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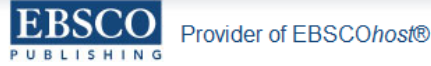
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İÇİNDEKİLER / CONTENTS

<b>M. Coşaner, T. Kiper, A. Korkut</b> <b>Mahalle Parklarının Peyzaj Tasarım ve Kullanım Kriterleri Açısından İrdelenmesi: İstanbul-Şişli Örneği</b> Evaluation of Neighborhood Parks With Regard to Landscape Design and Using Criteria: Case of İstanbul- Şişli.....	1-18
<b>S. Özyürek, R. Koçyiğit, N. Tüzemen</b> <b>Erzincan İlinde Süt Sığırcılığı Yapan İşletmelerin Yapısal Özellikleri: Çayırılı İlçesi Örneği</b> Structural Features of Dairy Farmers In the Erzincan: The Example of Çayırılı District.....	19-26
<b>Z.T. Abacı, E. Sevindik, S. Selvi</b> <b>Ardahan'da Yetişen Bazı Erik (<i>Prunus x domestica</i> L) Genotiplerinde Toplam Fenolik İçerik, Toplam Antosiyanin ve Askorbik Asit İçeriğinin Belirlenmesi</b> Determining Total Phenolics, Anthocyanin Content and Ascorbic Acid Content in Some Plum ( <i>Prunus x domestica</i> L.) Genotypes Grown in Ardahan.....	27-32
<b>H. Baytekin, C. Ö. Egesel, F. Kahrıman, M. Aktar, N. B. Tuncel</b> <b>Bazı Ekmeklik Buğday Genotiplerinde Gliadin Bant Değişimlerine Göre Verim ve Kalite Özelliklerinin Biplot Analizi ile Değerlendirilmesi</b> Investigating Yield and Quality Traits of Some Bread Wheat ( <i>Triticum aestivum</i> L.) Genotypes Based on Gliadin Band Variations using Biplot Analysis .....	33-44
<b>E. Özşahin</b> <b>Tekirdağ İlinde CBS Tabanlı RUSLE Modeli Kullanarak Erozyon Risk Değerlendirmesi</b> Using GIS-Based RUSLE Model in Erosion Risk Assessment in Tekirdağ Province.....	45-56
<b>G. Şişman Aydın, E. Tatlıdil</b> <b>The Effects of A Copper Mining On Environment Changes And Human Living With in The Concern Of EU Policy</b> Bir Bakır Madeninin Çevre Değişiklikleri ve İnsan Yaşamı Üzerine Etkilerinin AB Politikası ile İlgisi .....	57-66
<b>E. Torun, O. Akpınar</b> <b>Tüketicilerin Satın Alma Eğilimlerini Belirlemede Demografik Faktörlerin Etkisine Yönelik Bir Araştırma: İzmit Örneği</b> A Research On The Effects Of Demographic Factors In Determining Consumer Buying Trends: İzmit Sample .....	67-74
<b>H. A. Karaağaç, S. Aykanat, R. Gültekin, M. F. Baran</b> <b>Adana'da Ana Ürün Mısır Üretiminde Enerji Kullanım Etkinliğinin Belirlenmesi</b> Determination of Energy Using Efficiency at Corn Production in Adana .....	75-81
<b>G. Şişman Aydın, B. Büyükkışık</b> <b>Nütrient Pulslarının Türe Özgü Değişkenler Üzerine Etkileri: <i>Thalassiosira allenii</i> (Takano)</b> Effects on The Species-Specific Variables Nutrient Pulses: <i>Thalassiosira allenii</i> (Takano) .....	82-90
<b>R. D. Çay, F. Aşılıoğlu</b> <b>Ankara Kent İçi Yaya Bölgelerinde Yaya-Tasarım Etkileşimi</b> Pedestrian-Design Interaction in Urban Pedestrian Zones in Ankara .....	91-99
<b>F. Özen, F. Çoşkun</b> <b>Bitkisel Ekstrakt Kullanımının Tekirdağ Köftesinin Mikrobiyolojik ve Duyusal Özellikleri Üzerine Etkisi</b> Effect of Herbal Extracts Addition on Microbial Composition and Sensory Properties of Tekirdag Meatballs.....	100-109
<b>G. Keskin, D. Dönmez, F. Canik, N. Y. Yüksel, A. Z. Sancak</b> <b>Türkiye'de Bitkisel Ürünlerde Maliyet Hesabında ve Anket Uygulamalarında Teknik Elemanların Karşılaştıkları Sorunların Belirlenmesi</b> Determining The Issues Confronted By Technical Staff Considering Cost-Calculation and Implementation of Surveys on Plant Products in Turkey .....	110-118

