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A MODEL FOR THE OPERATIONALIZATION AND IMPLEMENTATION OF THE PRECAUTIONARY PRENCIPLE: CYANIDE-LEACH TECHNOLOGY AND GOLD MINING DEVELOPMENT

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ABSTRACT

Mining development provides tremendous amount of long-term environmental and community degradation all over the world. Often, local communities bear the burden. This article demonstrates how the Bergama environmental network has utilized international environmental treaties with a focus on precautionary principle in order to halt the cyanide-leach Ovacik gold mine project in Turkey. The network has not only operated under the principle of precaution, but it has also defined and illustrated how the precautionary principle could be operationalized and implemented in practice in mining industry. By doing so, the Bergama environmental network developed a model for the operationalization and implementation of the precautionary principle in mining sector. In contrast to risk assessment that focus on the question of what level of contamination is safe, the precautionary approach focus on the question of how to reduce or eliminate the hazards and considers all the possible means of achieving that goal---including forgoing the proposed activity. This network has been promoting precautionary principle instead of risk assessment in mining nationwide. This model can be utilized by other communities dealing with mining developments in order to make the companies and their states to adopt and implement the precautionary principle. This article is based on a larger research project that has been taking place since 2002 on Ovacik gold mine development in Bergama. It relies on data that comes from interviews, focus group discussions with local community residents and field notes as well as books and documents prepared by the network and local newspapers that covered the case extensively.

Key Words: Environmental policy, Precautionary principle, Ovacık gold mine, Mining development, Bergama

İHTİYAT İLKESİNİN KULLANIMA HAZIR HALE GETİRİLMESİ VE UYGULANMASINA YÖNELİK BİR MODEL: SİYANÜR TEKNOLOJİSİ KULLANIMI VE ALTIN MADENİ GELİŞTİRME

ÖZET

Maden işletmeciliği dünyada doğal çevre ve o çevrede yaşayan insan toplulukları üzerinde uzun vadeli yıkımlara neden olmuştur. Sıklıkla, yerel topluluklar bu işin negatif sonuçlarına katlanmak zorunda kalmışlardır. Bu makale, Turkiye'de Ovacık altın madeni projesini durdurmak için Bergama çevre ağının ihtiyat ilkesini bünyesinde bulunduran uluslararası çevre anlaşmalarını nasıl kullandıklarını analiz etmektedir. Bu ağ sadece ihtiyat ilkesini baz alarak hareket etmekle kalmamış, fakat aynı zamanda maden sektöründe bu ilkenin ne şekilde operationaze edilebileceğini ve uygulanabileceğini tanımlamış ve göstermiştir. Bu şekilde, bu ağ maden sektöründe ihtiyat ilkesinin uygulamasına yönelik bir model geliştirmiştir. Ne kadar kirlilik tehlikesizdir sorusu üzerine yoğunlaşan risk değerlendirmesi methodunun tersine, ihtiyat ilkesi tehlike ne şekilde azaltılır veya yok edilir sorusu üzerine yoğunlaşır ve bu amaca ulaşmak için önerilen projenin iptalini de içine alan bütün yollara başvurur. Bergama çevre ağı tarafından geliştirilen bu model maden işletmeciliği ile karşı karşıya bırakılmış diğer topluluklar tarafından kullanılabilir. Bu makale 2002 den beri devam eden daha geniş kapsamlı bir proje çalışmasın ürünüdür. Bu makalede yerel halk ile yapılan görüşmeler, focus grup konuşmaları, saha çalışması sırasında kaydedilen notlar, bu ağ tarafından hazırlanmış doküman ve kitaplar ve yerel gazetelerden toplanan veriler kullanılmıştır.

Anahtar Kelimeler: Çevre politikaları, İhtiyat ilkesi, Ovacık altın madeni, Maden endüstirisi, Bergama

INTRODUCTION

Although it has neither a commonly accepted definition nor a set of criteria to guide its implications, precautionary principle has been attracted significant attention in environmental public policy since the 1970s. One of the main practical issues discussed in the literature is related to the question of how to implement the precautionary principle, which has been adopted in international environmental agreements and laws, at the local, national and international levels

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(Gardiner, 2006; Maguire and Jaye, 2005; Saltelli and Funtowicz, 2005). Discussion of its application has intensified in recent years because of the trade controversies over beef and milk containing growth hormones and over genetically modified foods. The precautionary principle dominated the discussions at the Biosafety Protocol meeting in Montreal was at the core of the final protocol (Tickner and Myers, 2000). Yet, it has not become an issue overtly discussed in mining development except Emel and Krueger (2003). To test the principle's potential usefulness with respect to mining, they applied the precautionary principle, retrospectively, to a gold mining operation in Montana, U.S. that ended in disaster—local water systems were polluted and disrupted, and the corporation went bankrupt, leaving the mess for the state and the federal governments to clean up. The question of how the grassroots struggles operationalize and try to implement the principle tends to be ignored in the literature. Thus, the main purpose of the article is to provide input to the on-going debate on the operationalization and implementation of the precautionary principle in environmental policy in general and mining development in particular. It contributes to the literature by studying a concrete case in gold mining development and demonstrating how the Bergama environmental network developed a model for the operationalization and implementation of the precautionary principle through revealing their guiding strategies and legal actions taken to halt this project.

