

IBM AND THE FUTURE OF WATER MANAGEMENT

HANLEY: Welcome to a podcast on The Future of Water Management. I'm Joe Hanley. In August, 2005, the world was stunned by the impact of Hurricane Katrina on low-lying New Orleans.

With climate change gaining wider understanding, the issue of coastal flooding due to rising sea levels and extreme weather episodes is high on the agenda of many governments worldwide.

Here to discuss the future of water management are Arie Kraaijeveld, Chairman of the Netherlands Water Partnership, and Djeevan Schiferli, from IBM's Climate Change Impact Team. If you would, please set the scene. How pressing an issue is flood control for coastal areas?

SCHIFERLI: Well, that's a thing that's happening on a global scale. It's not only in the Netherlands where the country is over 60 percent below sea level, it's happening in 40 delta areas all over the world. And more than three quarters of all the main big cities with more than five million inhabitants are located in these areas.

And it's not only a coastal thing; it's also a delta area thing. It's also the rivers included. The extreme weather will lead to more periods of loads of water coming through the rivers, but also periods of almost no water at all. So it's not only too much water, it's also a lack of water in the future. And this is clearly a global thing.

KRAAIJEVELD: Yes, to add a little bit to that, because I fully agree with what Djeevan said. In the near future -- and it's from let's say the next 20 to 30 years -- we will see that the percentage of carbon dioxide in our atmosphere will grow and as a consequence the climate will change.

And it's not only in the Netherlands as said, so we will all be responsible for bringing down the carbon dioxide emissions and to prevent ourselves from enormous floodings and the climate change itself.

SCHIFERLI: And let's not forget that it's also the more extreme weather. Many businesses are currently reactive to the changing weather, and that has a big impact on their operations. If there's a storm or a flooding, they can be out of business for many weeks or even months. And you...the technology is there to take an active approach in dealing with the weather forecasts.

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HANLEY: With Netherlands 60 percent below sea level and Amsterdam itself 100 percent below sea level, how do the Dutch learn to cope with this challenge?

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KRAAIJEVELD: Well, we live here about 800 years, and you can realize that during this period from about 1,200 we have had big floodings. And even a few days ago, 1,200 people were sent outside by our government to look after the quality of our dikes.

So we do that frequently when there is a high tide with a big storm. And you can

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imagine that we have had disasters in the last 200, 300 years, even 800 years ago. And I remember that I was 10 years old in 1953, which was a big flood at that moment, that my father took me outside and said, you have to help me, because there will be a big disaster.

And he was running an engineering company, and we left the area where we lived at the moment, three days later, and we went to the area where 1,800 people died after the flooding in the southern part of the country.

SCHIFERLI: Yes, and myself, I'm too young, I never experienced the 1953 floodings. But I was taught in school, like all the kids were taught in school, that this happened in the past and everybody said this will never happen again in the future.

So you learn, you are aware of the fact that you think you are safe, only to find out with the Katrina events that what happened over there in the US can easily affect the Netherlands again.

So it's a continuous fight into the future. We have to come up with new ways to defend our country against the sea, and the same things apply to all the delta areas in the world.

HANLEY: So what can we learn from the history of the Netherlands in terms of protecting coastal cities and low-lying regions going forward as we address this climate change challenge?

KRAAIJEVELD: Well, to go back a little bit, after the disaster in 1953, the Dutch government said we won't have that again. So what are we going to do is make a big plan. And we thought that we were safe 20 years ago, that the big plan was finished.

But we see the climate changes coming up, and we say, are we really safe or not? And when you have a disaster like Katrina in another part of the world, or when you have another disaster in Bangladesh in [Lagoon], we realize in our country that we have to make a big step forward again and then of course develop new technologies, new know-how and make new combinations where we didn't have them before.

SCHIFERLI: Yes, and it's been...it's been.... The focus has always been on the engineering part, on creating levy systems, bigger levies. And what we see for the future is it's a data search. What's needed is, there's so many models involved, data source involved, so many solutions, [INAUDIBLE] that are being developed to measure stability of levy systems.

And all this needs to be tied in with all the existing experience from the water companies and the engineering companies to come up with the answers and the decision support systems for policy makers to keep people...to make the right decisions to keep people safe from flooding.

So it's really the fusion between information technology and the existing water knowledge already available that's needed for the near decades.

KRAAIJEVELD: Yes.

