

# Waste Atlas

The World's 50 Biggest Dumpsites

2014 Report

Powered by



## Collective Work

For the very first time, the World's 50 biggest active dumpsites are profiled in this 2nd Annual Report of Waste Atlas. Data on important dumpsites are collected and visualised in a unified way, supported by a brief statistical analysis. These dumpsites could be associated with important negative socio-economic and environmental impacts, highlighting the importance of global cooperation for elimination of uncontrolled disposal sites.



## STEERING COMMITTEE

<b>Antonis Mavropoulos</b>	- CEO of D-waste and Project Director
<b>Hermann Koller</b>	- Managing Director of ISWA
<b>Markus Luecke</b>	- GIZ, SWEEP-Net Teamleader
<b>Surendra Shrestha</b>	- Director of International Environmental Technology Center, UNEP
<b>Masuro Tanaka</b>	- SWAPI Coordinator, Tokyo University
<b>Nickolas J. Themelis</b>	- Professor of Chemical Metallurgy, Department of Earth and Environmental Engineering, Columbia University, US

## SCIENTIFIC COMMITTEE

<b>Jose Fernando Juca</b>	- Professor at UFPE, Recife Area, Brazil
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	- Member of the Board in WTERT/USA in Earth Engineering Center of Columbia University
<b>Agamuthu Pariatamby</b>	- Editor-in-Chief of WM&R, University of Malaya, Kuala Lumpur, Malaysia
<b>Mario Russo</b>	- Coordinator Professor at Polytechnic Institute of Viana do Castelo, Portugal
<b>Costas Velis</b>	- Head of Waste Atlas Scientific Committee
	- Lecturer in Resource Efficiency Systems, School of Civil Engineering, University of Leeds
<b>Goran Vujic</b>	- Assistant Professor at the University of Novi Sad, Serbia

## WASTE ATLAS TEAM

Waste Atlas has been developed through coordinated efforts and contributions by almost a thousand people. However, most of the work regarding the web interface and the data acquisition has been done by the permanent Waste Atlas Team, namely:

<b>Alexandros Mavropoulos</b>	- D-Waste Expert
<b>Antonis Mavropoulos</b>	- D-Waste Founder & CEO
<b>Ilianna Koukousia</b>	- GIS Expert
<b>Maria Tsakona</b>	- D-Waste Product Manager
<b>Niki Mavropoulou</b>	- Waste Atlas Project Manager
<b>Nikos Rigas</b>	- Graphic Designer
<b>Theodore Andreadakis</b>	- Layout Editor



## CONTRIBUTORS

We would like to thank all the contributors for the data they provided. We would like to thank especially the following people for their excellent contributions: Ranjith Annepu (India), Timothy Byrne (United Kingdom), Marco Caniato (Italy), Magda Correal (Colombia), Natālija Cudečka-Puriņa (Latvia), Makoto Fujita (Japan), Vujic Goran (Serbia), Alberto Huiman (Peru), Mansoor A. H. Imam (Pakistan), Edith Iriyuga (Nigeria), Joy Jadam (Lebanon), Nathalia Lima (Brazil), Ana Loureiro (Portugal), Nikola Maodus (Serbia), Liubov Melnikova (Russia), Ralf Mueller (Germany), Juan Antonio Munizaga (Chile), Iris Odenthal (Germany), Margaret Oshodi (Nigeria), Michiko Ota (Japan), Peru Waste Innovation S.A.C (Peru), Venkata Reddy (India), Eva Ridick (Mongolia), Ricardo Rollandi (Argentina), Atilio Savino (Argentina), Carlos RV Silva Filho (Brazil), Dini Trisyanti (Indonesia), Nickolas Themelis (USA), Tshephang Tumoyagae (Botswana), Jenny Westin (Sweden), Filipa Vaz (Portugal), Christos Venetis (Greece), Claudio Vieira (Brazil).

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## WASTE ATLAS PARTNERSHIP



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## PREFACE



This is the second Waste Atlas Report. After one year, 800 users of the Waste Atlas mobile app, more than 1,000 contributors, 5,500 downloads and 10,000 unique users of Waste Atlas, we are happy to create a second emblematic report dedicated to the 50 biggest active dumpsites of the world.