The Bergama environmental network has developed in order to halt the Ovacik cyanide-leach gold mine project development in Bergama, Turkey during the early 1990s. This article demonstrates that the Bergama environmental network has been operating under the principle of sustainable development with a precautionary principle. By doing so, it offers a different approach to environmental protection as an alternative to risk assessment. Risk assessment, which is the dominant approach in our political and economic system and in environmental policy, is based on an acceptable level of harm and risk calculations. In contrast to risk assessment that focuses on the question of what level of contamination is safe and acceptable, the precautionary approach focuses on the question of how to eliminate the hazards at the source, and considers all of the possible means of achieving that goal---including forgoing the proposed activity. The network argues that if clean technologies are not available, production must be halted until clean technologies are developed and are proven to be environmentally sound in the long run. Unfortunately, even though the network developed a model for the operationalization

and implementation of the precautionary principle, it has not been successful in convincing the Turkish State for its enforcement due to the powerful hegemonic order of neo-liberal capitalist development. Analyzing the linkage between the enforcement of precautionary principle and the powerful hegemonic order of neo-liberal capitalist development is beyond the scope of this paper (see Bridge, 2002, Konak, 2005, Krueger, 2002). Thus, the main purpose of this paper is to demonstrate the grassroots' effort to operationalize and implement the precautionary principle in gold mining development in Ovacik gold mine case.

This paper is based on a larger research project that has been taking place since 2002 on Ovacik gold mine development in Bergama. In 2002, fifty in-dept interviews and about eight informal focus group discussions were conducted with local grassroots participants, community lawyers, former mayor of Bergama and other civil-society members that have involved in the struggle. In addition, in the field, field notes were written down systematically for three months. This paper relies on data that comes from these interviews, focus group discussions and field notes as well as books and documents prepared by the network and local newspapers that covered the case extensively. Since 2002, I have been following this case through many phone and e-mail exchanges with community lawyers and informants and analyzing the court cases. Additional information gathered from the network's web page between 2002 and 2007 (BG, 2007).

This article first explains briefly what precautionary principle is. Second, it demonstrates the scientific controversy about the use of cyanide-leach technology in gold mining. Third, it illustrates the development of gold mining phenomenon in Turkey, and the Ovacik gold mine in particular, and the development of the Bergama environmental network. Fourth, through the use of four components, proposed by Wingspread Conference held in the USA in 1998, for guidelines for the implementation of precautionary principle, (Raffensberger and Tickner, 1999), it evaluates how the Bergama environmental network has operationalized and implemented the precautionary principle in Turkish context. It concludes with a brief discussion of the significance of this model for the global community and environment.

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PRECAUTIONARY PRENCIPLE

The precautionary principle emerged during the early 1970s from the German notion of "Vorsorge." "Vorsorge" means "foresight" or "taking care;" the "Vorsorgeprinzip" is the "foresight principle." At the core of early conceptions of this principle in Germany was the belief that society should seek to avoid environmental damage by careful "forward-looking" planning, blocking the flow of potentially harmful activities. By the early 1970s the principle could be found in domestic West German legislation in respect of environmental policies aimed at combating the problems of global warming, acid rain and maritime pollution (Raffensberger and Tickner, 1999: 4). In the years that followed, it was introduced to international agreements and laws (Raffensperger and Tickner, 1999). Ministerial Declaration of the Second International Conference on the Protection of the North Sea, issued in London in November 1987, was the first international agreement that explicitly refers to the precautionary principle. Later, The Maastricht Treaty forming the European Union stated that EU environmental policy is based on the precautionary principle. Each EU member state accepts precaution as a general principle of environmental policy. Several other countries including Australia, Hungary and Brazil have adopted precaution as a guiding principle as well (Tickner et. al., 2000).

