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## Reducing food and water waste in hotels: Sustainability at risk?

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### **Abstract**

Food and water waste are two elements that are very common in hospitality businesses. This article will consider why such waste occurs in hotels and the possible solutions to reduce these losses. Reducing food and water waste has an impact not only on the economy but also on the social and environmental environment. Relieving these harmful elements will therefore lead to an improvement in the hotel's profitability and better sustainability of the hospitality business.

**Keywords:** Food waste, hotel, waste of water, sustainability

### **Introduction**

#### **Food and water waste in the world: an introduction <sup>1</sup>**

Food waste is one of the most critical environmental problems of our time. This is both because food waste is something to be deplored and because millions of people are starving. Therefore, food waste should be studied in economic terms and socio-environmental terms so that a balance can be restored between the supply and demand for food, not just locally but worldwide. This is not the place to discuss this issue from an economic or social point of view at a global level. However, we cannot forget that in 2011, the first study on the impact of food waste on the environment carried out by the FAO showed that 1.3 billion tonnes of food were wasted every year, equivalent to one-third of total food production for humans consumption. Ten years ago, these figures highlighted a problem that needed and still needs an immediate solution to eliminate food waste and, at the same time, drastically reduce hunger in the world.

Ten years later, nothing has changed; on the contrary, it is possible to say that the situation has worsened. In the International Day of Awareness of Food Loss and Waste - it is stated that 29 september 2021 si afferma che "globally, around 14 percent of food produced is lost between harvest and retail, while an estimated 17 percent of total global food production is wasted (11 percent in households, 5 percent in the food service and 2 percent in retail).

Food loss and waste undermine the sustainability of our food systems. When food is lost or wasted, all the resources that were used to produce this food - including water, land, energy, labour and capital - go to waste. In addition, the disposal of food loss and waste in landfills, leads to greenhouse gas emissions, contributing to climate change. Food loss and waste can also negatively impact food security and food availability, and contribute to increasing the cost of food.

Our food systems cannot be resilient if they are not sustainable. Hence the need to focus on the adoption of integrated approaches designed to reduce food loss and waste. Actions are required globally and locally to maximise the use of the food we produce. The introduction of technologies, innovative solutions (including e-commerce platforms for marketing, retractable mobile food processing systems), new ways of working and good practices to manage food quality and reduce food loss and waste are key to implementing this transformative change. "

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<sup>1</sup> To facilitate reading, I have decided not to include in the text, except in exceptional cases, the names of the scholars who have dealt with the subject under analysis since the bibliography is endless, I have opted not to indicate all the terms of the scholars in the text because this would have meant a continuous interruption of the reading of the complete sentence in which I express my thought.

It is clear that food waste generates enormous social, economic and socio-environmental costs and has an environmental impact that makes it an element that runs counter to the sustainability that we have been talking about so much in recent years.

Tackling, investigating and overcoming the problem of food waste must therefore be a primary objective that scholars, academics, business managers, communities, and individuals must set a definitive end to a problem with economic, social, environmental, and ethical implications.

As we have already stated, this is not the right place to discuss such a globally relevant issue. In this paper, we will deal exclusively with the issue of hospitality. Our study will focus on both food waste in general and the waste of one particular element, water. The study we will carry out will analyse the economic impact on the hotel's situation and the effect on the sustainability of the waste of the two elements mentioned above. Our objective is therefore to highlight the consequences of food waste and water waste both from a purely comic point of view, illustrating the impact of this behaviour on the balance sheet of hotels, and from a general sustainability perspective that concerns the individual company, the community in which the company operates and the whole world.

At this point, the question arises as to who is to blame for most global food waste. Studies have shown that in Australia and New Zealand, food waste stands at around 6% of production, while in Central Asia and South Asia, the percentage rises to 21%. In Europe and North America, food waste stands at around 16%. As you can see, the rates are very high, so much so that it is the task of every person and every company to reduce food wastage, at least for social, ethical reasons in the face of world hunger. In studies carried out by various organisations, albeit with different percentages, it is clear that food and water waste is mainly due to households. However, there is no doubt that the rate of waste occurring in companies that use, market or sell these products is also high and has a significant impact on the total food and water waste worldwide.

