

# The World of **Watermaster**

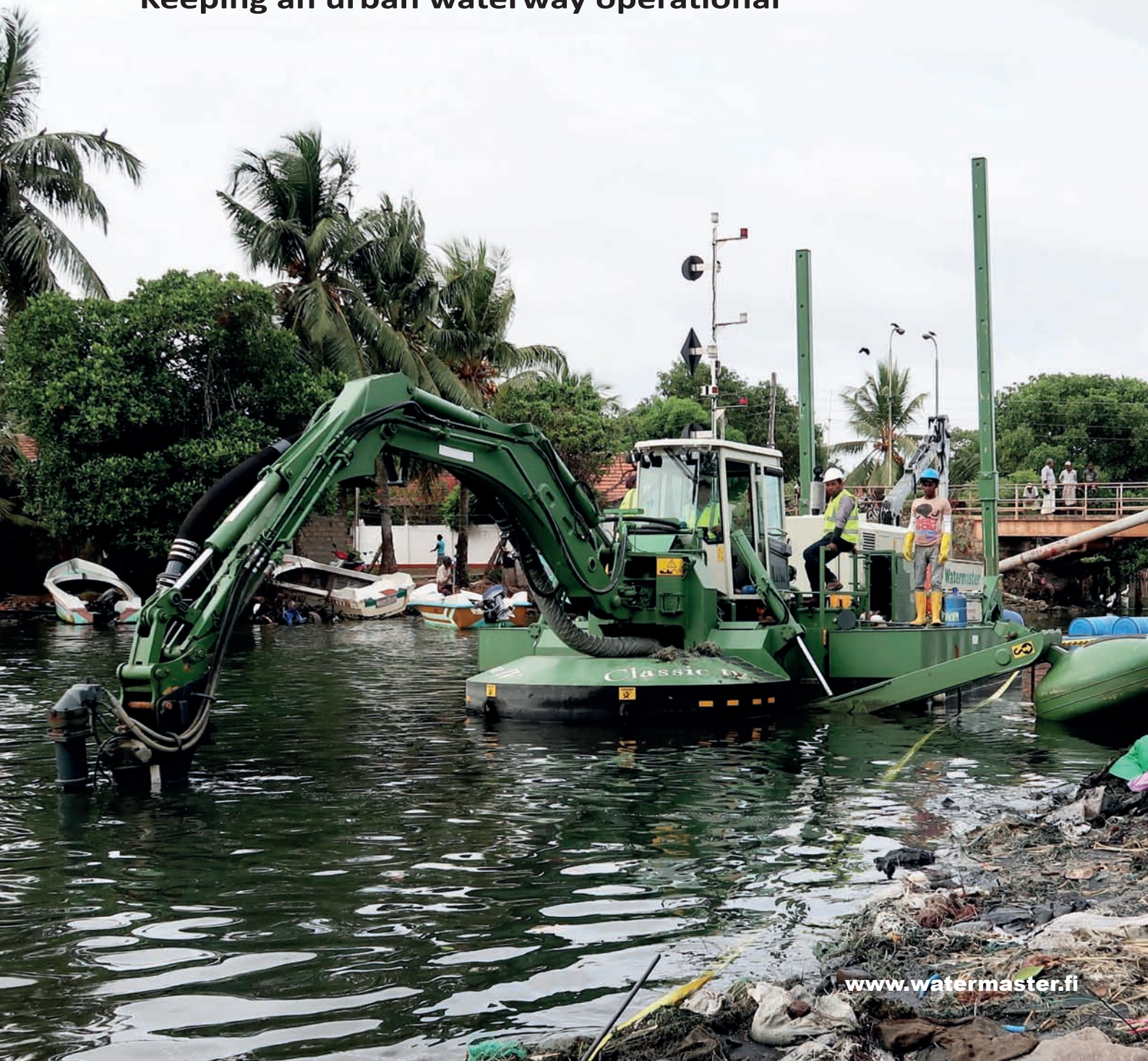
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smart solution for hard work

**Work safely and effectively in shallow waters**

**Innovative urban dredging**

**Keeping an urban waterway operational**



Operating a Watermaster is very similar to operating an excavator, but with fully amphibious multipurpose Watermaster you can safely and effectively cover all shallow water dredging, pile-driving and raking from dry ground to 6 meters depth.