## The Effects of A Copper Mining On Environment Changes And Human Living With in The Concern Of EU Policy

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A mining company called Cyprus Mine Coperation (CMC) operated copper mining industry in Turkish Republic of North Cyprus (TRNC) between the years 1914-1974. This abandoned copper (Cu) mine located in Lefke has shown acid mine drainage (AMD) to be a multi-factor pollutant. AMD affected different aquatic ecosystems in different ways and caused very serious environmental pollution in this area such as soil, air and water. This work carried out effects of this abandoned mine environment changes and human living with in the concern of EU policy and law the abandoned copper (Cu) mine.

**Keywords:** copper mine, environmental impact, European Union policy

### Bir Bakır Madeninin Çevre Değişiklikleri ve İnsan Yaşamı Üzerine Etkilerinin AB Politikası ile İlgisi

Kıbrıs Maden Şirketi (CMC) adlı bir madencilik şirketi 1914-1974 yılları arasında Kuzey Kıbrıs Türk Cumhuriyeti'nde (KKTC) bakır maden endüstrisi işletmiştir. Lefke bölgesinde yer alan bu terk edilmiş bakır (Cu) madeni multi-faktör kirlenici olan asit maden drenajı (AMD) göstermiştir. AMD farklı ekosistemleri farklı yollarla etkiler ve bu da toprak, hava ve su gibi, çok ciddi bir çevre kirliliğine yol açmıştır. Bu çalışma, terk edilmiş bu madenin çevre değişiklikleri ve insan yaşamı üzerine etkilerini AB politikası kapsamında gerçekleştirilmiştir.

**Anahtar kelimeler:** bakır madeni, çevresel etki, Avrupa Birliği politikası

#### Introduction

Just as countries economy can be swamped by global economic forces that it has little power to control or deflect, its environment can be threatened by activities such as mining taking place beyond its borders and its control. In some low income countries the threats may be severe enough to jeopardize further sustainable development.

Governments acting alone, and even regional organizations cannot respond affectively to this kind of environmental problems. The response must be global. Industrial countries have been thought to be responsible for the most of the these kinds existing global environmental problems. In this case, not only Cyprus has been face to face with Cyprus mine problem such as like a local problem, but also all the east Mediterean countries standing near by Cyprus island could be in the same station in this case.

Soil, ground water changes, coast and sea pollution, for example could effect agriculture, forest and fishing forced to villagers leave from their homeland. Such a like Cyprus as it is known surface and underground mining have caused environmental problems due to acidic discharges

(commonly referred to as "acid mine drainage"). Here exposed sulfide minerals react with oxygen and water to produce an acidic solution that dissolves metals and contains sulfate. Further reactions may occur resulting in a wide range of water quality characteristics. Additionally, sediment discharge due to inevitable erosion of the denuded soil hinders future land uses and degrades water quality.

In brief, special attention going to be given in accordance with global environment approach and also European Union's understanding of environment procedures and acts. And also in this case going to be discussed European Union-Amsterdam Treaty and Copenhagen summit approach among the member countries and the countries going to be member like Northern Cyprus with Turkey and the countries nearby the European Union.

