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LIFE 'HAWAMAN' PROJECT
LIFE06 TCY/TR/000292

**Improvement of Industrial
Hazardous Waste Management
in Turkey**

Layman's Report

LIFE06 TCY/TR/292 'HAWAMAN' PROJECT

The LIFE 'HAWAMAN' PROJECT improved hazardous waste management to reduce impacts of hazardous waste on human health and environment in Turkey.

Implementation

The Department for Control of Hazardous Waste of the Turkish Republic Ministry for Environment and Forestry implemented the LIFE06 TCY/TR/292 'HAWAMAN' PROJECT in cooperation with the German Technical Cooperation GTZ as a partner for technical and financial support.

Duration:

28 Months
January 2007 – April 2009

Finance:

The total project budget was about 800.000 Euro.

The LIFE Third Country Program of the European Union co-financed up to 70% and the beneficiary, the Turkish Republic Ministry of Environment and Forestry, and the project partner, the German Technical Cooperation GTZ, contributed about 30% of the project budget.

GTZ's share of 200.000 Euro was from the Study and Expert Fund funded by the German Ministry for Economic Cooperation and Development BMZ.



The LIFE 'HAWAMAN' PROJECT contributed to:

- *Capacity building, especially in environmental administration*
- *Standardized electronic reporting by environmental authorities and industry*
- *Classification and handling of hazardous waste in Turkey*
- *Dialog between the competent authorities, industry and universities*
- *Awareness on hazardous waste management in public and private sector*
- *Implementation of waste treatment and disposal facilities within the next years*

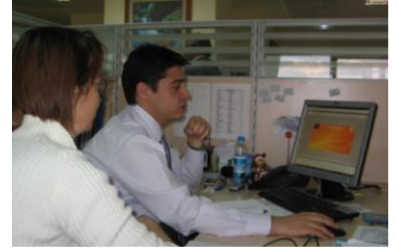
Results

- Overall concept of hazardous waste management for Turkey
- Manual and training-of-trainers for waste classification
- Improved annual inventory of hazardous waste
- Operational electronic hazardous waste record and monitoring system
- Improved control of waste management facilities and industry
- Clear procedures for control of plants and waste generators as well as for trans-frontier waste transport
- Improved hazardous waste management by industry
- Successful training of stakeholders on hazardous waste management

Project Management and Dissemination

The **flyer** in Turkish and English informed the general public about the project.

A **web site** for the LIFE 'HAWAMAN' PROJECT was created and maintained for the dissemination of information on upcoming events and the distribution of project results. The majority of documents is in Turkish language and available from the Turkish version of the web site.



2 stakeholder consultations with around 100 participants spread information on project results. One consultation in 2007 focussed on the introduction of the HWRS. The main topic of the second stakeholder meeting in 2008 was the concept on hazardous waste management for Turkey.

On the environment fair REW 2008 in Istanbul the technical project management of MoEF, Betül Dogru, and GTZ, Anja Schwetje, disseminated information on interim results of the LIFE 'HAWAMAN' PROJECT.



Skills on **management of EU projects** were acquired by on-the-job-training.



The **financial and technical project management** of MoEF and GTZ was often tested by the challenge of coordinating requirements of the LIFE programme, the Turkish Government regulations and GTZ standards.

About 30 government officials of the Ministry of Environment and Forestry in Ankara and from selected provinces and Turkish experts cooperated with a dozen German experts in 6 working groups, which were coordinated by the technical project management.

The Turkish and German experts were assigned and achievement of project results supervised by the technical management Betül Dogru of MoEF and Anja Schwetje of GTZ. Steering of the project proved more efficient by the coordination of working groups, which met with relevant stakeholders regularly, than by the steering group that had been initiated earlier.

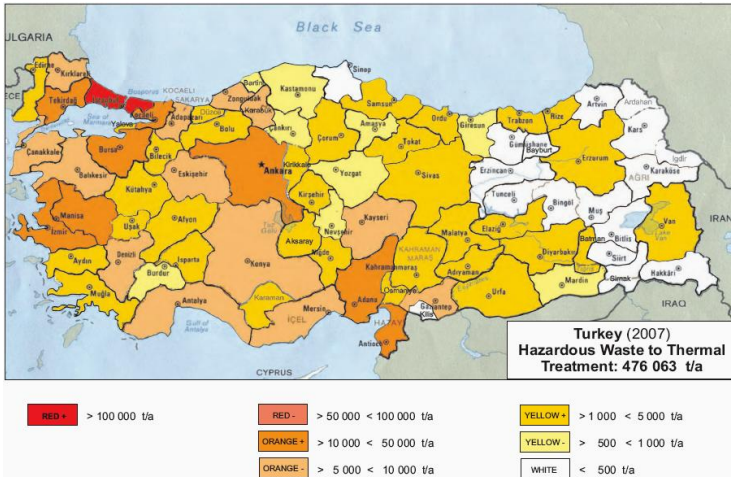
More than a dozen trainings and workshops, 2 stakeholder consultations, 20-30 site visits, a study tour and the **kick-off and closure** of the LIFE 'HAWAMAN' PROJECT were organized.