Concerning household waste, the solution to this problem can only come from spreading a culture of sustainability that should permeate the entire community, starting with primary schools. Only by spreading a culture of sustainability at the level of the individual will it be possible to reduce food and water waste within the family.

If, on the other hand, we are talking about companies, particularly hospitality companies like ours, the problem must be tackled both at a cultural level and at the level of company protocols. These protocols, however, will only be successful if they are shared firstly by the managers and the management of the company and secondly by the entire hotel staff.

To conclude this brief introduction to the problem of food waste, we can recall how the FAO, in 2015, set a goal for sustainable development divided into 17 sub-goals (no poverty, zero hunger good health and well-being, quality education, gender equality, clean water and sanitation, affordable and safe energy, decent work and economic growth, food, innovation and infrastructure, reduced standards, sustainable cities and communities, responsible consumption and production, climate action, life below sea level, life on land, peace, justice and strong institutions, partnership for the goals). In particular, the SDG target concerning the subject of our study is marked with the

number 12.3 and foresees the halving of food waste per capita by 2030. In particular, target 12 states: "Each year, an estimated 1/3 of all food produced – equivalent to 1.3 billion tons worth around \$1 trillion – ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices; 38 million children under the age of 5 were overweight or obese in 2019. Land degradation, declining soil fertility, unsustainable water use, overfishing and marine environment degradation are all lessening the ability of the natural resource base to supply food.

The food sector accounts for around 30 per cent of the world's total energy consumption and accounts for around 22 per cent of total Greenhouse Gas emissions."

In particular, SDG target 12.3 highlights: A Global Challenge

Around a third of all food produced for human consumption is lost or wasted from the farm to the fork. This huge level of inefficiency has economic, social, and environmental impacts. Food loss and waste causes about \$940 billion per year in economic losses. It exacerbates food insecurity and malnutrition. And food that is ultimately lost or wasted consumes about a quarter of all water used by agriculture, requires land area the size of China and is responsible for an estimated 8 percent of global greenhouse gas emissions. Reducing this food loss and waste is a "triple win." Reductions can save money for farmers, companies, and households. Wasting less means feeding more. And reductions alleviate pressure on climate, water, and land resources.

### **A Historic Opportunity**

In September of 2015, a historic window of opportunity opened to boost the issue of food loss and waste reduction onto the global agenda. At the United Nations General Assembly, countries of the world formally adopted a set of 17 Sustainable Development Goals (SDGs) as part of the Post-2015 Development Agenda—global goals to end poverty, protect the planet, and ensure prosperity for all.

SDG 12 seeks to "ensure sustainable consumption and production patterns." The third target under this goal (Target 12.3) calls for cutting in half per capita global food waste at the retail and consumer level, and reducing food losses along production and supply chains (including post-harvest losses) by 2030.

SDG 12.3: "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses"

### **A Historic Ambition**

This ambitious yet achievable target has the potential to embed the reduction of food loss and waste firmly in public and private sector strategies around the world for the first time. It is truly a global target; although solutions may differ between developed and developing countries, every region has a role to play.

Target 12.3 contributes to achieving other international aspirations such as the Zero Hunger Challenge, the UN Framework Convention on Climate Change, and more.

Target 12.3 can improve the economics of countries, cities, businesses, and households.

Target 12.3 can reduce impacts on climate, water, land, and energy."

It should note that food waste is also a factor affecting

biodiversity, which indirectly increases the need for new agricultural land. This leads to changes in the composition of the land: the need for more agricultural land leads to deforestation and a change in the use of much of the land, with easily understandable consequences for local flora and fauna. Reducing food waste and water consumption, therefore, has implications that go beyond the pure food problem; even if the latter were to be the only problem created by the waste as mentioned above, it would be more than enough reason to set the goal of drastically reducing food and water waste.

