

Talking Point





A multi-billion-pound scheme has been launched to save Venice from drowning. But will it? And why are the Venetians so sceptical about it? By Christine Toomey

FLOOD, SWEAT AND TEARS

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he siren that can often be heard wailing across the rooftops of Venice whenever the sea threatens to engulf the city is redolent of a second-world-war air-raid warning. But few people panic – most simply calculate what footwear they will need that day. Venetians, or at least those who have chosen to remain in the city while many thousands have left, have become used to this. At the start of the previous century, St Mark's Square – one of the lowest points in Venice – flooded an average of 10 times annually. Today the vast piazza can be covered in water more than 100 times each winter. In the past 10 years alone, the siren heralding extreme high water has rung out from a network of towers across the city more than 50 times, mostly in the winter months. It is then that the strong sirocco wind whips up the waters of the Adriatic, sending it surging into the lagoon and along the city's canals virtually unchecked.

In the past 30 years, the population of Venice has been haemorrhaging; the number of people living here has declined from 130,000 to around 60,000. And in this slow evacuation, the floods have played their part. After centuries of gradually raising the levels of the foundations of many of the city's buildings and pathways to their maximum height, the lowest part of Venice now lies just half a metre above sea level. Homes and shops are frequently inundated with water; shopkeepers know they must move quickly to shift goods onto high shelves. In this city, there is no such thing as a basement flat.

Some Venetians actually welcome what they refer to as *acqua alta* – high water. "I love it," says Ana Bianchi, 51, whose family has run a restaurant in the old San Jobbe slaughterhouse district of the city for generations. "It makes the city seem somehow surreal. Besides, the salt water cleans the streets." Shaking his head and laughing, her 77-year-old father, Lino, agrees: "When I worked in the meat-packing houses around here, we used to welcome high water, because it drowned the mice and rats."

But ask Venetians what they think about the multi-billion-pound engineering scheme now under way to check the flooding and they are far less phlegmatic. "Folly," "Absurd," and "A white elephant" were just three reactions confided to me. It is not that Venetians believe the floods should be ignored: many are simply sceptical about both the motives behind the scheme and its long-term effect. Many now question: for whom precisely is Venice being saved? The answer, they believe, is the tourists. Some fear the

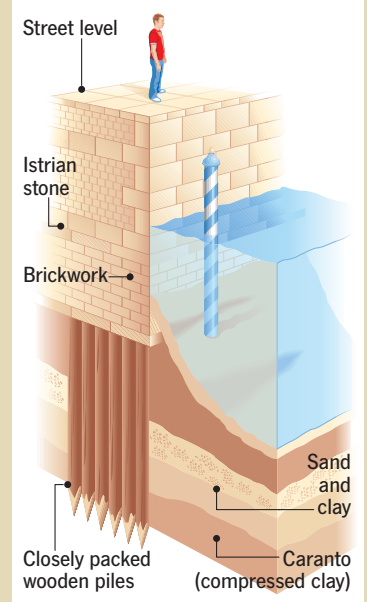


FOUNDATION WORK

The old methods of protecting Venice from high water – and the controversial new scheme

Above: workmen in Venice inject brickwork with stabilising materials. For centuries, engineers and builders in Venice have been preoccupied with reclaiming their city from the lagoon. Builders would create a dampcourse at the base of buildings using non-permeable Istrian stone, a type of marble. But as the water levels have risen, salt water has caused increasing devastation; particles of salt

that entered into the brickwork have expanded and increased pressure on the bricks, making them crumble. Right: the Venice lagoon lies above unstable land – which is why its 9th-century builders had to drive millions of piles made of oak, larch and alder into the more stable clay subsoil (*caranto*) underneath. Layers of wood were then laid onto the piles, followed by Istrian stone, which acted as a barrier against the water

