



Contents lists available at ScienceDirect

Waste Management

journal homepage: www.elsevier.com/locate/wasman

Solid waste prevention and management at green festivals: A case study of the Andanças Festival, Portugal

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ARTICLE INFO

Article history:

Received 16 February 2017

Revised 17 October 2017

Accepted 18 October 2017

Available online xxx

Keywords:

Waste prevention

Recycling

Awareness

Festivals

ABSTRACT

Research on waste prevention and management at green festivals is scarce. The present study helps to fill this gap by analyzing waste prevention/reduction and management measures implemented at the Andanças festival, Portugal. Waste characterization campaigns and a questionnaire survey were conducted during the festival. The results show that the largest amount of waste generated was residual waste, followed by food and kitchen waste and packaging waste. The amount of waste generated per person per day at the festival was lower than that of other festivals for both the entire venue and the canteen. Concerning food and kitchen waste generated at the canteen, the amounts are in accordance with the findings of previous studies, but the amount of the edible fraction is comparatively low. Source separation rates are high, in line with other festivals that engage in food-waste source separation. Factors affecting the participation of attendees in waste prevention measures at the festival are the type of participant, their region of origin, the frequency of visits, and whether they are attending as a family. Efforts must be made to increase the awareness of attendees about waste prevention measures, to develop guidelines and methods to quantify the waste prevention measures, and to formulate policies aimed at increasing the application of the zero-waste principle at festivals.

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1. Introduction

Interest in promoting green events and festivals has risen in recent years, including with respect to improving the competitiveness of events, reducing environmental impacts, and understanding the social dimension of such events (Dickson and Arcodia, 2010; Whitfield and Dioko, 2012; Wilks, 2013). A green event is one that possesses a sustainability approach or includes sustainability initiatives implemented in the management and operation of the event (Laing and Frost, 2010). A sustainability approach takes into account the three pillars defined in the Johannesburg Plan of Implementation of the World Summit on Sustainable Development of 2002 (UN, 2002), namely, economic, social, and environmental, in such a way that tourism events are developed and conducted without compromising natural systems (with reference to the definition of sustainable development of WCED (1987)). In this respect, the sustainability of events has been ana-

lyzed and assessed using various methodologies and indicators (Andersson and Lundberg, 2013; Liang et al., 2016). Regarding the three pillars of sustainability, previous research has been devoted largely to the social and economic impacts of events (Andersson et al., 2015; Warnick et al., 2016; Yolal et al., 2016). The environmental impacts of events and festivals have been assessed through establishing ecological and carbon footprints (Collins and Cooper, 2016; Gössling et al., 2011), measuring environmental emissions (Kulshrestha et al., 2004; Kuo et al., 2006; Wang et al., 2007), and conducting environmental impact assessments (Ahmed et al., 2008; 1995).

Events are activities that generate waste, with the waste made and left by participants being recognized as one of the most significant impacts of events (Collins et al., 2007). Dematerialization can be a strategy to achieve higher levels of sustainability in events, such as is already done in the wider economy (van Ewijk and Stegemann, 2016). Dematerializing an event involves the need to include the waste hierarchy principle, more commonly known as the zero-waste approach, in the events domain. Including the waste hierarchy is aimed at promoting firstly the prevention,

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reduction, and reuse of products and materials, and secondly the options for waste treatment and disposal (Chang and Pires, 2015).

Implementing a zero-waste approach at festivals is challenging because of the efforts required to organize measures for managing and preventing waste at the entire venue. To implement such measures, it is necessary to educate consumers effectively over time about how to sort materials (Hottle et al., 2015), to communicate with suppliers and change how retail food and drink is packaged for sale (Tennant-Wood, 2003), to establish indicators for assessing the efficiency of the measures applied, and to develop and test new methods for assessing the performance of waste reduction measures (Cierjacks et al., 2012).

Although some literature exists on waste generation at festivals (Cierjacks et al., 2012; Tchobanoglous et al., 2006), the current level of knowledge and understanding of waste generation and management at festivals and of the measures applied to prevent/reduce waste generation is insufficient. More knowledge is required of the qualitative and quantitative characteristics of waste generated in order to improve the planning of green festivals (Cierjacks et al., 2012), to reduce the environmental impacts derived from waste, to allow the waste prevention and management efforts of events to be monitored, and to enable different events to be systematically compared. Quantifying the waste dimension of an event will help to contribute to quantifying the sustainability of festivals.