Although the principle still has neither a commonly accepted definition nor guidelines to direct its implementation, leading proponents cite four central components of the precautionary principle which were cited at the Wingspread Conference, held in the USA in 1998 (Raffensberger and Tickner, 1999). Conference participants summarized four components of the precautionary principle that should guide its implementation:

1) action to prevent harm despite uncertainty about causality, magnitude, probability, and nature of harm;

2) shifting the burden of proof to proponents of a potentially harmful activity;

3) examination of a full range of alternatives to potentially harmful activities, including no action;

4) democratic decision making to ensure inclusion of those affected.

Jordan and O'Riordan explain "precaution means being honest and open about uncertainty rather than dismissing, ignoring or downplaying it. It means exploring the worst-case scenario and searching out the ill-informed and possible 'losers' from a course of action, asking what they regard as legitimate" (Jordan and O'Riordan, 1999: 19). According to these scholars, people should have the capacity to work out what the precautionary principle means for them in their own localities. Tickner (1999: 175) argues that "decisions regarding whether or not to undertake or stop an activity are public decisions because of their potential to impact ecosystems, public health, and the commons".

BATTLE OVER THE IMPACTS OF CYANIDE-LEACH TECHNOLOGY ON ENVIRONMENT AND PUBLIC HEALTH: PERSPECTIVES OF THE MINING INDUSTRY AND INDEPENDENT SCIENTIFIC COMMUNITY

The mining industry uses sodium cyanide (CN) in recovering hard-to-extract gold from lower-grade ores. There have been many debates and disagreements on cyanide use in gold extraction. The Gold Institute of the Gold Miners' Association (Gold Institute, 1996) claims that today's gold mining industry continually strives to operate in an environmentally responsible manner by taking precautions for protecting the wildlife, by reclaiming mined land, and employing new technologies to make operations safe for the environment. Mining and regulatory documents often maintain that cyanide breaks down quickly in the environment, in the presence of sunlight, into a relatively harmless, non-toxic substance, and that companies safely handle large quantities of this chemical (Moran, 2002). "Since cyanide oxidizes when exposed to air or other oxidants, it decomposes and does not persist. While it is a deadly poison when ingested in a sufficiently high dose, it does not give rise to chronic health or environmental problems when present in low concentrations" (Logsdon et al., 1999).

Many independent experts such as Robert Moran, and William Korte, two world leading geochemical experts, reject the claims presented above. They argue that world mining activities are largely self-monitored and self-regulated (Moran, 2002: 6). Most mining and cyanide research studies come from the industry sources or joint industry/government efforts. These studies have been performed by scientists and engineers that serve the interests of mineral

industry (Moran, 2002: 7). The industry cyanide code, including the code in the process of development by the International Council for Metals and the Environment (ICME) in the United Nations Environmental Program (UNEP) reflects, predominantly, what is best for industry, not the interest of the environment and public (Moran, 2002: 2).

Independent studies found out that although cyanide solutions eventually break down in the presence of sunlight and air at pH neutral conditions, such solutions will not do so when underground, or under cloudy or rainy conditions. Some of the cyanide ion then converts into hydrogen cyanide (HCN) or hydrocyanic acid. Cyanide (CN-) and hydrogen cyanide (HCN) are often referred to as free cyanide, which are highly toxic to humans and aquatic life if ingested. Both forms of free cyanide are largely controlled by water pH--a scale designed to measure the acidity or alkalinity of materials. As the pH drops, increasing amount of CN- converts to hydrogen cyanide (HCN). As a pH below 7.0, essentially all dissolved cyanide is present as HCN. HCN readily forms a gas—used in execution chambers—which is released into the air. If the cyanide solution is slightly acidic, it can turn into cyanide gas, which is extremely toxic. Cyanide in low pH (less than 10) transforms into a hydrogen cyanide gas and stays in the air (Hiçdönmez, 1997: 23). "There is no reliable analytical technique for determining free cyanide" (Moran, 2002: 9).

Currently most mining process solutions, such as tailings solutions or leach solutions are kept at alkaline pH levels—usually above about 10.0. This is accomplished by adding alkaline compounds, such as lime or sodium hydroxide, to cyanide-containing mining solutions. Even though the mining industry and regulators claim that cyanide breaks down in water into harmless components, these so-called harmless components potentially toxic to fish and other aquatic organism. These compounds stored, or bioaccumulate, in plant (Eisler, 1991) and fish tissue (Heming, 1989). Furthermore, if the solution is alkaline, the cyanide does not break down. Most of the original cyanide leached ores has been converted to other toxic forms, such as cyanide-metal complexes that can remain stable in leached ores for decades, (cyanate, and thiocyanate) (Johnson et. al.,1999, 2000, 2002**).** The cyanide-leach gold wastes are quite complicated chemically. Regulators almost everywhere in the world have often failed to require companies to perform monitoring of these chemicals. Thus, it is clear that the complexities and risks associated

with such wastes are poorly understood (Moran, 2002: 10). Independent studies to define bio-geochemical behavior of the cyanide compounds in and near these wastes are currently lacking and urgently needed (Moran, 2002: 11). Moreover, goechemical behavior of wastes is poorly known. These cyanide compounds go unregulated despite the potential environmental impacts. All this independent scientific knowledge has been made available to the individuals involved in Bergama environmental network with the initiative of former mayor of Bergama, Sefa Taşkın, since the 1990s (Taşkın, 1998).