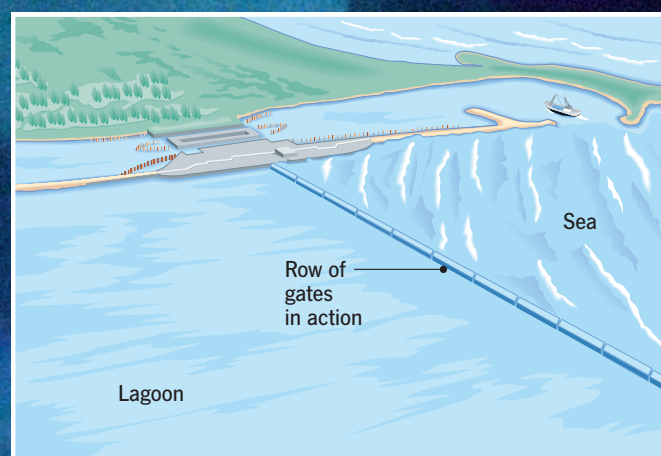
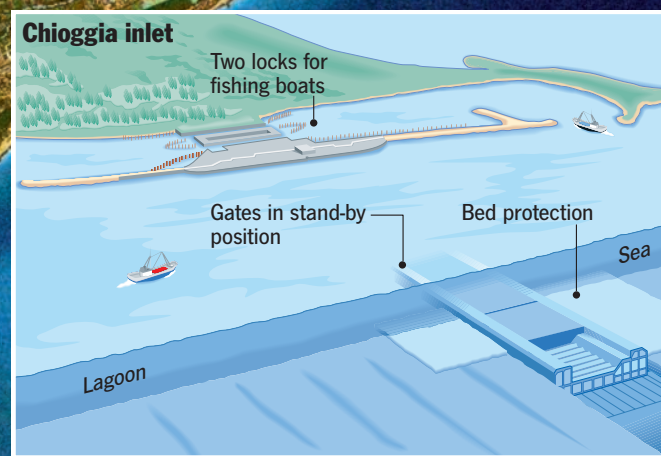
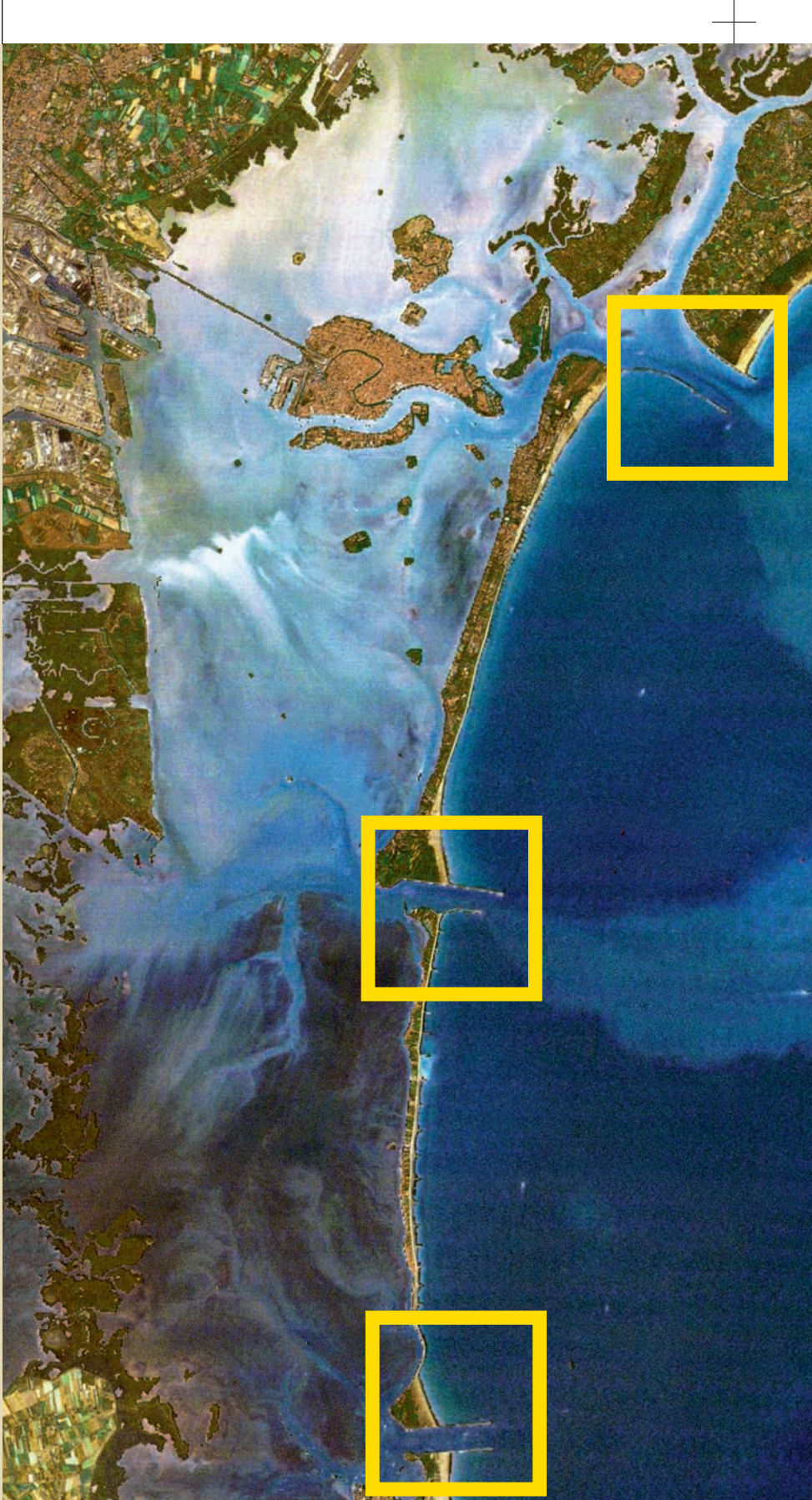


