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INDIAN LEADERS PROGRAMME 2018

Madrid-Valencia-Murcia-Cartagena-Almería

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#IndianLeaders

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6TH EDITION OF THE INDIAN LEADERS PROGRAMME

Five people took part in this edition, focused on water management and held in Madrid, Valencia, Murcia and Almería from July 9 to July 13

The Indian Leaders Programme is, along with the Forum and the SICF Award, one of the main events organised by the Spain India Council Foundation on a regular basis.

Through the Programme, SICF invites several experts in a specific area to visit Spain for a week. Thanks to meetings and technical visits, the participants get in contact with Spanish companies, institutions, public figures, experts and political representatives.

This gives them a chance to share knowledge, explain areas of potential and analyse challenges and opportunities in the two countries, creating paths for communication and knowledge with a view to strengthening Spain-India relations.

The Programme also seeks to provide participants with a broader overview of Spain's economic, social and political situation, given that it is all-important for the two countries to get to know one another in more general terms in order to be able to cooperate in specific areas.

This time, the Indian Leaders Programme focused on water management and invited five participants to visit Madrid, Valencia, Murcia and Almería from July 9 to 13.

The Programme's first edition had a multi-disciplinary focus with opinion leaders from the areas of business, academia, research and media; the 2013 edition focused on Indian media and had nine Indian journalists on board; six prominent figures in Indian higher education took part in the 2014 edition; the 2015 Programme brought five Indian MPs to Spain and, lastly, the 2016 edition focused on sustainable urban development.

INDIA'S WATER MANAGEMENT CHALLENGE

The Indian Leaders Programme analyses and explains how some issues common to the two countries are faced in Spain

With over 1.3 billion people, India is the world's second most populated country. 850 million live in rural areas, and the country's climate alternates dry and very humid spells (monsoons). This climate is one of the most heavily threatened by climate change: apart from rainfall, the main source of water for India's main rivers are glaciers in the Himalayas, threatened by global warming.

Optimal water management is therefore a priority for India. In 2016, 300 million Indians suffered heavy water shortages after two monsoons that were weaker than usual. According to AQUASTAT (FAO's global water information system), India uses 1,431 cubic metres per person per year (the equivalent to one and a half Olympic pools). In Spain, the average is 2,390 m³ (almost two and a half Olympic pools). As stated by trade media outlet iAgua, "if the latest climate trends are a source of concern in Spain, population 46 million, the forecasts are even more worrying in India with 1.3 billion."

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Regarding sanitation and access to drinking water, the Observatory for the Human Right to Water and Sanitation of the University Institute for Development and Cooperation (Universidad Complutense de Madrid) states that "over 50 million people suffer illnesses in India caused by polluted water and about two million children die every year" for that very reason.

In order to avoid this, the Observatory indicates that it is necessary to "put an end to underground water pollution and eutrophication (excessive growth of algae due to waste accumulation) in rivers and lakes, as well as to implement public services to guarantee access to quality water and sanitation for everyone."

The importance of this measure is far from new - Mahatma Gandhi said over fifty years ago that "sanitation is more important than independence." In order to

achieve this, education is just as important – even more so, in fact – than quality facilities. The Vicente Ferrer Foundation emphasises the importance of changing attitudes towards the proper use of toilets, which varies broadly between genders and age groups.

Regarding agriculture, a report by the World Business Council for Sustainable Development (WBCSD) estimates that close to 90% of all the water available in India is used for agricultural purposes and makes a connection between water, energy, food and climate change.

This issue is a priority for the Indian Government, which launched a National Action Plan on Climate Change in 2010 especially focused on water resources, agriculture and forestry. Since 2014, Narendra Modi's Government has stepped up efforts in this area, paying special attention to the cleaning of rivers and the use of renewable energies.

There are other players working in this area. We Are Water and Vicente Ferrer, for instance, work together to carry out projects related to solar energy and water use: drip irrigation systems, rainwater harvesting, aquifer recovery and water harvesting infrastructure, among others.

The WBCSD report also provides a set of actions that could contribute to improving the situation of water resources in India, on which some companies have already begun working: growing more environment-appropriate crops; smart management of harvests and sustainable use of fertilisers; mixed crops systems; efficient management of rivers and aquifers; efficient management of rainwater; energy efficiency in farm equipment and mechanisation; revenue improvement in crops; efficient and sustainable production of fertilisers; improvement of the marketing system and reduction of waste and produce loss during storage.

Throughout the Indian Leaders Programme, the participants had the chance to witness how some of the issues common to Spain and India are handled in Spain, to express their opinions about the actions underway in India and to point out cooperation opportunities for companies and institutions in the two countries.

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THE 6TH INDIAN LEADERS PROGRAMME KICKS OFF

SICF's Secretary General Alonso Dezcallar unveiled the agenda and objectives of this new edition

As is traditional at the start of every Leaders Programme, the Secretary General of the Spain India Council Foundation, Alonso Dezcallar, met with the participants to welcome them to Spain and explain the structure and purpose of the Foundation: to bridge the knowledge gap between the two countries. Dezcallar stated that "Spain and India still have a lot of work ahead of them to get to know one another better."

Another objective of the Leaders Programme, he said, is "to facilitate contacts with relevant people in the participants' sectors in Spain in order to create bonds that will allow them to carry out joint actions in the future."

Alonso Dezcallar emphasised that the Indian Leaders Programme, which celebrates its 6th edition this year, enables participants "get to know Spain better and for us to get to know India better through you. We would like you to participate as actively as possible, to ask as many questions as you like and to explain whatever you consider necessary."

Water management is at the core of this edition. In the opinion of the Secretary General, "we face many of the same challenges and we can share our experience. Spain has a solid international reputation in this area with large water management projects."

Architect Pankaj Vir Gupta mentioned some of the projects carried out in Spain that have achieved international renown, such as the transformation of Barcelona around the city's port and the recovery of the Manzanares river area in Madrid, and said he would like to learn more about them.

