

Precious Water

A celebration of 27 years of Egyptian-Dutch Cooperation

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Egyptian-Dutch Cooperation

Colophon

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Interviews & Copywriter	<i>Leslie Skyrms Wohlwend, Amycus Business Communications</i> <i>Tel. 00 1952 9382767</i> <i>E-mail: Iskyrms@amicusbizcom.com</i>
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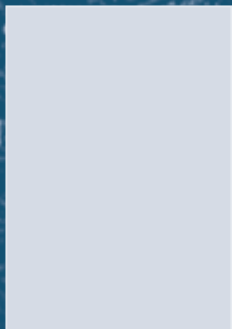
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Welcome to Precious Water

An
introduction
by the
chairman



Dear Readers:

We are proud to be initially presenting this publication at the 2003 World Water Forum in Kyoto. It is a celebration of a unique 27-year cooperation, namely the Egyptian-Dutch Advisory Panel on Water Management. This partnership has contributed to many viable solutions to the myriad water problems that Egypt has faced over the last quarter century. And, we believe, it can serve as a model for other countries considering partnerships to tackle this important issue.

The title of this publication reflects our commitment to the resource we have worked so hard to preserve. Water, of course, indicates the Panel's focus for these many years. The choice of precious, perhaps, takes more explanation. But it is, we feel, the appropriate word to explain our attitude towards our work. For precious has connotations of nobility and reverence, both accurate descriptors of how we view water.

And so we get the title of this booklet: Precious Water.

Our Panel has concerned itself with managing, measuring, testing and conserving this cherished resource, which continues to be so vital to Egypt's very existence. In this booklet we'll examine some of the highlights of our phenomenally successful partnership-development of a Groundwater Sector, establishment of water boards, organisation of a Gender Focal Point, etc. And we'll talk to several Panel members and advisors.

Beyond the results we have achieved, we are proudest of the relationships that have developed among the people of Holland and of Egypt over the years. This has not only involved Panel members but

also all those who have worked on the projects. We view the cooperation as a kind of friendship, even a family. It is because of this successful-professional and personal-partnership that we are convinced that our cooperation will continue forever. It's simply imperative for us.

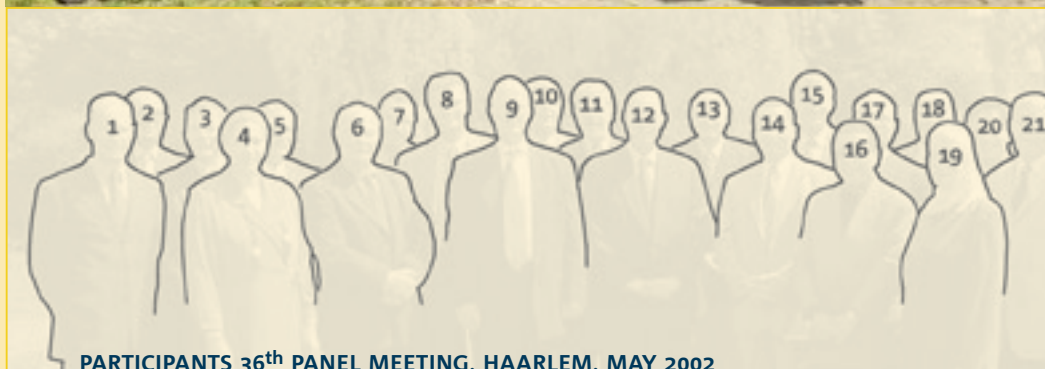
The urgency of careful water management is being driven forcefully home all over the world. Parts of the Middle East and Africa are facing terrifying droughts, while this summer sections of Europe were under water. Egypt and the Netherlands are, unfortunately, all too familiar with these phenomena, having dealt with them ourselves many times in the past. Yet these disasters only underscore that we are all a long way from solving the world's water crisis. And reaffirm the importance of our continued cooperation in providing sustainable water resources.

We hope these pages will help you better understand the issues the Egyptian-Dutch Advisory Panel on Water Management has faced over the years, as well as the solutions we have devised.

We wish you happy reading.

Dr. Mahmoud Abu-Zeid and Jan Faber
Co-chairmen of the Egyptian-Dutch
Advisory Panel on Water Management

February 14, 2003



PARTICIPANTS 36th PANEL MEETING, HAARLEM, MAY 2002

1. Dr. J.P.R.A. Sweerts (Representative Rabobank, Netherlands Water Partnership)
2. Dr. Magdy Salah El Deen (Ass. Director APP Central Office)
3. Dr. W. Wolters (APP Supporting Office)
4. Dr. Samia El Guindy (Director APP Central Office)
5. Dr. Tarek Morad (Senior Programme Officer, International Co-operation Department)
6. Ir. C.D. van der Wildt (Project Director International., Ministry of Transport, Public Works and Water Management)
7. Dr. Tarek Sadek (Director of the National Water Resources Plan Project)
8. Mr. P. Flik (Head, International Co-operation Department)
9. Ir. J. Faber, Co-chairman (independent advisor)
10. Ir. J. Boeve (Representative Union of Water Boards)
11. Drs. C.J. Kalden (Secretary General of the Ministry for Agriculture, Nature Management and Fisheries)
12. H.E. Dr. M. Abu Zeid, Chairman (Minister of Water Resources and Irrigation)
13. Eng. Hussein El Atfy (Undersecretary for the Minister's Affairs)
14. Dr. A. Ahmed Goueli (Secretary General Council of Arab Economic Unity)
15. Drs. H.J. Tankink (Managing Director, Industry Department, Ministry for Economic Affairs)
16. Dr. Shalan Nasr Shalan (Director SWERI, Representative MALR)
17. Eng. Yehia Abdel Aziz (Director of Water Boards Project)
18. Dr. M. Bahaa El Deen (Head of the MWRI Planning Sector)
19. Dr. Fatma Abdel Rahman Attia (Head MWRI Groundwater Sector)
20. Mr. R. Havinga (First Secretary, International Co-operation Department)
21. Eng. Hussein Elwan (Head of the MWRI Irrigation Sector)

Nuts, bolts and a mission

How the Advisory Panel Project works

Managing the requests of a dozen Panel members in two countries, scores of consultants and advisors from around the world and a host of ministers and other stakeholders is no easy task. Yet the three-person Secretariat of the Advisory Panel Project (APP) for Water Management manage to do just that with quiet efficiency. Dr. Samia El-Guindy and Dr. Magdy Salah El-Deen staff the Egyptian Central Office. Dr. Wouter Wolters of Alterra/ILRI, the International Institute of Land Reclamation and Improvement provides support from the Dutch side.

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A Panel with rich expertise

The APP has six Egyptian and six Dutch members. Egypt's Ministry of Water Resources and Irrigation (MWRI) selects the Egyptian members while the Royal Netherlands Embassy approves Dutch members. All members are selected based on Egypt's current needs in MWRI and the water sector at large. Every member brings a high level of expertise to the Panel. 'Wise selection of Dutch Panel members is behind the APP's success of the last several years', says El-Guindy. 'They are experts in many different fields of experience and they head or share in big organisations in the Netherlands. This helps them to give relevant advice on the different issues.'

Support staff with rich expertise

Like the Panel members, the Secretariat brings impressive credentials to their work. El-Guindy, El-Deen and Wolters all

have PhDs and extensive backgrounds in water-related fields. El-Guindy specialises in water-quality issues. She has worked with the Panel since its beginnings in 1976 and has been full-time Director of the Central Office since 1992. El-Deen is a biologist and his background includes extensive research on the effects of salinity and pollution on fish. He became Assistant Director of the Central Office in 1997. And Wolters, a civil engineer who has been acting as Supporting Office of the Secretariat since 1999, has worked extensively on water projects in Egypt, India, and at the International Waterlogging and Salinity Research Institute in Lahore, Pakistan. This familiarity with water issues serves them well in their work for the Panel.

The Secretariat, the Panel and MWRI

The Secretariat provides a crucial link between the Panel and Egypt's Ministry of

Water Resources and Irrigation. The Central Office is responsible for gathering all the issues the Panel will discuss. And this cannot happen without input from key MWRI members. 'We begin our work by having a meeting with all concerned parties in the Ministry', explains El-Deen. 'We meet them to collect the crucial water resources management issues that require elaboration at Panel level. We also meet with the Dutch team leaders of the projects the Ministry is involved in and collect feedback from them. We talk to a lot of the people concerned and each of them gives us two or three topics they feel deserve further study. The Secretariat acts as a central point where we gather and disseminate all information and knowledge, so it's always available when it's needed.'

El-Guindy considers this one of the Secretariat's key functions. 'We coordinate between all the ongoing Egyptian-Dutch projects in the Ministry', she says. 'I think the most important thing we do is selecting the issues and also providing a good link between the Ministry, the whole water sector and the Panel.'

Setting priorities

The Panel cannot tackle every issue at once, of course. So El-Guindy and El-Deen spend considerable time setting priorities for the Panel. Dr. Mahmoud Abu-Zeid, Minister of MWRI is also crucial in this process. 'The Central and Supporting

Office do the (preliminary) rankings and then we discuss those with the Minister' says El-Deen. 'We give him everything-the priorities and our proposed ranking of issues so he can highlight which are most important. He has a wider vision of what needs to be accomplished.'

Adds El-Guindy: 'I think it's very important that the chairman of the Panel is the Minister himself. The Minister has been the chairman for a long time and was a Panel member long before he became Minister. He can present any issue in the Ministry to the Panel. He is also the Minister so he is powerful and can make things happen when they need to. He is one of the success factors behind the Panel.'

Racking up the air miles

Once priorities are set, the Secretariat produces a Preparatory Document for the Panel. 'We forward everything to the Panel Members in Holland', reports El-Deen. 'About a month later we fly to meet them and discuss how they can contribute to the issues that have been raised. They give us feedback on our needs, problems, etc.'

'We stay in Holland for quite some time to prepare a yearly work plan based on the discussions we've had with the Egyptians, His Excellency, and the Dutch Panel members. After we finish the work plan we submit it to the Minister and the Royal Netherlands Embassy for review and



approval. After His Excellency the Minister and the Royal Dutch Embassy approve it we start planning our yearly activities-consultancy missions, meetings, etc.'

Panel meetings

The Panel meets as a whole once a year, alternating between Egypt and the Netherlands. The five-day events include three days of meetings, one day for a Panel workshop in which matters are addressed more thoroughly and one day for an excursion to view a local water-management project.

'We know ahead of time what will be presented in the Panel meetings', says El-Deen. 'We may have a consultant present something or members of the Egyptian delegation. Then there's a counter-presentation from the Dutch side in which they share their experience and background on the same issue. They also give advice on how to tackle related problems from different angles.'

The Panel does more than hear presentations. 'It's also a time for discussion', reports El-Deen. 'This is very important since it's vital for Panel members to share their experiences and ideas.'

After the discussions, each Panel member submits his or her recommendations and conclusions. The Secretariat collects these, types them up and submits them to all meeting participants. 'The Panel doesn't really take decisions', says El-Deen of the process. 'Instead they review the ideas, then talk together to come up with a definitive recommendation. By the end of the five-day meeting, every recommendation has been reviewed and refined by all the Panel members.'

Following up on recommendations

The Secretariat's work is never done. In addition to writing and distributing meeting minutes to the appropriate people, it is responsible for making sure things happen. El-Deen explains: 'after we finish the Panel meeting we always have quite a few recommendations. The Central Office looks at what these recommendations mean and what will be required to accomplish them. We write an action plan to implement each Panel recommendation so we know who is going to do what. We bring the recommendation to the concerned parties and we keep them on track (based on the action plan). And we get feedback.'

Coordinating Panel workshops

Panel workshop sessions are also a vital part of the annual meetings. Here Panel members roll up their sleeves and discuss topics in-depth. For example, at the next Panel meeting, a Dutch consultant will assist with a workshop entitled 'From Pilot to Policy'. The consultant is responsible for helping prepare an agenda and will facilitate the workshop. Local consultants will also be on hand to make presentations and elaborate on certain issues.

El-Guindy considers the Panel workshops critical for the APP's success. 'The Panel workshops are very important because in them we raise issues from the bottom, from the project level, to the decision makers at the top', she says. 'We raise issues and discuss them in-depth in these workshops. We also invite international consultants and national experts to give their vision and advice.'

Helping to build teamwork and trust

Not everything at Panel meetings is hard work and intense deliberations. Every meeting, the members also take time for

a one-day excursion to review water management in the field. Such excursions also create an opportunity to learn more about each other. Although not primarily social, El-Guindy believes they serve an important function.