## Work safely and effectively in shallow waters

**T**oo many shallow water dredging projects are still carried out dangerously and inefficiently with excavators. They are not properly designed nor certified for working in water at all. Watermaster, the amphibious multipurpose dredger, is specially made for shallow waters. It is a unique combination of both an excavator and a suction dredger, certified and proven to safely and cost-effectively handle all dredging, pile-driving and raking work from dry ground to 6 meters depth. Watermaster is the responsible choice for this work.

Focus on shallow water dredging is increasing. Extensive urbanisation and deforestation has led to massive siltation and pollution in many inland water bodies around the world. Unpredictable climate extremes are becoming more and more frequent, causing floods and many other problems. As the amount of shallow water projects increases, so does the variety of available dredging machinery. This is a good thing, but it is important to use all machinery in a correct and safe way.

**Inland dredging of rivers, lakes, canals and ponds** is regularly done by using different types of excavators: a long reach excavator, an excavator mounted on a barge and a floating excavator. This is due to the wide availability of such machinery – there is always an excavator somewhere nearby. But is something, which is primarily designed

for operating on land, really the best available solution for water work and dredging?

Excavators are not certified dredging vessels inspected by maritime authorities. **Excavators, whether barge-mounted or floating, are a significant safety risk when operating in open waters.** Many accidents have happened when excavators have been used outside their work area.

**Watermaster is an amphibious multipurpose dredger**, specifically designed and certified to work both in water and from land side. The new Watermaster **Classic V** model was launched last November. It offers **50% more dredging capacity**. The launching of the 5th generation model was a spectacular way to celebrate the 30-year-old Watermaster Classic series. Watermas-

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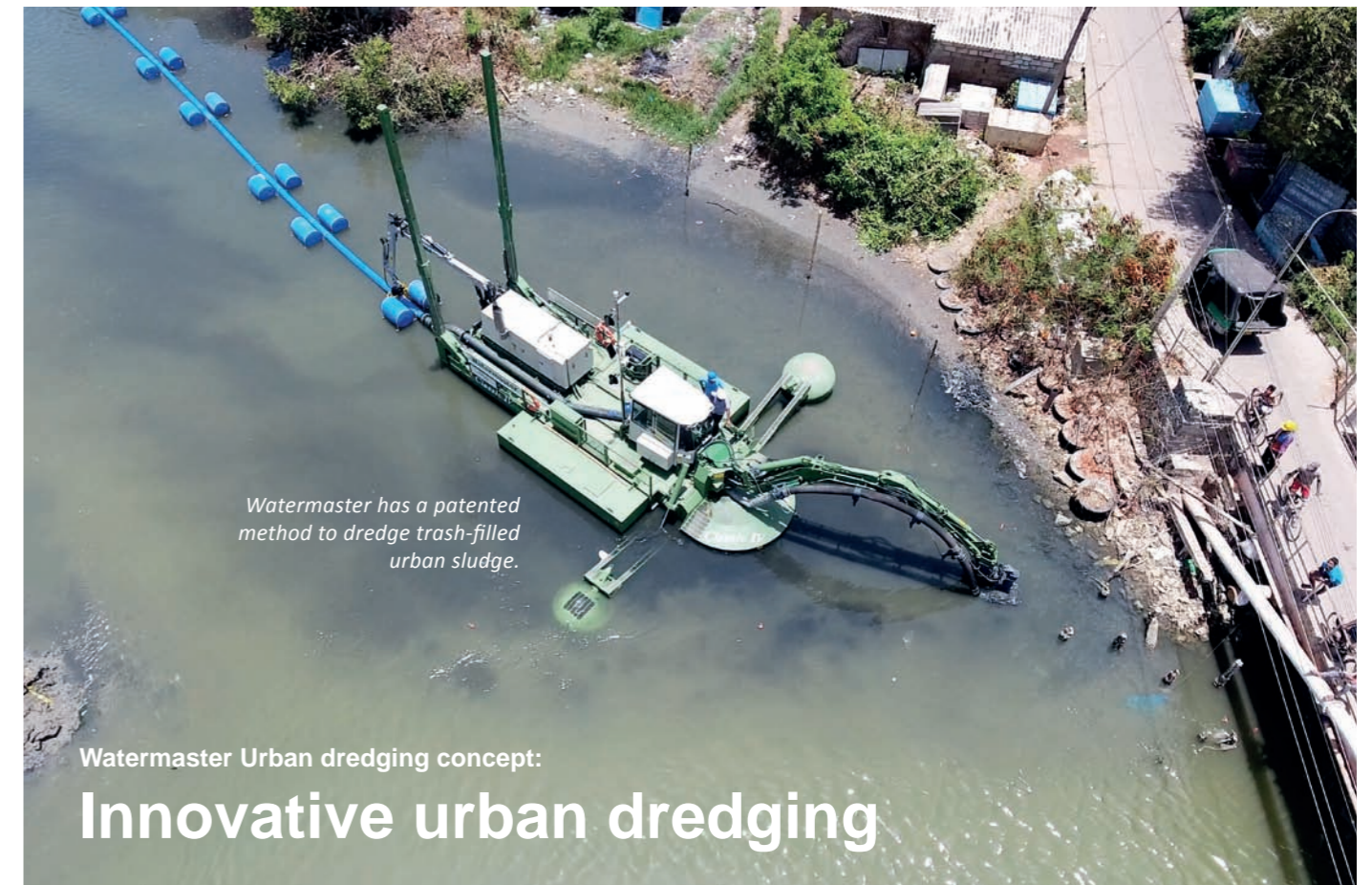
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ter has always been a pioneer in the modern shallow water dredging field.