THE DEVELOPMENT OF CYANIDE-LEACH GOLD MINING AND THE BERGAMA ENVIRONMENTAL NETWORK INITIATIVE IN TURKEY

Since 1989, the Turkish Ministry of Energy and Natural Resources has issued authorizations to multi-national corporations interested in searching gold for 560 different sites in Turkey (Arol, 2002; Taşkın, 1998: 11). According to the published official calculations there are 575 tons of proven gold reserves exist in Turkey. However, one scientist very optimistically estimated this figure as 6500 tons (Gözlem, 2000).

The Ovacik gold mine, the Turkish subsidiary of Normandy Mining Limited of Australia, in Bergama is the first gold mine using cyanide-leach technology in Turkey. It was completed in 1997 and began a “trial production” in June 2001 (Köksal et. al., 2002). Since then it has been operating. Ovacik gold mine is functioning already illegally since then, despite the vigorous resistance of residents.

In the early 1990s, while the company attempted to get permits from the Turkish government for construction and operation, a powerful environmental network began to develop in order to halt this project. The main reason why the network wanted to halt the project was due to its various risks to the environment and human health (Duman, 1998, Taşkın, 1998). The next section will briefly describe the nature of the network and then present research findings.

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Bergama Environmental Network

The Bergama environmental network developed out of a collaboration composed of potentially affected villagers who reside in 17 villages, local activists, former Bergama city government (municipality), particularly left oriented local party leaders; regional and national engineering based occupational organization such as TMMOB, environmental organizations, public health oriented organizations, university professors, the Izmir Bar Association and environmental rights lawyers. The European Parliament, Green Party in Germany and the international human rights organization, Food First Information and Action Network (FIAN) which upholds the right to food has called for urgent action to prevent the imminent destruction by gold mining of the Edremit region. This collaboration has been supported by international NGO and advocacy networks on cyanide and ecology such as the U.S. or International Greenpeace, and Food First (FIAN) as well as U.S. Mining Policy Center, Mine Watch in England, the Mineral Policy Institute in Australia. These organizations have provided with information on cyanide and accidents in various gold mines all over the world. Similarly, the local communities in Bergama have relied on these international and national organizations for obtaining scientific research findings, controversies, debates as well as detrimental environmental and health impacts of cyanide-leach technology use in mining in various parts of the world (Taşkın, 1998).

Linking Cyanide-Leach Technology to International Environmental Agreements on Sustainable Development with a Precautionary Principle and Human Rights

The Bergama environmental network has heavily relied on international environmental agreements such as 1990 Bergen Conference on Sustainable Development and 1992 Rio Declaration on Environment and Development to which Turkey is a signatory. It used these international environmental agreements not only for framing the issues, their strategies and legal actions but also utilized them in gaining legitimacy and accessing to government institutions and policy makers. The main characteristic of these agreements is that sustainable development and precautionary principle have been built into them. The Bergen conference linked the concept of precaution to sustainable development (Tickner et. al., 2000: 3). The Environment Ministers of

34 countries including Turkey plus the EU Commissioner for the Environment attended the Bergen Conference in 1990. In relevant part the Bergen Declaration provides as follow:

In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Similarly, Principle 15 of the Declaration of Rio (UNCED, 1992) states that: in order to protect the environment, the precautionary approach shall be widely applied by States, according to their capacities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. As governments throughout the world including European Union (Vig, 1999: 10), and the Turkish government has been trying to adopt this principle as well.

Operationalization and Implementation of Precautionary Principle by the Bergama Environmental Network

This section demonstrates how the Bergama environmental network has operationalized and implemented the precautionary principle in reference to the four components as proposed by Wingspread Conference held in the USA in 1998.