'When you have all these activities', she says, 'you build an atmosphere in which Panel members can talk freely and express their ideas and vision in a relaxed setting. It also allows friendships to be built.'

These relationships extend beyond the Panel members themselves to encompass various advisors and staff members. 'When we started with the Egyptian-Dutch cooperation many years ago', continues El-Guindy, 'we had some very young Dutch engineers who started as associate experts. Over the years, these associates have become important consultants in big firms. Many people in the Ministry know them and have friendships with them. When they come to Egypt to carry out a consultancy mission it's easy to have trust because many of those involved have known each other for a long time. These consultants also know the Egyptian situation and the Egyptian atmosphere and this makes it much easier to implement the work. We, for instance, still appreciate very much the co-operation we had with Mr. Van Aart, who worked with us in the Secretariat for about 17 years. We can also not forget the people who mainly initiated the Panel, Dr. El Gabaly, Dr. Osman El Ghamry and Mr. Schulze of ILRI.'

Ad hoc sessions and task force meetings

The primary work of the Panel is to provide recommendations and a policy framework for water-management projects. The Central Office works with MWRI and other ministry officials to make sure the Panel recommendations are carried out. 'We use ad-hoc working

groups for a number of different activities', explains El-Guindy. 'For example, we may use them to draft terms and conditions for consultancy missions. Or such a group might be asked to review results once a mission is completed.

'We also use working groups to help prepare the action plan which allows us to implement Panel recommendations. We meet with people within the Ministry and others who will discuss how a drafted Panel recommendation might be implemented. This involves Ministry people and certain others from outside the Ministry.

'Task forces are like working groups. But while a working group is responsible for coming up with certain ideas, recommendations, TORs, etc., a task force is asked to prepare a document on a particular topic-a report or something like that.'

Communicating with other stakeholders

Another key responsibility of the Central Office is providing information to other interested parties. 'We communicate with other stakeholders by disseminating our reports to the concerned ministries and people', says El-Guindy. 'We also invite them to our Panel workshops and general workshops. And we include them in some of our working group meetings and discussions. We also sometimes contract them as local consultants to help with certain issues in which they have experience.'

General workshops involve key people from MWRI or other ministries and serve a larger purpose than mere PR.

'The general workshops are very important', says El-Guindy. 'We use them if we need to discuss certain topics in greater detail at the technical level. The

Panel workshops are always at the policy level. But in the general workshops we discuss particular technical aspects.'

Abu-Zeid selects many of the workshop topics. 'He has strong opinions on what needs to be addressed', says El-Guindy. 'He selects the most-important issues facing the Ministry.' Last year, for example, MWRI had a general workshop on food security in conjunction with Egypt's Ministry of Agriculture. Information derived from these workshops is funnelled back into Panel activities. And Panel members are asked to make further recommendations based on what comes out of the general workshops.

Consultancy missions

Many Panel recommendations are implemented via consultancy missions. The Ministry hires consultants to perform studies, help with research, come up with alternatives for particular problems, conduct Panel, Ministry or external workshops and more. El-Guindy: 'We use international, Dutch and Egyptian consultants, depending on the topic. For example, when we had the workshop on food security, we hired an American consultant who had international experience in that field. She facilitated the workshop and also spoke on optimum water use and food security. In another workshop, (like the upcoming one on pilot projects) we might hire a Dutch consultant.'

'Sometimes we're requested by sectors in the Ministry to elaborate on a certain issue or to solve a problem. In the North Sinai project, for example, we are having problems designing land drainage in an area that has a difficult topography. In this case, we contracted a Dutch consultant. He came and studied the problem, presented alternatives and gave his recommendation on the best solution.'



Finding consultants and following up results

The Central Office is heavily involved in finding consultants and following up on their work. 'We review the terms of reference for all new consultant missions,' says El-Deen. 'And we play a role in finding out the most suitable consultant for any consultancy mission from the Egyptian side.'

'Wouter Wolters is our equivalent on the Dutch side. So he would be responsible for finding consultants in the Netherlands. Our work complements each other. We prepare the TOR, review it carefully and send it to Wouter. He reviews it again and we all discuss who is going to be the suitable candidate for the consultancy mission. Then we follow up with the consultant when he is finished. We review his report and follow his progress.'

An efficient and effective team

Although the responsibilities of the APP Central Office and Supporting Office are many, the three-member team manages to meet them. Says El-Guindy, 'it takes more than mere dedication to make Panel activities run smoothly. 'The supporting office is strong and we share our work', she says. 'We work well together as a team and this also adds to the Panel's success.'



A bilateral
triumph

Charter member

explores Panel successes

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In the beginning the Advisory Panel Project was a bit of an experiment. The first cooperation of its kind in Egyptian history. Now, 27 years later, it's a proven success. Wouter Hulsbos, a charter member who retired last year after 25+ years on the Panel, has a unique perspective on the Egyptian-Dutch partnership, which was formed to help resolve Egypt's water challenges. It was only logical for Hulsbos to be on the Panel from the very beginning. When the Panel started in 1976 he already had several years of experience working in Egypt. From 1961 to 1964, Hulsbos was manager of the FAO project that established drainage criteria for Egypt. He was part of the first World Bank mission to Egypt in the early '70s. He also worked on salinity problems in Iraq and Pakistan. Below the Dutch drainage and irrigation expert discusses the Panel's trials and triumphs.

Taking a chance on bilateral cooperation

No discussion of the Panel would be complete, says Hulsbos, without a look at its unique character. 'The Panel was one of the first, maybe the first bilateral project in Egypt', he reports. Egypt started to look outside its borders because it recognised the importance of efficient land drainage to combat potential salinity problems. These problems were strongly aggravated by intensive irrigation after construction of the High Aswan Dam. 'From the beginning Egypt realised that the drainage problem was critical', says Hulsbos. 'Everyone was concerned that this was not just a problem, but one of the main problems facing Egyptian agriculture, and therefore, the Egyptian economy.'

By any standards, the bilateral experiment has been successful, says Hulsbos. 'The Panel has grown into a unique and efficient instrument of bilateral development', he says. 'From an advisory panel on drainage it has evolved into a panel on full water management. In effect, with the participation of embassy representatives in the Panel meetings, it is a platform for discussing the whole water sector approach, including land reclamation. To me it's a mystery why this efficient and flexible organisation has not been copied for other countries. There have been attempts for a panel in Pakistan but so far these have not been successful.'

There's something about that river

Hulsbos says the nature of the Nile made the Dutch logical partners in the Egyptian initiative.

'The Nile is a very special river', he says. 'It's the longest river in the world and is one of the few that runs south to north. It

runs through Egypt for about 1,500 kilometres from the Sudan border and there are no branches. So it's a rather unique situation. On the other hand, it's nearly the Rhine because it has approximately the same yield and discharge capacity as the Rhine. We Dutch are used to these amounts of water. There is something familiar to the Dutch about the Nile.'

But, he adds, a touch of humility is necessary when discussing Dutch contributions. 'Irrigation goes back 5,000 years in Egypt', he says. 'How can we the Dutch with experience of say 500 years at most contribute to solving these problems in Egypt?

'Yet I think we can'.

'The present water supply system in Egypt doesn't date back 5,000 years. It's less than 200 years old. Egypt started with perennial irrigation in the time of Mohammad Ali, early in the 19th century, after Napoleon. Before that it was always basin irrigation, a form of controlled flooding. In addition, there was enough water. There was no need to figure out how to deal with scarce water. Egyptian farmers are used to working with water. It's been passed from father to son for many generations. But the farmers are not used to handling the problems they are facing with modern efficient water use. And this also holds true for the Ministry of Irrigation, which needs to adapt its organisation to be able to cope with new problems in water management. That's why we dare to say we can contribute. But I think some modesty is required.'

A magnet for powerful people

The importance of the Panel's work attracted high-level people from the very beginning. Charter members included the director of Egypt's Drainage Research Institute (DRI), the chairman of the

Egyptian Authority on Drainage Projects (EPADP), Undersecretaries of State in the Ministry of Irrigation, the director of the Dutch International Institute for Land Reclamation and Improvement (ILRI), and professors from universities in Cairo, Wageningen and Delft. Leading the prestigious pack was Mustapha El-Gabaly, a professor at Alexandria University and former Minister of Agriculture for Egypt. 'There was a huge amount of money involved in the nationwide drainage programme', remembers Hulsbos. 'Egyptian money but also international money. The first World Bank loan was already around \$50 million. So that helped attract the interest of powerful people.'



Powerful personalities, powerful leaders

El-Gabaly served as Panel chair for 12 years until his death in 1988. Hulsbos says he was a powerful force on the Panel and got it started on the right course. 'His weight counted with the directors of EPADP and DRI', says Hulsbos. 'These were independent directors and you needed somebody of some weight to get them together to talk about certain problems.'

Mahmoud Abu-Zeid succeeded El-Gabaly and continues to chair the Panel. 'Abu-Zeid has been very important in the further development and success of the Panel's activities', says Hulsbos. 'In 1997, he became Minister of Water Resource and Irrigation and he decided to remain chairman of the Panel. In my opinion this demonstrated that Abu-Zeid valued the Panel very highly. He didn't want to leave it to someone else. He wanted to do it himself.'

A leader with an international reputation

'Abu-Zeid has wide international experience', adds Hulsbos. 'He is known practically all over the world in the water sector. He has performed many functions internationally. He is generally accepted as an authority and much appreciated, I would say.'

'Under his leadership in the last five years the Panel has started to organise workshops-mostly one-day workshops before the Panel meetings. Officials from different ministries and other organisations attend these workshops. Through these workshops the Panel's effect has spread beyond the Ministry of Irrigation to other organisations. Thanks to Abu-Zeid's efforts the Panel has become known throughout the whole government.'

Patience and dialogue-part 1

Hulsbos says this strong guidance often came in handy. 'I know of only three conflicts that are worth mentioning in 25 years', he says, 'but we were able to resolve all of them because of patient and effective leadership.' The first concerned the early relationship of the directors of DRI and EPADP, or as Hulsbos also refers to it, the conflict between research and implementation. 'In the beginning the people from research (DRI) and the

people from implementation (EPADP) only talked to each other during the Panel meetings', he recalls. 'So the Panel provided an advantage from the start. The representatives of EPADP and DRI on the Panel were forced to discuss problems and policies during the Panel meetings. In public!'

This forced dialogue eventually led to more coordination between the two organisations. 'In the beginning EPADP was reluctant to implement the findings of DRI's research', recalls Hulsbos. 'DRI would say we have concluded on the basis of experimentation that you should do this and this. EPADP doubted them so much that they said, "no, no, no. The risk is much too big for us. We can't do that."

'On the other hand, DRI did not always gear its priorities to the problems of EPADP. So El Gabaly and later Abu-Zeid very patiently discussed and mediated between the chairman of EPADP and the director of DRI. Now there are excellent relations between the two organisations and things work much more efficiently.'

Patience and dialogue-part 2

Early EPADP-DRI tension led to a second conflict on the Panel, when DRI developed a modified rice drainage system. With a traditional system, it is difficult to drain both rice and non-rice crops without wasting water. The modified rice drainage system alleviates this problem, even when the two kinds of crops grow side by side. DRI had used the modified system on a pilot basis and proved it worked better. But for several years, EPADP refused to implement the system more widely.

'They still doubted the system would work', says Hulsbos. 'The system increased costs by about 5 percent over the traditional system. EPADP said, "We cannot bear the increased cost." This modified system also needed crop consolidation, which required the cooperation of the farmers and the Ministry of Agriculture. There was doubt about the water savings. They said there was a risk of resalinisation. All these arguments could easily be refuted. But again it took patient dialogue and discussion. Personality and pressure also



played roles. The (Panel) leaders had to be skilled at mixing patient dialogue with the right amount of pressure at the right time.'

Patience and dialogue-part 3

El-Gabaly and Abu-Zeid also helped mediate problems that arose when the Panel worked on efficiently reusing drainage water. 'This reuse involved the development of an extremely complicated mathematical model', says Hulsbos. 'At the start it wasn't clear how much time and money it would take to develop this model. But we gradually realised that it would take many more years than originally planned and much more money. Both the Dutch and Egyptian Panel members were very uneasy about the situation. It also gave rise to some friction between the Egyptian and Dutch staff of this reuse project.'

Again, patient discussions provided the solution. 'After many separate meetings-not a few, but many-and more money, the mathematical model was completed and the Egyptian staff was trained to use it. But the project gave grey hairs to some of our Panel members, including me.'