For more information please consult the **web site** at <http://www.lifetcy06.cevreorman.gov.tr>



Concept on Hazardous Waste Management

The LIFE 'HAWAMAN' PROJECT achieved the first complete and most recent **estimation of hazardous waste** types and quantities generated by industry in Turkey. The estimation took international experiences on hazardous waste generation of industry in account and was conducted by Mr. Denz of GTZ.



Maps of the concept on hazardous waste management in Turkey visualized the regional distribution of hazardous waste generated and the demand for hazardous waste treatment and disposal in specific areas.

Transport distances and areas with high waste generation played an import role.

The facility register of the electronic waste record system HWRS supported the elaboration of maps, which display the existing treatment and disposal capacities, by GIS application.



The allocation of specific waste streams to treatment and disposal options based on European standards laid the basis for the assessment of demands for treatment and disposal of industrial hazardous waste in Turkey.



The **procedures on hazardous waste management** described the criteria for the assignment of waste to disposal options.



The **Overall Concept on Hazardous Waste Management in Turkey** was prepared for the LIFE 'HAWAMAN' PROJECT with the expertise of Prof. Dr. Thomanetz from Stuttgart University, Prof. Yetis from Middle East Technical University METÜ and with the expert team of the Ministry of Environment and Forestry. The concept recommended capacities for treatment and disposal of

hazardous waste in Turkey.

Sustainability in the improvement of hazardous waste management in Turkey went beyond a successful preparation of a high-quality concept.

The LIFE 'HAWAMAN' PROJECT results were directly followed-up by an implementation study financed by KfW, which intends to financially support investment in the Turkish hazardous waste management sector.

The LIFE 'HAWAMAN' PROJECT successfully involved the stakeholders in the development of the concept on **workshops** and a **stakeholder consultation**, but the **dialog** started with the *fruitful exchange of international experiences on hazardous waste management in September 2008*



The Deputy Undersecretary Sedat Kadioglu chaired the intensive discussion between the heads of concerned departments of the Ministry of Environment and Forestry, the LIFE 'HAWAMAN' PROJECT team, KfW and representatives from other ministries, universities, industry associations and chambers, greater municipalities and waste disposal facilities on **transferability of international experiences for Turkey** regarding:

- 1) Ownership of waste treatment/disposal facilities by private or public sector or other ownership models and organisation of hazardous waste stream control by the competent authority have a large impact on investment in the hazardous waste treatment sector.
- 2) Information on regional distribution of the hazardous waste types and quantities generated and the assumptions for the assignment of the generated waste to treatment/disposal options have a strong impact on the planning and organisation of hazardous waste management.



Waste Classification

The By-Law on Principles for Waste Management transposed the Commission Decision on the European List of Waste (EWL) in July 2008 into Turkish law.

The EWL is the common language in the European Union on all issues related with waste.

It is structured in 20 chapters. Wastes are characterised by a six-digit code.

The EWL contains in total 839 waste codes of which 405 are entries for hazardous waste and marked by an asterisk.

Some of these hazardous waste entries in the EWL are absolutely hazardous.

Other waste's entries are included twice in the EWL, as a hazardous and as a non-hazardous waste, the so-called mirror entry.

Correct classification of hazardous waste is one of the most difficult and complex issues in waste management and for data reporting.

The LIFE 'HAWAMAN' PROJECT successfully supported industrial waste generators and environmental administration in their efforts on the correct identification and classification of waste in Turkey with

- Waste Classification Manual including waste data sheets regarding the mirror entries
- Training material
- Training of trainers

Basically two experts, Mr. Akinc and Mr. Behrend, dedicatedly elaborated the **Manual for the Classification of Hazardous Waste** comprising of about 500 pages and structured in 3 volumes:

Volume I:

- Introduction
- Legal basis on waste classification in EU and Turkey
- Classification of hazardous wastes and the hierarchy to be applied:
 - Information from dangerous substances and preparations
 - Information from experiences and the knowledge of waste generation
 - Analytics
- Possible application fields of EWL



Volume II:

Waste Data Sheets and waste specific guidance to support the classification of the so-called mirror-entries of the EWL

Reference to the OECD codes and other classification systems of hazardous waste.

