

Holland Water Indonesia

Special edition, June 2007



- ▶ **Prince Willem-Alexander**
Inspire further innovation
- ▶ **President Yudhoyono**
Water is an economic good
- ▶ **Roestam Sjarief (Indonesian secretary-general)**
Share and replicate lessons

Holland Water Indonesia is a single publication of Vewin and the Netherlands Water Partnership (NWP)

PUBLISHED BY
Vewin and NWP

FINANCED BY
Programme Partners for Water
www.partnersforwater.nl

CHIEF EDITOR
Lennart Silvis (NWP)
E. l.silvis@nwp.nl
and
Coen Sleddering (Vewin)
E. sleddering@vewin.nl

MANAGEMENT & EDITOR
PACT Public Affairs bv
Den Haag
E. vandongen@pactbv.nl

CONTRIBUTORS
Jeannette van Dongen
Alexander Haje
Dave Mangene
Jolanda van Mannekes
Arjan Schippers
Maaïke Veldkamp
Petra van Zuilen

DESIGN & LAY-OUT
Onnink Grafische
Communicatie BV, Oudenbosch

PHOTOGRAPHY AND ILLUSTRATIONS
ANP
DHV
DZH
Stichting H₂O-partners
Hollandse Hoogte
Martin Peters
Royal Haskoning
Fleur Veldkamp

PRINTED & DISTRIBUTED BY
Den Haag Offset BV, Den Haag

SUBSCRIPTIONS
Holland Water Indonesia special is being sent to those in Indonesia and in the Netherlands with a professional relation to the water sector.

No part of this publication may be reproduced without the prior permission of the Publisher.

Collaborate for a safer and better world



In front of you lies a publication about a common and, at the same time, very special element: water. More and more the world is discovering that water is one of those things that dominates our life. Every day.

This publication reflects the special relationship between the Republic of Indonesia and the Netherlands and the mutual relationship we have with water.

It also reflects collaboration, partnerships, and innovation. As such, I am very pleased with the contribution of two such distinctive people as His Excellency President Yudhoyono and His Royal Highness the Prince of Orange. Both, from their own experience, share a passion for water. And both

express their commitment, and that of our two countries, to focus their efforts in solving the challenges related to it.

I am also glad to find such effort not only amongst our leaders or top level experts but also amongst common people, civilians, farmers and students. Everywhere, people realize that we have to work together to solve the world's problems related to water. Floods, droughts, reliable drinking water, water born desires, sanitation. The list of challenges is long. As individual players we may be helpless towards the forces that nature sometimes lays upon us. But together, when we share our knowledge and experience, we are strong. Strong enough to protect our coastlines or cities from floods and strong enough to provide all of our people with clear and reliable drinking water.

As director of the Netherlands Water Partnership I hope this publication will inspire even closer collaboration between Indonesian and Dutch partners, a collaboration that leads us to a safer and better world. For that I thank all contributors for their efforts.

Jeroen van der Sommen,
Netherlands Water Partnership



All together now



Life is about water. Water is the source of life. Water makes up eighty percent of our bodies. The planet Earth has plenty of water, but not always fresh water. We share the Global Village with more than six billion human beings and there is plenty of room, plenty of life and plenty of water for everyone if we share our knowledge on water.

This special magazine is about water and about the future of Indonesia and Holland.

We commonly share the threats of nature: tsunami's, thunderstorms, pollution.

But we also share the opportunities of clean water: a healthy life, economic growth, fun, water sports, tourism.

If we want to share our future, we must be ready to share experiences.

Together we must gain more knowledge about global warming, building dikes, about desalination, water research and water innovations.

So, let us act, all together now.

Theo Schmitz,
managing director Vewin



- 2** Foreword Jeroen van der Sommen (NWP)
- 3** Foreword Theo Schmitz (Vewin)
- 4** Column Prince Willem-Alexander
- 5** Comments by President Yudhoyono
- 6** Jakarta Floods Initiative
- 8** H₂O-partners Sumatra
- 10** Mark Dierikx and Roestam Sjarief about joint challenges (4P-MoU)
- 11** Overview Water projects Indonesia
- 16** Twinning programs WMD in Eastern-Indonesia
- 18** Aceh Nias Sea Defence and Flood Protection
- 19** Lowland development
- 20** Water Fonds Indonesia and PWN in Lubukpakam and Pekanbaru
- 22** Sybe Schaap (Groot Salland Water Board) about polders to prevent flooding
- 23** Water technologies
- 24** Cooperative Programme on Water and Climate



Inspire further innovation

His Royal Highness the Prince of Orange



In recent years awareness has increased that a worldwide water crisis is a real possibility. Increasing industrialization and a growing world population on the one hand make for a higher demand for water, while on the other hand we see fresh water supplies running low as a result of climate change, pollution and abstraction of ground water. Such a crisis is not imaginary. Some countries and regions are already suffering water shortages as well as occasional flooding. But I don't believe in doom-mongering. People cannot live without water and will therefore do anything they can, as we do in the Netherlands, to be able to 'live with water'.

I am well aware that many people, organizations, research institutes and companies around the world are working with water. The Global Water Partnership, for instance, is a global network, for exchanging experience in water management between regions, countries, NGO's and companies. The network informs, facilitates and inspires. The United Nations have also incorporated a reliable water supply in their development agenda: the Millennium Development Goals specifically refer to clean and safe drinking water and to sanitation. And - as a result of my involvement in the United Nations Secretary General Advisory Board on Water and Sanitation - I personally know that this goes beyond mere talk. Action is being taken at all levels.

Innovation and development of new approaches and technologies are key to adapting to a future water situation. In this field much is happening already: the Dutch drinking water industry is very dynamic and is investing a lot in research and the application of new technologies. It is fascinating to see how a piece of equipment, designed in the Netherlands, is keeping water supplies going in reconstruction areas like Aceh after the tsunami. Dutch companies are also leading the way with integrated approaches in water resources management: combining engineering skills with specialties like spatial planning, ecology, institutional development and capacity building.

I sincerely hope that the examples of Indonesian-Dutch water projects from this magazine will inspire further innovation and strengthen the water cooperation between Indonesia and the Netherlands.

The importance of clean water

Susilo Bambang Yudhoyono, the president of Indonesia

Walk to fetch water

“I fully understood the principle of water as an economic good because I grew up in water-scarce Pacitan, located in the southwestern East Java Province. Back then, I had to walk up to five kilometres just to fetch a bucket of water.”

(Water partnership Movement In Indonesia, World Water Day 2005)

Improve performance and efficiency

“They must pay a high price to suppliers for clean water. The results of evaluation show that the restructuring of regional drinking water companies as part of the infrastructure policy package falls short of expectations. Therefore, I ask the regional governments and the regional drinking water companies to improve their performance and efficiency soon.”