Surviving political pressures

An early outside problem arose when, at the start of its activities, the Panel supported the use of drainage machines that replaced the hand-laid system then in use. 'Egypt had lots of labour available in the late '70s when we did this', says Hulsbos. 'One machine, well operated, replaced about 300 labourers. These machines had to be imported from Europe or elsewhere for hard currency. People raised the question: "is introducing all these machines justified at the expense of these manual labourers?"'

Although the political ramifications of this man vs. machine debate might have been nasty, in the end Egypt accepted that the

advantages outweighed the concerns.

'This huge national programme required an implementation capacity that could only be obtained by the machines', remembers Hulsbos. 'In addition, the output of a machine was of much better quality than the hand-laid systems. The machines also facilitated the introduction and use of plastic pipes. Of course training had to be provided for machine operators, mechanics and other staff.'

Possibly the largest land drainage project in the world

Such hitches are, perhaps, to be expected, since Egypt has been involved in completing one of the largest-if not the largest-drainage projects in the world. 'The Panel has played a small but, in my opinion, essential role in the planning and implementation of this nationwide land drainage project', says Hulsbos. 'This is a project of immense size, covering the whole of the Nile Delta and the Valley, an area of seven million acres, which is roughly the size of the Netherlands.

'The original planning was to complete this around the end of the last century. This was not fully achieved, but that's not uncommon for projects of this size. An important side effect is that Egypt is now internationally recognised as one of the leading countries for drainage of irrigated lands. Increasingly other countries, especially those from the Middle East, are looking for Egyptian experience in this field.'

Setting priorities

Possibly one of the Panel's most difficult challenges in the early years was setting priorities. 'The Egyptian government and the World Bank needed justification as to why these huge amounts of money were being invested in these projects', recalls Hulsbos. 'The economic justification was not easy. There was little doubt that the average economic return of land drainage



in Egypt was high-between 15-25 percent. We had already known that for some time. But the precise, detailed information for separate areas was difficult to obtain because there were so many factors involved in yield increases. At the same time we were improving drainage, farmers were using better seeds, planting other crops, improving irrigation procedures, and using more efficient ways of working the land. So it was really difficult to say that the yield increase was only due to drainage.

It was also difficult to set priorities for drainage of the different areas based on economic justification. Consequently, the programme of the national drainage project was based on practical considerations, such as available infrastructure, pumping stations and main drains. In effect, the programme started near Cairo and proceeded from there to the coast. The most difficult places are near the coast. The rice areas, the saline areas, the most salt-affected lands are all near the coast. So the programme started with the easy projects-and there's

something to be said for that approach, of course.'

Growing up, not out

When the panel started there was an ongoing discussion in Egypt about whether to increase production by improving existing lands (vertical development) rather than increasing production by expanding into new lands (horizontal development). 'Drainage was an obvious means of vertical development', reports Hulsbos. 'This was much more efficient than reclamation of new lands. In Egypt there are only very few possibilities to reclaim land in the Nile Valley or Delta so reclamation means mainly developing desert areas. There have been plans since the '60s to reclaim areas using water that became available once the Aswan Dam was online. But it was quite clear that in case of money shortages-and water projects require so much that you are always short of money-land drainage had a very high priority. Drainage gave a much better return both in terms of money and production

increase. The latter was especially important because Egypt had started to have to import grain since it was no longer self-supporting. The national drainage plan was formulated based on this higher priority in vertical development.'

Turning the attention outward

Times have changed since then. A key difference is the increased population. 'When we started the Panel there were about 30 million people. Now nearly all the Old Land has been provided with a drainage system. In the meantime, the population has grown to nearly 70 million. So, the priorities have changed. You will always be in need of a drainage department with a certain budget, because you have to maintain the system. But the country and the Panel are focusing more attention now on saving water by improving water management and water quality and developing new water resources and new lands in the Sinai and the western desert. The so-called Mega Projects aim to increase the crop area by 25%.'

Coping with competition

Hulsbos says the Panel's drainage programme progress has brought other issues to the fore over the years. Once the drainage system was well underway, the Panel tackled systematic reuse of the saline and polluted drainage effluent. The Panel 'sponsored' projects that mixed new Nile water with polluted effluent, thereby saving billions of cubic metres of water, which could be used for irrigation. This was the Panel's first water-quality activity, a concern that would become increasingly more important to Egypt as competition for water grew. 'Since the early '90s it's been clear that water scarcity is an issue', says Hulsbos. 'As the population continues to increase, so will competition between the various users: industries, municipalities and agriculture.'

'Water for industry and drinking water are both top priorities, but agriculture accounts for about 85% of the total use. So it's clear that as water becomes scarcer agriculture will suffer. There is an immediate need for more efficient water use, starting with the improved operation of the Aswan reservoir, but also including minimising transport losses, improving irrigation systems, treatment and reuse of wastewater and developing groundwater. The Panel has been concerned with all these subjects.'

'It's been a logical progression. You go from drainage, which is nearly completed, to related water management, to reuse of drainage effluent to water quality and then to water scarcity.'

Democratic water management

As the number of water-related projects has increased, the Ministry of Irrigation has been hard-pressed to keep up. So privatisation of parts of the water system is also a current hot topic, says Hulsbos. 'The Panel has been very concerned with how it can advise on 'privatisation' of parts of the water system. One result is the implementation of water boards, which are needed for various reasons', says Hulsbos.

'But I think the water boards are only a first step in increasing the involvement of the farmers and other water users in this sector. Stakeholder involvement will also be critical when it comes to making water use more efficient.'

'In Holland, we have had a similar kind of development. Our democratic system of water management has existed since the Middle Ages. Our water boards were founded in ancient times to organise local farmers in their struggle to protect themselves against the threat of the sea. These water boards were originally private and later partially taken over by the government.'

'In Egypt you have exactly the opposite situation in the water sector, since the government currently does everything and the intention now is to bring it to the water users. But still we can learn from each other. Our intentions are the same. We have to bring the right amount of water of the right quality at the right place and in the right time. The ICID Congress in The Hague proposed this goal worldwide in 1993. In Egypt a great effort is being made.'


Future of the panel

Although both countries have, from time to time, questioned whether the Panel should continue, Hulsbos is emphatic about the group's usefulness. 'The Panel has grown from a drainage panel to a panel concerned with all aspects of water management', he says. 'It has also grown to be a rather unique and efficient instrument for bilateral cooperation. It consists of a small but stable organisation,

staffed by people who know and appreciate each other. It is also flexible and has been able to accommodate questions the government has raised on various occasions.

'Egypt is facing a number of old and new problems of great magnitude in the water and land development sector and the Panel can assist in finding ways and means to face at least some of these. Among these problems are the drainage of newly reclaimed lands, the conjunctive use of groundwater and surface water in the Valley and the Delta, the development of extensive groundwater resources in the desert, the prevention of water pollution, and water purification and re-use. It is clear that there are many reasons to continue with the Panel as long as there is a bilateral cooperation.'





Looking
back, looking
forward

Minister discusses past and future water issues

Fact: Many countries are currently facing severe water crises, particularly developing countries in arid climates such as Egypt.

Fact: Just 6-8% of the total rainfall over the Nile Basin is now being harvested. The irony of these twin facts is not lost on Dr.

Mahmoud Abu-Zeid, Egypt's Minister for Water Resources and Irrigation. Neither is the urgency of the situation they represent. Nor the challenges and opportunities this situation brings.

Lost rainfall in the Nile Basin

Abu-Zeid has been on the Egyptian-Dutch Advisory Panel Project on Water Management for over 20 years, and the Panel chairman since 1989. The 12-member Panel-six Egyptians and six Dutch-advises the Ministry for Water Resources and Irrigation (MWRI) on ways to conserve Egypt's water resources. Abu-Zeid lists improving water management on the Nile as a top priority-for the Panel, for Egypt and for the Nile Basin Initiative.

The Nile Basin Initiative seeks to resolve water issues facing the 10 countries that line the river's banks. The limited availability of water is attributable to a number of factors. Plants rob the Nile of some of the 1,660 billion cubic meters of rain that fall in the basin each year. This problem, called evapotranspiration, is especially pronounced in the Nile Equatorial Lakes sub-basin. More rainwater is lost to regular evaporation and groundwater seepage.

Expanding water needs in the region

This enormous waste of water capacity is a more critical problem than ever. In the past, Sudan and Egypt, who are furthest downstream, were the countries most dependent on the Nile for water. 'In the rest of the countries they could rely on rainfall and other rivers', explains Abu-Zeid. 'They didn't have the means or the need to develop Nile water. But now their needs are increasing, among other things because they are becoming more industrialised and have larger populations.'

Egypt shares in these two trends, with a population that has increased rapidly in the last two decades and expanding development. But Egypt has been at the forefront in water development among Nile Basin countries. Both the APP and MWRI have spearheaded this progress.

Thousands of years of solving water problems

Egypt has been largely agricultural since the beginning of time. Dependent on the Nile, it has also become quite good at

controlling the river, which provides virtually all of its water. In 1976, the Dutch and Egyptians joined forces to tackle drainage, the most pressing water issue then affecting productivity of the land. 'At the time it was considered a priority for Egypt', remembers Abu-Zeid. 'We gained experience working together and we soon realised that just improving the drainage would not solve the problem. We had to look at the way we were using water, agriculture being the major use in the world and in Egypt. We also developed a pair of programmes to look at water



management, the problems we were having in that respect. If you look at the whole history of the Panel, I think you'll see we've had achievements in a wide variety of areas with respect to efficient water use.'

A gradual focus on water quality

At a certain point in the Panel's work, says Abu-Zeid, water quality became a priority. 'We realised that we had a set amount of water to work with (set by treaty with Sudan in 1959)', he says. 'Pollution was cutting into the amount of available water. We have had to learn to live with less water and water of different qualities. The Panel has been attracted to these issues. About 10 years ago, we started to concentrate more on water quality and the monitoring of water. Together we started a most effective monitoring programme. This involved training people, establishing monitoring sites and implementing improvements. We started with drainage water and irrigation water and then we moved to groundwater. Now our monitoring system covers drains, canals, groundwater and even the river itself-this last programme was with Canadian donors. This monitoring system allowed us to find out how much water we had in different parts of the system, the water quality and the most serious pollutants that we had to deal with.

'At that time we established standards and regulations for monitoring and controlling water. One of the results was development of groundwater maps, which show how much water we can use in different places. It also reports the quality of the water and suggests ways we can maintain this quality.'

A continuing need for conservation

Egypt has made some progress in

reducing pollution and managing water resources. And it continues to work at making new sources of water available. 'We need to improve availability of water for both Egypt and all the other Nile countries', says Abu-Zeid. 'Until we achieve this we have to live with limited water resources. So we must learn how to use what we have efficiently. We also have to reuse and recycle water that is currently lost to the system because of mismanagement and misuse. We have to train ourselves to use lower quality water, water with higher salinity, maybe different qualities of water for different uses and different crops. For example, we don't have to use high-quality water for growing trees or washing cars or streets.

'And we have to watch for loss of resources due to environmental impact-the pollution of resources from various sources. We have to prepare ourselves to avoid pollution. This involves awareness programmes, training, management, treatment-all this comes into play when talking about avoiding pollution. These are the priorities: live with less water,



with lower-quality water and try to avoid more pollution.'

Educating government officials and the public

Abu-Zeid recognises that these problems are more than the Ministry and its officials can handle alone. They will also have to be embraced by the general public and other government agencies. 'These are all environmental issues, actually', he says. 'To solve them will involve training the people and educating all water users-in the farms, in the industries and factories, in houses, in the streets. We will also have to work with the policy-makers to convince them that this is the top-priority issue. And we have to approach the media to talk about the negative effects of polluting the water. We're talking about quite a comprehensive programme of training and educating.'

A focus on the Nile Basin Initiative

The temporary solution is clear, but so is the long-term priority. Abu-Zeid: 'Another

new emphasis will be shared water resources. We have to work closely with the nine other countries we are sharing the Nile with. We have to agree on a strategy to develop the water in the Nile, which is not used efficiently in the upper Nile countries or in Egypt.

'These changing needs have led to the Nile Initiative. We have already outlined projects that will interest all the countries. We are now working at the study stage for different projects. The World Community has agreed to provide us with \$140 million to carry out the studies that are required to design and outline the projects. That alone could take five years. Through the studies we would like to find out which projects will benefit the most countries. We have agreed that we will not start projects unless they benefit at least two countries and cause no harm. These are the basic things we have agreed to in our work.'

Egypt's and the Panel's leadership roles

The Egyptian-Dutch cooperation on water issues has provided strong support for the Nile Basin Initiative. This is something that the other Arab-African countries, as well as world funding agencies, have acknowledged.