Volume III:

Annexes



The LIFE 'HAWAMAN' PROJECT organized 4 **training of trainers courses** on waste classification for professionals from public and private sector.

78 trainers learned how to apply and teach the complex principles of waste classification in practice.

Staff members of the Ministry of Environment and Forestry and its province administration, from other ministries, industrial chambers and industry associations, research centres, universities and industry received a profound **3-days training**.

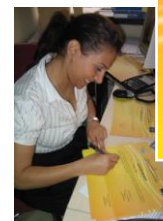
The evaluation showed that their knowledge increased by 75% and that **they felt confident and sufficiently trained to pass their knowledge on waste classification to others**.



The training course was a mix of presentations, exercises and waste classification of real waste samples and during a site visit to an industry.

The **training material** was distributed to each trainer on a CD.

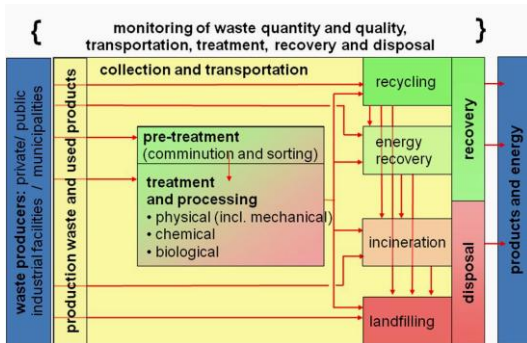
To prove a successful completion of the training course each trainer received a **certificate** and was included in the **list of responsible trainers** to be consulted at LIFE 'HAWAMAN' PROJECT web site.



The provinces Bursa, Mersin, Izmir and the Ministry in Ankara hosted the training of trainers courses from May 2008 to March 2009 and organized the visits to an industrial

facility for training purposes.

Optimisation of Hazardous Waste Management



The **Hazardous Waste Record System HWRS** is used for collection and validation of data on hazardous waste, which are reported by industrial waste generators.

This **lean and user-friendly data management system is perfectly replicable** in other countries.

ARGUS GmbH analysed the existing and planned data management systems for the **feasibility**

study and proposed models for the data flow and an implementation scheme of the HWRS.

A small but very efficient and hard working task force of Arzu Nuray of MoEF with ARGUS GmbH was formed, which cooperated excellently during the whole project duration.

With the LIFE 'HAWAMAN' PROJECT the innovative cooperation of the Ministry for Environment and Forestry with Turkish Statistical Office TURKSTAT gained momentum.

Until March 2008 a web-based **Hazardous Waste Record System HWRS** was programmed by TURKSTAT's IT department for the Ministry. It consists of

- A business register for the main data of waste generators. The basis was retrieved from TOBB. Now waste generators and local environmental administration are maintaining its content.
- A facility register for the main data of recovery and disposal installations. Its content has to be supplied and maintained by MoEF directly.
- The data collection system for the raw data of each annual survey. Survey data are validated every year. Each province administration has direct access to data of their province. MoEF has access to all data nationwide.



- The entry mask with the password-restricted access, which allows industry to enter and correct data discreetly. Several features facilitate the use of the system (pull-down menus on waste codes and links to the facility register to select the appropriate installation by mouse click etc).

All 81 provinces and about 50 members from associations and industrial chambers were invited by LIFE 'HAWAMAN' PROJECT to a **consultation on the HWRS application**.

The Hazardous Waste Record System is operational since April 2008 and gained the fully acceptance of the users from companies or administration.

Two surveys for the inventory of 2007 and 2008 waste data were successfully supported with the HWRS.

Capacity Building

The LIFE 'HAWAMAN' PROJECT successfully strengthened the control and supervision capacities of the local and central level of the Ministry of Environment and Forestry.

It effectively combined environmental capacity building with tangible improvements in hazardous waste management.

An assessment of shortcomings in the control and supervision system revealed that documentation and follow-up of control visits needed standardization.

The **guidance/check lists** support a structured and replicable documentation of inspection results for the Ministry of Environment and Forestry.