Democratic Decision Making to Ensure Inclusion of Those Affected

From the very beginning the Bergama environmental network has been arguing that production of gold decision must be based on precautionary principle instead of risks assessment. Thus, using the precautionary principle as a guide, the people leaving in the region refused to be drawn into debates on what levels of cyanide might constitute a danger to people's health. Instead, they pointed out that cyanide-leach gold technology was not a safe process, and insisted that the wise course was not to issue the permit to the gold company. For example, former mayor

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of Bergama argues that "if there is no other alternative to cyanide, we do not want gold mine to operate until new [clean] technologies develop" (Kuzey Ege, 1991, 3). In addition, the Bergama Environment, Culture and Art Society indicates that until new technologies with no cyanide involved developed the gold should stay where it is. It suggested that this issue should be carried to the judiciary platform based on the Bergen Conference stated above and the article 56 of the Turkish Constitution (Kuzey Ege, 1992, (3) 2). A local activist and organizer of many direct non-violent actions and demonstrations in this case (Ökçesiz, 1998) argues that: Gold mine with cyanide use involves risks. If it includes danger for the environment and people, we are against gold mine operation. If it is necessary, a referendum among the people who live in the region should take place (Kuzey Ege, 1992, 7). A referendum based on Bergen Conference continued to be the main suggestion of local communities and activists (Cumhuriyet, February 14 1994). Similarly, the former Bergama mayor argues in a public statement that: Local residents do not trust Eurogold because gold mine companies previously convicted crimes in many countries. For example in Chile, Nevada, Papa New Guinea and last year in Guyana in South Africa, mining companies destructed the nature. ..No one has a right to put the lives of Bergama's population into a danger. …The ultimate decision should be given by the residents who live in Bakircay havzasi…a referendum must take place. Local residents have a right for referendum based on an international agreement that the Turkish State also signed in 1989 (sic) in Bergen in Norway. This international agreement gives a right to public to decide if they want it or not… A referendum should take place in Bergama and [affected] villages. If the local residents do not want the gold mine, it mustn't run (Kuzey Ege, 1996, 4).

Other international and regional environmental agreements have been utilized by the lawyers of local communities as well. These are the 1972 Paris Convention concerning the Protection of the World Cultural and Natural Heritage, the 1976 Barcelona Convention for the Protection of Mediterranean Sea against Pollution; and the 1979 Berne Convention on the Conservation of European Wildlife and their Natural Habitat protection of fauna and flora. Noyan Ozkan, one of the attorneys of the local communities and who is an expert on international environmental law, explains that the company was also required to organize a formal public hearing according to Turkish national environmental law. Local approval is also mandated by international laws. He declares (Udesky, 1997): It's very clear in the Bergen

Agreement, the Paris Treaty and the Rio Declaration, to which Turkey is a signatory, and which are higher than our own law, that there must be a formal public hearing and approval by people who would be affected.

Noyan Ozkan claims that "It [the public hearing] was not publicized in the newspaper; there was no report, it was not a formal hearing" (Udesky, 1997).

In November 1994, 652 people from the villages of Camkoy, Ovacik, and Narlica that launched their three lawsuits at the Court in Izmir, to get the mine's license canceled. But the regional court ruled in favor of Eurogold and the peasants took their case to the Court of Appeal. In 1996, local communities in Ovacik gold mine area hold a self-appointed referendum. The result indicates that more than 90% of the people did not want gold mine project in the region. They sent the referendum result to the Turkish government and the firm officials (Alevcan et. al.,1998). Neither the Turkish government nor the Eurogold company paid attention to this referendum. They continued to support the Ovacik gold mine development.

On May 13, 1997, the Court of Appeal ruled in favor of the network indicating that the Eurogold company was violating the article of 56 in the Turkish Constitution, guaranteeing all citizens' right to life and right to protect their health and their environment. It declared Eurogold's licenses as invalid, and ordered that operation of mine must not be allowed (Danıştay Kararı, 1997). According to the attorneys that I interviewed in 2006 the precautionary principle became the foundation for the decision of the Court of Appeal.

The support for the use of this unsustainable technology was framed as a violation of basic human rights, right to life and right to live in a health environment (Özay, 1997). Lawyers involved in the network also argue that cyanide-leach technology use is also in contradiction with the 1948 New York United Nations Human Rights Universal Declaration (Özay, 1997). Senih Özay (1997) specified that the development based on cyanide-leach technology in gold mining is not only contradictory to the national and international environmental treaties and agreements, but also is a violation of human rights guarantied by the Turkish Constitution and the Universal Human Rights Declaration.