'The Council of Ministers of the Nile Basin chose Egypt as the lead country to implement the capacity-building programme for the 10 countries of the Nile Basin', says Abu-Zeid. 'The Dutch government is also contributing to Nile initiatives in different areas. Holland elected to provide training capacity. So the money for that is going to come from the Dutch government and Egypt is going to provide the technical assistance. We have already started some joint training courses in water management, drainage and river hydraulics.'



Centres of training excellence

'UNESCO has also selected the national Training Centre in Egypt to be a centre of excellence for training about water resources for the African and Arab worlds', continues Abu-Zeid.

'I guess there is general recognition from international institutions in different countries that Egypt can help with capacity building and training of institutions and scientists in the Arab-African countries.

'We're proud of that. And of the fact that we are now conducting programmes jointly with Dutch institutions for the other African countries. Together with the Dutch Research Institute, we have begun training specialists in Africa. We have also established a one-year diploma jointly with Cairo University and the Ministry to train Nile Basin countries in international legal issues related to water. We are also involving Dutch experts in this training. So there are several training programmes going on now that all fit under the New Nile Initiative Capacity-Building Programme, for which the Dutch government is contributing \$24 million.'

World water issues

Abu-Zeid himself is a renowned water expert. He is President of the World Water Council, which studies global water issues in different regions. The Council's findings came together in A Vision for World Water Environment for the 21st Century. 'About 12 to 16 scientists were involved in the different studies and different areas', says Abu-Zeid. 'We finally came up with a list of seven water issues facing the world. These are governing water wisely, valuing water, sharing water, managing risks, securing the food supply, protecting ecosystems and meeting basic needs. This last point refers to the fact that water might be available in terms of rivers and

rainfall, but is still not available to the people in the communities and villages because they have no facilities to pump this water or to treat this water. And, of course, the cross-boundary water issues are identified as problems.

'Another problem is lack of coordination between the different parties working-different ministries, different institutions. And also there's the question of lack of funds to respond to water issues, like water pollution, water facilities and so forth.'

The Vision Report concluded that 26 countries are facing water shortages at this time. Many of these countries are in the developing world and will continue to have to contend with increasing water needs. Yet the problems are likely to spread, leading to water shortages in 66 countries by 2025.

The future of the Panel

The fact that Egypt and its neighbours still face myriad water issues bodes well for the continuation of the APP. It's not a given, but Abu-Zeid is confident that the partnership will continue far into the future. 'The present Panel programme is set to end in 2004', he says. So we've started to think about the future of the Panel. Is it good that we continue? And we have found out from different people that both our countries agree that it is a model that has proved to be successful and needs to be continued.

'The environmental area is of interest to both countries, and how water can fit into larger environmental policies. We are already talking about many subjects that will form the programme for the future. '

Future financial arrangements

Still, there are details to be worked out. Abu-Zeid: 'one of the great challenges is how the Panel will be financed in the future. We would like to develop new



partnerships between the Egyptian institutions and Dutch institutions that have been working together for many, many years. These partnerships may mean starting some self-financing. The Egyptian government has already agreed that its financial contribution would increase in time. We are ready to contribute more monetarily to the work of the Panel. We

have also had suggestions that we jointly contribute to support travel, research, etc. For example, when the Dutch members come to Egypt, we could cover their costs. And when we come to the Netherlands they could do the same.'



A wild
27-year ride

Embassy officials chart

Panel's evolution

Like any long-term partnership, the Egyptian-Dutch Advisory Panel Project has seen its share of ups and downs in the last 27 years. That it's weathered the many changes so well speaks to its solid roots, excellent leadership and effective ways of working. Peter Flik and Dr. Tarek Morad, both senior officials in the International Cooperation Department of Cairo's Royal Netherlands Embassy discuss reasons for the Panel's lasting success.

A need to improve agriculture

The Panel owes its very existence to a fortuitous convergence of events. In the beginning there was Egypt's need. Construction of the High Aswan Dam (completed in 1967) initially gave Egypt the means to increase agricultural production. Instead of one crop per year, farmers could plant at least two. This intensive cultivation, however, caused drainage and salinity problems. 'We needed an accelerated programme of drainage to accommodate the agriculture', says Morad. 'The kings of drainage happened to be the Dutch. After all, they drained the sea.'

The Netherlands was receptive to the idea of assisting Egypt in tackling its drainage issues. The country, moreover, had the expertise and means at hand. 'We had just made all the polders in the IJsselmeer', recalls Flik. 'We had been doing a lot of work, but this had tapered off. So we had the capacity available to be of assistance. Egypt's need and the Netherlands' expertise fit neatly together.'

Moving with the political winds

But there was a third factor that contributed to the eventual partnership. The political winds were blowing that way, recalls Flik. '1973 was the oil crisis', he says. 'It was quite important for a country like Holland to have an active presence in the Arab world. So I think it was, on the one hand, the meeting of a technical drainage need, and, at the same time, a political opportunity there in the aftermath of the oil crisis. It was wise to start up a programme in Egypt.'

'It was', adds Morad, 'very much a win-win situation.'

Technical advice and policy seeds

The joint organisation was originally called the Drainage Advisory Panel and the official history contends that originally the Panel was totally focused on technological advice, only gradually shifting to the policy-making body it is today. Morad only partially agrees with this perception. He acknowledges the technical nature of much of the Panel's early activities, but adds that the seeds of policy-making were firmly established from the beginning. 'The Dutch certainly wanted to transfer technology and knowledge to Egypt', says Morad. 'On the other hand, the Panel was active in initiating activities and proposing these for funding. You can't exclude the policy matters from the process of identifying

project activities. And this was true from the very beginning.'

The impact of the Minister

Today the Panel focuses on policy discussions and implementation issues as well as institutional matters. The water issues are also broader, encompassing drainage, irrigation, water management, conservation and more. And, particularly in the last 10 years, the Panel has shifted its focus to integrated water resources. Attention is both on quantity and quality of these resources.

Flik says that Dr. Mahmoud Abu-Zeid, current chairman of the APP, brought about this continuity and shift in emphasis. When he first began his stint as chairman, Abu-Zeid was also chairman of the National Water Research Centre. Later he became the Minister of Water Resources and Irrigation. 'When Abu-Zeid became the Minister', says Flik, 'he was confronted with even wider issues of planning and institutional change. He considered it an advantage to have sparring partners (on the Panel) with whom he could discuss such subjects.'

The Panel in 'crisis'

About twelve years ago, the Dutch Ministry of Foreign Affairs began to have doubts about continuation of the Panel. According to Flik, the Ministry considered the Panel to be a project and felt that a 'project' that had gone on for so long had probably run its course. The Dutch selected an extremely critical but knowledgeable person to evaluate the Panel's activities. After talking to people, assessing the Panel's accomplishments and seeing the Egyptian's appreciation of these efforts, the evaluator wrote a positive report and warmly recommended extension of the Panel. He also enthusiastically proposed himself as a new Panel member. His report convinced the Dutch Ministry that the Panel should continue.

A new kind of Dutch Panel member

Dutch Panel membership was always related to the issues dealt with. 'In earlier years', recalls Flik, 'the membership consisted of technical people who were very experienced in the fields of irrigation and drainage. But changing issues and the changed focus of the Panel required people with different backgrounds.' Today, adds Flik, this wider expertise on the Dutch side has been further tailored. 'If we go to the start of the new phase- about two years ago', he says, 'and look at the composition of the Panel members we see that it now fully reflects the interests that the Egyptian side has expressed.'

'In addition to two members with experience in water-resources planning and agriculture, both of whom also hold very high positions in the Netherlands, there is a representative of the (Dutch) Union of Water Boards and an economist. There is also a person from the banking sector, who is also extensively involved in water-related programmes worldwide.'

A shift in Egyptian membership

Morad says that the membership on the Egyptian side has recently begun to follow suit in terms of varied expertise. Egyptian panellists have traditionally come almost exclusively from the Ministry of Water Resources and Irrigation, although the ministry of Agriculture has also always had one representative. 'But now', he says, 'you have, for example, Dr. Goueli (Secretary-General of the Council of Arab Economic Unity who is also an ex-Minister and ex-Governor). He is totally outside the Ministry of Water Resources, but he can help make the link with local government and the private sector very strong.'

A shift towards planning and conservation

As water issues have become more complex, the Panel's priorities have shifted along with its membership. Today these include planning and improving water quality. 'The competition between users is becoming more evident', notes Flik. 'This explains why the Panel has become much more interested in planning-not only from a technical point of view, but also how do you do the planning? How do you organise the planning process? How do you give a voice to different stakeholders?'

'Competition among various users-agricultural, industrial and residential-is not yet so bad', says Morad. 'But everybody knows that it's only a matter of time before two things begin to deteriorate: availability and quality. As more municipal and industrial users come into the picture we will see much heavier pollution than we have now. If you're reusing water for agricultural purposes, which is regularly done in Egypt, you have to consider that this water can be polluted both from agricultural applications and, increasingly, from municipal and industrial uses. As we get more of these users the reuse policy, and thus the total availability of water that can be used in Egypt, will be threatened. And the available quantity will have to be even more carefully allocated.'

Drawing on Dutch experience

Egypt is counting on the Netherlands' experience to learn to counteract 'spot pollution', specifically as this relates to pollution by municipalities and industry. The Netherlands can provide many practical examples when it comes to dealing with this issue.

'I think it's interesting to note the water quality problems the Netherlands faced in the '70s', says Flik. 'There are a number of lessons that Egypt can learn about how to

improve conditions and how the government can deal with the provinces and governorates, with water and sewage companies, with industry and especially with neighbouring countries. Egypt can also benefit from learning about the best affordable technology. It's good to have proper legislation, but it should be able to be implemented. Covenants have to be made with polluters to bring pollution down over a number of years. In the Netherlands we have the "polluter pays" principle, a concept that provoked interesting discussions in the Panel.

'Holland has also made some expensive mistakes and often took action only after actual or near disasters. Egypt can also benefit from these experiences.'

Short-term advice for long-term solutions

The Panel's flexibility and strong framework make such experience exchanges possible. For the last two years the Panel has also had access to a considerable fund, with which it can hire-Egyptian and international-consultants for advice on priority issues. 'The Panel has made very good use of these resources, which allow it to act fast,' says Morad. 'In a sense the Panel has become a think tank. The Ministry of Water Resources introduces the issues it finds important and these are thoroughly addressed. At our workshops we really beat the topic of the hour to death. These discussions are on real issues and focus on how the government has coped with these problems. It's very interesting to find out how others have done it. And this advice is translated into action.'

Support at the highest level

The Panel can trace much of its success to the fact that it addresses priority issues directly in a very constructive, open atmosphere. Says Flik, 'I find it important for this sector that the Panel has the

highest people in the Ministry and in agriculture, as well as an ex-governor, openly discussing subjects that are relevant to them with relative outsiders, whose experiences and advice is valued. This is a unique situation. These discussions are also valuable to the Dutch Panel members, as they are confronted by their own policies and approaches, causing them to widen their horizons. In addition, since members come from different sectors, they have the opportunity to learn from each other.'

Morad and Flik add: 'it's unique that you sit together with the top people in a Ministry plus top people from the Netherlands for four or five days and discuss the real concerns on the Egyptian side. In our opinion, this gives a policy framework for a real sector approach. You can address the sector almost in its totality. It's very different from a project orientation. It's a framework to address priority issues. And it works very well.'





Expertise
and
enthusiasm

Typical Panel member brings more than a title

A key asset of the Egyptian-Dutch Advisory Panel Project (APP) on Water Management is the collective brain trust represented by its members and advisors. The six Dutch and six Egyptian Panel members, therefore, are carefully chosen for the expertise they bring to the Panel's work. Cees van der Wildt, the longest serving Dutch member currently on the Panel, gives a glimpse of the kind of knowledge it takes to be a Panel member.

A strong foundation in water matters

Like all Panel members, Van der Wildt comes with proper credentials. He is currently International Project Director for the Dutch Ministry of Transport, Public Works and Water Management. Van der Wildt, a civil engineer, has worked at the Ministry in various capacities since 1975. The Ministry typically has a representative on the Panel, and Van der Wildt has filled this role for 14 years. He also brings worldwide experience in water matters, having worked as a consultant in British Columbia, Indonesia, Africa and the Middle East earlier in his career. Above all, Van der Wildt has experience on specific projects in which the Egyptians have an interest and has served as an expert discussion leader at several Panel workshops and meetings.

An expert in organisational management

Since the Panel's inception, Egypt's water issues have become much more complex and all encompassing. The Egyptian Ministry of Water Resources and Irrigation (MWRI), responsible for many of Egypt's water-management issues, has gained correspondingly more responsibilities. In response, the Panel has sought to advise MWRI in ways it can restructure to more effectively fulfil its duties. The Dutch Ministry of Transport, Public Works and Water Management has long been involved with similar issues. So Van der Wildt proved a key resource for these Panel discussions.