city is rapidly being turned into the museum quarter of the greater Venetian metropolitan area. "Venice is a dying organism, it's become a circus, a Disneyland for tourists, and who wants that?" laments Gherardo Ortalli, a history professor at Venice University.

For decades, saving Venice has been the focus of international debate. Much of the impetus behind the plans to safeguard the city has come from international bodies such as Venice in Peril, set up by the former British ambassador to Italy Sir Ashley Clarke in response to disastrous floods in Venice in 1966. This British charity, which for

30 years has received a proportion of the proceeds from every Veneziana pizza sold in the Pizza Express chain of UK restaurants, has donated millions of pounds for the restoration of the city's buildings and art works.

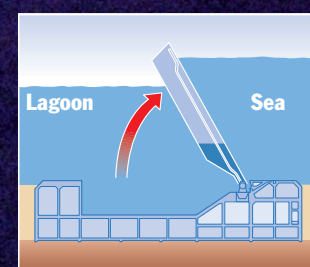
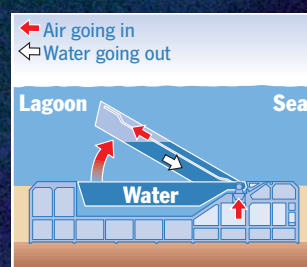
Construction of the latest flood-protection scheme began two years ago. Known as Mose, after the Italian acronym for "experimental electromechanical module", it has become the focus of huge controversy. The scheme, costing around £2.5 billion, is based on the creation of 78 mobile underwater barriers – each weighing more than 300 tonnes – which will for most of



PLAN FOR THE LAGOON

Left: the Mose system to save Venice will be built at the inlets to the lagoons at (from top) Lido, Malamocco and Chioggia, where a row of mobile gates will be installed. In the stand-by position, they are filled with water (below left) and rest on

the sea bed; to block the tidal flow when the water levels increase, they are emptied of water and rise to the surface (below right). Top: the Chioggia inlet with the gates in stand-by position. Above: the gates in place during a flood warning



'VENICE IS DYING, IT'S BECOME A CIRCUS FOR TOURISTS'

the time rest on the sea bed. But when the high tide surges more than 1.1 metres above the mean sea level, these barriers will be raised like a string of giant medieval drawbridges. It is a fantastically grandiose scheme; but the grandiosity is not such a surprise when you examine its provenance. The Italian prime minister, Silvio Berlusconi, cut the ribbon on this gargantuan project and declared it "the most important environmental-protection measure in the world".