As you can easily understand, the issue is being studied and given attention. The goals set out in the SDG are particularly ambitious, and it is to be hoped that we can achieve at least some of them. In the following pages, we will abandon this general analysis of world data and focus our attention on hotels to analyse how, in these businesses, the problems of wastage of both food and water, fundamental elements for human life on our planet, are addressed and overcome, at least in part.

#### **With particular reference to water, the FAO's SDG 12 target highlights that:**

- Less than 3 per cent of the world's water is fresh (drinkable), of which 2.5 per cent is frozen in the Antarctica, Arctic and glaciers. Humanity must therefore rely on 0.5 per cent for all of man's ecosystem's and freshwater needs.
- Humankind is polluting water in rivers and lakes faster than nature can recycle and purify
- More than 1 billion people still do not have access to fresh water
- Excessive use of water contributes to the global water stress.
- Water is free from nature, but the infrastructure needed to deliver it is expensive.
- Water use has been increasing worldwide by about 1per cent per year since the 1980s.
- Agriculture (including irrigation, livestock and aquaculture) is by far the largest water consumer, accounting for 69per cent of annual water withdrawals globally. Industry (including power generation) accounts for 19per cent and households for 12per cent.
- Over 2 billion people live in countries experiencing high water stress.
- Over the period 1995–2015, floods accounted for 43per cent of all documented natural disasters, affecting 2.3 billion people, killing 157,000 more and causing US\$662 billion in damage.
- Three out of ten people (2.1 billion people, or 29per cent of the global population) did not use a safely managed drinking water service<sup>4</sup> in 2015, whereas 844 million people still lacked even a basic drinking water service. “

It should note that food waste is also a factor affecting This is not the right place to go into this issue globally. There is no doubt that water is wasted at a population level. While there are only a few people, compared to the world's population, who adopt excellent behaviour concerning reducing the consumption of this precious element, there are many people who increase this harmful behaviour instead of

reducing water wastage. The lack of reservoirs and the presence in many countries of inadequate and obsolete pipelines causes water to be wasted without the individual to do anything about it. Such problems can only be solved at a central and political level. However, water wastage is also often found in households that do not apply optimal behaviour to reduce water wastage (for example, many people leave taps running even when water is not being used, and many people consume an abnormal amount of water for washing or sanitary purposes). As we have already pointed out in the previous pages, we do not intend to go into the correct use of water and the reduction of waste of this essential element. In the following pages, we will address the issue of water waste in hotels and businesses that implement hospitality in various ways (B&Bs, group gatherings, etc.). Therefore, our attention will focus only on water wastage in hospitality accommodation with emphasis on the business, economic and socio-environmental aspects of the behaviours that cause the loss of the most precious element for human beings, i.e. water.

#### **Food waste in hotels: from food production to customer consumption. Sustainability in the balance**

As it occurs in the household, food waste also appears in businesses that directly or indirectly deal with food. Food waste occurs throughout the food chain, from production to final consumption of the product. The FAO highlighted the conceptual difference between food loss and food waste. According to this hypothesis, in the FAO document of 2013, it is stated that "food loss refers to the decrease in the mass or quantity of dry matter or nutritional value or quality of food that was originally intended for human consumption", while "food waste refers to food deemed appropriate for human consumption that is discarded, regardless of whether it is stored beyond its expiry date or allowed to go bad". The differentiation made by the FAO is sometimes difficult to discern, which is why in this article, we will talk about food waste as including food losses in a hotel restaurant or other businesses that process and sell food.

Within a hotel or other business that processes and sells ready-made food (e.g. sandwich shops, restaurants, bakeries, etc.), a considerable amount of food waste occurs, which, when added up for all the activities carried out in the world, leads to tons of food being dumped.

Before any other consideration, it is worth pointing out that food waste in a hotel or other food-processing business can occur before or after the product is sold.