(Antara Indonesia, 23 August 2006: President asks regional government to give priority to education)

Statistics highlighting poverty

“There are several statistics highlighting the poverty my region currently faces. Two out of every three Asians have no access to safe drinking water, half have no access to adequate sanitation facilities, and malnutrition affects 100 million people in the Asia Pacific region.”

(University Wire, 14 September 2005: Indonesian president speaks at Columbia University)

22 billion dollars per year

“We estimate that over the next few years we will need at least 22 billion dollars per year to build infrastructure in the energy sector, roads, ports, harbours, housing and water sanitation and so on.”

(Indonesia's president urged foreign and domestic investors Wednesday 1 November 2006 to stump up funds to boost the nation's flagging infrastructure sector, arguing that new laws would assure profitability)

Strategic Partnership

“The Strategic Partnership highlights the need to address issues of common concern, such as armed conflict, weapons of mass destruction, transnational organized crime and terrorism. Our strategic partnership also emphasized the need to promote practical cooperation in areas such as trade, industry, investment, finance, tourism, information and communication technology, energy, health, transportation, agriculture, water resources and fisheries. We are determined to prevent conflict and resolve disputes by peaceful means.”

(Semi-centennial anniversary of the Original Bandung Conference, 26 April 2005)





Structural aid after Jakarta floods

Cooperation in Jakarta Floods Initiative

On February 4th this year heavy downpours in Jakarta caused serious flooding. Eighty people died and 450,000 people had to be evacuated. The Dutch Ministry for Development Cooperation donated one million euros for emergency aid. In addition, the Indonesian government requested the Netherlands' assistance in looking for sustainable solutions to overcome the flooding problems in Jakarta. That request soon led to the Jakarta Floods Initiative, in which Dutch expertise is being used to formulate communication strategies, set up community participation and produce flood hazard maps.

The Jakarta Floods Initiative fits seamlessly in the Four Party Memorandum of Understanding (4p-MoU), the cooperation agreement the Netherlands and Indonesia have signed in the field of water. The Partners for Water programme has earmarked a budget of one million euros for the Jakarta Floods Initiative. This programme is being implemented by the EVD (Agency for International Business Cooperation, part of the Ministry of Economic Affairs) and the Netherlands Water Partnership (NWP). "We act as the secretariat of the MoU, so the Indonesian request quickly landed on our table", says Lennart Silvis, project manager of the NWP. "We have a good overview of the

Dutch parties that are working in water in Indonesia and have found in our network six agencies willing to contribute to this initiative. Soon after the floods a small group of water experts travelled to Indonesia to further develop the request."

Integrated approach

They could get down to business very quickly. As a result of the floods in Jakarta five years ago, the Netherlands and Indonesia had already done some joint research and drawn up a plan. One of the Dutch water experts involved from the very start is Arno Kops, who is now project leader at Witteveen+Bos, and until 2004 head of its Jakarta office. Those first plans were

the foundations for what later became the Jakarta Floods Initiative, in which six Dutch consultancies are working together: Witteveen+Bos, HKV, Royal Haskoning, WL | Delft Hydraulics, Euroconsult and DHV. Their assistance is made up of three components dealing with non-structural issues. Silvis: "That is what the Indonesian government specifically asked for. The Indonesians are not calculating canals or building dams after us, but assist with non-structural issues. The Dutch are used to living with water and are at the forefront of designing ways to do that. The integrated approach common in the Netherlands is new to them. It is this know-how that we, in close cooperation, pass on."

One of the components of the Jakarta Floods Initiative is delivering assistance in setting up communication strategies, in order to help different target groups at the political and administrative level gain an insight into how the water system works. "We'll identify different target groups, all needing a different approach for the message about the importance and need for water management and its relation to spatial planning to be brought home. In actual practice that proves difficult to explain", says Arno Kops of Witteveen+Bos. The second component is flood hazard mapping. A computer model is used to



map out the risk of flooding for the entire area, which is 40 kilometres long by 40 kilometres wide with thirteen large rivers running through. The computer model shows, for example, what the effects are downstream when you intervene upstream in the river system. Kops: "We will help with producing maps showing which areas will be flooded first under certain circumstances. Those maps, which will also be used in the communication strategy, can be used in various ways, for example during evacuations, but also for decisions about granting planning permission or designing zoning schemes. In 2002 the Regent Hotel in Jakarta suffered flooding, only a couple of years after opening. It was out of business for nine months, a huge financial setback. It emerged that the hotel had been built, without anyone realising, in the river forelands of the Ciliwung river. Flood hazard mapping could have prevented that."

Making people aware

The third component of the cooperation in the Jakarta Floods Initiative is about creating awareness in the community, among the people who live and work along the rivers. "This community participation aims to make people aware that they are not just victims of flooding, but partly also the cause, for example because they build too close to the river or dump their waste in it, blocking drains. It is mainly meant to make people think and make them come forward with ideas about what positive contributions they can make. Two or three areas will be chosen to serve as model areas. In close cooperation with Indonesians and

NGO's a scenario will be developed on the basis of which we will start communicating with people", says Kops, who is enthusiastic about the smooth cooperation with the Indonesian parties. Lennart Silvis of the NWP also stresses there is a good rapport and interaction between parties involved in both countries. "The Dutch embassy, which is familiar with the people and the local situation, is also contributing to that."

In everyday life the six Dutch agencies are competitors, but you would never know from the way they cooperate in the Jakarta Floods Initiative. On the contrary, they complement each other very well, Kops and Silvis agree. "Every party contributes on the basis of substance and expertise: the best man or woman in the right place, that's what it's all about because that's how you achieve the best results."

Join forces in Dutch water sector



PARTNERS FOR WATER

The Partners for Water programme has earmarked a budget of one million euros for the Jakarta Floods Initiative. Partners for Water aims to join forces to strengthen cooperation in the Dutch water-sector the companies, governments, NGO's and knowledge institutes. It is being implemented by the EVD and the Netherlands Water Partnership (NWP).

To be eligible for funding, activities need to fit into one of the themes of Partners for Water: water for food and the ecosystem, water and climate, realisation of the Millennium Development Goals, integrated water management and groundwater. It is also a key requirement that it leads to long term cooperation.

Partners for Water 2005-2009 has a budget of 49 million euros and is a continuation of Partners for Water 1. Examples of projects begun during the first programme are the creation of the Water Fund Indonesia, sustainable improvement and development of drinking water supply in Bitung (North Sulawesi) and the creation of a pilot project for the integrated and sustainable management of the Ciliwung river. Partners for Water 2 has also yielded much interest in projects in Indonesia. The development of a programme for the development of drinking water supply and sanitation in rural areas around the cities in Papua province, for example, is largely funded through this programme.

