

WASTE KNOWLEDGE

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WASTE KNOWLEDGE

Introduction

We can say that waste is a substance or an object that the person who has produced it, wants to get rid of. Often we only see the waste in our trash can, and it does not make us worry, but actually waste is a serious problem for the Planet. Why?

What is waste

In nature, the concept of waste does not exist. In fact, in biological cycles whatever is discarded by one organism becomes a resource for other living beings so that nothing is wasted, and everything is transformed. Dead organisms, animal faeces, or plant remains are defined organic waste and are used as food for particular organisms known as decomposers, that transform the waste products of other living beings into precious resources and are therefore very important.

Up to the last century, man behaved very much like nature. Specially in the farming society, due to the lack of resources everything was utilized, and nothing was thrown as long as it was useful. Almost all that was thrown was organic and was disposed of by the decomposers in nature. The advent of the industrial revolution and the increase in goods brought into society, also determined an increase in the consumption, and therefore an increase in the amount of waste. In fact, in the current social and productive models, after withdrawing material and energy from the environment in order to produce consumer goods, the production of waste follows. Waste is not only organic as in the pre-industrial society but is also inorganic (as in the case of plastic) and often waste remains in the environment for a long period of time as it is not a source of food for any organism. This implies two things: first of all, waste is generated by us during our daily activities, and by the industries that produce the products that we make use of to live, but also there are no cleaners that re-use a large part of our waste, and therefore it accumulates in large quantities. Human beings are trying to find some solutions. Which?

Waste in pre-industrial society ...

Even though in the past human beings produced small amounts of waste, the problem of where to deposit the same existed even then. Whatever could not be recycled or reutilized was often thrown on the road, with severe consequences for health. Alternatively, waste was burnt or buried underground outside the inhabited centres, thus giving rise to the first waste dumps. Waste in ancient times was very different from ours. Waste was organic and consisted mainly of products that were discarded by the workshops and kitchens, human and animal waste, carcasses and their remains. The first humans who thought of waste disposal by burying waste underground were our ancestors – near their prehistoric settlements, in fact, archaeologists have found the remains of their meals (the bones of the prey they hunted) and small tools and earthenware. Instead, it seems that the Greeks were the first to feel the need for a public town-cleaning service, and a group of sweepers were appointed (probably slaves) to clean the city of Athens. During the Roman Empire, the Romans

established the first public service for waste collection and disposal, and they exported this model all over the Roman Empire. In the Middle Ages the situation worsened remarkably, and the citizens considered the road a privileged place where to get rid of their waste. In this period the forerunners of city waste dumps were born, cavities that were known as *butti*. The few inorganic waste products were disposed of differently. Before becoming waste, the objects changed owners various times, passing through the entire social chain. In ancient societies, and up to the dawn of the industrial society, whatever was thrown away, because it was considered useless by the rich, became precious for the poor.

... and in the consumer products' society

A big change took place in the second half of the XIX century. With the Industrial Revolution an intensive exploitation of the resources began. Industries started the mass production of items, that were more economical than those made by craftsmen and therefore more accessible to all. Soon humans passed from a frugal and semi-agricultural society to an industrial consumer society, that adopted disposable objects as their style of life. Since some decades, objects are no longer repaired, nor are they reutilized as they can easily be replaced by other new ones. The result has been an excessive production of waste in relation to the planet's capacity to dispose of it, thus becoming the negative symbol of riches and wellbeing. With the industrial era also the kind of waste changed. Besides the increase of glass, metal and organic wastes, new materials, as for example plastic, have appeared, and as these are not biodegradable, they remain in the environment for a very long time.

Which waste

The waste we produce every day is defined Municipal Solid Waste (MSW) and includes whatever is discarded during our daily activities. All other waste is defined special waste, which includes waste produced by industrial activities, handcrafts, hospitals, etc. In order to simplify waste management, MSW is subdivided according to its composition, also known as the product fraction. There are six main categories: 1) recyclable materials (paper, plastic, glass, etc.); 2) compostable materials (kitchen leftovers, garden trimmings, etc.); 3) bulky materials (sofas, furniture, etc.); 4) durable goods, waste electrical and electronic equipment (computers, TV sets, refrigerators, etc.); 5) dangerous urban waste (batteries, drugs, car batteries, etc.); 6) residue (whatever is not classified in the previous categories).

MSW can be considered a kind of documentation regarding the use and life-styles of those who produce them. In fact, the types of waste differ not only from one state to another but also within the same state (for example, waste produced by a town and by the countryside, or by different areas of the same town). If we analyse the average hypothetical rubbish bag of the Italians, we will discover that most of the waste produced, up to 40% of the total, consists of compostable materials. The other main component of our waste consists of recyclable materials (about 48%) subdivided according to the raw material they are made of: paper and cardboard paper (20-30%), glass (7-10%), plastic (10-14%), metals (4-6%), wood and textiles (5-7%). The remaining part consists of durable and dangerous waste.