'The Panel has been talking for many years about the institutional organisation of the Ministry', reports Van der Wildt. 'In the last few years it's become increasingly important that, for instance, we make a clear distinction between policy-making, execution and inspection. In the Netherlands we've worked hard to make

these divisions distinct between the different functions of the Ministry.

'I always compare it to a butcher who buys, prepares and inspects his own meat. We should never allow that. We should have different roles. If you make the regulations and the policy, there should be someone else inspecting it and another person who does the operational part.'

An expert in decentralisation of duties

More and more operational duties are currently being transferred to private water users in Egypt. The Dutch have a lot of experience in this area as well, and Van der Wildt has brought many examples of Dutch privatisation to the Panel. 'The Dutch water-management system has been organised democratically for a very long time', says Van der Wildt. 'It started around the year 1200, which makes it over 800 years old. In the Netherlands this was so because water users lived in certain areas surrounded by dikes and they said, "we'd like to protect our properties". And they started electing people and paying for it and making water boards. There was a real mutual investment in it from the start. The Ministry (MWRI) is currently working to involve Egyptian farmers in execution and operational tasks. This is also a matter of decentralisation since the Ministry is located in Cairo and can't keep up with issues far away from there.'

It is also a matter of transferring some water-related costs from the government to the users and doing so equitably. 'In the Netherlands', says Van der Wildt, 'two-thirds of the total expenditure on water management is paid by water users through decentral organisations like water boards. But these users have a definite voice in how things are managed in their area. And they can immediately see the benefits of what's being done.'



'We think this helps build interest in water management. The users pay but also have a say. So our motto is "Interest. Pay. And Say." In the water boards, farmers and other water users can elect their own people and take their own decisions. And they know why they are paying for it, because they see the benefits right away. So we have suggested that Egypt bring its water management closer to the people.

'Our Egyptian counterparts are absolutely eager to go that way. But of course there are a lot of constraints-legal, etc. And its taking some time to get the farmers interested in it.'

An expert in mega projects

A relatively new area of interest for Egypt is development of the so-called mega projects, which involves making desert areas habitable. The Netherlands is well known for one of the world's most successful mega projects, developing land

formerly covered by the Zuiderzee, which took 80 years to complete. Van der Wildt was part of the IJsselmeer Polders Development Authority from 1975 to 1986. He was, therefore, involved in land reclamation in the Zuiderzee area, and has reported to the APP on this project. Although the Egyptian projects involve bringing water to desert areas and the Zuiderzee project involved extracting water, many Dutch experiences are relevant to Egypt's efforts. The advanced drainage technology developed in the newly reclaimed areas was especially important for the Panel's work.

'Egypt was also very interested in how you manage a mega project', says Van der Wildt. 'They wanted to know how you make policy for these projects, who is responsible for what, how you manage the financing, etc.

'In our (Dutch) experience with mega projects, we found that you need a



distinct project organisation. The mega project might be under a ministry but it should have a separate project organisation. And it should be based on a law, because legal status is very important. Otherwise you have to fight about the project every year with different politicians.

'The financing is another crucial area. I told the Panel that in the beginning of the project, financing should come from the State. Later, State contributions should decrease and be replaced with private financing.

'But perhaps the most important thing we learned is that you should proceed step by step and keep flexible. Times change and so do the requirements. When we started the Zuiderzee Project (80 years ago), for example, we were primarily concerned with agricultural production because there were food shortages in the Netherlands then. Later on there was a

need for more urban development. So we had to make a different plan. Later still there was more a need for nature and recreation and less for agricultural land. Society around you is constantly changing. So it's good to be flexible in these things.

'The big projects in the north and south of Egypt are very much comparable. You always need to take into account that things are changing so you should do a mega project gradually.'

An expert in international cooperation

In the last several years, the Panel has been increasingly interested in international cooperation as this relates to water management. Climate changes and population growth throughout the Nile Basin have made it imperative for countries along the Nile to work together to stretch water resources. Dutch participation in the Rhine Commission, which governs cooperation among countries along the Rhine, has provided Egypt with a successful model for this kind of teamwork. 'The Netherlands has made a number of treaties and agreements with other countries concerning water quality and quantity', says Van der Wildt. 'Everything that is spilt in the Rhine upstream from the Netherlands influences our water quality, irrigation and especially the sedimentation in our Delta. The same is true of Egypt and countries upstream from Egypt along the Nile.

'We've exchanged ideas with Egypt on how to work with other countries in international cooperation. The Rhine Basin is smaller than the Nile Basin but it too includes a number of countries- Germany, France, Switzerland, etc. The Nile has the same issues only on a larger scale.'



According to Van der Wildt, Egypt was very concerned with practical matters. 'They were interested in the kinds of agreements we had made, whether people in the Commission were really ready to fulfil their agreements, what the legal status was and how you can influence those kinds of things. I once made a Panel presentation about the whole International Rhine Commission. I told the Panel that to be successful you have to make agreements at the ministerial level and get absolute commitment from everyone.'

'We also always work together on equal footing and have a common cause. That was very important when negotiating with the other Rhine countries to make sure everyone was equally committed.'

An expert in water forecasting

Egypt has been very interested in the Netherlands' ability to statistically forecast droughts and floods. 'We have talked in the Panel many times about how we do this in the Netherlands', says Van der Wildt. 'Egypt only has the Nile. If there is a dry period, the level of the Nasser Lake will go down. The Ministry wants to know how many years beforehand you can

forecast drought periods. This is now done in the whole river basin.'

The Netherlands, of course, has often had to deal too much water. 'If you talk about the large river basin in the Rhine you can get an idea of what your retention is in the basin and how much change there will be in the future', explains Van der Wildt. 'One example of that is climate change. Now we have more rainfall than before and more rainfall in certain areas. We also have to deal with rain that sometimes comes in a shorter amount of time. Everyone is aware that something is changing climate-wise in the world.'

An expert in planning

Egypt has recently drafted its first national policy document on water management, a must given the country's desire to integrate its approach to water issues. The Netherlands has had a National Policy Document since 1968 and is currently on its fourth edition. Van der Wildt told the Panel about the lessons the Netherlands had learned in revising its national document. 'In the beginning we wanted to regulate water quantity', he recalls. 'In the second Policy Document we focused on regulation of both the quantity and

quality. Now the fourth Policy Document is much more about how we can do things in an integrated manner. We want to address nature, recreation, urban development, and everything together with water management.

'So we've learned and made the policy more sophisticated as we've gone along. But it took us a number of editions to get to there. The Panel has initiated a number of projects in conjunction with the preparation of a water resources management plan for Egypt. Of course we take the Dutch experience into account when we're doing that. '

An enthusiasm for the Panel's work

Although Van der Wildt, like his counterparts on the Panel, often serves as a knowledge resource on Egypt's various water needs, he's quick to point out that the APP owes many of its accomplishments over the years to the members' continuing passion for and genuine commitment to the work. 'I always say that a major success factor for the Panel is that we don't have

commercial objectives', he says. 'The spin off of the Panel is much broader. We initiate projects and then consultants come in, factories get built, etc. But the Panel itself is not commercialised. I think that's very important.

'I think it's also key that we trust each other. This comes from the fact that we know one another so well and that we have a common cause.'





Maintaining
a delicate
balance

Water Management in the Fayoum Depression

In Egypt's arid Fayoum Depression it's all about balance. Balance between agricultural production and acceptable Qaroun Lake levels. Between irrigation, drainage and acceptable soil-salinity levels. And between the competing needs of some 1.3 million people, many of them farmers who are scrabbling to survive.

The Egyptian-Dutch Advisory Panel Project on Water Management was asked to suggest ways to secure these delicate balances within the framework of socio-economic development. From 1993 through 1997 the third water study was conducted there. Its recommendations contributed to more-efficient water use, more-effective regional water-management practices and stabilisation of the Qaroun Lake levels, and the establishment of local pilot water boards.

A unique geography

Grasping the unique needs of the 3,000 km² Fayoum Depression requires an understanding of the area's unusual geography. A depression similar to the Dead Sea, but only 50 meters below sea level, the Fayoum has been connected to the Nile River for centuries and functioned as a natural reserve reservoir whenever the Nile flooded above a certain level. Heavy floods would transform part of the depression into a 700-km² lake before years of evaporation again turned all into dry land. These floods made the depression very fertile. And prehistoric nomadic tribes began harvesting plants, making the Fayoum possibly the earliest agricultural area in the world. Today it is a rich source for agricultural products that serve Egypt and beyond: cotton, fruits (especially dates), vegetables (especially tomatoes), wheat, milk, meat, etc.

The Nile has long since ceased flooding the depression in a haphazard way and these days water is brought to the Fayoum via a controlled manmade canal. Nowadays, the only permanent water in the depression is Qaroun Lake, a 150-km² saltwater lake in the northwest corner of the area. All agricultural and urban drainage water flows collect naturally at this spot, the lowest in the Fayoum. When the water evaporates it leaves behind its dissolved salts and pollutants. This unique hydrological situation is a direct cause of the need for carefully balanced irrigation-water distribution and drainage-water removal.

The problem of too little water

Another factor is Egypt's rapid rural and urban population growth-to nearly 70 million people-while the country's amount of available water remains the same. I.A. Risseeuw, the resident engineer and team leader for the third Fayoum Water Management Study, says that these twin

considerations make the implementation and operation of an effective public irrigation and drainage water-management system for the Fayoum Depression extraordinarily tricky.

'There are very precarious equilibria to be respected when providing Nile irrigation water to the Fayoum', says Risseeuw. 'The whole (Nile) Delta and the irrigated lands that extend along its Western and Eastern borders must be supplied. There may be increasingly more years in which there will not be enough water in the Nile to fulfil all the agricultural-water requirements. So the question will always be "how much water can we send to the Fayoum without making everyone angry further downstream", because whatever we take here cannot go there.'

This limited water supply has implications for the farmers in the Fayoum, especially those located furthest from the Nile.

'At present, you only find land with a lot of irrigation water where the Nile irrigation system enters the Fayoum depression', says Risseeuw. 'The further you are from the main feeders, the less water you have. Because of the increase in the population, more and more people have begun to live and farm at the tail end of the Fayoum irrigation system, and along main drains that still offer good-quality water. But bringing in enough irrigation water (and hence producing enough good drainage water) is becoming increasingly difficult, especially if the irrigated area in the depression continues to increase.'

The problem of too much water

The farmers at the end of the Fayoum irrigation system and along the main drains are also those nearest to the relatively flat shores of Qaroun Lake, a fact that again puts them in a particularly

vulnerable position. Say that drainage water flows to the area, for example, because of a relatively ample supply of Nile irrigation water to the depression or a rare thunderstorm. Then Lake Qaroun will rise and flood its surroundings, sending crop- and soil-destroying saline water into the lakeshore farms. 'History shows that it can happen that a lot of water goes all the way to the lake', explains Risseeuw. 'Qaroun Lake has no outlet for the incoming drainage water except evaporation, so its level will rise. Eventually the adjacent lands are inundated until evaporation again exceeds inflow and lake-water levels decrease, leaving salts behind on the land.'

The problem of too much salt

Egypt's arid climate ensures -even without flooding- that the irrigated lands of the Fayoum are susceptible to soil salinisation. Risseeuw compares the situation with what happens when a houseplant receives too little water.

'If you give your potted geraniums only enough water to prevent signs of wilting, the top of the soil in the pot will eventually become whitish or even ochre', he says. 'That's because the water you use always contains some salts. Gradually the soil in the pot becomes salty and the plant begins to die. The only way to raise healthy geraniums is to always give them more water than is needed to keep them from wilting so that all the salts that accumulate on and in the soil after each watering are washed out with the extra water via the drainage hole in the pot's bottom.'

'You have the same thing in the Fayoum. You must supply extra water to carry away the salts added unavoidably with the irrigation water. However, the drainage flows this produces should not cause Qaroun Lake to overflow.'

Risseeuw notes that the kinds of crops grown in the Fayoum make salinity control especially necessary. 'Cotton resists salinity', he says. 'But most fruits and vegetables cannot resist salinity very well. Nor can maize, berseem and wheat. This is another reason that the capacity and operation of the irrigation and drainage systems have to be managed. We have to ensure that the Fayoum soils do not salinise beyond a certain level in order to retain-and if possible increase-their current production potential.'