Apart from funding projects, Partners for Water is also implementing the Four Party Memorandum of Understanding between Indonesian and Dutch ministries (see page 10). Activities within the framework of this cooperation agreement include the Jakarta Floods Initiative, the Semarang Polder Project (see page 22), two lowland development projects at macro- and micro level, and the Climate Workshop held in Jakarta on May 23rd and 24th (see page 24). More activities are in the pipeline.



Reconstruction Sumatra in full swing



H₂O-PARTNERS SUMATRA FOUNDATION

On Boxing Day 2004 Sumatra was struck by a devastating tsunami. Now, two-and-a-half years later, reconstruction is in full swing on the island. Water treatment installations have partly been restored into operation and a lot of effort is being put into improvement of sanitation. H₂O-partners Sumatra Foundation has dedicated itself from the very start to get aid in the field of water going and is still very closely involved in the reconstruction efforts. The aid programme aims to provide at least 60 percent of households with (direct or indirect) access to clean water and 40 percent with access to sanitation facilities.

Lest anyone forgot: about 300.000 people lost their lives and many more lost their homes. The disaster ravaged the northwestern coast of Sumatra while many other areas were struck as well. Straight after the disaster international emergency relief efforts got underway. The Dutch water sector responded swiftly: VEWIN, the Association of Dutch water companies and the Association of Water Boards founded H₂O-partners Sumatra. Apart from water companies and water boards several provinces, municipalities and organisations donated funds, but also services and staff. To this day donations are still coming in. Donations total over five million euros, an amount that has been matched by the Dutch government. Partners for Water donated one million euros.

Perfector E

The first phase of relief efforts focussed on emergency aid for the stricken area to provide the population with water. This phase was concluded in November 2005. The second phase, which begun in 2005, is aimed at rehabilitation and reconstruction of the area. The projects are implemented in close cooperation with the local drinking water companies (PDAMs). In the past period sanitation facilities, produc-

tion sites, offices, pipes and connections were delivered.

Much of the equipment used during the emergency phase is still running, such as the mobile purification installations that are still in use in five locations. A short while after the disaster a number of locations were provided with the Perfector E, an installation for temporary water treatment. After the earthquake in Yogja Java in mid-2006 the Indonesian army again deployed the Perfector E installations in the disaster area. Until the end of the year they were used by the local water company to provide their customers with clean drinking water. The mobile installations have now been sold (but remain operational in Indonesia) and the proceeds will go towards reconstruction projects. The pickup- and water trucks that were in service during the emergency relief efforts have been transferred to the local water companies.

The projects prepared and implemented in 2006 were technical, administrative and institutional in character, with the emphasis on renovating existing and building new water treatment plants. To this end Peer Kamp of the PWN Water Supply Company North Holland developed a new type of water treatment installation, making use of coagulation, floccula-

AT LEAST 60 PERCENT OF HOUSEHOLDS WILL HAVE ACCESS TO CLEAN WATER



tion and sedimentation. It's a very robust installation, easy to operate and maintain. After the design was finished in September the first five installations were contracted in October 2006, and the preparation and construction could get underway. Distribution systems were built last year as well and unaccounted for water in the existing distribution network was reduced. This year will focus on finalizing these projects and connecting households.

Another important activity within the aid programme is training staff from local water companies. It emerged that there is a great need for more technical training in distribution and production. To this end, several training modules have recently been developed. Courses have also started to implement the administrative system that has been introduced.

Six locations

The reconstruction effort focuses on six locations: Aceh Besar, Aceh Barat (Meulaboh), Aceh Utara, Simeulue, Nias and Nias Selatan. The first location was, together with the adjacent city of Banda Aceh, the worst hit area. Here, harbours and huge swathes of land were devastated by the tsunami. There were 100,000 casualties. The two water companies in the district suffered severe damage. Activities in Aceh Besar concentrate on rehabilitation of water resources, one of which has now been rehabilitated. The construction of the mains in Lok Nga has been completed and a lot of work has been put into connecting households.

Also, the water treatment installation for Selimum has been rehabilitated and is now operational. A preliminary study is being made into alternative resources for the city of Banda Aceh and the surrounding area of Aceh Besar.

Meulaboh, capital of Aceh Barat district in the southwest of Aceh province, was also severely damaged. Here again, much

progress has been made by reconstruction. The old water supply of Rantau Panjang has been completely repaired and the construction of a new water treatment installation is in full swing. Work is being carried out on other treatment plants as well and many households have been connected to the water network. Perfectors E take care of the water supply in places where there are no connections yet. This year has also seen the start of the rehabilitation of the drainage system of Meulaboh.

Twice hit

Aceh Utara is situated on the northern coast of Sumatra and despite its 'favourable' position, it was severely damaged by the tidal wave coming from the Indian Ocean on the northwest side of the island. The coastal strip of Loksumawe and the surrounding Aceh Utara district were hit by sideways waves that heavily damaged 750 household connections. Efforts are now underway to rebuild the devastated water treatment plant Kek Sawang. After completion it will be connected to the existing distribution system. In addition to this, a number of projects are being carried out to improve the water supply and also in sanitation adequate facilities have been and still are being delivered.

The island of Simeulue was twice hit by natural disasters. First it was struck by the tsunami and the following year it was hit by an earthquake. Here again, water treatment plants had been damaged. Efforts are underway to restore both installations and to connect them to the existing drinking water network. The network, which is in bad condition, is being renovated. Work on drainage and sanitation is also being carried out on the island.

Nias and Nias Selatan

Nias is part of a chain of islands (which includes Simeulue) off the south-western coast of Sumatra, southeast of the epicentre

of the quake that caused the tsunami. H₂O-partners Sumatra Foundation is working here to rehabilitate the water system of Binaka. The design for the rehabilitation of the sand filter is now ready. In addition, a new production location needs to be built at the river Idanoi. Those works are now underway. On Nias work needs to be done to reduce unaccounted for water, which amounts to nearly 50 percent. Last year teams from Water Company Drenthe, Hydron Central-Netherlands (now Vitens), Dunewater Company South Holland and Water Company Limburg together with staff of the local drinking water company worked, apart from in Aceh Besar, Meulaboh and Aceh Utara also on Nias to find and fix the leakages. The sixth location the foundations' reconstruction efforts are focusing on Nias Selatan. The construction of a new water plant installation has begun here. Two standard treatment installations designed by water company PWN are being built. In Teluk Dalam as well much work has been done last year to detect leakages. This year upgrading of the distribution system is being continued.

