Water and Waste Water Management

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Member of the research team of the Tourism Observatory of the Canary Islands (INSTO)
Canary Islands:

• Archipelago: 8 islands in the Atlantic Ocean
• Located 1,300km away from the Spanish mainland, close to the African coast
• Surface: 7,500 km²
• Population: of 2,175,952
• Tourism is the main economic sector: 15,1 (13,1) million inbound (international) tourists
• GDP contribution: 35%
Tourism Observatory of the Canary Islands

Report prepared by a research team of the University of La Laguna and the University of Las Palmas de Gran Canaria at the request of the Ministry of Tourism, Industry and Commerce of the Canary Islands in the context of the application to the International Network of Sustainable Tourism Observatories of the United Nations World Tourism Organization.

On 21st October 2020, the annual Global INSTO meeting confirmed the Canary Islands as a new member of the network.
## Impact of Covid-19 on the tourism sector

### Tourist arrivals January-April

<table>
<thead>
<tr>
<th></th>
<th>Foreign</th>
<th>National</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2019</strong></td>
<td>4,762,843</td>
<td>526,495</td>
<td>5,325,338</td>
</tr>
<tr>
<td><strong>2021</strong></td>
<td>401,895</td>
<td>161,094</td>
<td>562,990</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2019</strong></td>
<td>-92%</td>
<td>-69%</td>
<td>-89%</td>
</tr>
</tbody>
</table>

Source: Promotur

### % of occupancy in hotel and non-hotel establishments - 1st quarter

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2021</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>81,13</td>
<td>19,3</td>
<td>-76%</td>
</tr>
<tr>
<td>February</td>
<td>81,07</td>
<td>22,97</td>
<td>-72%</td>
</tr>
<tr>
<td>March</td>
<td>82,01</td>
<td>26,19</td>
<td>-68%</td>
</tr>
<tr>
<td>April</td>
<td>69,75</td>
<td>28,17</td>
<td>-60%</td>
</tr>
</tbody>
</table>

Source: Promotur

### REVPAR of hotel and non-hotel establishments - 1st quarter

<table>
<thead>
<tr>
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<th>2019</th>
<th>2021</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>70,01</td>
<td>15,78</td>
<td>-77%</td>
</tr>
<tr>
<td>February</td>
<td>70,94</td>
<td>18,65</td>
<td>-74%</td>
</tr>
<tr>
<td>March</td>
<td>70,78</td>
<td>23,26</td>
<td>-67%</td>
</tr>
<tr>
<td>April</td>
<td>58,74</td>
<td>25,21</td>
<td>-57%</td>
</tr>
</tbody>
</table>

Source: Promotur
3 key messages:

1. Water management context are future challenges are very important
2. We need information on water consumption, services & water quality in tourism: the least prepared sector!!
3. Water intelligence & alliances: Smart metering and monitoring from utilities
Water scarcity and wastewater problems (1/2)

- Private water markets (aquifers & reservoirs) combined with public intervention (to limit water prices and increase competition)
- Public intervention: 7 Island Water Councils
- Market segmentation: irrigation (60%; subsidized banana export markets) and domestic/industrial municipal networks (40%); ≠ qualities
- Overexploitation for 150 yrs.:
  - Among owners, since it’s a common pool resource
  - Lack of artificial reservoirs for demand load curve management
  - Water pollution: salt, nitrates, fluor ... and many other volcanic gases
  - Lack of information: water integral cycle
  - Desalination: 100% of water in east CI (1/2)
  - Water regeneration: 10-20% of treated
• Financial imbalances, lack of maintenance of distribution infrastructure (60% of water losses), investment deficits from the lack of private-public cooperation and regulation

• Energy intensity: water pumping and desalination in the islands may take more than 10% of electricity

• Emergency situation regarding wastewater:
  • More than half of the discharge of waste water into the sea is not registered or authorized
  • Even though a number of treatment plants were built in the past decades, the lack of complete sewer networks prevents full exploitation
  • Land/aquifer pollution (from irrigation and black waters wells)

• Lack of information, social participation (private markets!!) and financial resources

• But hotels in Fuerteventura or Lanzarote may pay 5€/m$^3$
• Tourism environmental costs (waste, water and wastewater) are invisible within residential impacts and networks

• The *Polluters Pay Principle* is systematically violated: cross-subsidies are generalized

• 2 lines of research and tourism efforts:
  1. Sustainable destinations: *water intelligence*
  2. Sustainable hotels: reduce water bills and “sell” sustainable hotels
CASE STUDY: SAN BARTOLOMÉ DE TIRAJANA (GC)
Sample 213 big establishments, with smart meters: 2011-2018
Water Dashboard for utilities: from selling water to managing water and providing water services

• Services and related water consumption are quite heterogeneous (Categories)
• Undetected water leaks may increase water consumption by 30-40%
• Hotels manage better fixed water consumption: gardens, swimming pools and other services
• Age of construction, location, and renovation are key determinant of water consumption
• Smart meters: more frequent information and interactions through the Virtual Office have reduced water consumption by 10%
The impact of smart meters on residential water consumption: Evidence from a natural experiment in the Canary Islands

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