Balancing irrigation water supplies, drainage flows and lake levels

The study proposed several solutions to cope with the different water-management problems in the Fayoum Depression. These were based on hydrological data collected during a number of years before and during the study. Risseeuw: 'The Dutch government started assisting Egypt in maintaining and improving agricultural conditions in the Fayoum in 1983. At that time information was collected about soils, cropping, the amounts of irrigation water needed and supplied, drainage flows to the Lake and to the Wadi Rayan tunnel, the salinity of various water flows, the levels of Qaroun Lake, etc. A first model was prepared to understand the water-management situation and its impact on crop production and on Qaroun Lake levels. This was also used to assess the impact of changes in total Fayoum irrigation-water supply, main-water distribution, drainage-water reuse, etc.'

'You have to manage water flows at strategic points in both the main irrigation system of the Fayoum area and in the main drainage systems flowing towards the Qaroun Lake and to the Wadi Rayan tunnel. We recommended ways to improve the irrigation system's efficiency such as reuse of high-quality drainage-

water flows to reduce the pressure on Qaroun Lake levels and to facilitate the availability of extra water to wash salts out of the soil. But we also recommended that the drainage-water tunnel to Wadi Rayan be used as a "tap" to manage Qaroun Lake water levels while respecting agriculture, fishery and tourism requirements as much as possible.'

Balancing human requirements

An equally challenging portion of the project was balancing water requirements among people farming in the Fayoum. 'What happens in a country without rain and in which people who cultivate land cannot find enough irrigation water-or cannot find it in time-for their developing crops?' asks Risseeuw. 'For example when water users closer to the feeders, who are also concerned about getting enough water, just take it, leaving none for the farmer downstream.'

'Imagine you have sown a crop and it's germinating. Then you don't get any water for two months. You will lose everything. This is what is happening to some farmers in the Fayoum. And it threatens to become an even more-widespread problem considering current socio-economic developments, unless more-effective irrigation-water planning and irrigation- and water-management practices are established.'

The Ministry of Water Resources and Irrigation (MWRI) through its Irrigation Department in Fayoum is, among other things, responsible for all water-management issues in the Fayoum Depression. But it's becoming impossible for this organisation to fairly distribute irrigation water to (small groups of) individual water users as water becomes scarcer.

A tense situation

'As long as there were relatively few farms, people in the Fayoum normally had plenty of water', says Risseeuw. 'But nowadays the government has to send a lot more water to accommodate the growing number of farmers in the Fayoum. This is not possible to the extent demanded by the farmers. So the government has great difficulty in securing proper operation and maintaining the technical integrity, particularly in the smaller public irrigation and drainage system structures.'

'In short, more and more farmers were applying for less and less available water. So they took water they deemed fit for irrigation whenever they saw, either from a nearby public canal or drain, and without much consideration for water users further downstream. Desperate, people have killed each other over the ensuing water disputes.'

Water boards to the rescue

In view of the situation, APP advisors have proposed to gradually transfer the government's responsibility for the operation and maintenance of the public elements of each local irrigation-water distribution and drainage-water-removal system to the farmers served. This has led to the establishment of the first local pilot water boards in Egypt.



Because of the volatile situation, this was no easy task. But Risseeuw says it was precisely the time to act. 'For the concept of a water board to work', he explains, 'you need circumstances where people recognise that there's a mutual problem. Dutch water boards started based on the need for dike maintenance, because high seas threatened everybody in a polder. The people had a clear common interest in maintaining a strong dike everywhere, because if a breach happened the whole community would flood. So a water board must have a common danger of such intensity that people are willing to cooperate.'

'That was the situation in the Fayoum. By cooperating and jointly sharing the water that the government supplied to them, farmers saw that they could make the irrigation and drainage situation better for each one of them and for the area as a whole.'

Finding the right people

Not everyone in the Fayoum was able to see the benefits. 'It's best not to test the concept of a local area water board in an area where the people are desperate and fighting-or worse-over scarce irrigation water', says Risseeuw. 'You also can't test it where people are extremely poor or where you have a lot of economic disparity. The community should be rather homogeneous-and not extremely poor or extremely rich. It should be a community that still has faith in the future, where farmers understand that by cooperating they can make a better living. And where the system's technical conditions allow for important short-term water-management improvements, e.g. via repairs, maintenance and rehabilitation. These kinds of socio-economic considerations made it difficult to identify hydrological units within the Fayoum Depression, in which the introduction of the water board concept would stand a reasonable chance of success.'

Political considerations

The Panel also reviewed the various issues and looked for potential water board members who had some political savvy and clout. 'If the concept of water boards is to work well', says Risseeuw, 'eventually you have to change some basic legislation in Egypt, so that these boards can take over responsibilities [from MWRI].'

'To make things more complicated, some people were afraid of the proposed water boards. Some farmers who had enough water and strong relations with Parliament members worried that if the project was successful it could mean they would no longer have plenty of water.'

Early economic successes

In 1995, 15 prospective pilot water board areas were identified for the project. Budget and personnel restrictions later reduced that number to five areas that best met the criteria proposed by AAP and accepted by MWRI. The project's main objective was to show all interested parties that the water board concept was viable in the Fayoum Depression. Moreover, that it was necessary for effective public irrigation and drainage-water management at the local water level. It worked.



'The situation of people in the pilot boards improved', Risseeuw says simply. 'In the areas of the pilot water boards cropping in the summer increased by 15%. It wasn't just "I think it's nice that the people are cooperating." The pilot boards showed real immediate benefits.' The new system also created jobs for more people in the Fayoum Depression. Before the project, Cairo-based contractors maintained the system. Today many of these tasks are performed by local contractors and farmers hired by the water board. 'Money for operation and maintenance is no longer spent on people living in Cairo', says Risseeuw. 'Much of the money stays in the area itself. It's creating jobs, if you will. This is also a very important factor in a relatively poor society. I'm convinced that one of the reasons people are more likely to cooperate in the water boards is that they have perceived the local social-economic benefits of the concept.'

Ensuring water-system integrity

The pilot boards also allayed other fears. 'They demonstrated that there was no reason to be afraid of the water boards', says Risseeuw. 'They have not become communist organisations and they are not taking over the Ministry of Irrigation. On the contrary, their cooperation with government officials enhances the technical quality of local water management and makes farmers respect the system's technical integrity more. They do their job as farmers and at the same time solve problems that formerly fell to the Fayoum Irrigation Department. Thanks to the pilot boards it has been possible to demonstrate that the concept works in Egypt.'

Above all, the boards ensure the integrity of the water system. 'The cooperation of the people on the water boards meant water services were more predictable',

says Risseeuw. 'Without changing the amount of available water to the area, farmers got more assurances that they would receive water services when they were supposed to. This also boosted farmer support.'

The project expands

Eventually the APP extended the number of water boards to 12. Today, in the project's final stages, there are some 40 pilot water boards and the concept is being expanded to other areas in Egypt.

'People are now meeting to attain the legal empowerments necessary to continue', says Risseeuw. 'It's a complicated problem to ensure continuity in local water boards. If, for example, the chairman dies or a big change happens in the community, the water board may suddenly not function. This is not acceptable once a water board has taken over all the local water-management tasks of MWRI. The law, therefore, must include a provision stating that the government will step in if a water board doesn't function, because that would endanger effective daily water management.'



Ensuring user
involvement;
cost recovery

Water boards at the district level

44

What do you get when you take a single water source, add an arid climate, a forty-three-year-old treaty and an exploding population? It might sound like a recipe for disaster. But in the hands of the Egyptian-Dutch Advisory Panel Project it's been an opportunity to increase farmer involvement in water management, specifically through the use of water boards.

This Water Board Project is intended to improve user participation in solving water problems, enhance water-management efficiency and accelerate cost recovery on various water projects.

Building on a successful model

Water boards are not an entirely new concept in Egypt. The project merely seeks to bring them to a new level. Most water associations in Egypt are currently at the mesqa (private field channel) level, and involve only a small number of farmers.

The new project wants to extend farmer involvement to include managing water use on governmental canals. After long research, the most efficient solution appears to be establishment of district water boards. And this is where Egypt plans to focus its efforts.

Yehia Abd El-Aziz, Director of the Water Board Project, has been involved with various water association initiatives since 1984. That's when the first local water organisations, known as Water User Associations, were introduced as part of the USAID-funded Irrigation Improvement Project (IIP). These mesqa-level groups were given legal status in 1994 and now efficiently manage water distribution and maintain pumps and other water equipment at the tertiary level.

Catalysts for expansion

The available irrigation water in Egypt was set by treaty with Sudan in 1959. El-Aziz says the problem now is that the number of users has nearly tripled to 67 million people since then and is expected to reach 90 million by 2025.

El-Aziz: 'The big challenge now is that the need for water is increasing but the amount of water resources stays the same. This means that we have to manage the water efficiently to minimise losses. We can't do this without the involvement of users in water management activities. This is one of the main impulses to form water boards.

'The second is that the government can't continue to provide water to users

without repayment, without cost recovery. We have two options for cost recovery. The first is to impose taxes or a water charge. The second is to transfer some of the tasks to water users, so they do the management tasks by themselves.

'With water boards we are looking at this latter option: task transfer and cost transfer from the government to the users. I think this policy can be successful in Egypt. It will relieve the responsibility of the government and increase the efficiency of water management.'

Early success

The APP had its first success with water boards at the branch level (the lowest level involving governmental lands) in the Fayoum Depression beginning in 1993.

'These local boards gave the farmers an opportunity to participate on the distributory level-at the branch canal level', says El-Aziz. 'The farmers appreciated this new system and achieved good results. The farmers, therefore, are happy to work at this level.'

Pilot water boards throughout Egypt

Thanks to the success in the Fayoum, the APP recommended that eight pilot water boards be established at the national



level. El-Aziz says project members took great care in establishing the pilot areas to ensure a representative sample: two in the East Delta, two in the West Delta, two in the Middle Delta and two in Upper Egypt. The pilots are also divided between old lands (irrigated for thousands of years) and reclaimed areas (settled 25-30 years ago).

'We also differentiated between big commands and small commands', says El-Aziz. 'One branch canal serves 1,000 acres, another 10,000 acres. We also looked at cropping patterns. In Lower Egypt there is rice and in Upper Egypt there is sugar cane. We also chose water board areas that covered both improved and unimproved areas, for example, one with tile drainage and one without tile drainage. We wanted every water board to have a unique character.'

Water boards: not for everybody

Although El-Aziz is a strong proponent of water boards, he recognises that they are not necessary everywhere in Egypt. A case in point is the Siwa Oasis in the western desert. The APP thought it would be a prime area for water management. So early on, it recommended that the project establish a board there. According to El-Aziz, however, the local users already had things under control. 'We found that people living in the Siwa Oasis have traditional rules to manage water that are more powerful than what we were working towards. They are tribes and they

have traditional ways to control their wells. Their own system was strong so they didn't need our guidelines. It was a waste to go there with a system when they had a system that was already working well.'

Water board make-up

The number of members on each water board varies. Farmers make up the majority of water board members. But most boards also include industrial and residential users.

Each district or branch area is divided into base units of 50 to 100 acres. This means the people in the unit are neighbours and usually have a previous working relationship. It is, therefore, easier for people in the unit to make an informed decision about who will represent them on the board.

In a 3,000-acre district, for example, there would be about 40 base units. Every unit elects a local representative. All representatives are brought together in a Representative Assembly of users. Since most of the pilot areas are largely rural, there might be only two or three industrial representatives in the Assembly, as well as a handful of residential representatives. The Representative Assembly is responsible for setting plans and priorities for the water board. The Assembly also elects the water board from among its membership, including a chairperson and six to 10 members.

Water board duties

The board is responsible for integrated water management-irrigation, drainage and other issues related to water in its area. Recent priorities have included water quality and conservation. According to El-Aziz, this often includes hands-on intervention, a further benefit of the water board concept.



'When the users are involved', he says, 'they better understand the need for water conservation-even the need for reduction of pollution. Local farmers prevent area residents from throwing garbage in the canals or any other kind of illegal actions. They may also be involved with removal of waste and weeds from the canals. The farmers themselves can create a lot of problems. This means that the water boards can help solve these problems because all farmers have representatives on the water boards and all have to schedule irrigation through the water boards.'

Moving beyond the branch level

Most current water boards operate at the branch level. But El-Aziz says eventually focus will shift to the district level. 'We've found that we want to work at a higher level than the branch canal', he says. 'We've discovered that a branch-level organisation can't generate enough funds to be self-sustainable. We took a lesson from the Dutch here. Initially the Netherlands had 3,000 water boards, but found that was not the best solution. So they merged the smaller boards together. Currently there are 50 water boards in the Netherlands.