In the field of sanitation the construction of sanitation facilities (MCKs) was recently finalized. The BRR (Badan Rehabilitasi dan Rekonstruksi) will take care of all rehabilitation works for (sanitation) drainage on Nias this year.

Aftercare

H₂O-partners Sumatra Foundation will remain active in the affected areas until the end of this year. By that time most projects will have been finalized and the focus will shift to aftercare. Aftercare is important to firmly embed the projects. Strengthening of technical, financial and management capacity of the local drinking water companies is necessary. Some of the projects started in 2006 and 2007 will carry on until the middle of 2008.

Indonesian water problems quite similar to those in the Netherlands

Mark Dierikx, Dutch director-general Water, and Roestam Sjarief, Indonesian secretary-general: “Joint challenges important topics of discussion.”

In June this year the Four Party Memorandum of Understanding (4P-MoU) was extended for another five years. Its signatories are the Dutch Ministries of Transport, Public Works and Water Management (VenW), of Housing, Spatial Planning and the Environment (VROM) and the Indonesian Ministries of Environment and of Public Works. Much more than the previous one, this MoU is focussing on water. A Joint Steering Committee has been set up for its implementation, with a high-level representative from each ministry. Mark Dierikx, director-general Water at the Dutch Ministry of VenW, and Roestam Sjarief, secretary-general of the Indonesian Ministry of Public Works, are both members of the Steering Committee.

The 4p-MoU aims to intensify the existing cooperation between the two countries in the field of water, addressing various themes such as integrated water management and the millennium development goals related to water and sanitation. But why the focus on water? Mark Dierikx explains how this came

about: “The last MoU with the Ministry of Public Works had a much wider scope, and we were rushing from one project to another, which made it hard to establish long term cooperation. We then agreed to concentrate on a limited number of focus areas. We decided on water because it’s an area where government still has a very

prominent role, and both Indonesia and the Netherlands have obvious problems with water.” Roestam Sjarief agrees: “Both countries are threatened by flooding, especially in the future because of the rise of sea water as a result of climate change. These and other joint challenges became important topics of discussion and the basic underlying consideration for several policies, that ultimately has led to the 4P MoU.”

Long term

“The activities envisaged in the MoU are mainly strategic in nature”, says Roestam Sjarief. “We want to develop and create knowledge of water issues via pilot initiatives. The lessons from these pilot programs can then be shared with people in the water network and replicated elsewhere.” And the emphasis is on long term cooperation, adds Mark Dierikx. “All the projects we’ve done are of course very useful and fulfill real needs, but we’ve done two or three



LESSONS FROM PILOT PROGRAMS CAN BE SHARED WITH OTHERS AND REPLICATED ELSEWHERE

feasibility studies for the Jakarta floods and stopped there. That hasn't contributed anything to reducing the suffering from the floods, so now we say that after making plans together, you should also cooperate in implementing them. And that means working together for much longer."

Joint interest

Indonesia is eager to benefit from the Dutch expertise in water. Roestam Sjarief: "The Netherlands has a lot of knowledge, in their own country and worldwide, including Indonesia, in areas such as lowland development, polders, flood management and coastal protection. Areas in which Indonesia faces many challenges. In partnership with the Netherlands, Indonesia is hoping to learn in these fields. But it is not a one-way street, stresses Mark Dierikx: "The MoU is essentially about cooperation and not about aid to a country needing Dutch expertise. We are really working from a joint interest. We are discovering problems in Indonesia that are

quite similar to those in the Netherlands. The problems we have in the Netherlands relating to polders, like soil settlement, you will find there too. Or the Jakarta Flood Initiative we're developing. It's not unlike what we're doing in the Netherlands by letting the rivers run free, but in Indonesia with much heavier downpours, you can put that idea to the test much more often."

Participation

Although the 4p-MoU is a government-to-government affair, both parties agree that private sector involvement is essential. Dierikx: "Knowledge institutes and private parties play a significant role. In Semarang for example a Dutch water board is involved as well as a consultancy." Roestam Sjarief says he hopes to see a growing role for Indonesian consultants in the new 4p-MoU. He adds that private parties should also include the beneficiaries of the projects: "Their involvement right from the start is an essential element in the effort to make

the programme sustainable. They should be consulted in the development of their own living environment, by allowing them to participate from the planning phase to the implementation and maintenance of the system."

Some of the projects are already underway, as they are a continuation of the previous 4p-MoU, but are being reviewed. After the recent floods in Jakarta, the Ciliwung river basin programme for example, is being adapted to contribute more structurally to protecting against floods in urban areas. Many challenges lie ahead in Indonesian water management and it would be easy to think that after the recent floods and the tsunami, water professionals are demoralized. That is not the case, says Roestam Sjarief: "I believe that they all see the disaster events as a professional challenge to look for solutions and to help the victims in any way they can. These disasters also trigger new ideas and concepts."

Raise the issue of drinking water to a more political level

Jaap van der Velden, water resources expert at the Dutch embassy

The Dutch embassy in Jakarta plays a key advisory role in the preparation and the implementation of the 4P-MoU. Jaap van der Velden, water resources expert at the embassy, lists the key issues in Indonesian water management that need to be addressed: "Flooding of the rivers in the lowlands and especially in affected urban areas, shortage of water to increase rice production, the shortage of water in general and especially for the production of drinking water, the development of lowlands for agriculture and institutional issues with regard to water management." Some of those issues are not unlike problems the Netherlands has experienced and consequently both countries share a realization that water is not easy to control. A case in point, says Van der Velden is subsidence of the ground as a result of water abstraction or settlement of soil. "As a result whole swathes of land along the coast are gradually sinking below sea level and need protection. So polders and polder management is

needed. Some polders have already been established in the Jakarta area, but the question is how to operate and maintain them. It is a real challenge for the Dutch to translate the lessons they have learnt into useful know-how for the Indonesian situation."

Indonesia already has great technical expertise, but solutions cannot be exclusively technical. And that's where Dutch expertise comes in, he says, which is particularly strong in institutional matters. "You need to look at the management and planning side of things as well."

The 4P-MoU provides a solid framework for increased and integrated cooperation focusing on water management. Van der Velden would like to see more attention to drinking water in the Memorandum. There is a lot of activity in drinking water taking place in public-private partnerships, he says, but it could do with more policy to back it up. "The issue of drinking water needs to be raised to a more political level."



Clean drinking water for three million people



EAST INDONESIA



Water companies can make a vital contribution to help supply people all over the world with safe drinking water. And they're doing that all the time. Dutch drinking water companies are eager to help. Via twinning programmes they offer their Indonesian counterparts technical support and training on a non-profit making. The vigorous approach of the Drenthe Water Company (WMD) in east-Indonesia is a good case in point. This projects' target is to provide three million people with clean drinking water.