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Action to Prevent Harm Despite Uncertainty about Causality, Magnitude, Probability, and Nature of Harm

Even though the Turkish environmental law did not require an Environmental Impact Assessment (EIA), the Eurogold/Normandy company prepared an Environmental Impact Assessment and published it with a name, Bergama-OAM CED Report in 1991 (Uslu et. al., 1997). The report mainly concluded that the Ovacik cyanide-leach gold mining in Bergama did not include any adverse environmental risks and impacts. While the Turkish state and the company seemed quite comfortable with this EIA, members of the environmental network were not as optimistic. When this EIA report went public (Taşkın, 1998: 24), a commission composed of Turkish scientists and experts evaluated this report in 1992. Further, it began evaluating the environmental impacts of the planned Ovacik gold mine project itself. In contrast to the Bergama-OAM CED Report, this commission concluded that the Ovacik mine project had many technical shortcomings. The first technical shortcoming identified was related to tailings pond where toxic waste stays. The tailings pond was planned to be covered only by clay. The scientists asserted that covering tailings pond with only clay does not guarantee the prevention of leakages of cyanide into the groundwater (Special Commission Report, 1992). The commission suggested that it must be covered with synthetic geo-membranes as well. Second, it argued that since the proposed mine project is within the first-degree earthquake zone, an earthquake risk analysis of the tailings pond must be conducted. Thus, the commission concluded that the construction of open and/or underground mines would not take into account the fact that an earthquake will increase the risks of cyanide spills and result in environmental pollution (Special Commission Report, 1992; Çevre (Environment) 1992: 19-20; Milliyet, August 18 1992). If the construction was designed based on the current plan, this involves the risk of leakage of cyanide solution into the groundwater if the pond cracks during an earthquake (Taşkın, 1998: 32). In response to these criticisms, the company tried to improve the construction of the tailings pond in 1996 (TÜBİTAK Report, 1999). However, Turkish scientists and experts found improved tailings pond defective once more (TMMOB, 2001: 28).

Another main issue raised was that earthquake risk has been discussed only in relation to the tailings pond. It raised the question of whether the storage where the cyanide is stored was

strong enough against an earthquake risk (DEU, 2000). Consequently, another independent report concluded that as long as cyanide-leach technology is the main method to be used in gold extraction, the mining process would entail severe risks to the environment and public health. The company also ignored to prepare an emergency plan in case of cyanide spills into water and land (DEU, 2000).

Professor Korte, who is a leading geochemical at the Institute of Chemistry at the Technical University of Munich, Germany, and has many researches on the ecological and social impacts of cyanide use in mining, has been the scientific advisor for the local people. In 1997, he participated to a symposium on the environmental problems of gold mining in Turkey. Steve D'Esposito, the general manager of the U.S. Mineral Policy Center, was among those who participated to the symposium as well. At the end of the symposium they announced the "(Bergama) Pergamon Declaration". The "Pergamon Declaration" (1997) reads as follow: "Based on current evidence, including the technologies involved and a knowledge of the natural and cultural environment, the planned extraction of gold in the Bergama (Pergamon) region is not acceptable." This declaration was a result of an international meeting, organized by the Technical University of Istanbul, Faculty of Mining Sciences, Turkey, June 26-27 (1997).

Later, the Berlin Declaration on Gold Mining was announced in 1999 by the same experts and some activists involved in this struggle. This declaration announces that : Critical scientific analysis…empathetically proves that the cyanide process in Gold mining cannot be accepted because of its irreversible damage to the ecosystems. The necessary safe technologies (like detoxification, neutralization, reduction in the availability to the ecosystems among other heavy metals) are only in a limited way available. They cannot guarantee safe Gold mining…the technologies to reduce the risk are not manageable and cannot be controlled….It destroys, in the long term, the basic necessities of life and threaten adequate nourishment…promotion of Gold mining projects are to be stopped and, where necessary, the affected people should receive compensation.

Based on the independent scientific evidence provided above, both national and international independent scientists has been advocating that cyanide-leach technology in mining

must be banned not only in the Ovacik gold mine in Bergama, but worldwide due to its severe and irreversible ecological impacts and social risks. "There are no safe and effective options to treat cyanide once it has entered natural surface waters such as streams and lakes" (Moran, 2002: 8). Korte and Moran argue that United Nations Environmental Program (UNEP) and the European Union (EU) must take a precautionary approach to cyanide (Moran, 2002: 8). In addition to above mentioned risks, later another report prepared by the Environmental Engineering Department at the September 9 University in Izmir, Turkey also raised the issue that any other environmental impact assessment (EIA) prepared by the firm did not mention the necessity of assessing the impacts of mining on the local ecology, flora and fauna. No detailed and comprehensive study has been undertaken (DEU, 2000). The EIA reports have not addressed the question of how the gold mine operation will affect fauna and fauna in the surrounding area (Övez, 1999). The mine may change the local ecosystems of the region and result in the loss of some plant and animal species, including endemic and rare species (Övez, 1999). If particular studies are not taken soon, it will be impossible even to know which species of flora and fauna peculiar to the region has been and will become extinct.