"That is precisely the objective of the Programme", said the Foundation's Secretary General, "for you to be able to understand how things have been done here and be able to share your own experiences."

A common feature for Spain and India is the need to balance the measures taken by central government and regional authorities.

SPAIN AND INDIA: COMMON CHALLENGES IN WATER MANAGEMENT

The Leaders analyse Spanish water policy with representatives of the Directorate General for Water

The first meeting of the Leaders Programme 2018 took place at the Ministry for Ecological Transition. There, a delegation spearheaded by the Director General for Water, Manuel Menéndez, welcomed the Leaders and showed them how the Spanish Government manages the country's water resources.

Manuel Menéndez welcomed the Leaders and emphasised that "Spain and India have a similar situation regarding water. India is a lot bigger and a lot more populated," but the issues are essentially the same.

Eduardo Orteu, Head of the Support Unit to the Directorate General for Water, began by outlining the main challenges posed by the management of this natural resource, "not only for Spain but for many countries around the world, including India." Scarce resources, floods and climate change are the main

issues faced by Spain, as well as the obligation to comply with European Union directives.

A common feature for Spain and India is the need to balance the measures taken by central government and regional authorities. The Leaders were particularly interested in basin management in Spain (inter-regional basins fall under the central government) and the distribution of competencies between central government, regional governments and local corporations, as well as the coordination of surface and underground water management along with non-conventional water sources in order to optimise their use.

Carlos Escartín, who boasts extensive water management experience, gave an overview of the current situation of water management in Spain, "the world's first country to create bodies for river basin management." Spain is also a world leader in desalination, both in terms of installed capacity and building capacity and a European leader in water reuse with 30% of the EU's total volume.

Eduardo Orteu stated that all those systems "have been provided by Spanish companies, and that is really important. We rely on those companies to carry out all these tasks." The representative of the Directorate General for Water Management pointed out that the Leaders would get to meet some of the companies in charge of the aforementioned projects.

International agreements for shared basin management, agricultural regulation and cooperation with other countries were some of the issues the Leaders enquired about.

"SPAIN HAS VAST EXPERTISE TO EXCHANGE WITH INDIA"

The Foundation's Chairman, Juan Ignacio Entrecanales, welcomes the Leaders to Acciona offices

Acciona's VP and Chairman of the Spain India Council Foundation, Juan Ignacio Entrecanales, welcomed the Leaders to the company's offices together with the Head of Business Development, Manuel Manjón.

The Foundation's Chairman welcomed the Leaders in the name of all SICF's patron companies and institutions and reminded the participants in the Programme that Spain has outstanding infrastructure companies, as well as universities and business schools which are not well known in India but have increased their capacities and competitiveness over the past few decades.

In the case of water management, this increased capacity is due to the fact that European legislation has boosted investments in water management and desalination in the past few years. This has allowed

Juan Ignacio Entrecanales: "India has many great companies in terms of conventional water management, but when it comes to large desalination projects, Acciona can offer a lot of added value."

Spain to accumulate “vast expertise to exchange, not only at a corporate level, but also at a government level.”

In India, Acciona has offices in several regions. In the water business, however, the company’s main activity is in the Americas, the Middle East and the North of Africa. “Over the past few years we have tried to understand the market in India, and we are still trying.” According to Juan Ignacio Entrecanales, the country has “many great companies” in terms of conventional water management, “but when it comes to large desalination projects, we can offer a lot of added value.”

Afterwards, the Leaders were treated to an informal lunch organised by Acciona and were joined by other patrons of the Spain India Council Foundation.

ELCANO ROYAL INSTITUTE EMPHASISES THE POTENTIAL OF SPAIN-INDIA RELATIONS

Water management is one of the industries that afford opportunities to Spanish companies

Elcano Royal Institute is a Spanish think tank for international and strategic studies and one of Europe's top ten institutes of its kind. The Leaders visited its headquarters to hold a meeting with its director, Charles Powell, and researchers Mario Esteban and Lara Lázaro.

In January, the institution presented

the report "Spain and India: seeking stronger bilateral relations", drafted by Rubén Campos, from Elcano Royal Institute, and Jayshree Sengupta, from the Observer Research Foundation, and sponsored by the Spain India Council Foundation at Instituto Cervantes in Delhi.

The report highlighted the infrastructure, railway, renewable energies and smart cities sectors as key to the development of Spanish companies in India, and emphasised the pharmaceutical industry and ICT as potential areas for Indian companies to succeed in Spain. More specifically, it pointed at desalination and water purification (by Abengoa and Eptisa, with the support of CDTI).

Relations between Spain and India, which celebrated their 60th anniversary in 2016, were, according to researcher Mario Esteban, "barely nominal" until the past few decades,

when India's economic growth attracted the whole world's interest. As a consequence of the recent economic crisis, many Spanish companies sought to branch out internationally and settled in India. "We realised we have a lot in common in many areas," said the researcher from Elcano Royal Institute.

Regarding water management, Charles Powell stated that Spain has a lot of experience in the area, "both among private companies and in the public sector." Lara Lázaro emphasised, in turn, that Spain was one of the first countries to implement the water footprint and "there are Spanish companies with a lot of experience in this industry."

Lara Lázaro gave the example of Acciona and Abengoa, companies which "have an outstanding technological level." In this regard, Charles Powell suggested looking for Spanish companies that are interested in working in India, since the country set truly ambitious environmental commitments at COP 21 (the United Nations Climate Change Conference).

The work of institutions such as Elcano Royal Institute, as stated by Dinesh Kumar, "can be very useful" to implement efficiency criteria to reach those commitments. Spain-India relations have gained momentum, so much so that, as stated by Mario Esteban, the Institute is preparing an update of the relations between the two countries: "There is a huge gap between the image that people in each country have of the other and the potential of Spain-India relations."