'As part of the APP we looked for an ideal size. We've found that to be the district level. Each district represents 40,000-60,000 acres. If we can form boards at this level in the rest of Egypt I think they can be self-sustaining and self-sufficient.'

A focus on user participation

Although cost recovery is one of the project's key goals, El-Aziz says true participation is more important still. 'We want members to participate by in-kind or cash contributions', he says. 'And we want these boards to be quite small but effective.

'Egypt has a very unique system', he continues. 'We have essentially one source of water and a very complicated [distribution] system. I don't believe we can manage it and divide the resources effectively with a big group system. The water boards are a kind of decentralisation so actually we are looking for water management, even more than the revenues. Our job is to give farmers authority and prestige and give them a role-not just to get them to pay money.'



Establishing a legal framework

Users have embraced the concept of water boards and are eager to see it work. The main stumbling block now is establishing the legal framework that will make the boards both truly autonomous and truly responsible. Currently the boards are supported by ministerial decree. This gives them limited legal standing.

An amendment to law number 12, which established the mesqa-level water user associations, will give water boards wider powers, including the right to collect fees. This amendment has now been introduced in the Egyptian parliament where it waits acceptance. Once the law passes, water boards will have the necessary legal status and can be implemented throughout the country.

Keeping a reasonable tax burden

El-Aziz is very concerned that water boards not add to users' tax burdens. 'I made it my business', he says simply. 'We have to support the government. But we also have to support the water boards, at the very least by exempting them from governmentally imposed land taxes. Instead, I told the government, we can leave the land tax to them. I said that if we left this to the water boards, the government would get the same funds without imposing a new burden. The local user will pay the same as he paid last year, but to the local water boards. This will generate funds.

'I felt very strongly that we should not put a new burden on water users. If needed, some of the money can initially come from the government to support the people. We want to give them the opportunity and power to operate the system, rather than making them pay more. That has been our track right from the beginning.

Gradual acceptance

Sensitivity to user concerns and concrete results have helped make the Water Board Project successful and overcome initial user scepticism. An original member of the Deir El Musalamy Canal Water Board in the Sharkeya Governorate illustrates this gradual acceptance. Her name is Sahar and she is one of two women in Deir El Musalamy chosen to represent the residential constituency. 'At first, I was sceptical of the idea of water boards and of the benefit of my participation', she recalls. 'People made jokes about my membership. My husband did not appreciate the lengthy meetings.

'Above all, the male board members were not very comfortable with the idea of a woman attending meetings with them. But with persistence and diligence, we women managed to get our issues on the Water Board's action plan. Soon, and



much to our delight, a fence was constructed right on the canal to prevent the drowning of our children. We also held an environmental awareness workshop for men and women in our village to highlight the hazardous effects of canal pollution.

'Now people no longer mock me. They come to me to tell about their problems. My husband no longer objects to my participation. Many women and children have stopped throwing garbage in the canal, because they know it will block the water flow from reaching the fields where their husbands work and that it will pollute the water. I am very proud of what we women did on our canal. And for us, this is only the beginning.'





Updating
ancient
traditions

Gender issues in the Water Sector

SD

Egypt is a traditional country. And nowhere is this truer than when it comes to men's and women's roles. Yet tradition has not kept pace with Egypt's new reality-namely that women are being asked to fulfil roles previously thought to be men-only.

One place this is happening is in the farm sector, where necessity, opportunity or other circumstances are giving increasingly more women primary responsibility for the crops and livestock. Some estimate that 30 to 40 percent of Egypt's farms are worked by women. And since water is an integral part of farming life, this reversal of traditional gender roles has been a subject of great interest to the Egyptian-Dutch Advisory Panel Project on Water Management.

Addressing the entire population

It's a mistake to think of gender issues as referring only to women, cautions Dr. Samia El-Guindy, director of the APP Central Office. 'When it comes to water issues, gender concerns the performance of men and women together', she says. 'It is not just women. It's important to address both, and previously this was not done. If you look to the society you find that women represent 50% of the society. Women are responsible for the household. Many women are also responsible for fieldwork. And if you talk about water quality protection, or water management or introducing new technology-irrigation systems, and so on- you cannot neglect 50% of the population. If you do that your initiatives will fail. Or at least you will miss a large portion of the workers.'

The Panel recognised this truth years ago, and in 1996 it began formally to consider and incorporate gender issues into its activities.

Raising Panel awareness

El-Guindy says that a priority was to raise sensitivity to gender as this impacts water issues. The APP staff began with high-level officials associated with the Ministry of Water Resources and Irrigation (MWRI), which is closely linked to the Panel. 'Our first step was to raise awareness, first among the Panel members, both Egyptian and Dutch, and among the decision-makers in the Ministry. We wanted them to understand what gender is. So we had a workshop. Then we started to make some assessment studies to incorporate gender within the policy of the Ministry. This occurred at two levels: the institutional level and mainly at the grassroots or field level. The idea-not only in our Ministry but in many agencies-was always that women were involved in a high percentage of agricultural processes.

But in irrigation the question was how was she involved?'

Dutch experience leads the way

As in many Panel initiatives, Dutch experience provided guidelines for raising awareness of the issue. El-Guindy says it actually wasn't too difficult to educate the Panel on gender sensitivity. 'The Dutch have a very good understanding of this issue. With some of the Egyptians it may have been a little trickier because in the beginning they had the idea that irrigation work was too difficult for women. Now we are working to extend that understanding so that this issue can be incorporated in the policy of the Ministry.

'Based on information we received from assessment studies, the Panel tried to draft a policy for gender. The idea was to incorporate this policy in the Ministry's policy in the short- and long-terms. We are now in this process. With the assistance of local and Dutch consultants we are currently making more assessments to develop an issue paper to help in drafting the policy in the Ministry. We want them to take into consideration that women are exactly like men. There's no difference in this process and they should be included in the whole decision-making process and in the advisory processes and so on.'

Tradition vs. reality

Some members of the Panel, and many men and women in the field, had trouble buying this concept. Traditional male and female roles are simply too established in Egypt. An interview with an Egyptian farmer draws this distinction very clearly. On a video commissioned by MWRI, which explores gender issues as these relate to irrigation, the farmer says: 'a woman here can only do certain tasks. She can mow but she can't irrigate. We're

bound by certain traditions here. When a man irrigates he can undress and work in his underclothes. A woman could never do that. Another thing, we irrigate at night. By day the demand for water is high. The flow is minimal because we're at the end of the watercourse. So, a woman can't irrigate at night or during the day either. She may need to gird up her dress but our tradition doesn't permit that.'

This is a typical sentiment, says El-Guindy. But reality is a different matter. 'Through our assessment studies we discovered that women are fully involved in irrigation', she says.

A changing Egypt

Many recent events have literally changed the face of Egypt's farmers. An expanding population and industrial development mean it's harder to make a living solely by farming. Many husbands, therefore, opt for jobs in nearby cities or abroad, leaving their wives to take care of the farm. It's much less expensive for her to do the work herself than to hire a labourer. Here's a typical story from the video: 'Ten years ago, my husband went abroad to Jordan and Saudi Arabia', says the woman in the video. 'I did all the work at home and in the field. I'd irrigate and tend the flow of water, water the corn and thin it out. Also the cotton. I did all the fieldwork. I'd tend the livestock; take care of my kids. I carried the responsibility for 10 years. He'd go abroad to work and I'd work here.'

Other women farmers have been widowed or have lost their husband through immigration. An early Panel study was to document these changes. Field studies and interviews soon showed that women farmers were very common in most of Egypt and that women had found a way to overcome the challenges of restrictive clothing, hard labour and

traditional attitudes. Women are particularly active in the Delta and Upper Egypt where gender issue pilot programmes are in place.

Women on the water boards

One area that has started to include women is the water board initiatives. These organisations provide farmers with local representation on water issues.

'The Water Board Project is already helping raise awareness about the role women can play in this arena', says El-Guindy. 'Of course the Dutch government plays a role in that-in the Dutch embassy in Cairo, for example, we have gender specialists, experts who support us on this issue.'

Some female farmers have already been elected to these boards. Here, too, however, some traditional farmers insist that women respond inappropriately to



water challenges. 'Women don't have sufficient knowledge of irrigation problems', says one opponent on the video. 'Supposing the husband is abroad and there's no water in the irrigation canal. She asks the neighbours to provide her with water from the drainage canal or a groundwater pump. She depends on her neighbours.'

As the video shows, some resistance comes from farmers who believe that it is unseemly for women to serve on a water board. As one of the farmers in the video puts it: 'regarding the participation of women in the union, women who have land are few. A woman usually has someone to represent her: her husband, son or anyone with power of attorney-a worker she trusts. So women are not elected to the committee. The number of women who irrigate is low. They can never do the work a man does. Besides, we have our traditions and customs. It's

not possible for a woman to attend a meeting except for a few rare cases. She can't take on a man's role.'

Slow acceptance of women representatives

And yet experience is putting the lie to these ideas. Farhana Habib is a case in point. She owns her own farm, supervises the land herself and is a member of the local water union.

'We do have female farmers on these boards', confirms El-Guindy. They represent the farmers in these associations. In some cases the women are well respected although in some areas, such as Upper Egypt, it is still an issue because people there are very traditional. There it is not easy. But we are working on that.

'There are women representatives on the water boards in Upper Egypt but they are representing households rather than representing farms. We are looking forward to the time when women will also represent farms. '

Expanding gender sensitivity to all water areas

The Panel hopes to extend acceptance of women farmers throughout the water sector, and indeed throughout the nation. 'We think that the issue of gender will spread to all areas of the irrigation policy', says El-Guindy. 'Of course awareness is very, very important in this process. This is true not only at the Ministry level but also at the national level. We have planned to organise a big national workshop. It will be held at the end of 2003 or the beginning of 2004 after we have solid results to disseminate. This information will raise awareness among all the national organisations. We would also like to publish a newsletter and coordinate with other ministries, especially the Ministry of Agriculture.





These kinds of activities are currently being implemented.'

There is already support for these initiatives at the national level, where consideration of women's issues, in general, is a national policy. Egypt now has a National Women Council. The MWRI has close ties to this council and El-Guindy sees such support as evidence that awareness about gender issues has been gradually growing.

Establishing a Gender Focal Point

The Panel recently suggested that the MWRI formalise and coordinate its position on gender issues. Consultants advised establishment of a gender unit or focal point in the Ministry. MWRI has already implemented this Gender Focal Point as part of the Irrigation Advisory

Services Directorate, which has the most direct link with the field and with farmers. 'We put the focal point in this directorate to strengthen the advisory services to female farmers' says El-Guindy. 'In the past, these female farmers had always been neglected when it came to the decision-making process.'

The Gender Focal Point consists of one female engineer and one male engineer who acts as her assistant. They are currently involved in a very intensive planning programme designed to coordinate among various Ministry projects involving gender activities. They are also organising the national workshops to raise awareness.

Increasing the number of female engineers in the Irrigation Advisory Service

El-Guindy says giving women better role models and leadership is equally essential in promoting gender equality. 'We are looking at how to increase the number of female engineers who are working in the Irrigation Advisory Service', she says. 'This will help provide an easy link with female farmers since these engineers work closely with those in the field.'

Women engineers are not completely new to this sector, and these field workers are often best equipped to describe the reality of women in farming. Says one 18-year veteran at the local office of the irrigation department: 'I see women coming with their problems just like men do. A woman's role in agriculture is equal to a man's. In her husband's absence she manages everything. She comes to the office with any problems and we solve them for her. Women engineers are as numerous as the men and most of our employees are women. There are women in all the agricultural cooperatives. There's no difference between men and women.'

Or as one (male) proponent of gender equality on the farm succinctly puts it in the video: 'They used to say 'a man's a man and a woman's a woman. Today, a man's a man and a woman's a man too!'

At least where irrigation and other water issues are concerned.





Sustaining an
'invisible'
resource

Management of groundwater issues

The old saying 'out of sight, out of mind' describes one of the key dilemmas facing Egypt's fledgling Groundwater Sector. For how do you begin to protect a resource that is vital but hidden to most people? This issue haunts Fatma Attia, head of the Ministry of Water Resources and Irrigation's (MWRI) newest sector.

'Groundwater is an invisible source', explains Attia. 'When you talk about water distribution (from the Nile), people see it. But what about what's below the ground?'

Egypt's baby water sector

In 1999, the government established the Groundwater Sector (GWS) in an effort to bring a large number of groundwater issues together under one roof. MWRI and the Egyptian-Dutch Advisory Panel Project on Water Management had been concerned with groundwater since 1983. As a result of the long cooperation, various recommendations on the initiation of a groundwater executive body in the Ministry were brought. Finally in 1999, the MWRI decided to respond to such requests and recommendations and initiate the GWS.