Neither the company nor the Turkish government has concerned with the nature and the level of dust produced (TMMOB, 1998: 30). The independent scientific community argues that the dust produced by the mine operation will affect villagers' livelihoods and environmental quality adversely. The nature of the ore is quartz (SiO2). Quartz dust is considered to be a source of lung cancer. The Turkish Protection of Air Quality Regulation declares it as a cancinogen (TMMOB, 1998: 54). Thus, the former mayor addresses the issue as follows: "The company that claims that it brought the advanced technology to Turkey, are going to give people cancer with the ore dust, not to mention the adverse impacts of cyanide" (Taşkın, 1998: 28). Moreover, dust pollution pose severe impacts on agricultural production, especially olives trees in the surrounding area. This is no systematic study that evaluates how the gold mine operation impacts agricultural produces in the region.

In the production process, the company indicated that 1000 m3 water will be used daily. According to Bergama city officials, the daily water requirement for the Bergama City center with a 47000 population in 1997 was 14000 m3 (Taşkın, 1998: 29). The scientific community

report also pointed out the fact that environmental risk assessment reports prepared by the company did miscalculate the amount of groundwater to be used in the plant. According to calculations of the independent scientific community, the plant will use more water than indicated. Consequently, dewatering would dry up wells and springs, depriving other users in surrounding communities of access to water for agricultural irrigation purposes and drinking water. The quotes above best represent the community perspective.

If the Ovacik gold mine begins to operate, and use 1000 m3 underground water daily, how are farmers going to irrigate their cotton plants? Isn't the gold production going to cause dewatering? Under this situation, how is the cotton production that is under the threat of dust going to be accomplished? … How do thousands of villagers make their living? (Taşkın, 1998: 29).

This means money lost for farmers in the region. In addition, it means that in the long run, it is a threat to food security for the people in the region and for Turkey as well. The destruction of water and land means deprivation of communities and people of their very base of existence or livelihoods (clean water, lands for agriculture, forest and fishing) (Rose and Lyon, 1997; Moran, 2002: 2). In another report, the possibility of a flooding problem was raised due to heavy rain. In this case, cyanide can spill to the environment from the tailing ponds. There is no emergency plan in case of flooding (DEU, 1999).

The below quotation best represent what the community concerns are: We saw in Lefke. The firm escaped. For the clean up cost 700 million dollars is required. It is a very serious number. Rehabilitation of the environment requires a lot of money. The firm is not going to clean up and rehabilitate the environment. This is the source of a real problem. Seventy to eighty years its impacts will last. This is the point that makes us worry a lot. Evaporation, earthquakes, landslides would cause the waste basin to crack etc. That poses lots of environmental risks (Interview 1 2002).

The Turkish Health Association (TTB, 2001) argues that ore includes arsenic and other heavy metals that exist in the tailings pond during the operation and after the mine closure. It claims that the contemporary public health perspective require us to take a precautionary

measure and eliminate all the possible risks instead of waiting people to get sick. Istanbul Technical University Meteorology Professor Ismail Duman also pointed out that ore includes an arsenic mineral which is toxic (Radical, June 24 2000). Health experts argue that it is more likely that cancer, birth defects and other abnormalities will increase in the near future, and human health will continue to be impaired over time.

Shifting the Burden of Proof to The Proponents of a Potentially Harmful Activity

The Turkish government institutions supposedly places responsibility on the developers to show the soundness of their environmental assessment. Since 1997, the Turkish government and the mining company have been trying to find ways of bypassing domestic court verdicts via various techniques of persuasion and silencing. The related Turkish state institutions from the beginning seemed open to demands by the network. However, instead of banning cyanide use in gold production or halting the project, they ordered the Eurogold/ Normandy firm to take "necessary" measures to minimize the social and environmental risks. The Turkish government announced that it found Turkish court decisions rather ambiguous. It argued that cyanide has been used in mining and in many other industries worldwide. In March 1999 the prime minister instructed the Turkish Institute of Scientific and Technical Research (the *TÜBİTAK*) to prepare a report assessing the potential impact of using cyanide in the mining operation. The report mainly concluded that the risks referred to by the Supreme Administrative Court had been completely removed or reduced to a level below the acceptable limits. On April 5, 2000 the prime minister's office drew up a report concluding that the gold mine could be allowed to operate. Between October 2000 and January 2001 the Forestry Commission, the Ministry of Health and Ministry of the Environment successively granted permits or extensions of permits on the basis of the *TÜBİTAK*'s report. On April 13, 2001 the mining company started its mining operations.

The Izmir Bar Association (Izmir Bar Association, 2001) applied to Izmir Administrative Court in order to enforce the decision given by the Turkish State of Appeal in 1997. The regional Court canceled the permission given by the Turkish Prime Ministry indicating that risks were not eliminated as long as cyanide use continued in gold production processes. On 29 March 2002 the Turkish Cabinet decided "as a principle" that the operating company could continue its activities.