The scheme, which is due to be completed by 2011, is the most ambitious in a series of grand engineering works given the go-ahead in recent

years by the Italian premier. Other projects include the building of a giant bridge linking Sicily to the mainland, and a high-speed railway link between Turin and Milan. But it is the barriers that Italians, and especially Venetians, are most sceptical about. As Berlusconi preened, placing an elaborate scroll carrying his name inside a hollow in the first massive stone to be laid at the inauguration ceremony, a mini armada of protesters surrounded the site. They have since regularly blocked water traffic on the Grand Canal with their flotillas of boats carrying placards denouncing the scheme. ➤➤➤

Many Venetians, and environmental organisations including the World Wide Fund for Nature, fear the barriers could impede tidal flushing and irreversibly damage the lagoon's delicate ecosystem. Others oppose them on the grounds they will, at worst, be ineffective, and at best, only a short-term solution, with rising sea levels owing to climate change rendering them obsolete within a few decades.

Critics are also incensed that the barriers are being built by the same consortium of industrial and engineering concerns that proposed them – a consortium that operates with little control or restraint. They say there are no proper safeguards, and that the project is simply another example of political opportunism by a perma-tanned premier who once compared himself to Jesus Christ. Long embroiled in scandal, Berlusconi sees investment in infrastructure as a way of stimulating the economy – and saving his political skin. Many of the scheme's critics are, however, reluctant to shout too loudly. They fear that if this project is scuppered by opponents – given the amount of time the Mose scheme took to progress from drawing board to construction – it could take decades before an alternative system of protection is approved. "There is absolutely no alternative to the barriers at present," argues Anna Somers Cocks, chairman of Venice in Peril. "They must go ahead. They should not become a victim of stop-go government."

If construction is stopped, experts predict the city that was once Europe's most powerful merchant empire could be uninhabitable by the end of this century. Far-fetched as it sounds, they argue, Venice could become a real-life Atlantis, only visible from a glass-bottomed boat.

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For centuries, Venetians have tried to hold at bay the water that has threatened to engulf what has always been one of the world's most fragile cities. Engineering work began as early as 1501, when legions of workers toiled for nearly 200 years, diverting the three main rivers and scores of smaller ones that flowed into the lagoon. The problem then was that the rivers brought so much debris with them from the surrounding plains that they were silting up the lagoon and slowly raising water levels.

The rate of human intervention in the natural dynamics of the lagoon speeded up dramatically with the advent of the industrial era, particularly in the first half of the 20th century. From the 1920s, factories on the mainland around the perimeter of the lagoon started tapping into underground freshwater, causing serious land subsidence over a wide area, and depressing land under Venice so that the city started slowly sinking. By the time pumping was stopped in 1970, Venice had sunk by more than 12 centimetres – a significant change. In addition, the lagoon itself was reduced in size by almost a third when the giant industrial port of Marghera expanded in the 1940s and 50s; with this came highly polluting chemical and petrochemical plants. Large sections of the lagoon were also lost



Venetians clean up beside the Doge's Palace, following the flooding that hit the city in November 1966

when they were separated off for use as fish farms. Perhaps the harshest blow to the stability of the lagoon, however, was the construction in 1952 of a 15-metre-deep channel in one of the three main inlets leading from the Adriatic, to allow oil tankers to berth at Marghera. Deep shipping channels were also dredged through the two remaining inlets.

These modifications had a complex and devastating effect on the lagoon. Pollution of its water from industrial waste and pesticides contained in agricultural runoff from the surrounding area killed off much subaquatic life, including sea grass that once helped anchor sediment on the lagoon bed. This lack of aquatic vegetation, together with the deeper channels, allowed stronger currents to flow into the

lagoon, accelerating the speed with which high tides could rush towards Venice. It also led to the floor of the lagoon becoming further eroded, with unknown quantities of sediment washed out to sea each year.