Charles Powell suggested looking for Spanish companies that are interested in working in India, since the country set truly ambitious environmental commitments at COP 21 (the United Nations Climate Change Conference).

NEW WATER MANAGEMENT TECHNOLOGIES

Indra tells the Leaders about the most innovative technology applications for water management

The meeting held by the Leaders at Indra's offices focused on safety and cybersecurity in the water industry.

The Spanish company has extensive experience in India, where it is a leading provider of technology for air traffic management. It has also implemented its solutions on metro lines and toll motorways, as well as on the Chenani tunnel, the longest in South East Asia.

The company also provides smart water management solutions, which streamline water resource management through the use of key components such as sensors, IoT communications and platform, artificial intelligence and big data. Indra also pays special attention to cybersecurity, especially in indispensable systems such as the water supply.

María Ángeles Pérez Espinosa, representative of Public Affairs and Institutional Relations at Indra; Lucía Herrero, technical consultant for energy and water; Liliana Velasco, Head of Indra´s Water Division and Araceli Iniesta, a member of the Department of International Business at Prointec (part of the Indra group), spoke to the Leaders about the different areas and services offered by Indra.

Through different solutions such as InDROP, IGEA and InGEN, Indra provides tools to control the whole water cycle and all the activities involved, from organising work teams to utilities for customer services or integrating water management in the concept of smart cities.

Architect Panjak Vir Gupta took a keen interest and asked about examples of the integration of water

management into smart cities. One of the best such examples is the case of Coruña and its Coruña Smart City project, which implements smart water management and monitoring systems and provides for savings of up to 25% on water bills.

Lucía Herrero emphasised that Indra also pays a great deal of attention to cybersecurity in order to prevent people from the outside from taking control of one of the country's most important facilities.

Dinesh Kumar and Wapcos' Managing Director, Shri R. K. Gupta, enquired about water losses, both physical and commercial (billing errors) and the potential application of Indra's systems to long-distance water transport infrastructure. In this area, there was a landmark case in Monterrey, Mexico, where Indra's control systems detected a level of loss of 37% and the company was able to develop a strategy to reduce the volume.

AN ANALYSIS OF RISK MANAGEMENT IN THE WATER SECTOR

The Programme visited the Control Centre of the Tagus River Authority, where the Leaders held a meeting with the consultancy firm iPresas

Founded in 1953, the Tagus River Authority (Confederación Hidrográfica del Tajo) is one of the institutions through which the Government exercises water management in basins that run through more than one region. Its Chairman, Juan Carlos de Cea, welcomed the Leaders together with the person in charge of the Automated Water Information System (SAIH), José Antonio Hinojal.

The Tagus River Authority is managed in accordance with Spain's Water Act (Ley de Aguas) which, according to Juan Carlos de Cea, is "the oldest in Europe." This Authority manages an area "which covers approximately 10% of Spain's surface area" and runs through several regions on to neighbouring Portugal, which entails a number of obligations to that country. It also includes the city of Madrid, with over 6.5 million people and a similar number of visitors every year: "We have to cater for a large population, as well as purifying water."

Apart from water supply and treatment, safety is one of the main concerns of the Tagus River Authority. One aspect of safety is cybersecurity, and another is the

safety management undertaken at dams through risk analysis: "Investments in dam safety are always massive; the resource is limited and these investments aim to be as efficient as possible."

José Antonio Hinojal also mentioned the pressure that stems from the need for irrigation, with some 230,000 ha between private and state-owned land: "That is one of the most significant demands in terms of water consumption, and the needs cannot always be met." Due to climate change, among other factors, flows into reservoirs at the top of the basin have been reduced. One of the tools to manage contingencies is the Automated Water Information System (SAIH), which was first implemented in Spain in the 80s after the Tous dam disaster. The SAIH for the Tajo basin has "over three thousand sensors generating information that is transmitted to the control centre in real time: rain and snow gauges, dam control systems, canals, lifting stations, water level controls on bridges and so on."

The SAIH system cost 42 million euros to implement and 2.5 million a year in maintenance, including personnel, parts, communications and repairs.

The management of all this data allows for a large number of studies and feeds the Decision Support System (SAD), which combines the data with weather forecasts to generate probability forecasts for two, six and ten days. These serve as an indicator to discharge water before a flash flood, for example, among other measures.

The system is different from the one used in India, as explained by Dinesh Kumar and Nidhi Srivastava: "We make forecasts at a specific point upstream, one or two hundred kilometres away, between six and ten hours in advance. Forecasts are 99% accurate," so the main issue according to Nidhi Srivastava lies in "the transmission of data and coordination." The system used by the Tagus River Authority, stated José Antonio Hinojal, allows for "forecasts to be obtained at all points of the basin."

The Tagus River Authority manages an area "which covers approximately 10% of Spain's surface area"

The Leaders also visited the SAIH's Control Centre, which is operational 24/7 and monitors data in real time, as well as one of the Authority's water stations.

Meeting with iPresas

Later on, Adrián Morales, Technical Director of iPresas, gave the Leaders an overview of his company and the work it does. iPresas is a spinoff of Universidad Politécnica de Valencia which specialises in providing integrated safety and protection to dams and other critical infrastructure. The company acts as a consultancy firm for companies and authorities all over the world, including India, where it recently drafted a document for the Central Water Commission - set to be released at the end of the year - and carried out a risk analysis for the Bhadra dam in the state of Karnataka, one of the country's largest facilities.

iPresas undertakes full risk analysis, which includes from structural safety to technical documentation and emergency plans, and combined with water data these analyses determine the probability of failures and the potential consequences, as well as the measures needed to reduce this probability. The Leaders were interested in the iPresas' work and wanted to learn more about the company's activity. Shri R. K. Gupta enquired about the possibility of carrying out risk studies before building reservoirs, which would allow for changes in their design. Dinesh Kumar asked about the possibility of creating a detailed risk map for all the country's reservoirs to determine those in which it might be a good idea to carry out a more comprehensive risk analysis.