To extend and deepen knowledge of festival waste management, this paper reports an experimental study whose objectives were to understand, by using indicators, how waste is managed at a specific green festival (the Andanças festival in Portugal) and to identify the perceptions of the festival's stakeholders concerning waste prevention and management measures. The hypotheses were (1): the waste generated at Andanças is lower than in other festivals, (2) source separation is higher in Andanças festival than in other festivals, and (3) the attendees, volunteers/staff, artists and service providers of the festival participate at the waste prevention and management measures. Being the Andanças festival based on sustainability principles, the participation in waste prevention and management measures is expected to be high as the festival would be expected to attract individuals already significantly committed to sustainable behavior (e.g., Mair and Laing, 2013).

2. Material and methods

2.1. Case study: The Andanças festival

Since 1996, the Andanças festival has become established as an international world music and folk-dance festival, with the attendees being mostly young adults coming from Lisbon and the Tejo Valley area and who are mainly “alternative lifestylers” with a pro-environment bias. The approach of the Andanças festival to sustainability is based on four pillars: music/dance, volunteering, community, and environment/sustainability. The music/dance pillar refers to the promotion of folk dance/music as an instrument of social cohesion. Volunteering ensures the independence of the festival from political, commercial, and financial interests, where individuals, companies, and public institutions are invited to contribute without being remunerated for their work. The community pillar is aimed at involving the local population, local partners, and citizens in the festival, including, for example, restricting the food acquisition until 50 km of the festival location. The environment/sustainability pillar aims to ensure that good environmental, social, and economic practices are implemented at the festival.

A total of 21,960 attendees (i.e., those who paid for entrance) and 15,225 volunteers, artists, and staff visited the festival located

in the area of Póvoa e Meadas dam, Castelo de Vide municipality, Portugal (Fig. 1), in 2014, and 23,861 attendees plus 15,610 volunteers, artists, and staff in 2015. The festival occurs once a year, in the first week of August, over a period of seven days.

Besides the festival area as a whole, there are specific locations where waste is generated, such as snack bars, a grocery shop, the canteen, near stages, and near workshops (all at the festival venue), as well as camping areas (outside the festival venue). At the festival venue and camping sites are plastic bags and 50-L containers for the separate collection of packaging waste (lightweight packaging and paper/cardboard packaging only) and residual waste. Two times a day, associated with meal services, the separate waste and residual waste are collected by the staff and disposed of in containers in the waste management area, which hosts two containers of 25–30 m³ for lightweight packaging and paper/cardboard, with glass waste being disposed of in a mini-container measuring 6 m³. Residual waste is disposed of in 1100-L containers. Residual waste is collected by the Castelo de Vide municipality, and packaging waste is collected by a private company. Residual waste is treated at a mechanical–biological treatment plant that generates compost and obtains materials for recycling. Packaging waste is sent to a mechanical sorting plant for recycling. The waste generated by snack bars is disposed of in the waste area, where nine 1100-L containers are available for the different waste types, namely, food and kitchen waste, lightweight packaging, paper/cardboard, glass, and residual waste. These containers are collected by festival staff and disposed of in the containers hosted in the waste management area.

In the canteen, five 50-L containers are available for waste cooking oils, and five 25-L containers are available for food and kitchen waste. There are also 240-L containers for waste packaging separation, including paper/cardboard waste (two containers), lightweight packaging waste (two containers), glass waste (one container), and residual waste (one container). When containers and bags are full (by the end of the meal service), staff collect the containers and dispose of them in a dedicated waste area located there. Food and kitchen waste generated is collected by the staff twice a day and transported to the composting area at a farm near the festival venue, where it is composted together with waste from dry toilets located at the venue and camping site. Littering at the venue is almost non-existent except for a considerable number of cigarette butts.

Besides the aforementioned aspects of waste management, Andanças festival staff define the waste prevention measures to be implemented by their own snack bars and canteen, by the private snack bars located at the venue, and by all participants in general. The rules/guidelines related to waste prevention and management are:

- Disposable tableware is prohibited, with the exception of plain paper cups (i.e., without ink) for espresso coffee and paper napkins, because these are sent for composting. Apart from the exception of paper cups for espresso, the authorized option for drinks is to use a mug. At all venues (including the snack bars), a 200-ml mug can be used with a deposit–refund system, with the deposit being returned when the mug is delivered. The mug deposit is €1, but a carabiner (to hold the mug on a person's belt or pack) can also be obtained for an additional €0.50. The mug is sold at a specific store in the venue, as well as at the snack bars and canteen, as disposable tableware cannot be used. Snack bars sell mostly mugs from the festival but can also sell drinks in other mugs with 200-ml capacity. The refund is made only at the mug store.
- In the canteen, metal cutlery (i.e., not disposable) is used and is washed in industrial washing machines.

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