Food waste and loss of product can occur at the time of purchase and storage of raw materials. Next to this moment, food waste can also occur during food preparation and display. On the other hand, food waste occurs at the post-production stage if it occurs after the product has been sold. This occurs when food is wasted by a customer who orders more food than necessary, resulting in large leftovers that are inevitably thrown away. Regardless of the cause of food waste, the presence of such products purchased and not used or not consumed harms the company's profitability and assets. If food products are partly bought and not sold, this causes a loss and therefore constitutes a cost for the hotel or the company that handles and sells food products. The goods brought to the customer's table and not consumed are also, in fact, a business cost because although the selling price covers them (the customer pays for everything he orders regardless of what he consumes), they might not have

been incurred if the portion had been better calculated. In this case, the customer would not have caused leftovers and would not have generated food waste. Reduced portions must indeed correspond to a lower selling price. Still, if an average calculation is made, it can be seen that the reduction in the selling price of the portion would be less than the reduction in the cost not incurred because of improved portioning. Therefore, food wastage by the customer also indirectly causes economic damage to businesses, which could avoid this expense by better managing the portions and products sold.

However, food waste in hotel restaurants or other businesses that handle and sell food occurs mainly in the pre-sale phase, i.e. when food is procured and produced. Food waste related to food procurement derives from excessive quantities of food purchases compared to sales needs, which inevitably become spoiled and landfill. Another pre-sale food waste occurs at production, where production is often excessive compared to actual sales. In this case, too, the unsold food becomes, by definition, food waste. Food waste at the production stage can also be due to human error or portioning errors. All leftovers occurring at buffets of various kinds are included in food waste. A case in point is the cruise buffets. From conversations with staff on ships and personal experience, it can be said that the free buffets on cruises produce tonnes of food waste, both because of the massive production of unconsumed food and because of the huge quantity of goods that customers request and then do not consume and leave on their plates. All this results in food waste of immense proportions.

A study carried out by Papargyropoulos *et al.* Shows that around 56% of food waste in the hospitality sector could be prevented if better-planned stock and portion management. This shows the relevance of management control, cost analysis and planning also in hotels and foodservice companies. In hotels and other businesses, planning and budgeting are often given low priority because it is too complex to predict the number of customers the establishment will receive in the coming months. This statement is also frequently made by managers of non-hospitality businesses. Still, it is particularly common in hotels because managers say it is almost impossible to identify a year in advance which and how many customers will arrive day by day in the following year. It should be noted that good planning in a hotel also identifies the nationality of future customers as this affects the restaurant sector as the location of customer arrival requires exceptional food to be prepared.

Setting up a control system that highlights changes in raw material consumption and revenue changes in terms of sales price and sales quantity is essential if food waste is to be reduced. Only by correctly identifying the motivation for the creation of such waste can the causes of food losses be reduced. It is clear that reducing food waste produced by restaurants, hotels or businesses that handle and sell food products requires a willingness to change the existing situation. The thought of running a business according to the instincts of the entrepreneur, owner, or manager is now obsolete. Implementing a control system that monitors warehouse management, the production of goods, the quantity in individual portions and the link between production and display can be said to have become a necessity for all hotels that wish to keep food waste under control. It should also be noted that food waste often leads to the

creation of other items that have to be disposed of in landfills. Purchased food generally has packaging, which in turn creates things that end up in landfills. Preventing food waste, therefore, in reality, can have three positive effects on businesses:

1. Reduce pre-sales costs for goods to be thrown away;
2. Reducing costs associated with sales which in turn lead to unconsumed leftovers;
3. Reduce the production of landfill goods consisting of food packaging.

There is also another positive effect which we will discuss in the following pages, concerning the tendency of customers to look for sustainable environments, including hotels. However, we will make some remarks on this issue later, after addressing the issue of reducing water consumption.

Concerning food waste in hotels and businesses that handle and sell food products, it should be remembered that in 1989 the European Parliament issued a document entitled "Community strategy for waste management". It identified a hierarchy of food waste. In this document, later taken up by every document issued by the European Parliament on this issue and by the legislative documents issued by the EU member states, it is stated that the priority scale of waste should be as follows:

- a) Prevention
- b) Re-use
- c) Diversion of unused foodstuffs to composting or renewable energy generation
- d) Landfill.