The Indonesian water companies are struggling with losses due to leakages and overdue maintenance. There is no money to restore and expand the water pipe network. Only twenty percent of the households are connected to water mains and clean drinking water is scarce. Surface water is often polluted and the cause of water-borne diseases. Many people have no option but to buy bottled water, which is expensive and for some takes up more than ten percent of their income. Supported by the Ministry of Development Cooperation (7.5 million euros) WMD (3.5 million euros) can assist in improvement of the drinking water supply, which is needed so badly. It is partly thanks to the large Moluccan community in the province of Drenthe that WMD is working in east-Indonesia. Water company Groningen and Vitens-Evides International are also taking part in the project by providing manpower.

Water company 'new style'

WMD is working to get the water supply going again at eleven locations in North Sulawesi, the Moluccans and Papua. The aim is to deliver a better and sustainable water supply, healthy and self-financing water companies and increase the number of people with access to clean, healthy

water from 0.6 million to three million and to reduce unaccounted for water from fifty to ten percent. In order to achieve that, the Dutch water company enters into partnerships with local water companies and takes over operational management for a period of fifteen years. The legal status of the partnerships is that of a public limited company (PT). The local government provides staff and the licences. WMD provides management, know-how and funding for the investments. This approach focuses on rehabilitation and construction of infrastructure, technical support, the introduction of modern financial and administrative systems and training of staff. The aim is to make the Indonesian water companies fully independent and self-financing within fifteen years. After completion of the project WMD will, on the basis of full cost recovery, transfer its shares to the local water companies against their nominal value. There are six 'new style' water companies already: in Biak, Merauke and Sorong (Papua), Ambon (Moluccans), Manado and Tomohon (north-Sulawesi).

Block renovation in Manado

The focal point of WMD's activities is Manado, which has one of the largest East Indonesian water companies. It is the site of the WMD-office, the water laboratory



and the Wenang training centre. The new water company is forecasting to increase the number of household connections from 25,000 to 100,000 within fifteen years. 600,000 people should be provided with safe drinking water by 2020. The SNS Reaal Water Fund has granted a loan of two million euros for the rehabilitation of the infrastructure of PT Air Manado. It is this water fund's first large investment. The rehabilitation includes the restoration of part of the water treatment of Manado. The distribution network and household connections in Manado are in very poor condition. Many of the pipes are leaking. Water meters are lacking or not working properly and there are many illegal household connections. It is a huge job to fix this: the entire network needs to be checked for defects. That is why the city is divided into distribution districts and a full rehabilitation is carried out per distribution district or 'block', so-called block renovation. This entails meters being installed in the entire block, leaks detected and repaired, household connections renovated and entire client data bases overhauled. Technical and administrative unaccounted for water should eventually be reduced to 15 percent and the water services should be improved to such an extent that clients are willing to pay their water bills. This increased revenue should cover operational costs. At the same time the entire network is recor-

ded in a Network Information System. That has already been done in Sorong and Biak.

Train staff

Training is indispensable to enable water companies to operate independently. The Wenang training centre in Manado officially opened in August 2006. Here, all employees of water companies in East Indonesia will soon be able to do courses, which are made up of modules and can thus be offered to suit requirements. Training also ensures uniformization of working practices, proper use of materials and high quality. A pilot for a production course has now been completed. It was attended by the heads of the production departments from Sorong, Biak, Manado, Tomohon and Minahasa Selatan. A distribution course is due to start and English courses and computer programming for Manado staff will be offered. The training centre also hosts a laboratory. The intention is to fit out a simple lab at every location so water can be tested for pH, chlorine, oxygen and coli. The lab in Menang has served as a training laboratory for a few months now. Staff is being trained in analytical methods, setting up monitoring programmes, setting the treatment installation and dosing aluminium sulphate.

Preparations are in full swing for the construction of an accredited water- and environment laboratory at the training

Crucial contribution businesses

Businesses could make a vital contribution to provide people all over the world with safe drinking water. The Dutch Minister of Development Cooperation Bert Koenders has dedicated himself to making the Dutch contribution better and more effective and is involving civil organisations, businesses and knowledge institutes. WMD contributes 3.5 million euros to the public-private cooperation in the project in east-Indonesia and the Minister of Development Cooperation 7.5 million euros, in the framework of the Millennium Development Goals. The Partners for Water programme, an inter-ministerial cooperation, is facilitating the funding in the framework of developing innovative forms of public-private cooperation in the water sector.

centre. This lab should be equipped to perform more complicated analyses. In future it will be possible to carry out activities for the commercial market, like mercury analyses for the nearby gold mines. The new laboratory should be completed at the end of this year, with an ISO 17025 certification. The lab should be fully operational before May 2008, when the World Ocean Summit is being held in Manado.

Cooperation WMD and Simavi: Water- and sanitation in rural Papua



At the beginning of 2006 WMD and Simavi decided to work together to improve access to clean drinking water in rural areas in Papua. They do so together with local partners representing the communities in Papua. WMD has years of experience in working in rehabilitation of urban water supply in Indonesia and this is a step to expand its activities via local water companies into the surrounding rural areas. The local water companies have thus far only been active in cities and do not have the capacity to spread out into the rural areas of Papua. Simavi is a non-governmental organisation which has knowledge of and experience in working with local NGO's, representing the interests and needs of local communities. Simavi's policy is to improve public health, in which access to safe drinking water plays a key role.

After a feasibility study workgroups on water and sanitation have been established in Biak and Wamena with representatives from local authorities, village chiefs, the local water company and a local NGO. The programme is currently in its third phase. Technical proposals for the construction of water- and sanitation systems in four villages in Biak and in Wamena are ready. A proposal for the exploitation is being drawn up. It is expected that the first pilots can start before the summer.



Limit victims and damage in case of a tsunami

Aceh Nias Sea Defence, Flood Protection, Refuges and Early Warning Systems

To reduce the impact of a tsunami the Dutch engineering consultancy DHV, in conjunction with Witteveen+Bos and WL | Delft Hydraulics, is conducting a study into coastal protection and implementing an early warning system. Arnold Galavazi, manager Asia at DHV: "It's all about reducing the number of fatalities and limiting the damage as much as possible when a tsunami next strikes."

After the tsunami disaster in 2004 the Dutch embassy in Indonesia initiated the project 'Aceh Nias Sea Defence, Flood Protection, Refuges and Early Warning Systems'. The know-how and experience of two Dutch engineering consultancy agencies was brought in as well as the WL | Delft Hydraulics research institute. There is also close collaboration with local consultants on the projects.