It was a clear result of the first Waste Atlas Report. More than half of the world's population is using dumpsites for waste disposal. Then the next questions come naturally. Which are the most risky dumpsites? Where are they located and what are their health and environmental impacts? How many people are affected? It seems unbelievable, but up to now there was no effort to list the biggest (and most possibly the riskiest) dumpsites of the world, despite the fact that all the international stakeholders prioritise the closure of dumpsites as a top priority for health and environmental protection.

So, the Waste Atlas Partnership decided to respond to this challenge and this report is the first one that lists and profiles the 50 biggest (at least from what we know) active dumpsites of the world. Maybe there are some big dumpsites, which are not included, because we did not acquire a sound data set for them. Maybe there are even bigger ones for which we have no idea. But in any case, this list is an important first step and we hope that, with the contributions of several institutions, it will be expanded to include the 100 and then the 1,000 biggest dumpsites of the world, with more and better data sets available.

It is clear that the 50 biggest active dumpsites should not be considered, simply, as local problems. They affect the daily lives of 64 million people, a figure similar to the population of France. Their total waste volume is 0.6-0.8 km<sup>3</sup>, almost 200-300 times the volume of the Great Pyramid of Giza. Most of them are located in very poor countries, with no financial and human resources available to implement a sound waste management system. I really believe that the closure and rehabilitation of those dumpsites (and the development of sound waste management systems) must be considered as a global challenge and not a local one. And I am sure that the list provided by this report will serve as a first step towards the understanding of this global challenge.

This list would never be realized without the combination of crowdsourcing and scientific research. We are really thankful to the hundreds of contributors of Waste Atlas and the most important of them are listed at the beginning of the report. I believe that the time has come to create a vibrating community of contributors, users and followers of Waste Atlas – this is the only way to make the project sustainable and to increase its scientific value. Waste Atlas is an evidence for the power of crowdsourcing, when it is combined with scientific analysis.

We are also thankful to the University of Leeds for its scientific support that upgraded data collection and acquisition. As part of Waste Atlas general policy, we are ready to involve more universities, students and academics to Waste Atlas, with a variety of ways. Waste Atlas has a huge data set and the more people involved in data sets elaboration and analysis, the better the results achieved.

Last, but not least, I would like to ask everyone to provide us feedback for this report but also for the Waste Atlas website and apps. This feedback is of vital importance as we are in a phase of redesigning the interfaces and the databases, in order to make them more attractive and interactive for the users. Please let us know what you need more, what you like or no, give us more ideas that you would like to see implemented. Please propose ways for more and better involvement of the users, for better user experience. In other words, let's work together to make Waste Atlas a tool for a massive scientific collaboration regarding the global waste challenges. Both the first and the second report of Waste Atlas indicate that we can do it!

**Antonis Mavropoulos**  
D-Waste Founder & CEO





## KEY MESSAGES

### HEAD OF WASTE ATLAS SCIENTIFIC COMMITTEE



Where the most severe threats to human health and natural environment, local and planetary, associated with unsound management of solid wastes occur around the world today? We may lack the evidence to authoritatively answer this landmark question. Yet, dumpsites can be safely linked to very high levels of risks and potential harm. There, simulta-

neous inhaling of fumes from burning plastics, contamination of aquifers, and release of substantial quantities of greenhouse gasses takes place. In that sense, the invention of the sanitary (and then engineered and controlled) landfill was one of the single most important steps in minimising the adverse effects of poor solid waste disposal methods. Some 100 years after starting building engineered landfills in Europe and the US, considerable part of the world's waste is still disposed of openly on the ground, wetlands, rivers and seas. Therefore, there is an urgent need to raise our awareness on this challenge; and hopefully stimulate co-ordinated efforts to rapidly eliminate this threatening disgrace. Hence a name and shame publication here, with the ambition of putting the 50 biggest dumpsites of today's world on the map. So that we cannot anymore say that we did not know.