Landfills should be the last option considered to prevent food waste. It is noteworthy that small hotels, in particular, produce a significant amount of waste even though most of the studies focus on large hotels or hotels belonging to hotel chains. However, the large number of small hotels means that collectively small hotels produce a high amount of food and water waste and result in a large amount of solid waste. Interviews conducted in person and studies conducted by academics show that, especially in small hotels, food waste goes directly to the landfill without even considering more sustainable alternative options. Small hotels feel that recycling food waste is too high a cost to bear on top of the waste that already occurs. The presence of composting or biogas plants and the treatment of wastewater to generate energy is virtually unheard of in small hotels, which is why sustainable management protocols are rarely seen in small hospitality businesses.

However, it should be noted that even in large hotels, these systems are primarily non-existent or not very widespread. Even in large hotels, we see composting or biogas production plants or wastewater treatment managed by third parties outside the hospitality business.

To drastically reduce food waste pre-purchase, post-purchase, pre-consumption, post-sale, it is necessary that those who manage food products implement this basic strategy.

1. Improve warehouse management
2. Monitor the consumption of various goods and raw materials daily
3. Monitor the correctness of portion weights and, first and foremost, carry out a careful study of the standard portion to be considered as a reference, which must not

- be too large for the needs of the average customer
4. Present food in reduced quantities and organise buffets so that there is time to put together finished dishes only when necessary.

All this requires a cost analysis and specific planning, without which it is not possible, intuitively, to reduce food waste.

If waste continues to exist or is unavoidable, we must draw up a unique waste disposal plan to create valuable resources for other purposes.

It should note that, in addition to the problems on which the protocols focus, the implementation of strict protocols in the company can also help solve food waste.

In this respect, ISO 22000 'Food safety management systems- Requirements' is the voluntary international standard for the certification of Food Safety Management Systems (FMS). The technical standard is a global, public standard for food safety. The ISO 22000 standard manual guarantees agri-food safety from production to consumption based on internationally recognised core principles of the industry. The prerequisites for obtaining certification are the adoption of the GMP (Good Manufacturing Practice), GHP (Good Hygiene Practice), GAP (Good Agricultural Practice) schemes, maintenance programmes and procedures for equipment and buildings and pest control programmes and the HACCP principles: Hazard Analysis & Critical Control Points.

When analysing the hospitality businesses that are subject to this certification, it was noted that food waste is also drastically reduced. This means that implementing control protocols even for issues other than food waste can help better manage the purchase of raw materials, their processing, the production of goods, and their sale. The ISO 22000 standard, from this point of view, has been shown to help reduce waste to a considerable extent, even though it does not directly address this issue. So here is another method to control the amount of food waste produced by the hotel or food processing company. As you can see, sometimes good management of an issue has beneficial knock-on effects on other issues that are elements of a company's weakness.

Djokovic points out that waste management, and many other issues, are different if the hotel is part of a chain or an independent hotel. It is clear that if the hotel is part of a chain, it is subject to stringent standards that will undoubtedly reduce food waste. In the case of independent companies, however, the issue is more elusive and challenging to manage. The only way to reduce food waste and thus reduce company costs is to make company staff understand the negative impact of food waste or losses on the company's situation. Only with appropriate training focused on this specific issue can this be achieved. Thinking of solving the problem by simply advising staff not to waste food is the first step towards failing to reduce food waste.

In some hotel restaurants, signs can emphasise the importance of following set standards regarding portion sizes or raw material purchases. With these signs, managers hope to reduce food waste. In the writer's opinion, such characters are not very compelling because, in the absence of a culture among staff based on the need to reduce food waste, no sign can convince a person to comply with a standard that they do not feel is their own. A practical example of this is a hotel in Indonesia that had a problem

with the spread of diseases from the kitchen due to the lack of personal hygiene of the employees working in this area. The Food & Beverage manager created mandatory protocols requiring staff to wash their hands after going to the bathroom but did not follow the protocols despite heavy penalties. The problem was solved when, for each handwashing, they gave a monetary amount to the employee.