Galavazi: "The Dutch embassy felt very concerned after the tsunami disaster about the question of how to reduce the impact of such an event in the future. And: How to organise the reconstruction of the area hit by the tsunami as effectively as possible? In order to get a good grip on that, it called on the knowledge and

expertise in the Netherlands in the field of water."

The Sea Defence-project that's now being implemented consists of a whole range of activities, Galavazi explains. "We advise and assist BRR, the Indonesian government body charged with reconstruction of the area who formally commissioned us, in taking preventative protection measures in north-west Sumatra. The study we're conducting is aimed, among other things, at introducing optimal protection against flooding. The implementation of an Early Warning System is also part of that and we're investigating which locations could best serve as refuges in case of an emergency. Apart from that we work to improve urban drainage systems. And we explore which protective measures could best protect the coast against tidal waves. Protection against a tsunami like the one in 2004 is currently not considered feasible. A Tsunami Early Warning System is intended to protect people."

Awareness

Introducing an Early Warning System is an important component of the project carried out by the Dutch water experts. The system should warn people as quickly as possible in case of a tsunami. The system, that has not yet been applied in Indonesia, detects quakes under the sea, analyses them and calculates what impact the tidal waves will have and issues a warning to the areas at risk. Galavazi: "Evacuation plans are being drawn up for the coastal zone, which include refuges and escape routes for the population. The refuges are existing high rise buildings, and new buildings are to be added. These new buildings will be multi-functional, with several community functions. A tsunami warning is issued by sirens, and via radio and text-messages.

In implementing such a detection system it is essential to create awareness among the population, says Galavazi. "People should become and stay alert, and should know what to do in case of an emergency. To create that awareness campaigning is necessary. That in turn involves local institutions with people who have been trained in communication. We are helping to set up these institutions and produce the training programmes needed for these people."

Pioneering

Galavazi: "We are currently in the phase of detail engineering. The next phase will be implementation and reconstruction. It is difficult to say when the implementation is finished, because the entire process of reconstruction is a very complex one, in which all sorts of issues are connected. Coordination is in the hands of the BRR. They regard the Sea Defence project as an important pioneering component to which other programmes should link up. Right now it is important to optimize the involvement of the population, because that is key to the entire process."





Lowland development essential for Indonesia

Dirk Doorn (Euroconsult) and Ingrid Gevers (Wageningen University)

With its growing population it is of the utmost importance for Indonesia to further develop its agriculture. The lowlands along the coast are the obvious areas to be designated, as all other areas have already been developed.

It is essential that this development takes place in a sensible manner, says Dirk Doorn, commercial manager at Euroconsult which, in conjunction with Wageningen University & Research Centre (WUR), will work on a plan for the rehabilitation of lowlands in Kalimantan and East Sumatra. Doorn: "This plan will eventually be presented to the World Bank and donors. It will be the basis on which lowland development for all of Indonesia will be taken forward."

On the one hand wetland eco systems need to be protected and rehabilitated, on the other hand agriculture needs to be developed in these areas, says Ingrid Gevers. As a co-teamleader at the WUR she is involved in the lowland project in Indonesia on behalf of Wageningen International in cooperation with Plant Research International (PRI). "To achieve a sustainable development the water management in the lowlands needs to be improved. Together with Euroconsult we're working on a plan that will be picked up by multilateral donors and which will serve as a basis for

the development of all lowlands in Indonesia. Traditionally, water management was focussed on sectors; agriculture, industry and drinking water and directed at supply management. Managers were hardly ever interested in nature and wetlands. But nature needs water too. The new approach to water management is a holistic integrated approach, involving from stakeholders of various sectors. This approach is mainly focussed on demand management. And water management is directly linked to nature conservation." Wageningen International will look into the involvement of local stakeholders and specifically the role of 'Water Users Associations' (WUAs) in water management and lowland development. The way these WUAs operate and the division of tasks and responsibilities between the Indonesian government and WUAs will be evaluated and recommendations for improvement will be made. PRI will map out the land use and agricultural production in two districts in Kalimantan and East Sumatra and will do market research, Gevers continues. "One district, Barito Kuala, is situated in South Kalimantan. The second district, Tanjung Jabung Timur, is in Sumatra in Jambi province." Dirk Doorn says Euroconsult has decades of experience in drainage and rehabilitation of swamp areas. "Swamp development - as lowland development was initially called - has been completely out of fashion for a while. For years no one talked about swamp or lowland development. During that time the World Bank was mainly interested in irrigation. But it emerged

that in practice such an approach did not yield sufficient possibilities. As a consequence there was a renewed interest in lowland development."

The lowlands along the coast are also called second stage, says Doorn. "They are areas that have been rehabilitated before, but were never developed. Areas that were populated in the sixties and seventies during the transmigration, but where afterwards nothing went on and that have not been maintained. Those are the areas we're talking about when particularly we're talking about lowland development. The central question is: How do we rehabilitate them again? Don't forget, we're talking about long term processes of ten to fifteen years. Areas that need to be drained properly and where it will depend on integrated water management."

Gevers: "This project is the basis for the development of a larger programme for all of Indonesia in which eventually the National Lowland Development Strategy for Indonesia will be formulated. This smaller Partners for Water-project will give the initial impetus to collect data, information and lessons learned in lowland management from the past few years. It will make it easier to carry a large national follow-up programme to a good end."

Doorn continues: "Indonesia is very closely involved in the development of lowlands. Government and local population (farmers) lead the way in this approach. That is extremely important, because we must achieve an approach that is geared to the local situation and needs."

From twinning to investing in household connections

Since 1980 onwards Dutch water companies have been providing their Indonesian counterparts with technical support and training via twinning programmes, to everyone's satisfaction. At the end of the nineties it became clear that this cooperation needed a facelift. Indonesia signalled that, in addition to advice, it needed investment. This signal was picked up by five water companies in the Netherlands, which together set up the Water Fund Indonesia (WFI) in 2000.



WATER FUND INDONESIA

Those water companies were PWN, Brabant Water, WMD and WRK. Later DZH joined, and the start of the WFI was heralded by advanced funding and construction of household connections. MTI, a subsidiary of the WFI, is tasked with the construction of household connections. The first contract, for 19,000 connections, was concluded with the local water company in Bogor. MTI now has contracts with six water companies, for a total of 190,000 connections, one third of which have been completed, resulting in tap water for 900,000 people. MTI checks what material is needed, contracts the work out locally and takes care of advanced funding. The water companies receive monthly invoices and the proceeds are reinvested in new connections.

The construction of household connections soon led to more, different projects in Lubukpakam (see box) and Pekanbaru. These projects have a different set-up. They are projects for the rehabilitation, extension and operation of water treatment installations. That is being done via joint ventures, in which the WFI has a 51 percent stake and the local water companies 49 percent.