A freak confluence of low atmospheric pressure and torrential rainfall, along with exceptionally high tides exacerbated by these conditions, caused Venice to succumb to its worst recorded floods on November 4, 1966. Back then, there was no siren system to alert the city's population to impending disaster. It was left to a handful of volunteers to run through the streets shouting a warning through megaphones.

It was around 7am when Ranieri da Mosto heard someone calling at the door of his palazzo in the heart of Venice. Da Mosto was then a correspondent with the Rai broadcasting corporation, and the caller was a technician who had come to pick him up – by sailing a small gondola right through the front door. When da Mosto heard the warning an hour or so earlier that an exceptionally high tide was expected, he was, he says, "alarmed, but not too much. We had no idea then what would happen later that day".

With the water rising to 1.27 metres above sea level at the height of that morning's tide, da Mosto was taken by gondola to his office near the train station. He was able to make a single brief broadcast about the city's exceptional flood before the phone lines and electricity went

**'ALLOWING
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dead. As torrential rain continued, strong sirocco winds prevented the morning tide from leaving the lagoon before the afternoon tide rushed in. By 7pm the water had risen to nearly two metres above sea level. "There were boats in many of the streets, a total electrical blackout and, because many underground oil tanks had burst, there was thick black fuel floating on top of the flood water," da Mosto recalls.

When his loyal technician finally managed to get one phone line working that evening, da Mosto broadcast a report, written by candlelight, alerting the world to the fact that Venice was submerged in the worst floods for over 1,000 years. Paolo Canestrelli, the current director of the city's tidal forecasting and warning centre, also remembers that day in 1966 clearly, though he was just 14 at the time. He recalls making paper boats with his brother, which the boys launched from the first-floor window of their home, carrying lighted candles. "Looking back I realise how dangerous this was, given the amount of raw fuel floating on the water. But for us at the time, it was an adventure."

Few others saw it as such. When the flood water eventually receded 20 hours later, Venice was devastated: 5,000 people had lost their homes, businesses had been destroyed, and some of the city's unique treasure chest of art and architecture was irreparably damaged. But Venice was not the only Italian city to have suffered that day. Torrential rain and flooding across the country, particularly in Florence, had caused widespread destruction. In the following weeks and months it was Florence, not Venice, that became the focus of national and international efforts to salvage precious art works and buildings damaged in the floods.

Once this work was under way in Florence, however, art and architecture experts from around the world turned their attention to the problem presented by Venice. Organisations such as Venice in Peril were formed, and they have kept the city's plight in the international spotlight ever since. In the wake of the 1966 disaster, the government provided funding for restoration projects and for work to find long-term measures to protect Venice from future flooding. Under the auspices of Unesco, experts from around the world gathered to discuss what could be done to "save Venice".

Italy's unstable political scene – 60 changes in government in as many years – did little to ease decision-making in the search for definitive solutions. It was not until Berlusconi was re-elected four years ago that he threw his weight behind the Mose barriers mooted for decades. Other, less costly proposals – which were also easier to reverse if found to be ineffective – were dismissed. One of the alternatives was to make the three inlets to the Adriatic shallower, to reduce the amount of water flowing in and out of the lagoon. This, it was argued, would restore its natural equilibrium. This proposal was rejected on the grounds that it would block the passage of deep-



Anti-Mose protesters with a sign featuring Berlusconi that reads 'He throws the first stone into the sea'

draught oil tankers to Marghera, and of gigantic cruise liners. Yet many believe the largest ships should be banned from entering the lagoon anyway. Their powerful wash, together with the waves from the growing number of motorboats constantly ploughing along the canals, is one of the biggest causes of crumbling foundations. Plans have long existed for building a marina beyond the lagoon's perimeter, from which passengers could be ferried into Venice, and for laying a pipeline between Marghera and a docking station for tankers in the Adriatic.