The local inspection staff may easily detect and report shortcomings and necessary improvements in the facility's hazardous waste management. The electronic version of these guidance/check lists by HAWACON further improves the communication between the province and central environmental administration.



Turkish inspection staff was **trained-on-the-job** by German experts on several control visits to disposal and recovery facilities in Istanbul, Ankara, Izmir, Kocaeli and Hatay:

- D10 Incineration on land
- R2 Recycling/reclamation of solvents
- R3 Recycling/reclamation of organic substances not used as solvent
- R4 Recycling/reclamation of metal compounds
- R13 (Interim) Storage of waste

The application of the improved control system was explained to the ministerial staff during the **control group** meetings, the control visits and on a special training.

But a **balanced control and supervision system of waste disposal facilities** needs competent professionals in administration and in the facilities likewise to improve handling of hazardous waste sustainably.

So the LIFE 'HAWAMAN' PROJECT took care that the inspected facility also profited from the intensive **advisory service** of the German experts during the site visits.



The same procedures were applied for the **control and supervising system for waste producers**. The control system was standardized and improved by adapted guidance/check lists for waste producers.

Waste generators in Istanbul, Kocaeli, Ankara and Konya were controlled in the framework of **training-on-the-job and advisory service** during which the checklists were applied in small and medium size enterprises.

These type of companies needed special support to classify waste and handle/dispose of it environmentally sound.



Guidelines on waste management issued by MoEF supported:

- Galvanization
- Metal Shaping
- Car Repair Workshops
- Leather Production
in cooperation with the leather industry
- Foundries
in cooperation with the foundry association
- Coating and Painting
- Paint Production



Both in cooperation with the paint industry association.



Guideline on trans-frontier waste transports to EU and non-EU improved the transport of hazardous waste and supported Turkish waste transporters to comply with recent EU regulations.

The **control of special parameters of disposal plants** involved almost all waste incineration and gasification facilities in Turkey.

A **monitoring group** created by the LIFE 'HAWAMAN' PROJECT of staff from the departments for hazardous waste and for emission control and the reference laboratory strived to become a knowledge pool and task force on waste incineration control at the Ministry. **Exchange of experience and on-the-job-training on repeated control visits** with GTZ experts Mr. Sarac and Dr. Weber built the capacity of the monitoring group members and at the environment administration of Istanbul, Izmir and Kocaeli on inspection and regarding the interpretation of monitoring reports.



The LIFE 'HAWAMAN' PROJECT openly shared the **advisory service** with the operators of the plants. A significant improvement in control equipment performance and documentation/reporting of monitoring results was achieved by the concerned operators between two control visits.

Turkey's important research institute TÜBİTAK took part in the discussions on control of special parameters, which ranged from interpretation of monitoring reports in general to parameters like mercury, dioxin/furan or other unintentionally formed persistent organic pollutants.

Training

The LIFE 'HAWAMAN' PROJECT assessed that improvements in hazardous waste management in Turkey required more specific expertise on hazardous waste treatment and disposal technologies in industry and administration.

So the LIFE 'HAWAMAN' PROJECT **trained more than 120 professionals on 3 training courses on hazardous waste treatment and disposal.**

Training Results

3/4 of the participants trained by the LIFE 'HAWAMAN' PROJECT stated that

- *their knowledge on the treatment and disposal of hazardous waste had increased more than 50 %*
- *they were satisfied to highly satisfied with the training course*

The provinces Ankara, Kocaeli and Antalya hosted the three-day training courses, which successfully reached a broad audience.

The local and central level of Ministry of Environment and Forestry, the Ministry of Industry and its departments for large enterprises (OSBÜK) and small and medium size enterprises (KOSGEB), the Ministry of Energy and the Ministry of Transport benefited from the know how presented as did members of industry chambers and industrial associations, engineers responsible for environmental management in enterprises/waste generators or scientists of universities and research centres.



Training material:

The training comprised of 4 modules:

- Turkish situation
- Disposal of hazardous waste by thermal processes and landfill
- Treatment options for solid and liquid/sludgy hazardous waste
- Physical-chemical treatment in publicly available facilities
- Treatment/disposal costs

All participants received the Turkish **training manual on CD plus a certificate.**



A **study visit** to Germany opened opportunities to study the network of facilities and actors necessary to improve hazardous waste management. A dozen participants discussed the organization of waste management with public and private sector, the control of facilities by the authorities on 10 visits and exchanged valuable information with DG Environment in Brussels.

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