Since October 2005 Tirta Sumut has been running the installation for the treatment of surface water which supplies water to Lubukpakam, a town with a population of 120,000. Tirta Sumut is a joint venture company of the WFI (51 percent of the shares) and the Medan water company. From 2003 to 2005 WFI rehabilitated the

water treatment plant in Lubukpakam and increased its capacity from 80 to 120 litres per second, with a subsidy from the Dutch Ministry of Economic Affairs and partly with its own finances. That was done by a team in which PWN was also represented. Since 2006 the installation has been producing 3.5 million cubic metres per year. Tirta Sumut has a licence for fifteen years and supplies the drinking water to the water company in Medan, which distributes the water and collects the bills, which in turn pay for the Tirta Sumut invoices.

Since 2005 PWN has twinned with the Medan water company and Tirta Sumut. PWN has trained staff from Tirta Sumut in the skills necessary for the optimal operation of the surface water treatment installation. In consultation with the Indonesian Association of Water Companies Perpamsi the installation will be used to train staff from other water companies as well. "PWN has played an important role in Lubukpakam and during the project another idea developed", says Bert Jansen, director of WFI. "Indonesia does not have an abundance of energy- and chemical efficient water treatment plants and the ones they have are prone to breakdowns. The idea came up to develop something with a Dutch hallmark: a compact water treatment installation that does not have all those drawbacks. That was to become the Perfector-R."



Idea for compact water treatment Perfector-R just arose

PWN commissioned WFI, which since 2005 has designed the Perfector-R, in which R stands for Regular. It is a standard, modular, treatment installation for surface water to produce drinking water. It has a capacity of 60, 120 or 240 litres per second, enough for 30,000, 60,000 or 120,000 people. The design has now been finalized. Bert Jansen: "Its main strength is the simplicity of the design. It comes as a kind of assembly kit for surface water treatment and a pile of paper with specifications, that can be commissioned and built in any country. It is a very convenient piece of equipment, easy to use by local people."

Apart from WFI and PWN, the M-Consult and Haskoning agencies and the Indonesian Inowa and Triweger consultants were closely involved in the development of the Perfector-R.

Cooperation WFI and PWN

Pekanbaru is the capital of Riau province on the island of Sumatra. It has 700,000 inhabitants, of which only 100,000 are connected to the water mains. The municipal water company was not capable of running an adequate water supply in terms of quality and quantity. Capital for investments and expertise needed to improve the situation were lacking. "The condition of the water treatment installation was appalling. Maintenance was overdue and many pipes had broken down. Production capacity was halved and on top of all that water meters weren't working so there was hardly any revenue. The mayor of Pekanbaru decided it could not go on like that any longer and intervened", says Bert Jansen, director of WFI.

Public-private cooperation

The municipality sought cooperation with the private sector and concluded a cooperation agreement with the local company and licensee KTDP. This joint operation agreement had a duration of ten years and should supply better quality water to 200,000 people. KTDP in turn sought cooperation with WFI, and in mid-2005 this led to the conclusion of a Public Private Partnership (PPP) between the Ministry of Development Cooperation, WFI, the municipality of Pekanbaru and KTDP. Its point of departure is that the number of people with access to good quality tap water should increase from 100,000 to 350,000 within five years. The investment sum needed was funded by the Ministry of Development Cooperation (five million euros) and the private parties (WFI and KTDP). In the meantime, the Dutch water company PWN has joined the PPP, in which it is playing an active role. PWN, one of the five shareholders in WFGI, is contributing 1.4 million euros. In 2005 WFI and KTDP established the joint venture Tirta Riau, which will, among other things, improve the water treatment installations and increase the capacity from 500 to 900 litres per second. That will be done by building a number of Perfector-R modules. PWN will mainly focus on improvement of management of the company and of the distribution sector. The investment will in the long run pay for itself through the sale of water, on a no profit, no loss basis.

Unaccounted for Water

A lot has been achieved in Pekanbaru in the

past two-and-a-half-years. The water treatment installations and water towers have been restored and the distribution network and the customer database have been mapped out, WFI-director Bert Jansen says. "But gradually we realised there's an enormous problem with unaccounted for water. That amounts to 65 percent, mainly because water meters don't work properly. As a consequence the water company does not generate enough revenue", he adds. "It also became clear that there was plenty of cause to replace the management of the water company. They proved to be incapable of managing the company in a responsible manner."

The choice was made for a PPP, to be able to implement the necessary organisational changes first and then make the planned larger scale investments, like expansion of production and transport, the construction of household connections and an implementing programme to reduce unaccounted for water. Jansen: "Implementing organisational changes is (also) in Indonesia a tough process, but fortunately it was supported by the municipality of Pekanbaru. We recently placed advertisements in newspapers looking for new managers, and have had some good response. So we're confident that the water company will soon be led by motivated, competent managers. That is an absolute prerequisite to ensure that investments and advice in the PPP framework result in the population of Pekanbaru getting access to an adequate water supply."



Polders to prevent flooding



**Sybe Schaap (chairman Groot Salland Water Board):
“Semarang on the eve of first polder board.”**

A consortium of five Dutch parties is advising the Indonesian government on the implementation of decentralized water management, says Sybe Schaap, chairman of Groot Salland Water Board. “In the city of Semarang the decentralisation of water management is taking shape now. No large scale end-of-pipe investments, but a local and effective approach to water management.”



The consortium of Water Boards and the Indonesian government have been discussing decentralisation of water management since 2001. Schaap: “We respond to a worldwide problem; too stringent centralism.” That centralism is hindering efficient water management and causes unnecessary flooding, says Schaap. “Because governments are not really well-informed about regional water problems, have no money for it and lack sufficient management qualities, there is an unnecessarily high number of floods worldwide. The causes are often human in nature and people often have resigned themselves to the flooding.”

Coastal areas and deltas across the world are becoming more and more densely populated, Schaap notes. “Instead of using surface water for producing drinking water, ground water is being pumped up, causing subsidence. That’s what is happening in Semarang. It is a city that for a large part is below sea level. When the tide is in, salt water flows into the city from the side of town facing the sea. On the other side of the city something similar is happening. Forests have been cut down, water levels in rivers are rising because of sedimentation and excess rain water, and so Semarang is suffering the threat of flooding from both sides.”

Flooding doesn’t only cause a lot of material damage but also causes serious health problems. “The urban waste water system is poorly maintained and full of filth. That increases the risk of flooding and compounds hygiene problems. All that litter causes clogging in pumping-stations, making the situation even worse.”