Adrián Morales mentioned that a similar process was implemented for the Duero River Authority, for which iPresas analysed 27 dams with the purpose of identifying the best candidates for more thorough research. The meeting came to an end with both parties committing to meeting up in the future to identify potential areas for cooperation.

LUNCH WITH THE AMBASSADOR

The Leaders were welcomed to Madrid by the Ambassador of India to Spain, Venkatesh Varma, who talked to them about the reality of bilateral relations between the two countries.

THE LEADERS WERE IN AWE OF THE MANAGEMENT OF CANAL DE ISABEL II

The participants found the meeting “really interesting and comprehensive” and learned about the systems used for water management in the region of Madrid

The output of the river Manzanares is insufficient to provide water to a large population, which makes Madrid the only European capital without a major river or lake nearby. To remedy this and boost the city’s growth, Canal de Isabel II was built in the 19th century. This canal is 76 km long and takes water from the river Lozoya to the capital.

Now, over a century and a half later, Canal de Isabel II is responsible for the treatment and supply of water to the entire Madrid region. Guided by the area coordinator at the Control Centre, Elías Manrique, the Leaders learned about the workings of an institution that, despite its old age, has been able to adapt new technologies to its infrastructure.

Elías Manrique outlined all the areas of water management in Madrid, from billing, which is organised so that it is compliant with European Union directives on the responsible, efficient use of water, to the treatments used to prepare water for human consumption. “We are lucky with the raw material: the water quality is good and we do not

need to spend a lot on getting it ready for consumption," he said.

The Leaders were surprised by the figures indicating that, despite the reduction in rainfall since the 80s and the increase in population, the institution has managed to contain the demand for water thanks to loss reduction plans (by renewing piping and better managing pressure) and highly effective public awareness campaigns.

They were also impressed by the fact that Canal treats almost 100% of used water for new uses such as irrigation, and generates energy with some of the waste. In fact, the company generates 60% of the energy it uses.

The Leaders were fascinated by the workings of the Control Centre, particularly regarding the monitoring of infrastructure and the reduction of non-revenue water. Over thirteen years, Canal installed 600 DMAs, parts of the network which can be isolated from the rest to analyse the inflow and outflow of water and identify potential losses or thefts. Pankaj Vir Gupta was "inspired" by the system, which he considered to be "critical work" and noted that

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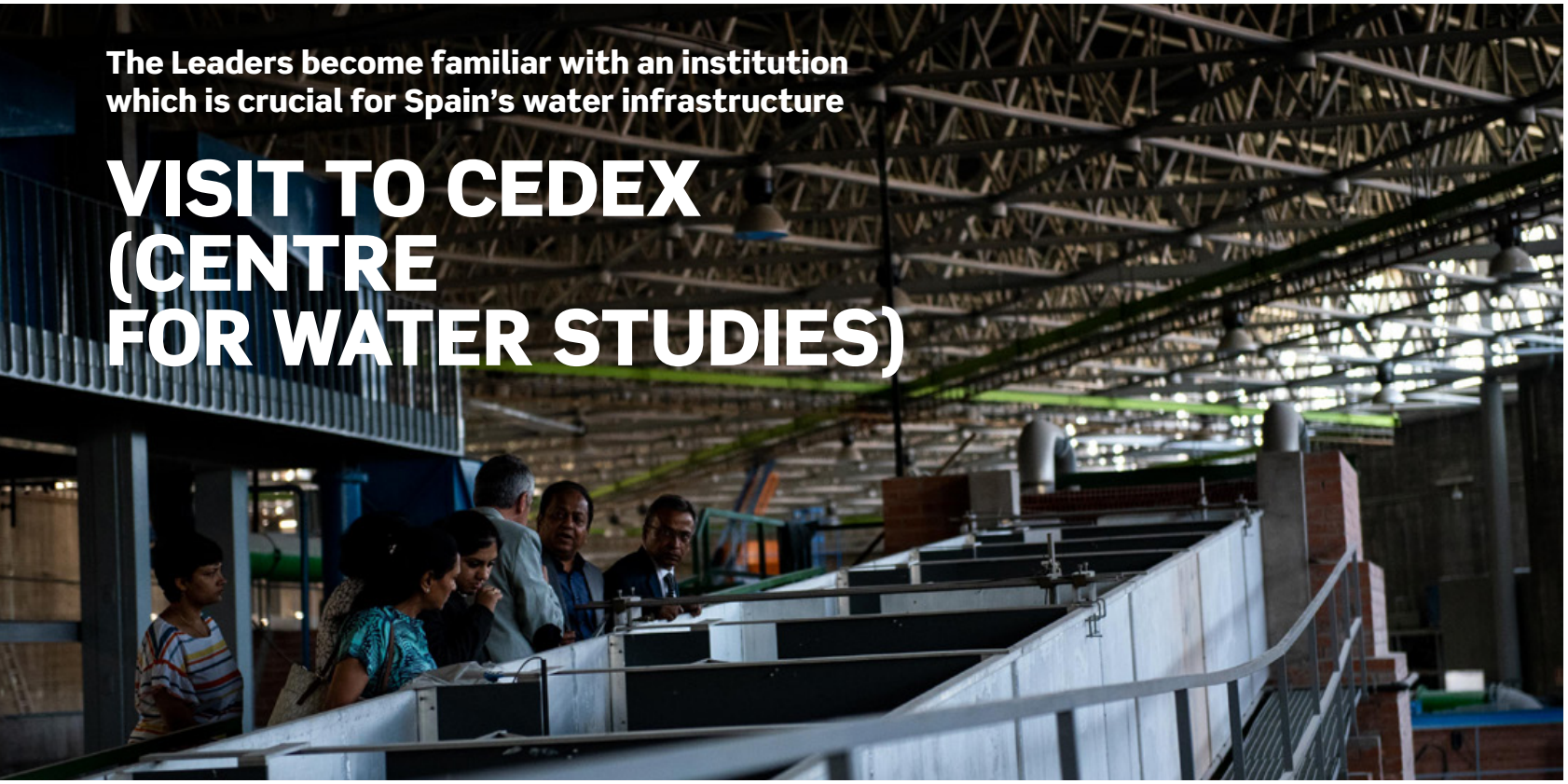
in Delhi, populated by 26 million people, "only two areas have water pressure."