#### Study Area

#### The Main Environmental Problems in Cyprus

Cyprus as a Mediterranean country has "mediterranean climate", is characterised by hot,

dry summers, and mild and wetter winters, with run off from infrequent but often massive rain fall causing soil erosion. However Mediterranean regions of Europe have witnessed rapid changes over the past thirty years, in particular in the last decade, affecting all aspects of society. For a number of countries, accession to the European Union has led to major socio-economic change. These upheavals have disrupted the special relationship between man and environment in these areas with highly specific climate. At the same time, landscape itself has undergone rapid change. As a result, Southern Europe is facing a process desertification, which is evident in the cultivated land, pasture grounds and forests, and in the substantial loss of biological diversity. Paulo Mairota, John Thornes and Nichole Greeson pointed out that vast rural areas are temporarily and permanently abandoned, urban sprawl is rampant, agriculture is intensifying and water shortage, accentuated by the droughts of the 1980s and 1990s has become the main problem in the terms of resources and environment (Penreath, 1994).

In this sense Cyprus is a Mediterranean country not excluded from this typical Mediterranean climate conditions. For that reason badly influenced agricultural production and biological diversity in accordance with Regular Report of European Commission on Cyprus (CEC, 2000): Over the years the contribution of agriculture has gradually fallen to 4.2% of GDP (Gross Domestic Product) and 9.3% of employment. Due to the fall in agricultural production, which was particularly badly affected by the recent drought, the primary sector declined by almost 7% in 2000. Also in the same report declared that no concrete development in rural development and forestry could be reported in this area since last regular report. Even if this report concerning with the south Cyprus, the same situation can be seen in North Cyprus as well. As regards Rural Development and Forestry, Cyprus has already some experiences in these areas also comprising agri-environmental measures. However the

necessary control bodies for the environmental scheme will have to put in place. Furthermore, a code of good agricultural practice needs to be established. (CEC, 2000 Regular...p.49-52)

### **From The Environmental Issues Cyprus Mines Problem**

An American mining company called Cyprus Mine Corporation (CMC), which operated copper mining industry in Cyprus between the years 1914-1974 (Figure 1). According to some expert reports (Erdem, 1999; Altınbaş., 1999; Doğan, 1999), mine and its waste was left in Lefke region caused very serious environmental problems such as soil, air and water pollution which is usually defined as the resource of "global environmental problem" The areas has been still faced by environmental pollution with the mine waste left behind alone after the firm leaving the country in 1974. In this sense, it is understood that CMC had never been concerned their waste pollutions effects on environment on their mine closure procedures after 1974.

Pollution through erosion and sediment control should be in a significant part of every mining waste management strategy. It means every effort should be made to control the sediment at, or near to, and its source (as opposed to relying on one or more large sediment settling basins opposite and in the major drainage ways). It is more desirable to segregate sedimentladen waters from the rest of the surface flow. However it is understood from expert reports (Erdem, 1999; Altınbaş., 1999; Doğan, 1999) that Cyprus mine Corporation had not been taken available waste management techniques in this area. In accordance with EPA (United States Environmental Protection Agency) reports to Congress: The report provides in depth information on mining process, the wastes produced an associated health and environmental effects, ways to minimize waste production and the means of treat and dispose of the wastes as well as mine closure procedures and costs.