Semarang’s problems are typical for many Indonesian cities. In that respect the cities have not been well maintained, says

Schaap. “That is why we are working with the Indonesian government to see whether we can change that. We want to implement decentralized water management by means of (urban) polders and water boards. Our proposal is to divide Semarang in areas that take care of their own water management and thus control the water problem themselves. So the solution is not, as was so often the case in the past, to construct expensive pumping-stations to drain the rising water, but make sure that a way out is found at a local level.”

The universities of Semarang and Bandung have done technical and sociological research to find out what would be the best organisational structure. Schaap: “It emerged that the organisation of urban polders and water boards should fit in with the dormant Kampong structure in the cities. It is important that local people themselves indicate what they think is the best organisational structure for them. We don’t give them a blueprint, all we want to do is point them in the right direction.” Semarang is now on the eve of the construction of a first polder with its own autonomous management. “Only when a proper management structure at technical, financial and organisational level is in place, more large-scale investments will be considered”, Schaap says.

The Indonesian government has high expectations. Schaap: “They will write a manual for all Indonesian cities with a water problem. And they will encourage regions to go and search for good solutions for decentralized water management themselves.”

The consortium consists of two Water-board (Schieland and Krimperwaard, Groot Salland), Witteveen+Bos, Quest Consult and UNESCO-IHE.



Water technologies

Upgrade water quality



The Dunewater company Zuid-Holland (DZH) has been active in Indonesia for a number of years now. It has finalized a three-year project in the Bekasi region on Java, improving distribution of water supply, reducing unaccounted for water and upgrading water quality. DZH also trained local staff in hydraulic design so they can design extensions and improvements to the network independently. Leo Nijland, international affairs manager for DZH: "We are now doing a similar project in the Kabubaten region on Bogor, addressing the same issues and also supporting the creation of a new logistical system. It started in January and will run to the end of 2008." DZH has also contributed staff to the H₂O-partners tsunami project in North Sumatra.

Focus on drinking water supply



The Logo South programme, administered by the international cooperation agency of the Association of Netherlands Municipalities (VNG International), has been set up to strengthen local government in developing countries as a condition to reduce poverty. In Indonesia the focus of the programme is on drinking water supply, to improve service coverage and to bolster human capacity development in water companies. Logo South is currently funding four projects in Indonesia through twinning projects between water companies and water boards. To facilitate exchange of information between these projects and to

disseminate lessons learnt to more water companies the Association of Indonesian Water Companies Perpamsi is involved in a coordinating role.

Training centre fully operational



Oasen has been working with PDAM Pontianak in West Kalimantan for several years now. In the initial stages of the project the cooperation was of a very practical nature: Oasen assisted PDAM Pontianak in locating and repairing leaks (one of the main challenges in the water supply in West Kalimantan) and simultaneously trained staff on the job. In 2005 Oasen and PDAM Pontianak established a training centre, which is open to other water companies in the region as well. Arie Haasnoot, Oasen's project leader in Pontianak: "The training centre is fully operational now and the focus of our effort has shifted from jointly working on projects to educating and training staff in Pontianak, in order to equip them to carry out projects themselves."

Secure access to safe drinking water



The Water Supply Company North Holland (PWN) is involved in a twinning project in Medan and in Lubukpakam. Leo Commandeur, director of international projects at PWN: "In this project we are developing a network model for a pilot area and working to reduce unaccounted for water. We are also advising on improvement of production processes." Together

with Water Fund Indonesia (WFI), PWN is planning to take a stake in KTDP, the company running the water supply in Pekanbaru, Sumatra. PWN and WFI will invest in the transport- and distribution network and in production capacity. One of the plans is to deploy the Perfector-R, a very cost-effective modular surface water treatment installation. In various ways PWN is also still contributing to the effort of H₂O-partners to rehabilitate the drinking water supply in Aceh and Nias after the 2004 tsunami.

Introduce low cost technologies



World Waternet, the new foundation for international cooperation of Waternet (the watercycle company for the Amsterdam area), is advocating an integrated approach to the watercycle. In its catchment area Waternet is dealing with drinking water, waste water, surface water and flood protection. It takes this approach to Banten province where its twinning programme with six water companies is focussing on water resources and master planning. In the past three years Waternet has assisted with a GIS system and the production of a master plan, in order to increase production capacity to achieve the MDG's on drinking water. In the second phase emphasis is on implementation of the master plan. Paul Bonn , drinking water manager, World Waternet: "We're interested not only in quantity but also in quality of water and therefore we want to share perceptions and visions on drinking water and waste water and introduce low cost technologies shared with the main stakeholders in the province of Banten."

Indonesia prepared for effects of climate change



HENK VAN SCHAIK, programme for the coordinator Cooperative Programme on Water and Climate (CPWC): "In December 2007 the next annual UN climate conference will take place in Bali. In the run-up to this conference the CPWC has organised, in cooperation with the Indonesian Water Partnership and the Indonesian government, an international workshop on Water and Climate on May 23rd and May 24th in Jakarta. Indonesia has always been plagued by serious floods and periods of drought. Climate experts forecast that in future there will be heavier downpours in shorter periods of time. It is expected that climate change will increase the frequency of weather extremes even further. The CPWC aims to support vulnerable countries to prevent problems caused by climate change. The workshop in Indonesia was intended to boost a number of concrete projects and pilots that prepare Indonesia for the effects of climate change. The workshop was one of the activities within the framework of the Memorandum of Understanding between two Dutch and two Indonesian ministries. Among other things, this Programme aims to increase awareness and knowledge of national, regional and local water- and government organisations in Indonesia and to better equip them. One of the outcomes of the workshop is for Indonesia to improve monitoring of river discharges. By monitoring systematically, Indonesia could learn how changes

in precipitation affect river discharges. The resulting information could be used by the government for early intervention through water storage, water retention or water discharge. One of the parties involved in the improvement of the monitoring system is the World Bank. Also high on the workshop's agenda was the development of an early warning system to inform the population about storms and floods. An early warning could prevent loss of life and lots of damage. The Red Cross is involved in this activity. Another topic at the workshop was reduction of greenhouse gases emissions. Burning peatlands emit huge amounts of carbon dioxide and they also cause heavy smoke drifting over to neighbouring countries. It is the result of deforestation and reclamation of millions of hectares of peatlands on Kalimantan and Sumatra. Wetlands International and WL | Delft Hydraulics are working with the Indonesian government to find a solution for these fires, and to reduce carbon dioxide emissions. One of the solutions is reflooding of peatlands and increasing the water table by building small dams. The Dutch government has already pledged 20 million euros for rehabilitation of the peatlands in central Kalimantan. The workshop was attended by two hundred specialists from Indonesia, interested parties from the Philippines and Thailand and twenty representatives from the Netherlands, Unesco and the United States."