**Use the right machine for the right job.** Excavators are for operating on dry land. Floating excavators are for wetlands. Watermaster is the versatile shallow water dredger.

Yours faithfully,  
AQUAMEC LTD.

Lauri Kalliola  
Managing Director



Watermaster has a patented method to dredge trash-filled urban sludge.

Watermaster Urban dredging concept:

## Innovative urban dredging

**I**t is easy to understand why suction dredging is more efficient and costs less than excavating: you can pump the dredged materials directly to the disposal area, without having to handle the same material many times with many different machines. Dredging in urban areas brings extra challenges to the process, but Watermaster has the solution.

A cutter suction dredger (CSD) is the popular choice for rural and offshore dredging projects. Inland waters are more problematic for them because these environments are often too shallow and narrow for operating a CSD properly. Their wire-cables cause disturbance to passing water traffic and the presence of urban debris (plastics bags, bottles etc.) easily blocks their pumps and makes suction dredging unfeasible. Inland dredging has thus been dominated by excavating machinery. Excavators, however, are not properly designed nor certified for water work. They are a compromise that has been used due to the lack of a better option.

**Watermaster is neither a conventional dredger nor an excavator.** It is a fully amphibious multipurpose dredger - a certified vessel inspected and approved by a maritime authority. It is self-propelled and can travel considerable distances in water to reach the

work site (max. speed 4 knots). Watermaster has a smart way of anchoring and dredging that provides excellent stability and does not block the passing traffic. Agile Watermaster is thus the perfect fit for confined inland waters.

Another limiting factor for CSDs in urban and sub-urban areas has been the lack of disposal space. Excavating is inefficient, but it does not require much space on land. The materials are typically first excavated into a barge, which is then transported to shore and emptied with another excavator to a truck and taken to the final disposal area (see next page). Laborious and costly, but it is often seen as the only possible method. Watermaster has a new solution: the **Watermaster Urban dredging concept**.

**Watermaster's unique Cutting Knife System enables suction dredging of trash-**



Watermaster is fully amphibious - it is a vessel certified for work both in water and on land.

**filled urban sludge** and disposal of the materials directly into a settlement pond on land without having to handle the same material many times with many different machines.

If the land space is limited (typical in urban areas) a space saving option is to pump the sludge into **geotextile tubes**. **Dewatering** is significantly quicker using the tubes and thus needs a lot less space. They are also particularly useful when dredging polluted sediments, as the dredged materials can be neatly sealed inside the tubes without the risk of leaks to the environment. →