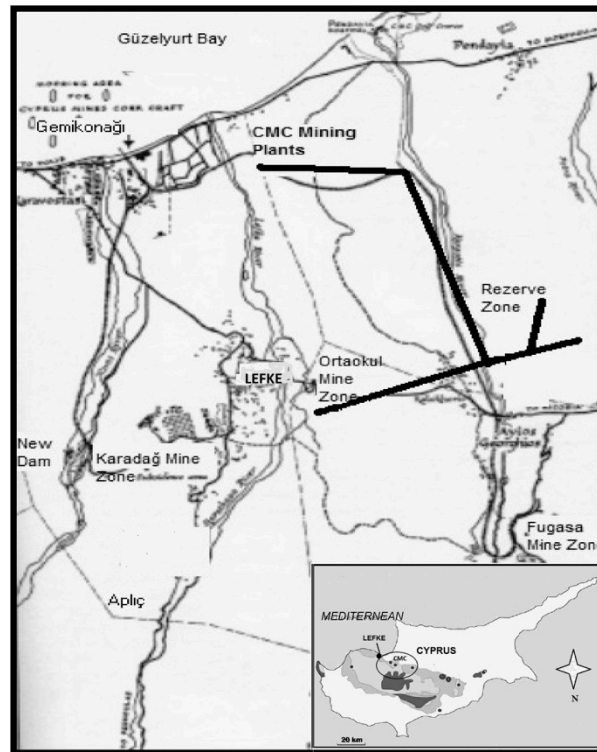


Figure 1. Cyprus Mine Corporation (CMC) study area.

Several management alternatives such as prevention and chemical, physical and biological treatment are available to minimize the impact of mine drainage on the environment. In this sense it is understood that CMC had been never taken account in their mine operation these basic rules or they had not concerned their waste pollutions on environment in account on their mine closure procedures after 1974. In this case an example can be given; beginning of the 1970s the Court of Lefke punished CMC due to cause of polluting the agricultural cultivated areas. Also according to expertise reports water, soil, air, costs and sea pollution comes from ex CMC mines areas. In this region all these expertise reports say, environmental pollution during the period of 1914 and 1974 responsible firm is the only one private sector CMC. It means environmental pollution caused by an American mining company operated copper mining industry in Cyprus in Lefke region between the years 1914-1974. As it is understood nowadays ex-mining wastes still working polluting water, soil, air, costs and sea, and also it's wastes produced and associated with health and cultivated effects. Therefore in this region approximately 7000 people are living and working

in cultivated areas under the effects of environmental pollution directly or indirectly in the mean time circus fruit, vegetables corps and sea foods growth in this region are distributed to the other regions in TRNC for consumption by the way this means that environmental pollution is also exported to the other regions in Cyprus.

Mining operations in this region has been gone for a long time in this period authorized politicians were changed who were responsible for copper mining industry, mining business, using poisoned materials during the operations, storage of waste and legal-administrative regulations concerning the mine export.

Cyprus was a British Colony during the standating period of mining operations. Between the years 1960-1974 CMC continued its operation according to regulations of Cyprus Republic. In 1974 Intervention of Turkish Armed Forces to the island under the rights of Guarantee Agreement, Turkish political authorities started to control these mining areas, mining plants and waste storage. For this reason environmental pollution in this region should be examined with historical and legal framework.

## Result And Discussion

### Effects of Copper Mining Activities On Aquatic Ecosystem

Copper mining is a non-renewable activity and environmental management is essentially a process of removing the minerals with minimal harm to the environment and maximum profit to society. In recent decades, enhanced industrial and mining activities have contributed to the increasing occurrence of copper in aquatic ecosystems (Boojar and Goodarzi, 2007) and generate a large amount of waste rocks and tailings, which get deposited at the surface. For example, Japanese mining (Nittetsu-Nippon Comp.) operation, to be located at the head of two major rivers, would dump 100,000 tons of tailings, equal to the weight of 1 million people, into the waters of the Navua Delta every day. The amounts of wastes due to mining activities exceed 400 million tonnes annually (Commission of the European Communities, 2003). In other words the yearly amount in European Community (EC) reaches up to 29% of whole wastes (Çetiner et al., 2006)

Copper and zinc are essential trace elements for plant, micro and macro plankton and animal life (including humans) (Boojar and Goodarzi, 2007). On the other hand, Cu is a potentially toxic trace metals like Cd, Pb, and Zn is present at elevated concentrations in coastal waters due to anthropogenic inputs (Windom 1989; Moffett and Brand, 1997). Phytoplankton is the first level of food chain (Figure 2), followed by the zooplankton, which feeds on the phytoplankton. The zooplankton are then eaten by fish and other crustaceans, which all go on to be eaten by big fish. The food chain continues when these are eaten by mammals. Cu also plays important roles in CO<sub>2</sub> assimilation, ATP synthesis and is a component of various proteins and particularly those involved in both the photosynthetic (plastocyanin) and the respiratory (cytochrome oxidase) electron transport chain (Demirevska-