The Izmir Bar Association applied to the Izmir Administrative Court once more in order to cancel the one-year trial production permission granted to the firm by the Ministry of Health. The Izmir Administrative Court decided to cancel the one-year trial production on January 10, 2002 provided by the Ministry of Health on the basis that the consequences likely to arise due to hazards of mining can not be compensated for later (Kuzey Ege, 2002 456/457). The court decision indicates once again that "the risk caused by cyanide was tried to be reduced by Normandy, however, the method is apparently the same, cyanide leaching."

Examination of a Full Range of Alternatives to Potentially Harmful Activities, Including no Action: Agriculture and Tourism as Alternatives to Gold Mining Development

Since the cyanide-leaching gold mine involves ecological and social risks and uncertainties, local communities and others have promoted agriculture and tourism as alternatives to gold mining development. According to experts, local communities and university professors involved in the network, the development policies based on mining that include toxic material using and toxic waste production at the end is ecologically, geographical and agriculturally unsustainable. Thus, it needs to be halted, and instead, ecologically sustainable agriculture and truism sectors in the region should be continued to be promoted. According to the Eurogold/Normandy, the Turkish state will gain $ 7.5 million dollars annually and 238 individuals will be provided employment. In eight years the Turkish state will gain $ 60 million dollars in total (Reinart, 2003: 29). According to the Bergama Trade Institution, in 1995 the income gained from cotton, tobacco, tomatoes and olive oil produces was almost $ 42 million dollar (Alevcan et.al., 1998). In 1997, the total financial value from all the agricultural produces in Bergama was $ 278 million dollars (Övez, 1999). Thus, local citizens believe that this development project will not significantly contribute to the national economic growth. On the contrary, it will bring a big threat in respect to the environmental degradation in the long run. Thus, this means a threat to their livelihood. One of the village residents explained that gold mine in the region will adversely affect the community. She argues as follow:

Our land is very productive. 100-200 people will work in the mine. However, this land provides bread for a lot of people. It means 100 people would work while 1000 people would get

hungry. This brings hunger, this brings oppression (Interview 2 2002). Independent scientific reports also raise the issue that after the gold mine operation finished, who is going to be in charge of clean up. The Chair of the Environmental Engineering Department at Istanbul Technical University argued that 700 million dollars is needed as clean up cost of toxic waste. "In order to gain just 60 million, why is it allowed to operate (Radical, June 24 2000). When gold production ends, the firm indicated that it would monitor the mining waste tailings for five years. Who is going to monitor it after that? In the U.S. it is well known that majority of the superfund for clean up has been reserved for the cleaning up the mining sites. Another resident expresses its worry as follow:

The mining company has provided jobs so far for 300 people. However, ten thousands people earn their living from agriculture in the region. Worldwide famous cotton, olives and tobacco grow here. Cyanide-leach gold mine will not only lead to destroy renewable and continual agricultural income but also lead to unemployment among people (Interview 3 2002). They argue that not only their survival is under risks but also their children's and grandchildren's future are at jeopardy.

CONCLUSION

The Bergama environmental network was simultaneously shaped by already existing national and international environmental norms (right to live in a health environment, sustainable development and precautionary principle) and defined and illustrated how the precautionary principle could be operationalized and implemented in practice in mining industry. This network has challenged the internationally accepted norms and practices, that the cyanide-leach gold extraction process is safe, and considered to be a sound production technology. Instead of this accepted norm, the network argues that the cyanide-leaching mining process includes high levels of risk for the environment and health. This accepted norm and practices are based on risk assessment. Risk assessment, which is the dominant approach in our political and economic system and in environmental policy, is based on acceptable levels of harm and risk calculations and risk acceptance. In contrast to risk assessment that focus on the question of what level of contamination is safe, the precautionary approach focus on the question of how to reduce or eliminate the hazards and considers all the possible means of achieving that goal---including

forgoing the proposed activity. This network has been promoting precautionary principle instead of risk assessment in mining nationwide.

The model developed by the Bergama environmental network can provide some insights and strategies for other communities dealing with mining developments in order to make the companies and their states to adopt and implement the precautionary principle in environmental policy in general and mining development in particular. However, the findings of this case study raise broader questions for the proponents of precautionary principle in mining: even if the global community resolved the issues concerning conceptual and operational definitions, who should be in charge to enforce it? Proponents of precautionary principle, companies, state institutions? Is it possible to enforce precautionary principle under the current hegemonic neo-liberal development policies? Proponents of precautionary principle scholars should take into account the consideration of these questions and should develop global strategies for its implementation and enforcement.

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