## 1. DREDGE

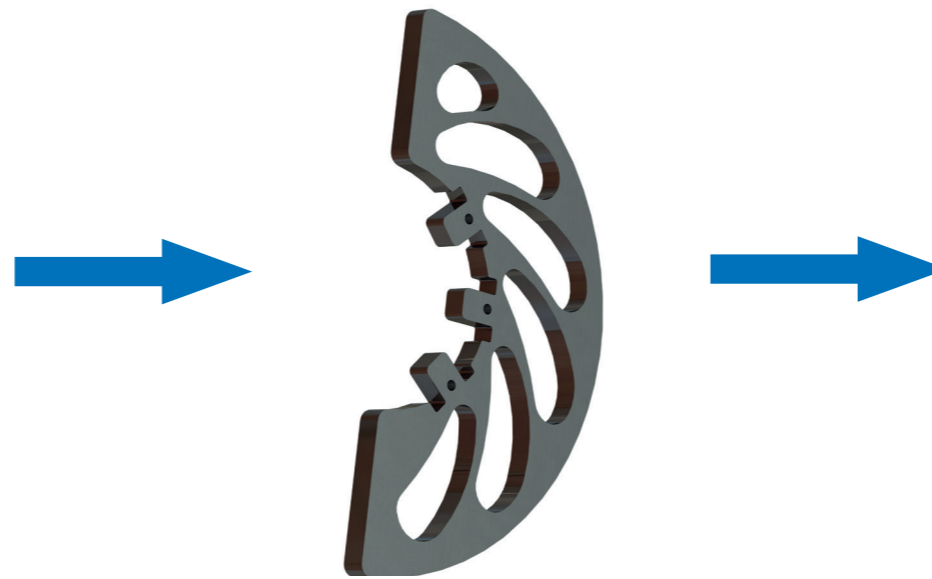
Dredge the urban sludge



Watermaster can dredge soil containing a considerable amount of trash and discharge the materials up to 1,5 km away via a pipeline (3 km with a booster pump). No extra steps, simple and efficient.

## 2. SLICE

Slice the trash contained in the sludge



Watermaster's **patented Cutting Knife System** slices urban debris into smaller particles that will then pass through the pump and pipeline.

## 3. DEWATER

Discharge into GEOTEXTILE TUBES



Geotextile tubes offer a space saving option in places where available land space is limited - which is typically the case in urban environments. Geotextile tubes can efficiently **dewater** the sludge leaving only the solid content inside the tubes.

OR

Discharge into a **SETTLEMENT POND**



Another alternative for dewatering is to make a settlement pond on land. A portion of the waterway can also be temporarily separated and used as a settlement pond (as in the picture).

## 4. FINALIZE

Landscape or transport the materials

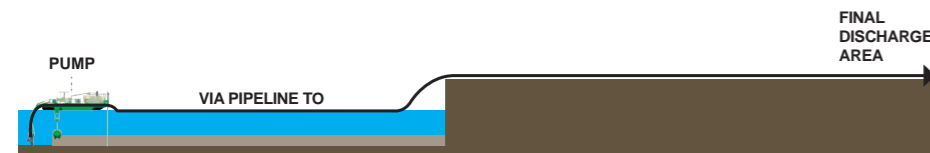


Depending on the site, the dredged materials can be either landscaped onsite or transported to the final disposal area using trucks.