Kepova et al., 2004). On the other hand, Cu is a widespread contaminant mainly originating from mining and smelting of Cu-containing ores. (Boojar and Goodarzi, 2007)

The biological availability of Cu is proportional to the concentration of the free copper ion (with a few excep.). Complexation by organic ligands maintains free Cu ion concentrations as low as 10<sup>-13.5</sup> M in coastal and oceanic surface waters (Bruland et.al., 1991; Kozelka and Bruland, 1998), but small increases in total dissolved. Several studies show that free Cu concentrations in the range of 10<sup>-12</sup>-10<sup>-9</sup>M can cause growth inhibition (Reinfelder et al., 2000; Ługowska and Witeska, 2004) and metabolic stress in estuarine phytoplankton (Ahner et al., 1997; Reinfelder et al., 2000), cyanobacteria (Moffett and Brand, 1996), and zooplankton (Sunda et al., 1987).

Acid streams resulting from mining activities from certain types of mineral deposits are highly toxic to the aquatic environment (Penreath, 1994; Gray, 1997; Quinn et al., 2003; Pandey et.al., 2007; Porter and Nairn, 2008). The ochre precipitate (orange precipitate) could affect the genetic, morphologic, physiologic and successive position and abundance of organisms (Barry et al. 2000; Reinfelder et al.; 2000; Ługowska and Witeska, 2004; Lim et al., 2008) and reduce the area available for fish to lay their eggs on by smothering the seabed near the coasts, hence affecting fish breeding (Tovar- Barry et al. 2000; Olsen et al., 2004; Sanchez et al., 2006). It could cause coral mortality (Fallon et al.; 2001), the exhausting of aquatic organisms (Cooper and Wagner 1973; Jennings et al., 2008) and the smothering would cause loss of benthic organisms on the seabed (Farag et al. 2003). Acid streams from mining area having domino effects up the food chain (Kim et al., 2002; Quinn et al., 2003; Greenpeace, 2006 ) by reducing the food sources available for animals at the top of the marine food chain, e.g. fauna and flora. Similarly, AMD and heavy metals pollution can poison ground and surface water.