Gathering the evidence was far from straightforward: scientific and 'grey' non-peer reviewed literature were both scanned for information on dumpsites. Somehow not surprising, the scientific evidence on the topic is limited. What got us further was the data sharing from local experts, to whom we are grateful for their enthusiastic key contribution of otherwise inaccessible or obscure information. This demonstrates the power of the Waste Atlas in mobilising expertise and collecting scientific and lay knowledge on transformative topics of landmark nature, materialised with relatively minimal resources. However, it also demonstrates inevitable limitations and barriers to be overcome in future efforts, such as the obvious gap of relevant information within China.

University of Leeds leading the scientific advice within the Waste Atlas Partnership, supported this effort by informing the data collection pro-forma, statistically analysing the data collected and reviewing the literature on implications of dumpsites on human health. Analysis revealed key patterns, documented here for the very first time, such as

the correlation between numbers of people potentially exposed to dumpsites and the size of dumpsites, evident for biggest population agglomerations. And allowed us to create the profile of the average 'monstrous' dumpsite of our times, which we invite you to examine and see how it fits with your own experiences.

There is strong scientific evidence regarding the adverse implications of living and working on dumpsites which affects the informal recyclers / waste pickers who frequent the dumpsites to make a living from our wastes. This worldwide reality vividly demonstrates the residual value in solid wastes, but also should alert us about the unnecessary risks these unprivileged people are exposed to. Some of the biggest risks and effects stem from co-disposal of municipal with hazardous and healthcare wastes: it is high time to move away from such practices, ensuring separate management routes. Considerable urban populations live close to dumpsites. Whereas concrete evidence on adverse effects is still in its infancy, limited by the inherent difficulties of epidemiological studies, the mere fact of this proximity should suffice to alert us.

Waste Atlas once again shares a unique dataset on solid waste management: it is about the potentially maximum harm to humans and the environment occurring today around us because of poor management of solid wastes. Action to alleviate this will require demanding efforts of international collaboration and substantial funds. But now, having revealed the tip of the dumpsite iceberg, we know.

**Costas Velis**  
Lecturer in Resource Efficiency Systems, School of Civil Engineering, University of Leeds



## STEERING COMMITTEE



**Hermann Koller, Managing Director of ISWA:** Despite considerable advancement in waste management practices worldwide, this report sends a crystal clear message that we are still falling far short of the mark in many of the world's cities. This bold and successful effort to quantify the scale and impact

of the largest sites of uncontrolled waste disposal, comes at a time when high level attention to address the need for appropriate waste management needs to be reinforced. Growing quantities and complexity of wastes being generated, together with a lack of funds and institutional capacity, means the issue is far larger than the resources available to many cities. A concerted effort by all actors involved in waste management is needed to bring to an end the practice of uncontrolled disposal, which as this report underlines, leads to tremendously detrimental health and environmental impacts.



**Markus Luecke, GIZ/SWEEP-Net Team Leader** (<http://www.sweep-net.org/>): Waste Atlas is an excellent and very useful application for global and regional waste management benchmarking and provides a global platform where countries can present their state and pace of development

in this important sector. SWEEP-Net as the regional network for the exchange of expertise and experience in the Middle East and North Africa (MENA) is proud to be part of it. SWEEP-Net in its ambition to support its partner countries in further developing an integrated solid waste and resource management will continue in its efforts in contributing with all possible means.



**Nickolas J. Themelis, Professor at Columbia University and founder of Global WTERC Council:** The Global WTERC Council is proud to be a part of the Waste Atlas Project. The information that has been compiled will help the developing countries in Africa and Asia to advance sustainable waste management and

phase out existing illegal dumpsites and non-regulated landfills. It will also encourage the society, starting from the simple needs to policymakers to reuse



**Surendra Shrestha, Director of International Environmental Technology Center, UNEP:** UNEP supports initiatives associated with moving away from open dumping to practices where the waste is better contained and covered, utilized as a resource for raw material and for energy, and environmental impacts from

waste disposal are progressively reduced. Identifying the location, characteristics and impacts of the

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