As far as waste is concerned, such a policy would not be possible. Therefore, the only way to reduce these costs is to spread the culture of sustainability and cost-effectiveness of the company by making it clear that food waste is unethical, destroys the earth, and, last but not least, destroys the company in which the staff work. If the company dies, the staff lose their jobs. This is perhaps a convenient method for all employees to understand the importance of reducing food waste in hospitality businesses.

Food waste means cost, and cost means a negative income element that inevitably makes the business worse. Worsening business means pre-bankruptcy. Bankruptcy means closure with the dismissal of all employees. This would be the sign that, according to the writer, should be present in hotel kitchens. It would undoubtedly be more effective than the one you sometimes see nowadays in restaurant kitchens that we have referred to in the previous pages.

As it occurs in all other businesses and even in households, food waste in hospitality businesses can only be achieved by a cultural dissemination operation regarding the disastrous economic and socio-environmental consequences of food waste. Hanging posters in restaurant kitchens or homes and advocating waste reduction seems pointless and ineffective. Only the dissemination of a culture of sustainability, including reducing food waste, will be able to have a positive effect on the issue we are studying. The lever of the negative economic impact on the financial reporting of a hotel or other company can undoubtedly facilitate the development of widespread training among employees to understand the harmful consequences that food waste has on the company's accounts. However, this must be accompanied by culture and awareness-raising beyond the purely economic impact of food waste. Highlighting the social, environmental and ethical consequences of food waste should complement the illustration of the adverse effects on the hotel's financial reporting of food loss or waste.

The hotel management may have the levers outlined above for employees to reduce the amount of raw materials and processed products sent to landfills or compost.

The levers available to business managers to reduce post-sale food waste is, instead, minimal. As highlighted in the previous pages, this waste occurs in the portion of food ordered by the customer that is not consumed and is therefore left on the plate. All these products constitute food waste in the same way as in the pre-sales phase. Reducing this post-sale waste is, however, a complex operation. In theory, it would be enough to reduce the portions and the amount of food connected to each plate sold.

In contrast to the purchasing and food preparation phase, the post-sales phase is characterised by a marketing issue that heavily influences portion choices. Reducing the quantity of the portion could lead to customer dissatisfaction and loss of customers. Bringing large portions to the table is interpreted as a marketing element that promotes customer loyalty.

Customers see quantities of food on the table that are often not provided at the household level. Reducing portions to eliminate leftovers and, therefore, food waste could hurt the business of the hotel restaurant or the company or firm that handles and sells food products. Such waste is therefore difficult to control and manage. In this case, too, could only reduce food waste by spreading a culture of sustainability. Still, in this writer's opinion, this is a complicated issue for individuals to accept.

The posting of signs in the dining room, similar to those we have referred to in the previous pages, in restaurant kitchens appears to be a decidedly counterproductive operation. Or the wish that no food is wasted can negatively affect the customers' perception of the quality of service. In my opinion, it should never display such signs in restaurants. Only the widespread dissemination of a culture of sustainability at the level of the individual can lead to a reduction in post-sale food waste as a result of the acceptance of standard portions that are not excessive and adequate for the dietary needs of an average person. This goal seems quite challenging to achieve as the customer attending a restaurant or a cruise or another buffet perceives the abundance of food on display and consumables as a positive element of the culinary experience in the context of a trip or simply concerning a dinner or lunch at the restaurant. Only the diffusion of a culture of sustainability, including food waste, will help achieve positive objectives in this field. Without this, post-sale waste in restaurants and buffets, in general, will be difficult to control or reduce. Its complete elimination seems to be an unattainable goal, not least because, objectively, a certain amount of leftovers is physiological both in restaurant portions and, perhaps above all, in buffets whether they are organised in restaurants or other places (e.g. cruises, conventions, conferences, etc.).

### **Water waste in hospitality businesses: almost unachievable sustainability**

In hotels and businesses that offer hospitality in various ways and food loss, there is another form of waste with severe economic and social-environmental consequences. Sustainability is threatened not only by food waste but also by water waste.