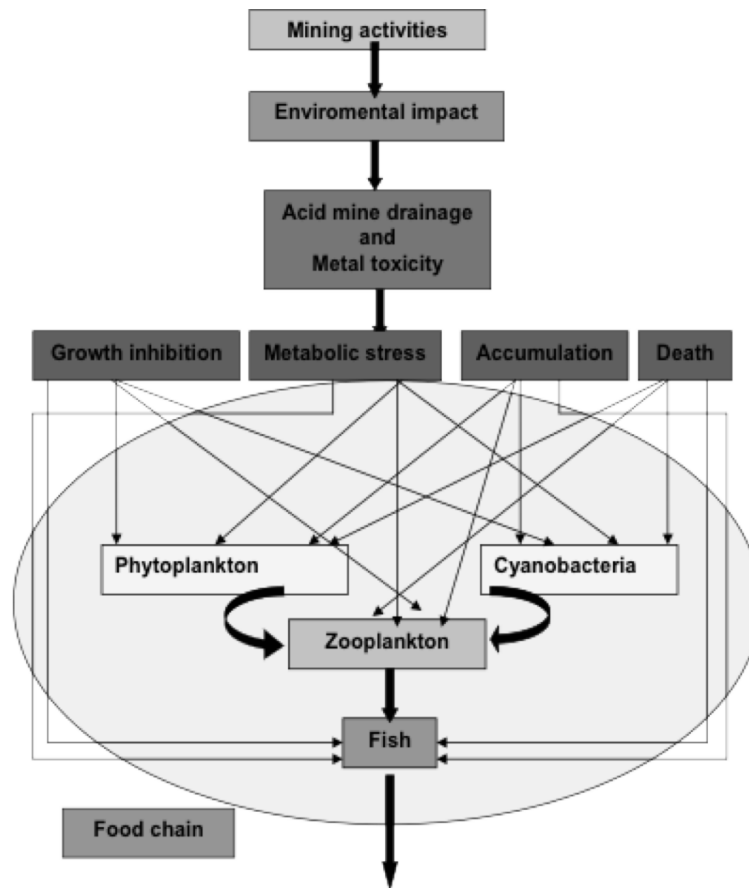


Figure 2. Effects of AMD on aquatic food chain

### Human Rights and Environment in the EU Policies

As one can easily see that European Union develops, in which a growing number of decision has been taken on the everyday lives of its citizens. All these decisions should be taking account in democratic society. The peoples of Europe creating an over closer union among them, are resolved to share a peaceful future based on common values. According charter of fundamental Rights of the EU

Article 1 says: Human dignity is inviolable. It must be respected and protected. Article 2 says: Everyone has the right to life. Also Article 41 consists of right to good administration. From this respect EU decisions on living of citizens taking account to environmental cases. As Article 37 mentions environmental protection, and also in article 35: states that a high level of human health protection shall be ensured in the definition and implementation of all union policies and activities.

-A high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the union an ensured in accordance with the principle of sustainable development (European parliament, charter...Dec.2000, p.6-11).

In accordance with the social summit of 1995 in Copenhagen commitments were (EESC.; Apr. 2000, p.1-2).

- Commitment 1: We commit ourselves to creating an economic, political, social, cultural and legal environment that will enable people to achieve social development.
- Commitment 3: We commit ourselves to promoting the goal of full employment as a basic priority of our economic and social policies, and to enabling man and woman to attain secure and sustainable livelihoods through freely chosen productive employment and work.

- Commitment 9: We commit ourselves to increasing significantly and/or utilising more efficiently the sources allocated to social development in order to achieve the goals of the summit through national action and regional and international cooperation.
- 20 and 21 September 2000 Economic and Social Committee adopted the following opinion in the topic of over all political objectives (EESC., Sept.2000, p.1-2).
- Ecological Objectives; conserving natural resources and protecting the climate, preserving and developing the natural environment safeguarding natural resources in the long term through the use of renewable resources, maintaining biodiversity.
- Social Objectives; preserving and developing recreational areas, creating jobs, protecting social and cultural resources, ensuring equity for a "fair" distribution of income.
- The European union participated actively in the deliberations on the right to the development in various bodies of the United Nations concerned with human rights and development.

According to the UN general assembly; human being is the central subject of development and should be the active participant and beneficiary of right to development. The right to development is based on the understanding that development is a process targeted at the realisation of civil, cultural, economic, political and social rights meeting equitably the developmental and environmental needs of present and future generations. (EU annual report on human rights 1999, p.47)

All over EU Treaty communication from the commission on the global assessment of the European Community program of policy and action in relation to the environment and sustainable development concerns European citizens living conditions and related to human kind social, economic, cultural situations. From all these points, European Community and European Parliament always taking account the citizen's believes and understanding of living.

Understanding of living nowadays becomes global. For that most of the European citizens

thinking of the environmental problems not only consisted of European community political borders, but the neighbouring and/or the other countries in this world, may create global environmental problems for themselves.

### **Environmental Approach in the European Union**

In global levels environmental policy become one of the greatest social challenges facing the public authorities and all sectors of the economy today. It is also a subject of whom the public is acutely aware, since it is directly affects its welfare and health. May be, after Montreal Protocol and Rio Treaty which brought all the countries together to address a common environmental threat.

The world has already seen one genuine environmental success story in the Montreal Protocol of 1987, which brought all countries together to address a common environmental threat. (The World Bank, 1999-2000 p, 8)

The world faces a number of other pressing environmental problems that threaten the global commons. Perhaps the best known is the climate change, which is associated with increasing emissions of carbon dioxide into the atmosphere. Others include biodiversity loss, which occur at an alarming rate; desertification; the depletion of fish stocks; the spread of persistent organic pollutants.

It was not until the 1970's, the emergence of environmental concerns triggered moves in this area at Community level. At the July 1972 Paris Summit the Heads of State and Government recognised that in the quality of life, particular attention should be paid to the environment.