### SUCTION DREDGING IS MORE EFFICIENT THAN EXCAVATING

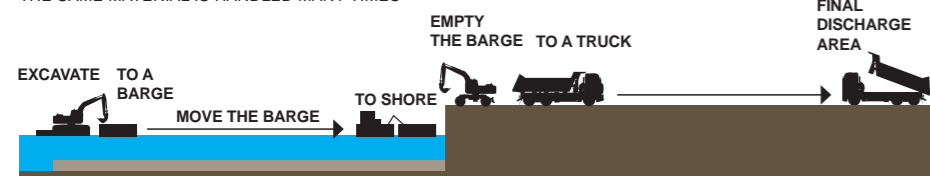


ONE MACHINE  
ONE OPERATOR  
THE SAME MATERIAL IS HANDLED ONLY ONE TIME

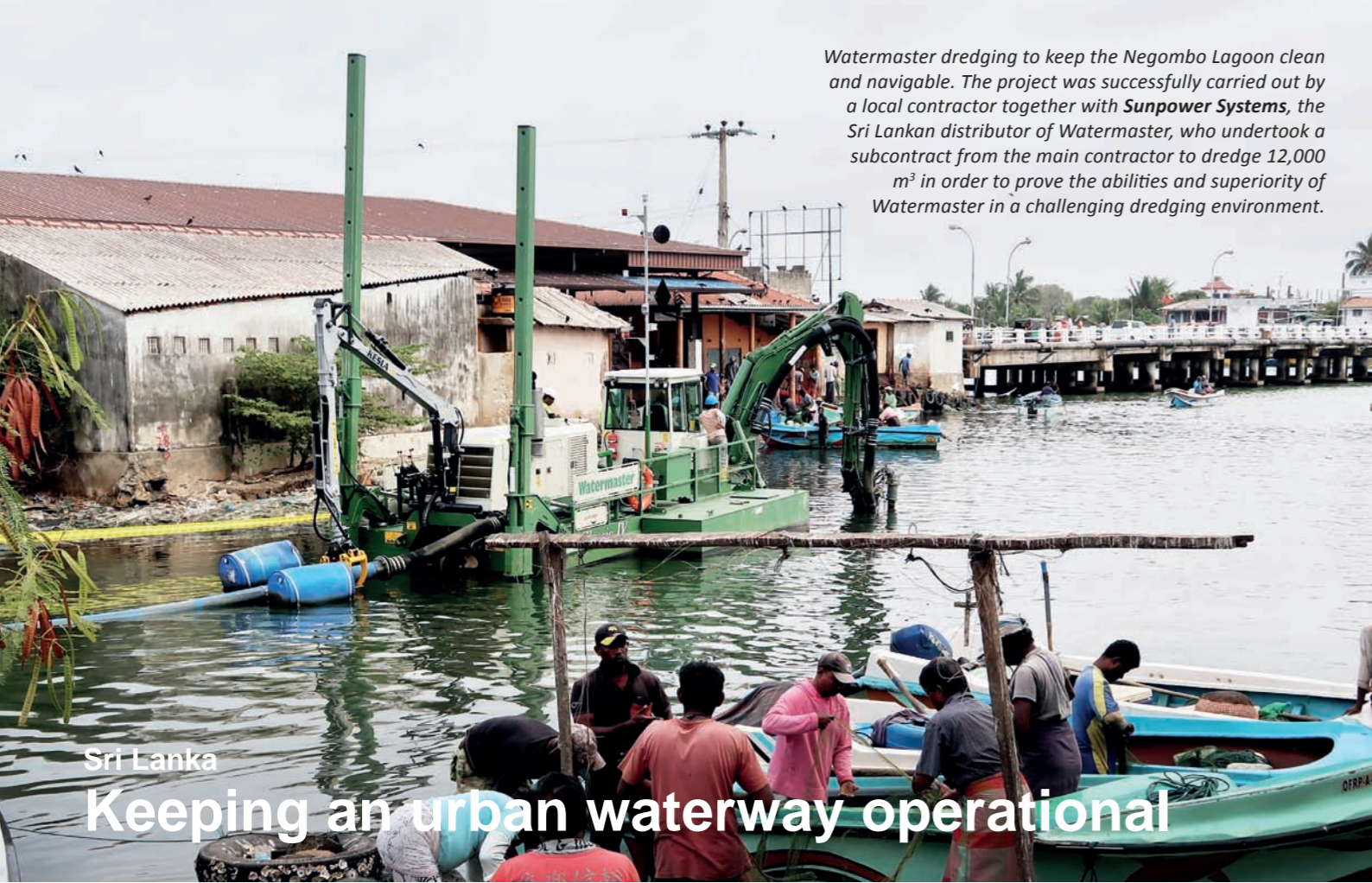


### CONVENTIONAL

MANY MACHINES  
MANY OPERATORS  
THE SAME MATERIAL IS HANDLED MANY TIMES



Suction dredging is more efficient than excavating because you do not need to handle the same material many times with many different machines.



Watermaster dredging to keep the Negombo Lagoon clean and navigable. The project was successfully carried out by a local contractor together with Sunpower Systems, the Sri Lankan distributor of Watermaster, who undertook a subcontract from the main contractor to dredge 12,000 m<sup>3</sup> in order to prove the abilities and superiority of Watermaster in a challenging dredging environment.

## Sri Lanka Keeping an urban waterway operational

**T**he Negombo Lagoon in Sri Lanka is experiencing the effects of urbanisation: accumulating silt and trash is causing problems in the daily lives of local fishermen and visiting tourists alike. This kind of pollution and siltation is an increasingly common problem in many locations around the world. Watermaster's new Urban dredging concept offers an efficient, safe and environmentally friendly cleaning method for polluted and silted urban water bodies.

### THE NEGOMBO LAGOON

Negombo is a bustling coastal city in the western province of Sri Lanka, 35 km north of the Capital Colombo. The Negombo Lagoon is located next to the city. The lagoon is a semi-enclosed coastal water body which is fed by several small rivers and is linked to the Indian Ocean. The Negombo Lagoon area has a vital importance for the locals. It is packed with a rich variety of flora and fauna, which bring a number of tourists every year to experience the special atmosphere and environment of the lagoon. The sightseeing boat tours are popular and very important for the economy of the city.