Juhi Chaudhary compared the losses in supply in Madrid, which stand at just 14%, to those in Delhi, which total 45% due to both technical problems and irregular connections. Elías Manrique indicated the steps to reduce non-revenue water: on the one hand, locating public supplies such as irrigation that are not registered, abnormal consumptions that may indicate technical problems and detecting fraud, and on the other, ensuring adequate management of pressure and updating and maintaining the network.

The meeting, which the Leaders found "very interesting and comprehensive", concluded with a visit to the Control Centre, guarded by no less than five people round the clock across the whole Canal de Isabel II network. Those people use a range of IT tools to guarantee water control, monitor infrastructure and respond to alerts, manage incidences, collect data and draft reports.



The Leaders become familiar with an institution which is crucial for Spain's water infrastructure

VISIT TO CEDEX (CENTRE FOR WATER STUDIES)

Cedex, the Centre for Water Studies or for Studies and Experiments on Public Works, was founded in 1957 and is a government institution specialising in civil engineering and technology. It is part of the Ministries of Public Works and Ecological Transition and devotes its eight centres to carrying out studies and reports to support decision-making at both Ministries, as well as other Spanish and international bodies and private companies.

The Leaders visited the Centre for Water Studies, where they were greeted by the Hydraulics Lab Director, Luis Balairón, and by María Isabel Berga, who is Head of Programmes at this lab and is in charge of International Relations. The two experts told the Leaders about the functions of CEDEX, especially those of the Hydraulics Lab. "Water infrastructure in Spain is very important," said Balairón.

"We have 1,200 large dams, many of

which were built in the second half of last century." The Hydraulics lab facilities were "built to support the engineering of all those dams. There are currently about twenty dams being built in Spain, many of which have been tested at our lab. We also carry out tests for many older dams, which require an extension of overflow channels and other actions to improve their safety."

The Leaders were especially interested in CEDEX's work around updating old facilities. "We run all the tests to adapt the dam to current legislation, which is more restrictive than back when it was built," which allows the lifespan of the infrastructure to be extended, rather than demolishing them and starting from scratch.

In addition, CEDEX has the capacity to support private companies and other public administrations, both Spanish and international. It is particularly active in South America, where it provides services both to Spanish companies abroad and to the programme that the Ministry of Foreign Affairs, European Union and Cooperation has in place to support Latin American countries in the promotion of water supply and sanitation plans. "Through this programme, the Spanish Government funds sanitation and purification plans in many countries, and we have been trusted with the mission to provide technical assistance for the selection and development of those projects."

Regarding the Hydraulics lab, María Isabel Berga gave an overview of its areas of activity in dam engineering, for which they prepare physical and numerical models.

The Leaders were able to see both models at the Virtual Reality room and the Hydraulics lab with spectacular scale models of dams and other infrastructures used by CEDEX to analyse their performance and potential improvements. The combination of virtual and physical models allows for the streamlining of resources.

The Leaders and their hosts also discussed the difficulty of building new dams because of the lack of space and the need to maintain environmental protection areas, as well as the social resistance to this type of infrastructure. "Many of our dams were built to meet water demands, but many others are there to prevent flooding," said Luis Balairón. "There are records of

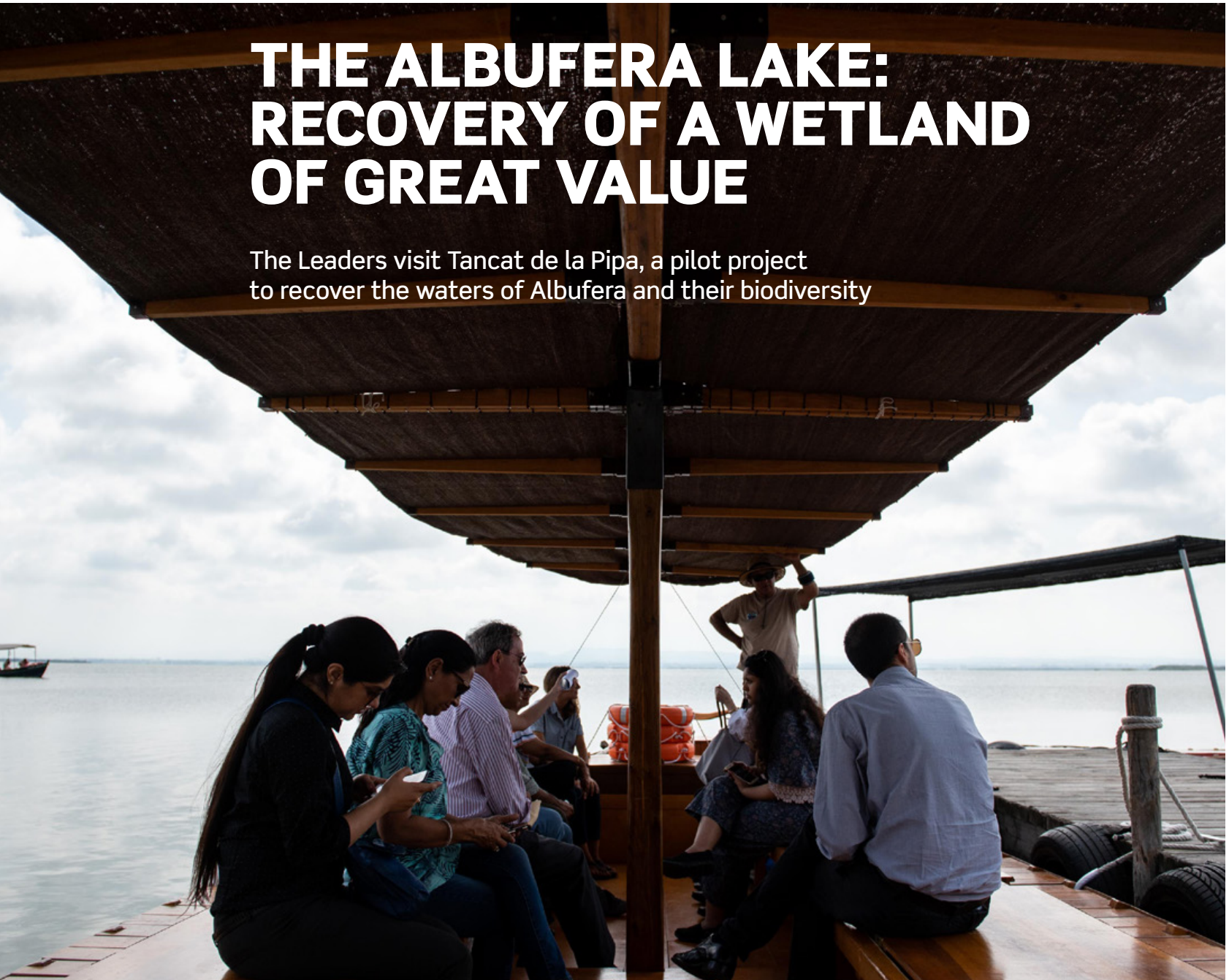
many floods in the past few years that, thanks to the dams, have not caused any personal damage. That is an aspect that needs to be communicated to society, that there has been no personal damage and we have those structures to thank for that."