"These cruise ships are like skyscrapers," argues Gherardo Ortalli, who is also a member of Italia Nostra, one of Italy's foremost environmental organisations. "It is both stupid and dangerous to allow them into the lagoon. People say tourism is important for Venice, yet it is not Venetians but international shipping companies that profit from these ships."

In common with many Venetians, Ortalli believes it is because of the "enormous financial interests invested in the Mose project" that it was given the go-ahead while other cheaper, possibly more effective solutions were shelved.

"It is obviously in the interest of the big companies and industrialists who proposed the Mose scheme, and are now contracted to build it,

to have as expensive a project as possible," says Stefano Boato, professor of city planning at Venice University and another keen environmentalist, who has been trying to challenge the legality of the Mose project.

He questioned the conflict of interest that the same consortium proposing a solution to Venice's flood problem was then charged with executing that solution. More recently, he has launched a legal challenge on the grounds, he contends, that the scheme contravenes urban planning laws. Maria Teresa Brotto, the engineer who co-ordinated the final design of the barriers and one of the chief spokespeople for Consorzio Venezia Nuovo (CVN), the consortium of private companies behind the Mose project, dismisses critics such as Boato and Ortalli as "a small but noisy minority". Dressed in a white-and-silver leather jacket, jeans and cowboy boots, Brotto eases back in her chair as she fields questions about the scheme with an exasperated look on her face. "I am amazed that people keep asking me the same things after all this time. This is the most studied project in the world. I am strongly convinced it is the best solution to this city's problems. It has all the necessary approvals," she concludes, looking at her watch.

But the scientific community remains divided. In 1996 the Italian government commissioned two exhaustive studies on the Mose project: one environmental-impact assessment by Italian experts, and another by scientists from Brussels, the Netherlands and the Massachusetts Institute of Technology (MIT). The former issued a negative report, not only questioning the efficacy of Mose, but saying it would be too detrimental to the environment. The latter concluded, with reservations, that it was the best solution for Venice. Some have since questioned the independence of their verdict, noting that several of the MIT professors had previously been paid as consultants ➤➤➤

'THIS WILL PROBABLY ONLY BUY VENICE SOME TIME'

by the consortium that is building the barriers.

This is the crux of much of the controversy that continues to engulf the Mose project. As far as many are concerned, the consortium behind it – set up by the Italian government 20 years ago as an “exclusive concessionaire” charged with uniting private companies vying for fat public-works contracts – is simply too powerful and operates with too few checks and balances.

In theory, the activities of the consortium are supervised by a local authority in Venice called the Magistrato alle Acque. In practice, critics argue, this thinly staffed local body acts as a virtual rubber stamp. “It is an empty box. The consortium controls everything and, like our present government, it is very interested in big business,” says Silvio Testa, a senior correspondent with one of Venice’s main newspapers, *Il Gazzettino*. “People here are both perplexed and dubious about Mose, and those who are more informed are very critical of the scheme. They simply don’t want it. I am convinced that as people come to realise the impact it will have on the environment, hostility to it will grow considerably.”

Even people such as Somers Cocks, of Venice in Peril, recognise that the barriers are likely to be only an interim measure. “The barriers will probably only buy Venice some time to search for longer-term solutions,” says Somers Cocks. “But I believe their construction should go ahead. People are living in a state of denial about how Venice is being irreparably damaged by the constant flooding.”

Two years ago, the British charity, which funded a research project into the problems facing Venice, organised a conference in Cambridge aimed at clarifying the state of scientific research into these problems. Somers Cocks admits that some Italians initially viewed such efforts by outsiders, particularly the British, as “interference”. Some even went as far as to suggest it smacked of “colonial arrogance”. But the Cambridge conference was considered a great success. It brought together 130 scientists and engineering experts from around the world who specialised in lagoon processes and flood control. Among the accusations levelled at the Mose scheme, when alternatives to it were being mooted, was that crucial data that should have been made available to the scientific community for independent analysis were not released by the consortium. One of the principal conclusions of those who attended the Cambridge conference was that it was essential that those in charge of Mose – already by then given the green light – remain flexible enough to adapt to improved understanding of the lagoon, advances in technology and unforeseen consequences of the construction of the barriers.