Well, interesting to add a little bit on that, the NWP, where I'm chairman from, was asked by the Dutch government to come up with an innovation program where our companies -- engineering companies, IT companies, know-how institutes, researchers...

...are working together, define new projects and therefore the flood control concept which was pushed quite heavily by IBM, was combined with the know-how institutes, which was our former [Delt Hydraulics] which is world famous working on the Panama Canal and in other areas in the world [with them on us] and you've seen that the new combinations...

...because we bring them together in the NWP, and we gave the list to the Dutch government in December, and the second project which is called flood control, is given quite a lot of money from the Dutch government and IBM is really the tugboat of the project.

HANLEY: What kind of new technologies or innovation around existing technologies are required?

KRAAIJEVELD: That is a very interesting question. I was once taught by an engineer who was responsible for the whole project after the disaster in 1953. And he said, we created new technologies while we were working with the problems we faced during the project, because sometimes we didn't have the solution in advance, but it was kind of development while we're working. That's one element.

This is happening at the moment because we're making a tunnel from the northern part of Amsterdam through the inner city of Amsterdam along all those piles and come up in the southern part of the city. That's one element, bringing up new technologies during the project itself.

But secondly, new skills have to be made in universities and higher professional education systems which can be done especially we're working together with practical projects like this and bringing it to those new studies.

And everybody knows that the danger is that you have a certain subject which is deep with a lot of know-how and don't look aside and bring in, for instance, enough modeling from IT in certain engineering activities.

So I expect that new technologies is not the fundamental issue but more or less new combinations. And suddenly something comes up like inventions always has taken place in chemistry, or physics, or in engineering, that someone says, my God, I didn't realize that it worked like that.

SCHIFERLI: Yes, what we keep hearing is that there's a lot of existing models in place, a lot of data sources, a lot of central networks are being deployed in all kinds of industries and in the physical landscape.

And these models need to increase in resolution, which means computer power. These

models need to be integrated with each other, they need to share information with each other. Models need to be integrated with existing central networks and future central networks to calibrate the models and to make sure that they produce more accurate information.

And all this means that it's one big integration effort, and the need for standards that will enable the decision and the policy makers to make the right decisions based on better and improved information.

HANLEY: With a lot of emphasis on collaboration in what you're saying, do you see that new partnerships have to be established in order to make this a reality?

KRAAIJEVELD: Yes, that is in fact the basis of the innovation program we delivered to the Dutch government, because the projects we are given. Let's give another example. The dredging companies in our country are very famous. They have about 50 percent of the world market.

And up until now, they were just going up in the sea or in the river deltas with their dredging equipment, dig all that kind of stuff which was [below that] and bring it somewhere else.

And today they realize that it's not sufficient enough. They have to combine that with ecological effects. So another project which is on it and where IT is a very relevant element as well is building with nature.

So working as a dredger in the field where nature is not demolished and up until now everybody said, well, we'll bring a lot of sand together and push it over there, create an island, and we'll do some monitoring and that's finished.

But today you see that especially the ecologists are putting pressure on those processes and so what is the consequence in ecological sense. So as a consequence we bring those people together and even the dredgers said we need people from the area of ecologists...

And they have proposed a project of about 25 million euros where they paid all together 12 and a half million by private companies together with know-how institute, ecological institutes, Dutch government, and they have said we are going to create a project which is named Building With Nature.

In fact, it's the same model as what is done with IBM as the big partners, flood control is a partnership between research institute, IBM and a few other ones, which is really the Dutch model. And my role is bringing the good people together that something comes out and say you are going to make it. Otherwise you don't get the money from the Dutch government, although, I'm not the Dutch government representative.

SCHIFERLI: And the challenges of climate change are so big that there's not a single company or organization or government that is able to do it on its own, to provide

an answer. And that's clearly the case in this situation.

You need to find each other. You need to find the experts with the in depth knowledge. But you also need the integrators, and you also need to scale up a lot of the things that have been happening in the knowledge institute world, in the university world, to scale them up to an industrial strength solution that's not only applicable in, for instance, in this case the Netherlands, but also in 160 other countries possibly. And that's all about collaboration. You can't do it alone anymore.

HANLEY: Well, thank you both for being with us today. Arie Kraaijeveld and Djeevan Schiferli, thank you very much. We appreciate it.

KRAAIJEVELD: Thank you.

SCHIFERLI: It was a pleasure.

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For more on water management, see [Ideas from IBM](#).