Even though tourism has replaced fishing as the main source of livelihood in the area, the city is still known for its centuries-old fishing industry. The local

fishermen catch crabs, shrimps, lobsters, cuttlefish and many native species of fish provided by the lagoon and sell them at the fish markets located on its shores.

But progressive urbanisation had started to cause practical problems in the lagoon area. The siltation coming from the rivers and massive amounts of urban debris, including plastic bags, bottles, cans and tires from the nearby settlements, had decreased the water depth in places to a critical point – the fishing and sightseeing boats had trouble entering and exiting certain parts of the lagoon, especially during low tide. In addition to the negative effects for local livelihoods, this pollution was harmful to the birds and fish and the whole environment. Restoration work was badly needed.



The Negombo Lagoon is situated in the Western Province of Sri Lanka, near the Capital Colombo

### Briefly

- The Negombo Lagoon in Sri Lanka suffers from heavy siltation and the presence of urban debris
- Conventional suction dredgers and excavators were poorly suited to the site
- Watermaster's Urban dredging concept was used to solve the problem
- Watermaster dredged 12,000 m<sup>3</sup> of silt and urban trash from the key locations

### CHOOSING THE WORK METHOD

The City Council entrusted the project to a local contractor. The company already had a good selection of heavy machinery, but still lacked the right machine for the project at hand. The work could not be done with land-based machines, and the floating excavators they owned were limited to the depth where their tracks still touch the bottom – about 1m. The ability to float is an extra safety feature for swampy, soft terrain areas, in open water they are too unstable for working. The target dredging depth at the lagoon was 2.5 meters, so the contractor needed a different kind of machine.

Excavating in general would not have been the ideal approach for the site. The disturbance to the active water traffic had to be minimized. Several barges and excavators on pontoons operating on the site would have blocked the waterway for the fishermen and sightseeing boats. Excavating is also quite inefficient, as the same materials have to be handled many times. Suction dredging is simpler and cheaper - if the dredger can handle the trash.

Negombo Lagoon was the perfect place to utilize the **Watermaster Urban dredging concept**, a new innovation by Aquamec Ltd. This pioneering technology enables suction dredging of soils that contain significant amounts of urban debris. Trash has been notoriously difficult for conventional suction dredgers - it frequently blocks the cutter, pump and pipeline, making pumping practically impossible.

Watermaster's **innovative patented solution** is to use special blades and coun-



A part of the waterway was separated and used as a settlement pond. Floating excavators helped finalizing the site by lifting the dredged materials onto trucks.

ter blades to slice the materials before entering the pump and the pipeline and thus significantly reduce the blocking of the dredging system.

### URBAN DREDGING

The task was to deepen and clean two critical sections of the lagoon, which were causing the most problems. A part of the waterway was separated and used as a temporary settlement pond, while the rest of the waterway was still kept open to traffic. Watermaster pumped the silt and trash into the pond via a pipeline a few hundred meters long. The excavators and floating excavators owned by the contractor had an assisting function at the disposal area, lifting the dredged materials onto trucks.

Watermaster was dredging 12 hours a day and sometimes even throughout the night, removing a total of 12,000 m<sup>3</sup> of silt and urban debris from the key locations. Watermaster's amphibious capabilities proved their worth since parts of the lagoon were so shallow, that

Watermaster had to walk in water using the rear spuds and the excavator arm instead of using the propeller. The project was successfully completed in the space of a couple of months.

### A COMMON PROBLEM

Urbanisation and the amount of urban pollution is showing no signs of decreasing. Urban water bodies are especially vulnerable to the effects of this trend. More and more maintenance and restoration work is needed to keep these vital water systems clean and operational. Safety, efficiency and choosing an environmentally friendly work method should be topping the priorities list when planning this work.

The Negombo Lagoon case was a pilot project for the Watermaster urban dredging concept. This kind of urban sludge had never before been dredged so efficiently. The vast majority of similar cases globally are being handled by excavators, often unsafely and at a high cost.

### Before and after

Watermaster successfully cleaned the critical parts of the heavily silted and polluted waterway by suction dredging.





**Aquamec Ltd.**

P.O.Box 260, FI-27801 Säkylä, Finland

Tel: +358 10 402 6400

Fax: +358 10 402 6422

E-mail: [watermaster@watermaster.fi](mailto:watermaster@watermaster.fi)

**[www.watermaster.fi](http://www.watermaster.fi)**