damage caused to water, land and air, as well as the impact on culture and society that the emergence of these companies have caused in the territory. This dialogue may include the participation of not only La Gudalupana members but also other water management cooperatives, from Altepexi and surrounding towns, since this is a regional water pollution problem.
- Authorities from Altepexi and owners as well as representatives of corporations should promote actions against the exacerbated alcohol and drug use, gangs, killings, robberies, violence, sexual abuse, prostitution since they are related to the impact generated by the increasing industrialization in the area.

These recommendations, that came from conversations and interviews to the community researched and directly affected are not definite. They are proposed to be analyzed, clarified, and/or reinforced by members of La Guadalupana association or any member of other water management organizations, as well as residents of Altepexi or surrounding affected communities of the Valley of Tehuacán.

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VITA

Leticia Aparicio-Soriano was born in San Francisco, Altepexi, Puebla, México. As a research assistant for Universidad Nacional Autónoma de México, she conducted research in four incarceration facilities located in Mexico City. This experience led her to her BA thesis “Mujeres Indígenas en Reclusión y el Papel de las y los Trabajadores Sociales en el Centro de Readaptación Social Santa Martha Acatitla, Ciudad de México” (Indigenous Women in Jail and the Social Worker Role at Santa Martha Acatitla Center in Mexico City) which received a special mention after it was presented. She received the degree of Bachelor of Social Work from Universidad Nacional Autónoma de México in June 2007. She also worked for two years (2006-2008) in Mexico City’s Government, Office of Social Development/Indigenous Assistance Program, and with various NGO’s where she was in charge of designing of programs and projects related to Indigenous Rights, productive projects with women, and the promotion of Indigenous Culture (language, folklore, handcraft). In 2008 she got a Specialization on Intercultural Bilingual Education from Intercultural Indigenous University. Mayor St. Simon, University. Cochabamba, Bolivia. In August, 2009, she entered the Graduate School at the University of Texas at Austin.

E-mail: leticia_ifp@yahoo.com

This thesis was typed by the author.