The Treaty of Amsterdam should resolve these problems and respond to the need to make Community environment policy clearer and more efficient. The Treaty seeks to provide stronger guarantees than given by inserting concept of sustainable development.

This new article must be seen in conjunction with the declaration on environmental impact assessment, annexed to the Final Act of the Intergovernmental Conference, which drafted the Treaty of Amsterdam. In other words Amsterdam Treaty pointed out that sustainable development and taking the environment into account in all policies, should be realized (European Commission, The Amsterdam Treaty, p.42).

Faced with the **loss of biodiversity**, the EU has made some significant progress, notably through the implementation of the Natura 2000 network and the integration of biodiversity protection into the agricultural policy and the relevant thematic strategies (marine environment and air quality).

### **Environmental liability - Directive**

The first EC legislation whose main objectives include the application of the "polluter pays" principle, this Directive establishes a common framework for liability with a view to preventing and remedying damage to animals, plants, natural habitats and water resources, and damage affecting the land. ( Environmental liability– Directive 2004/35/EC).

According to amending acts; Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage. From this approach it is understood that the Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage ( *in ibid.*).

The first liability scheme applies to the dangerous or potentially dangerous occupational activities listed in Annex III to the Directive. These are mainly agricultural or industrial activities requiring a licence under the Directive on integrated pollution prevention and control , activities which discharge heavy metals into water or the air, installations producing dangerous chemical substances, waste management activities (including landfills and incinerators) and activities concerning genetically modified organisms and micro-organisms. Under this first scheme, the operator may be held responsible even if he is not at fault (*in ibid.*).

### **Preventing and remedying environmental damage**

Where there is an imminent threat of environmental damage, the competent authority designated by each Member State will require the operator (the potential polluter) to take the necessary preventive measures, or will take such measures itself and recover the costs incurred at a later date ( *in ibid.*).

Where environmental damage has occurred, the competent authority will require the operator concerned to take the necessary restorative measures (determined on the basis of the rules and principles set out in Annex II to the Directive), or will take such measures itself and recover the costs incurred at a later date. Where several instances of environmental damage have occurred, the competent authority may determine the order of priority according to which they must be remedied. ( *in ibid.*).

Environmental damage may be remedied in different ways depending on the type of damage: In this case CMC damage affecting water or protected species and natural habitats, the Directive is aimed at restoring the environment to how it was before it was damaged. For this purpose, the damaged natural resources or impaired services must be restored or replaced by identical, similar or equivalent natural resources or services either at the site of the incident or, if necessary, at an alternative site ( Environmental liability – Directive).

From this point, special attention has to be given on "Chemical pollution of surface waters and the Water Framework Directive"

On 17 July 2006, the Commission adopted a **proposed Directive**. It was setting environmental quality standards for the priority substances which Member States must achieve by 2015, to ensure "good chemical surface water status". The proposal also requires progressive reduction of emissions, losses and discharges of all priority substances, and phase-out or cessation of emissions, losses and discharges of priority hazardous substances within 20 years.

### **The Responsibility of Non-Governmental Organizations (NGOs) to environmental damage and environment protection**

Recently, understanding of life quality and european citizenships responsibility arrived out for protecting of natural environment for that reason responsibility given to NGO's within the concern of european citizenships. Natural or legal persons who may be adversely affected by environmental damage and environment protection organisations may, subject to certain conditions, ask the competent authorities to act when faced with damage. Persons and organisations requesting action may bring legal action before a court or an *ad hoc* body for review

of the lawfulness of the decisions and actions of the competent authority, or of its failure to act (EU, Programme promoting NGOs active in the field of environmental protection).

According to this regulation, the public will be able to access this register free of charge on the internet and will be able to find information using various search criteria (type of pollutant, geographical location, affected environment, source facility, etc.)

### **Programme promoting NGOs active in the field of environmental protection**

The purpose of this Community programme is to encourage the activities of European NGOs whose primary aim is to protect the environment and which contribute to developing and implementing European policy and legislation in the field of the environment.