Hotels and hospitality businesses frequently use an abnormal amount of water compared to the standard needs of their guests and the hotel. As we will see later, this wastage occurs both directly and indirectly.

Direct wastage of water can be attributable either to the hotel or to the hotel guests. The hotel may cause wastewater when more water is used in the kitchen than is needed. This occurs, for example, when taps are left running with very strong jets for hours even though water use is only intermittent (e.g. washing raw materials) or when very strong jets of water are used to wash dishes when less water would be sufficient to achieve the intended purpose.

In general, at the hotel level, water wastage occurs when more water is used than is needed for cleaning purposes.

However, it should note that the wastage mentioned above is generally kept under control by management for mainly economic reasons. High consumption of water turns into a high cost for purchasing this element, with easily understandable consequences in terms of company profitability. Managers, therefore, generally implement strict protocols to minimise such waste.

Direct water wastage can be attributable not only to hotel

employees but also to customers. For psychological reasons that have been extensively studied in sociology and psychology, a person staying in a hotel, unless they have an ingrained culture of sustainability, tends to behave in a way that they would never do at home. The typical case is the taking of long showers for hours with an obvious enormous waste of water. The direct waste of water by customers generally comes down to the problem of personal hygiene, which is carried out abnormally compared to regular home habits.

The highest water waste is indirect and is linked to the customers' desire to change sheets and all towels daily. This habit has no place in everyday household life as, in general, changes are not made every day. In a hotel, however, the customer's attitude towards changing sheets and towels changes completely. The customer experiences the daily change of these elements as an essential feature of the hotel's service quality. The request to change bathrobes and towels several times a day is prevalent. Such behaviour causes an abnormal waste of water for the continuous washing of sheets and towels. This results in an exorbitant cost to the hotel and an unnecessary waste of water. However, the hotel, realising that the customer links this behaviour to the quality of the service offered, does not place limits on the changes required, with the result that, from an economic-business point of view, costs rise and, from a sustainability point of view, we helplessly witness an absurd and unnecessary waste of water.

This indirect waste of water (as the customer does not use water directly but consumes it through unnecessary washing of clean goods) can only be reduced by the widespread dissemination of a culture of sustainability that makes the individual understand the consequences of the acts they undertake.

In several hotels, we see minor signs in the rooms that should make the customer aware of this specific problem. For example, one reads that a towel on the floor means a request for a change. In addition to this consideration, one can often find some remarks concerning the relevance of water on a terrestrial level and the underlining that washing inevitably affects the consumption of this essential element necessary for human life.

From various interviews with hotel managers, such suggestions do not affect customers unless the customer is already aware of this issue.

Only the dissemination of a culture of sustainability, also translated into specific acts by individuals, can help reduce water waste, not only in hotels but in every human community.

In the writer's opinion, this goal is far from being achieved since, especially in hotels and hospitality businesses, a sense of irrelevance of non-proprietary things prevails in most customers. Everything that can be consumed, especially free of charge, is consumed as if this act would drastically improve the hotel's overnight stay.

As long as the culture of sustainability is not spread at a personal level, it will never reduce indirect water wastage in hotels. On the contrary, as the number of days spent on holiday or staying in a hotel decreases, the trend will be for this wastage to increase, with easily foreseeable economic, business and social-environmental consequences.

They are reducing the number of days spent on holiday or staying in a hotel causes customers to want to take full advantage of all the service possibilities provided by the

hotel. The most accessible free service to use is the change of room linen. Reducing the number of days spent overnight, especially when it relates to holidays or holidays, therefore causes an increase in indirect wastage of water as the customer's perception is that satisfaction is highest when the services offered by the hotel are used to the full, especially if these services are free.

Only the cultural diffusion that should permeate all the subjects constituting the community will therefore reduce the indirect waste of water. This dissemination will inevitably also lead to a reduction in food waste and direct water waste and, more generally, to the implementation of behaviour that is more in keeping with a concept of global sustainability.

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