Among other observations, Pankaj Vir Gupta noted the need for planning in order to guarantee water supply in India, with a growing population and scarce water resources. Juhi Chaudhary mentioned that "the amount of sites of environmental value is a problem when it comes to undertaking water projects," adding that it would be necessary to "assess the benefits of dams and those of areas of environmental value."

The meeting finished with a visit to some of the most interesting parts of the CEDEX building, built in 1963 by renowned architect Miguel Fisac. The building is a landmark of 1960s Spanish architecture and is not only visited by water industry professionals, but also by architects and students from all over the world

HIGH-SPEED RAIL VIEWED FROM THE COCKPIT

The Leaders had the chance to become familiar with Spanish high-speed rail by visiting the cockpit on a trip from Madrid to Valencia.



THE ALBUFERA LAKE: RECOVERY OF A WETLAND OF GREAT VALUE

The Leaders visit Tancat de la Pipa, a pilot project to recover the waters of Albufera and their biodiversity

The Leaders travelled by high-speed train from Madrid to Valencia and even had a chance to visit the cockpit and learn about high-speed rail in Spain. Once in Valencia, representatives of the Júcar River Authority took the delegation to visit the Albufera National Park, where a pilot project is being developed to recover the lake's water quality through a natural water treatment system.

The Albufera lake, the largest in Spain and designated as a Ramsar site (Wetlands of International Importance) was heavily polluted in the 70s due to the growth of its neighbouring towns, which dumped their waste in the lake, the rise of chemical industries in the area and the intensive use of fertilisers and pesticides on the adjoining rice paddies.

The project, named "Tancat de la Pipa" after the area where it is being carried out, has transformed rice paddies in the Albufera into a natural purifying plant: the water of the lake runs through a number of fresh water plant fields, called Green Filters, which purify it by absorbing







the excess nutrients that lead to an accumulation of algae and, after a 10-day long process, the clean water is returned to the ecosystem.

The programme, developed by NGOs SEO/Birdlife and Acció Ecologista Agró with the support of the Júcar River Authority and the regional government, has managed to meet the water quality levels expected for 2020 and some species which disappeared in the 70s are being recovered, especially water plants

The Albufera lake, the largest in Spain, was heavily polluted in the 70s

which grow on the bottom of the lake and are crucial for the rest of the ecosystem.

The coordination between civil and government organisations is one of the main reasons for the programme's success. Some universities have also participated by carrying out a number of studies on flora, fauna, water quality, etc. The Leaders asked for data great deal of additional information from those in charge of the Júcar River Authority and the Tancat de la Pipa project, from the crop volume of the rice paddies in the Albufera to the composition of mud and percentage of heavy metals on the bottom of the lake. They also compared this pilot project with lake cleaning initiatives carried out in India. At the end of the visit they congratulated the people responsible for the project on its success and were treated to a boat trip around a natural park that has been reborn after half a century of decay.

THE SEGURA RIVER PROJECT: A HUGE SUCCESS FOR THE RIVER AUTHORITY

The Leaders analysed how Spain's most polluted river was recovered

The President of the Segura River Authority, Miguel Ángel Ródenas Cañada, told the Leaders about the characteristics of a land which is "more typical of the North of Africa than of Europe." This is, he said, "the basin with the least rainfall out of the 215 largest rivers in Europe" and where, when it happens, rain is usually torrential.

Agriculture is at the core of the region's social and economic system. The excellent quality crops are mainly exported to the European Union. The sector uses 80% of the water managed by the River Authority, whose main tasks are the Tajo-Segura transfer, the network's maintenance, managing droughts and floods and desalination (the basin has thirteen large plants generating 333 cubic hectometres, one of the greatest concentrations in the world), on top of the Segura river project.