According to decision 466/2002/EC of the European Parliament and of the Council of 1 March 2002 laying down a Community action programme promoting non-governmental organisations primarily active in the field of environmental protection (see amending acts) (*in ibid.*).

### **A Marine Strategy to Save Seas through Criminal Law**

A Marine Strategy Directive will establish European Marine Regions on the basis of geographical and environmental criteria. Each Member State, in close cooperation with the relevant other Member States and third countries within a Marine Region, will be required to develop Marine Strategies for its marine waters (EU, A Marine Strategy Directive, 2008).

The Marine Strategies will contain a detailed assessment of the state of the environment, a definition of "good environmental status" at regional level and the establishment of clear environmental targets and monitoring programmes.

Each Member State will draw up a programme of cost-effective measures. Impact assessments, including detailed cost-benefit analysis of the measures proposed, will be required prior to the introduction of any new measure.

The Marine Strategy is consistent with the water framework directive from 2000 which requires that surface freshwater and ground water bodies (lakes, streams, rivers, estuaries, coastal waters...) achieve a good ecological status by 2015 and that the first review of the River Basin Management Plan should take place in 2021.

From the proposal of criminal law to environmental protection understood that the Council and the Commission have both recognised the need to establish Community rules to combat environmental crime. At sense, the proposal would require Member States to ensure the proper application of Community law on protection of the environment by providing for criminal penalties for serious environmental offences (EU, Protection of the environment through criminal law).

One can easily understand from this proposal that the European Commission has proposed an ambitious strategy to protect more effectively the marine environment across Europe. In our case, which are CMC ex-mining wastes still working in polluting marine of European Seas, namely Mediterranean including coast of Northern and Southern Cyprus.

Turkey and Northern Cyprus as applicant country as Member States will have to ensure that CMC ex-mining pollution committed intentionally or out of serious negligence which breaches the Community rules protecting the environment is treated as a criminal offence.

Turkey and Northern Cyprus as applicant countries and Southern Cyprus country will submit a report on implementation of the Directive to the Commission. The Commission will then send a report to the Council and the European Parliament. For protecting and remedying disturb or polluted area.

### **Conclusion**

An American mining company called Cyprus Mine Cooperation (CMC) which operated copper mining industry in Cyprus between the years 1914-1974 under the rule of different authorities and environmental laws. According to some expertise reports, mine and its waste was left in Lefke region caused very serious environmental problems such as soil, air, water coasts and sea pollution which is usually defined as the resource of " global environmental problem". It is also

understood that CMC had never been concerned their waste pollution effects on environment on their closure procedures after 1974.

As it is understood nowadays ex-mining wastes still working polluting environment. Governments acting alone, and even regional organizations, can not respond effectively to this kind of environmental problems. The response must be taken account in EU Directives.

In other case, according to the opinion on the White Paper on environmental liability, (COR, 2000, p.1 and 4) proposed European regime should be comprehensive and help to improve implementation of key environmental principles such as the "polluter pays". The costs of preventing and restoring environmental damage will be paid by the parties responsible for the damage, rather than being financed by the tax payer. It means that CMC is responsible for this case.

In other sense, the establishment of a European environmental liability regime will accompany the introduction in the common Environmental Policy of compulsory. The establishment of an effective European environmental liability regime will help to facilitate applicant countries efforts to adopted the EU environmental acquiesce and help to ensure the protection of biodiversity, landscape,

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diversity and the environment of Europe as a whole.

In accordance with the environmental policy of EU, Cyprus Governments (North and South acting together) and non-government organizations and other civil agencies have a chance to apply to EU institutions within the several funds cleaning, restoring, and remedying the environment which was caused environmental damage by the Cyprus Mines.

In this case, has to be mentioned that the importance of the NGOs systematically participating in drawing up and implementing European policy on the environment. Within the concern of small and large NGOs working on the environmental problems locally and regionally, probably all NGOs concerning the protection of environment will receive grants on the priorities of the Sixth and Seventh Environment Action Programme.

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