Laws regarding waste

Up to the Seventies, Municipal Solid Waste (MSW) was collected without any separation, and it was disposed prevalently in non-controlled dumps. As an alternative to the direct disposal of waste in the ground, thermal treatment or incineration was used. In Italy, the concept of recycling and recovery of materials through separate waste collection began only in the 90s. In this period also laws regulating waste disposal in the dumps were issued. In Italy a legislative measure, which was very important from the point of view of waste disposal, was Legislative Decree n. 22 dated 1997, better known as the “Ronchi Decree”, from the name of the Minister who signed the law. The more important aspect of this decree is that it represented a change in the legislation regarding all the regulations on waste. Practically, the philosophy of the decree is based on the belief that pollution produced by waste must be coped with by decreasing the total amount of waste produced, and not only by the simple disposal of waste in the dumps. At present, the Ronchi Decree has been superseded and cancelled by Legislative Decree n. 152 dated 2006, subsequently followed by Legislative Decree n. 205, dated 3 December 2010 – in force from 25 December 2010 – implementing European Directive 2008/98/EC on waste in the Italian legislation.

European Directive 2008/98/EC

The Directive states how waste must be treated in the Community. The primary aim of the directive is to protect the environment and human health, through the prevention of the negative and dangerous effects deriving from the production and management of waste. According to the directive, a greater protection of the environment requires the realization of a series of measures that are applicable according to an order of priorities: 1) prevention of waste; 2) preparation for waste re-utilization, 3) recycling; 4) another type of recovery (for example of energy), 5) disposal. This means that first of all we need to think of preventing waste, avoiding producing waste; and if this is not possible measures must be taken to reutilize it, after which it must be recycled, and so on...

All the Member States of the European Community can apply further legislative measures in order to strengthen this hierarchy, but what is important is that human health must always be guaranteed, and that the environment must be respected. Whoever produces or possesses waste products must take care of treating the same or must hand it over to someone else who is appointed to do so. In particular stocking and treatment of dangerous waste products must follow an even more severe code for their disposal than domestic waste, to avoid any risks for humans or for the environment. Furthermore, since the production of waste tends to increase in Europe, the regulations carry an invitation to strengthen all measures in the field of prevention and reduction of the correlated impacts and to encourage the recovery of waste.

Ronchi Decree and Legislative Decree 52/2006

The Ronchi Decree defines waste as “any substance or object which the owner discards or intends or is required to discard”. First of all, this definition assumes that any goods are destined, sooner or



later, to become waste. Secondly it can be deduced that the transformation from goods to waste depends mainly on the consumers' choice. Waste is classified according to its origin, into Municipal Solid Waste (MSW) and Special Waste (SW) and, depending on its characteristics and dangerous nature, into Dangerous Waste (DW) if the waste contains at least one of the substances listed in the attachments of the Decree, and into Non-Dangerous waste if the waste does not contain any of the said substances. For example, batteries, expired drugs and exhaust oil are considered DW.

If, instead, we look at waste management, we must remember that any treatment will only lead to a transformation of the waste and/or its transfer from a physical state to another, however in no cases does the treatment lead to its destruction (the law on conservation of mass). Therefore, the most sustainable behaviour with regard to waste, is to reduce the amount upstream, in other words to produce as little waste as possible trying to use each thing a number of times (as in the past). And these were the principles that were followed when the Decree was written. In order to reach these aims, it is fundamental to inform the citizens and the producers and make them aware. Wherever it is not possible to reduce the amount upstream, or in case the materials cannot be re-utilized, waste that cannot be recovered must be separated from waste that can be sent for recycling.

Legislative Decree 152 of 2006, became effective on 22 April 2006, and at the same time it also cancelled the Ronchi Decree. Legislative Decree 152 of 2006, regulates waste management, packaging and other special categories, such as electronic waste, hospital waste, etc. The area of application of this Decree regards waste management and reclamation of polluted sites, also in fulfilment of the EEC Directives. The management activity has the task of guaranteeing a high level of protection of the environment and efficient controls, bearing in mind the specific nature of dangerous waste, and also the protection of natural resources. Waste must be recovered or disposed of without any danger for human health and without using processes or methods that could jeopardize the environment. The Decree promotes, as a fundamental point, the prevention and reduction of waste production, and of poisonous waste, in particular through the development of clean technologies, techniques to eliminate dangerous substances in waste with the scope of favouring the recovery of the same; and lastly a decrease in the quantity of waste. Finally, the measures aimed at the recovery of waste by reutilization, recycling of the same or any other direct action, must be oriented mainly at using waste as a source of energy. Among the principal novelties of the Decree, there are measures to increase separate waste collection, which includes a definition of the aims.

Text updated to August 2022