The project attracted the Leaders' attention due to its similarities to the Yamuna river project, recently presented in Spain, co-directed

Miguel Ángel Ródenas Cañada: "The Segura basin has the least rainfall out of the 215 largest rivers in Europe"

by architect Pankaj Vir Gupta and Spaniard Iñaki Alday. In the 90s, the Segura river was considered to be the most polluted river in Spain. Where it flowed through Murcia, according to Miguel Ángel Ródenas, it was "an open sewer, all it carried was waste water."

The Segura River Project was born with the purpose of obtaining more water to be used in agriculture, as well as recovering the river and its ecosystem. An integrated sewer, purifying plants and billing per pollution levels was proposed. Over the course of 10 years, 46 tertiary treatment plants were built. Thanks to them, currently "99% of the water is treated" and reused. In 2012, the project's success was clearly demonstrated by the sighting of an otter in the river in Murcia. Also, artificial lagoons by the treatment plants attracted many birds, some of them belonging to endangered species. Two of those lagoons even qualified as Ramsar sites (Wetlands of International Importance).

For the Leaders, the results of the Segura River Project are "amazing" and its implementation reflects "outstanding work"

For the Leaders, the results of the Segura River Project are "amazing" and its implementation reflects "outstanding work." Dinesh Kumar considered the economic returns of the water use for irrigation to be "impressive" and noted that, with the existing profit margins, "even desalination can be profitable."

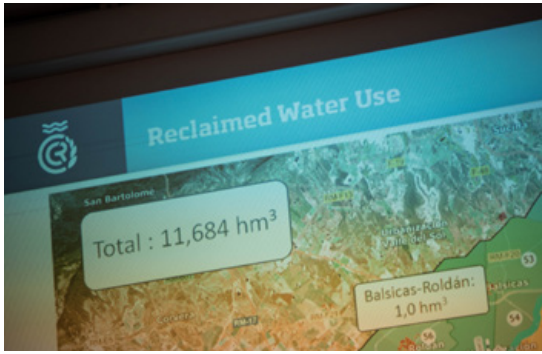
Architect Pankaj Vir Gupta emphasised his admiration for the planning process carried out by the Segura River Authority. "Over the past twenty years they have devised a plan which has worked for them. I would love it if we could build a similar system together in our country over the coming years."

CARTAGENA COUNTRYSIDE IS TRANSFORMED THANKS TO THE TAJO-SEGURA WATER TRANSFER

The Cartagena Countryside Irrigators Community, founded in 1952, has one of the most profitable irrigation agricultures at a regional and national level and is also one of Europe's largest and most technically advanced communities.

Between 1996 and 2010 it underwent an intense modernisation process which involved the automatisation of control and measurement elements, the installation of measurement elements in reservoirs and water mains, the clustering of pumping stations, the increase of storage capacity and the distribution network and the integration of ICTs into the community's management system. Currently, every member of the community can monitor water

The Irrigators Community is one of Europe's largest and most technically advanced



closely and manage irrigation on their mobiles.

The Leaders visited the Irrigators Community headquarters to learn about the organisation and its performance, and were welcomed by the Chairman, Manuel Martínez; Mariano Soto, Secretary General, and Pablo del Amor, Head of ICT.

During the presentation, the Leaders learned about the importance of the Tajo-Segura water transfer for the region of Murcia, considered to be "Europe's vegetable garden," as well as the farmers' efforts to improve water use. "The application of technology has become a habit for the irrigators, and their purpose is to maximise production and quality while reducing water use. They have managed to obtain 8 kg per cubic metre of water, while traditional crops only manage 3 kg," said the Community managers.

Vegetables (59%) and citrus fruits (30%) are the main produce of the region, which uses highly technical methods. Mechanisation, fertilisers, species and seed selection, greenhouse crops and drip irrigation are some of the strategies used in the area.

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The Community's water resources also come from the Segura basin, the reuse of water and the El Mojón desalination plant

As well as the Tajo-Segura water transfer, the Community's water resources come from the Segura basin, the reuse of water and the El Mojón desalination plant, where water is sourced from the drainage of the irrigable area, avoiding the pollution of the Mar Menor. The area's underground waters are too salty and would need to be desalinated to be used, which is why "they are never the first option."

The Leaders wanted to learn about several aspects of the Irrigators Community daily operations: from the monthly planning of water transfers to the billing of the service and the control and monitoring tools.

Lastly, the Leaders took a guided tour of the city of Cartagena, visiting its landmark buildings and its impressive Roman theatre.

PRIMAFLOR'S GREENHOUSES AND HYDROPONIC CROPS YIELD HIGH-TECH VEGETABLES

The company's facilities are developed around water scarcity

Pulpí is Almería's tenth largest municipality by greenhouse surface area. Vegetables started being grown in greenhouses in 1963 and in 1971 they started growing at a larger scale. This is where Primaflor is based, a company founded four decades ago to grow flowers and which changed its business model in the 80s to start growing vegetables and producing ready-to-eat salads.

It currently has a 2,700-strong workforce and sells its products

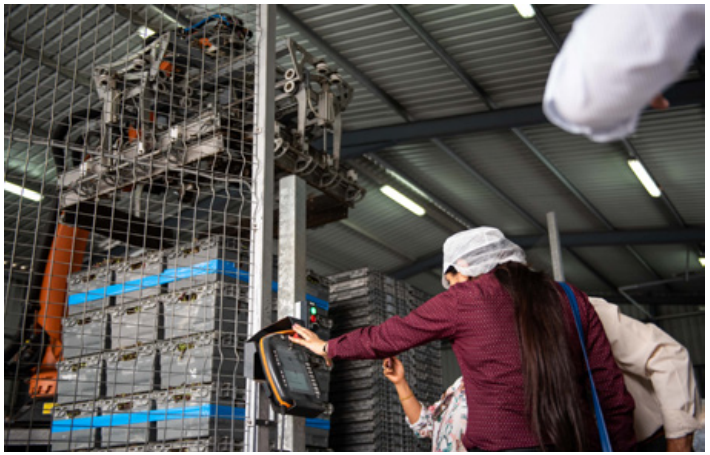
all over Europe, especially in Spain and the UK, as well as Canada and several Arab countries.