To ensure this happens, Somers Cocks believes an international commission should be set up – under the auspices of the European parliament, perhaps – not only to oversee the project as it is being built, but to monitor how it is working once construction is complete. “This



Above: a poster by Italia Nostra, which describes the barriers across the Lido, Malamocco and Chioggia as ‘monstrous dentures’. The group has campaigned against Mose for over 20 years

will not happen unless there is enough international pressure to push it forward,” she says. “But I believe passionately that the Italian government needs to wake up to its responsibility, and to realise that you cannot deal with the problem of Venice on an ad hoc government-by-government basis.

“Venice is a microcosm,” she adds. “Some of the problems the city faces now, and will face in the future as a result of global warming, will eventually confront other cities around the world. We all need to wake up to this. We need to get it right here, of all places.”

It is a conclusion echoed by Jane da Mosto, an environmental scientist and co-author of a book, *The Science of Saving Venice*, that resulted from the Cambridge conference: “Venice is a precious laboratory for dealing with complexities. Man and the environment have co-existed here for a thousand years. Whatever is done to safeguard Venice, we need to take into account all the interrelationships that exist here.”

What Venice lacks – and, most agree, desperately needs – is a long-term strategic plan. Because saving the city from flooding has been the focus of attention for so long, the question of what sort of city is being saved has been ignored.

‘THIS IS A FOLLY. THERE ARE CHEAPER SOLUTIONS’

Lack of jobs, rising housing costs and the inconvenience of living in such an unusual city have driven young people, in particular, to the mainland, leaving it with an ageing population and an ever-expanding influx of tourists – an estimated 15m a year. Although tourism provides a vital source of income for Venice, it makes life almost unbearable for many who live here. Testa reflects the view of many Venetians in describing tourism as a “cancer” that is destroying the fabric of the city. Initiatives such as tax breaks for businesses that are relocating here, and the provision of affordable housing for young workers and their families, could revitalise the city’s economy and make it less dependent on tourism. Plans for an underwater metro line linking Venice to the mainland – known as the *sublagunare*, or sub-lagoon railway – are also mooted as a solution to the island-city’s transport difficulties – though some fear this would simply increase the influx of tourists.

But here again, the expense of the Mose scheme comes under attack. For as soon as the project was approved, nearly all state funding for Venice, which once went to projects such as reinforcing the foundations of the city and repairing its buildings, was funnelled through the consortium constructing the barriers. Those who run it now virtually control the city’s purse strings, deciding how all government money allotted to preserving Venice is allocated.

One of the most startling sights for any visitor to Venice is the spectacle of sections of canals drained of water, as workmen using the latest technology shore up the city’s rotting foundations. Such work follows a tradition dating back to the 9th century, when Venice was transformed from temporary refuge to permanent settlement, as millions of wooden poles of alder, oak and larch were sunk into the lagoon floor so that Istrian-stone and marble platforms could be laid on top. But what money will be available now for such feverish restoration activity is in doubt.

Since the very first plans for the Mose scheme were first mooted, the retired architect Pino Rosa Salva has campaigned vigorously against them. Sitting in front of a large draughtsman’s table scattered with photographs of Venice during its many floods, Rosa Salva unfurls one of the posters he and other members of Italia Nostra have repeatedly plastered up on the city’s crumbling walls over the years.

In stark black and white, the poster depicts the barriers as giant teeth stretching across the three inlets of Venice, denouncing them as “monstrous dentures” that will destroy the lagoon and devour millions in state funds. “This scheme is a folly. There are cheaper and simpler solutions that should at least be tried,” concludes Rosa Salva, now in his nineties. “If man cannot save Venice, what can he save? But I am an old man now and do not have much energy left to fight.”

It is a weariness echoed by many in La Serenissima, which, when it comes to the fallout from the Mose project, is anything but serene ■