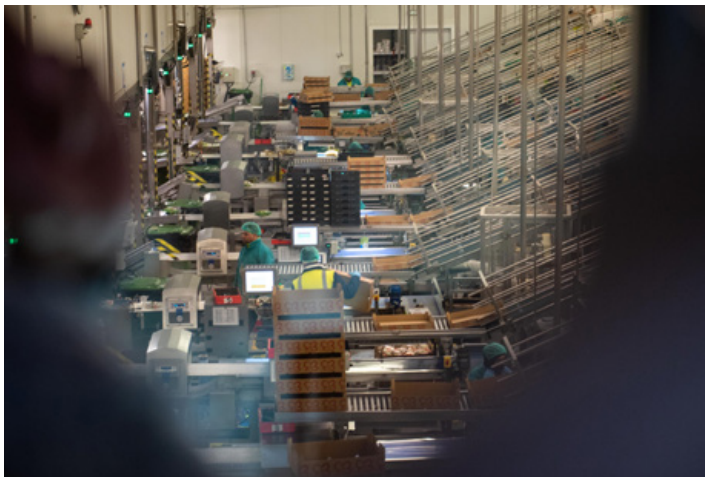
Primaflor's Corporate Director, Cecilio Peregrín, welcomed the Leaders and shared business figures with them, as well as other interesting facts about the company, which has 6,000 hectares of land at various above-sea levels, which allows them to maximise harvests every year.

The Leaders enquired about the sale of products to department stores and profit margins, as well as about adaptation to climate change and the inclusion of organic products into the company's portfolio, among other things.

The company invests heavily in technology in order to save water and improve sustainability. Therefore, the visit also included a tour of Primaflor's cutting-edge facilities: its high-tech greenhouse, the Fourth-Generation plant and the Experimental Technological Greenhouse.

At the high-tech greenhouse, Primaflor produces baby leaf greens. This 'veg factory' applies industrial techniques to agriculture. With a surface area of six hectares, this





greenhouse produces the same as 60 hectares of traditional crops using less water and resources. “We have excellent weather but water is always scarce, so we do whatever we can to save even one drop,” said Cecilio Peregrín.

They also got to visit the Fourth-Gen plant, where product preparation takes place (chopping, washing and packaging) in a controlled environment and at temperatures between 2 and 4 degrees Celsius. The company’s corporate director highlighted the importance of temperature control. “Our company’s cooling capacity is currently the highest in the industry. We can make temperature drop to 1-2 degrees Celsius in 20 minutes, stopping the decay process.” As a result, the ‘best before’ date on the products is extended. “What we harvest today can be anywhere in Spain by tomorrow. It takes 4-5 days to reach the Baltic countries, for instance, and it still has 5-6 more days to be consumed,” he said.

Hydroponic crops do not need any soil, the plants’ roots get water and fertilisers and obtain high oxygenation. Since the greenhouse is a controlled environment, pesticides are not needed and water use is reduced by 70%, yielding more plentiful crops. At the tech greenhouse, which the Leaders found impressive, they learned about the work of NGS, part of the Primaflor group. The company has patented several technologies for hydroponic crops and developed around one thousand projects in twenty different countries.

VISIT TO THE WATER DISTRIBUTION CENTRE AT CUEVAS DEL ALMANZORA

The Water Museum served as an excellent backdrop for the closure of the Leaders Programme's 6th edition

The last visit of the Leaders Programme 2018 was to the company Aguas del Almanzora in Almería. As pointed out by the hosts, the meeting took place at a strategic point of the basin: the point where the waters from the Tajo-Segura transfer join those of the Negratín-Almanzora transfer, which the company manages.

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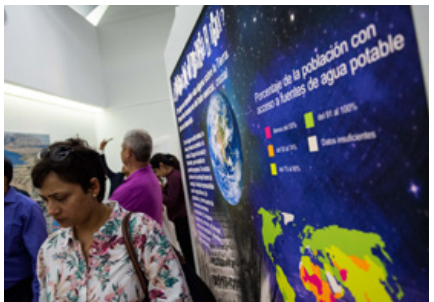

The irrigators community also receives water from two desalination plants. All those resources come together and are distributed among the irrigators and for the use of several municipalities in the area.

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The Leaders learned about the Control Centre, from which the company's two water reservoirs are monitored in addition to the rest of its facilities, including water pumps at the beginning of the transfer and remote facilities which are controlled every five kilometres with water flow valves as necessary. They also visited the pumping station, which obtains 80% of its energy from renewable sources, especially solar power.

They also had a chance to visit the Water Museum at El Saltador, which shows a series of old mechanisms used to seek and extract water, such as the cimbra (old galleries that used to be excavated by riversides), water wheels, cisterns and distribution systems.

Lastly, the Leaders and their hosts had an informal lunch at the museum, which served to close the 2018 Indian Leaders Programme. The Leaders were highly satisfied and impressed by the facilities and the level of professionalism of all the institutions visited during the week, and particularly by the candour and warmth they encountered at all meetings.

ART, CULTURE AND GASTRONOMY

THE BEST FLAMENCO AT CASA PATAS

The Leaders had a chance to sample Spanish gastronomy and enjoy one of Madrid's best-known flamenco shows.

ART,
CULTURE AND
GASTRONOMY

WALKING TOUR AROUND MURCIA

The Leaders took a tour of the city and visited its main attractions, such as the Casino, Las Claras Arab Palace and the Cathedral.

ART, CULTURE AND GASTRONOMY

CARTAGENA'S TOURIST TREASURES

The day in Murcia ended in Cartagena, a historical jewel in the Mediterranean in which various different civilisations settled and left their marks, such as the famous Roman theatre.

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