'Before the initiation of the GWS, there were many scattered groundwater directorates that reported to the Irrigation Sector', recalls Attia. 'But groundwater is used for things other than irrigation so there were lots of conflicts among the groundwater users. Also, enforcement of the laws involving licensing and planning, control and pollution regulation was not done. It was difficult having scattered directorates reporting to a sector that had no special groundwater expertise. There was a move to consolidate groundwater, rainfall harvesting and flood control activities-whatever is in the desert.'

The work of the sector was not started from scratch, because activities related to research and monitoring had already begun in 1954. Before joining the Water Sector, Attia was the head of the well-respected Groundwater Research Institute. She has 36 years of experience in this field.

Response to a growing need

As with other water issues, the move from research to implementation was a reflection of Egypt's changing needs. Attia: 'the increase in groundwater requirements had to do with the population increase and the increase in the dependence on groundwater in

various regions in Egypt. In the desert you have no other source of water. And more and more people were settling in these areas.

'At present about 1% of the population is settled in the oases of the western desert and in both Sinai and the eastern desert. In addition to settlers and farmers, there are many other activities. For instance, there is tourism in the South Sinai and along the Red Sea Coast in the eastern desert. The entire northwest coast of Egypt has no access to Nile water. They all depend either on groundwater or on flash flood harvesting. So the need for water comes both from the people who live there and the people who are just visiting.'

A wide range of responsibilities

The Groundwater Sector is more than the newest water-related division in Egypt. It's also one of the most diverse and is the only sector in the Ministry to cover the whole country. A staff of about 1,300 people, including technicians, operators, professional staff, administrators and labourers, handles the tasks. Tasks include implementing, monitoring and licensing every groundwater well in the country, as well as design and construction of structures that protect the land from flash floods. 'We're even responsible for wells with brackish water', says Attia, 'because people can use it for fish farming or growing salt-resistant crops. We are also responsible for pollution control and enforcement of the law. This is an important responsibility. We cannot leave it to others.'

In addition, the Sector is charged with raising awareness about any issue that impacts the country's groundwater and wadis.



The vulnerability of groundwater

One thing many people don't understand about groundwater-or indeed think very much about at all-is the problem related to groundwater pollution. Unlike surface water, groundwater vulnerability to pollution is generally low.

Once polluted, however, rehabilitation is either very costly or impossible.

Especially where the soil is permeable, groundwater is susceptible to pollution from industry, farm fertilisers and pesticides, and salts that are flushed from the earth above. 'The salt you find on the soil is not just going to stay there. It will leach to the water below', explains Attia. 'Groundwater vulnerability is an extremely important issue and one that deserves more attention.'

'We need to focus people on pollution prevention rather than amelioration. Sometimes it's not possible to reverse the groundwater pollution. That's not true with other water sources. When surface water is polluted with organic waste, it

can treat itself in a couple of days because of the aerobic conditions. But groundwater can't.'

An emphasis on sustainability

Producing truly sustainable groundwater is the Sector's number one priority. And when Attia talks about this emphasis, it's clear she's concerned that water be available for 100s or even 1,000s of years. The Groundwater Sector has identified a number of strategies to ensure this long-term solution. First, she says, the major part of the water is not renewable. True sustainability requires conscientious planning. This will ensure that the majority of water will come from renewable sources like rainfall and flash flood harvesting, while only a small amount will be drawn from finite sources.

Another key to sustainability is matching water quality and technology to use. Attia says, 'you can use shallow and brackish groundwater for agriculture and/or fish farming, for example. This water may be of lesser quality, 1,500 to 5,000 ppm, but it will be adequate for some crops. We

also need to take a look at technology. The average farmer cannot afford to drill a deep well to get flowing water. Why don't we develop simple technology that takes economics and education into consideration?'

Finally, according to Attia, sustainability means educating people about reducing pollution and conserving existing resources. These issues bring up others.

Maintaining difficult equilibriums

The environment is complex and so are the aspects of it related to groundwater management. For example, says Attia, it is important to consider the effects any proposed management would have on wetlands and natural springs. 'These resources have existed for hundreds and even thousands of years', she says. 'If you start developing or managing groundwater without understanding the impact on these areas you can bring about environmental imbalance. So you

have to be aware of how things influence each other.'

Egypt is also concerned with understanding and respecting the needs of groundwater users. 'The social part of groundwater management is very important, says Attia. 'People who live in desert areas have been depending on groundwater as their sole source for centuries. If you bring in people from other areas and settle them in the desert without understanding the society and culture they will be joining you can upset the whole balance of the community.'

Sensitivity to the existing population is more than a vague standard. It's government policy. 'When Egypt settles an area, we also study and prepare the area for those coming in. Years ago most settlers were university graduates and landless farmers from the Nile Valley and the Delta. But today the expansion is based on large investors. We work closely with them to make sure we are protecting



the native people and the established settlers. Otherwise they would be lost-and this is not right.'

A passionate public awareness campaign

Attia is a strong advocate for and educator about groundwater problems and solutions. She works hard with various constituents, her staff, the government and even her grandchildren to ensure they all understand the issues.

'A major challenge is creating a good staff', she reports. 'We're talking about capacity building. You need to train people to understand, for example, what is meant by integrated water management, what is meant by quality. Many of my staff members were civil engineers. Civil engineers do not have a lot of experience with quality. So we needed to train them and add staff members of other disciplines/education, such as geologists.'

'Another challenge we have is helping the country to reduce pollution of water resources and to conserve such resources. The country is your children and your grandchildren and their children.'

'This means creating awareness both with very high politicians and policy decision-makers and the grassroots-not only with the farmers but also with schoolchildren. I do that with my granddaughters when I try to develop awareness in them. I talk to them. I tell stories about water, about how it comes and how it can become polluted and how we can lose it. They are interested. They can even make you ashamed of yourself. They can say, "Grandma, you said don't waste water and now you opened the tap and left it open. Oh! Oh!"'

A passionate exchange of ideas

Attia and her in-house staff cannot tackle all the issues facing them alone. She says the Egyptian-Dutch Panel has involved a passionate exchange of ideas, with both sides learning much from the other. The Dutch, for example, have been excellent resources in terms of geology and artificial recharge and treatment of water. And, Attia says, they have been an invaluable resource when it comes to planning. 'In Egypt it's very common to just work', she explains, 'and when the work is finished, it's finished. The Dutch have taught us about putting plans into place and sticking to them. To become a professional consultant you need this kind of discipline. And the quality of your work should be evaluated using measurable standards.'



Among other things, says Attia, Egypt has brought knowledge of the social aspects of water management to the table. 'One of our main interests is the social part', she says. 'The Dutch learned a lot by watching and working with our farmers. They also worked with our investors to see how we deal with problems like economies of scale and large-scale projects.'

Learning from the unofficial experts

The knowledge exchange has not been the exclusive property of the Advisory Panel Project and other government officials. Attia praises the role of the people living in groundwater-use areas. She enjoys talking, listening and learning from her constituents in the desert.



'Before we start any project, we talk with the people living in the area and work with them', she says. 'I've learned a lot by listening. I'll give you an example from the Nile Valley and Delta.

'About 30 years ago I took part in an FAO-World Bank drainage programme. I saw that one of the farmers was trying to hide something behind his clothes. I asked him what he was trying to hide. It was a pump. So I asked him "why are you hiding a pump?" He told me that he was supposed to turn the pump in since the High Aswan Dam had replaced the need for groundwater.

'I said, "you have water all the time. You don't need a pump. It's more expensive." And he said, "You don't understand. Of course I can have water all the time. I can grow vegetables as a cash crop. But with a pump I can also achieve drainage." This was a dimension of pumping that we had never thought of. And so you learn.

'I love the users', she continues. 'When you go into any oasis, they recognise you. They come and ask you about things. You want to satisfy them and you feel proud of yourself when you can help them. In the beginning we had lots of problems but in the end they found we were doing it for them, not for ourselves. They know I'm not making myself the boss of the water but rather trying to conserve it for them. It's there for them and for their children.'



Investigating unconventional sources

The Panel tackles water quality

Water quality and its sister issue water scarcity currently dominate most world discussions of water problems. In Egypt it's no different. With an exploding population and increasing industrial development, the Egyptian-Dutch Advisory Panel Project on Water Management has placed water quality high on its priority list. Dr. Samia El-Guindy, director of the APP Central Office, says that the Panel has long been interested in preserving water quality-almost from its formation in 1976. Yet in the last several years, quality problems have taken on a new urgency. This has led to several achievements in this area. And today the Panel is working to better coordinate all its quality efforts.

Success breeds opportunity

The Egyptian-Dutch partnership was originally formed to help Egypt develop a more-efficient drainage system. And these early Panel efforts, which allowed better recovery of irrigation water, first stimulated Egypt to consider water-quality issues. 'When the Panel Project started and showed some success in the areas of land drainage', says El-Guindy, 'the Ministry of Water Resources and Irrigation (MWRI) asked the Panel to assist in studying the possibility of reusing drainage water. Since the 1970s the Ministry has had a policy in place mandating the reuse of agricultural drainage waste.' Reuse of water is an unconventional means of stretching water resources. As the population continues to grow, the focus has turned ever more tightly towards this method for extending the amount of useable water.'

Tracking water quality

When Egypt first considered reusing agricultural water, water-quality data was virtually non-existent. El-Guindy: 'At the time we're talking about, around 1976, there was hardly any information about water quality. They could collect information about water quantity from the pumping stations, but there was no means to do the same with water quality.' A first step for the Panel, therefore, was establishment of a water-monitoring system. In the beginning, the study was mainly concerned with water salinity, the major parameter for agricultural water. Since most of the drains in Upper Egypt discharge into the Nile, the project first focused on the Delta. The monitoring system was gradually increased, and today MWRI monitors quality in drains, canals, groundwater and the River Nile, as well as all water used in irrigation and drainage.

Predicting outcomes in different scenarios

Another Panel initiative was finding a way to forecast the kind of water quality produced in various agricultural conditions. 'The Drainage Research Institute (DRI) developed a mathematical model to predict long-term water quality under different water-management policies', says El-Guindy. 'This model allowed the Ministry to predict the water quality under different scenarios. For example, we could tell what might happen if the rice cultivation increased, if the rice cultivation decreased, if we used different cropping patterns, if the irrigation improvement programme was implemented.... This model let us determine what the quality of water would likely be.'

Studying water effects

Once the Panel had determined the quality of water in different actual and predicted scenarios, it wanted to find out the effects reused water would have on crops. So it discussed and commissioned a number of technical studies that would trace the environmental impact of saline water on soil and crops. It also studied the long-term impact of reusing drainage water in reclaiming part of the northern lakes (Lake Burullus and Lake Edku).

New problems-sewage and industrial effluents

El-Guindy notes that time and changing demographics have brought new water-quality issues to the forefront. 'As the population increased and the development programs in Egypt expanded', she says, 'we began seeing another water-quality problem. This is pollution of the drainage water-mainly sewage effluents and industrial effluents. The Panel responded by looking at how the problem could be solved and devising policies that could achieve those goals.' Major problems in the Delta region

Unsurprisingly, Egypt's most populous area-the Nile Delta-is also the most beset by water-quality problems. 'The water-quality issues there are more severe than elsewhere in Egypt', confirms El-Guindy. 'This is because of the high population density and also because of the impact rural areas have on the pollution rates. About 80% of the rural area of Egypt has no sewer system. So residents there dispose of their effluents directly into the drains.'

The impact of industrialisation

The Nile Delta is also one of the areas most influenced by expanding industrialisation. And this too has added to the amount of spot pollution in the region since industrial and municipal water users contribute more heavily to pollution than do farmers. The increased industrialisation is a by-product of Egypt's rapid population growth. As Egypt gets more populous it has to look beyond farming as a source of income. Industrialisation-steel, chemical, food processing, etc.-has grown apace.

El-Guindy: 'There are also smaller polluters-small workshops and factories-in the Delta. These contribute to the water-quality problems there.' These water users do not come directly under the jurisdiction of MWRI, but these users do impact water quality and so the Ministry is concerned. 'We only work with the ministries on water quality, not so much individually with the small stakeholders', she says. 'The Ministry of the Environment is responsible for water-quality protection.'

This brings up another focal area: working with other Egyptian ministries. 'MWRI is not a major polluter', says El-Guindy. 'There are other ministries who pollute the waters to a much greater extent. We have to work with them-the Ministry of Housing, the Sewage Authority, the

Ministry of Industry and other ministries-quite closely to develop a coordinated water-quality protection policy and to control pollution. For example, we work with the Ministry of the Environment and the Ministry of Agriculture to deal with pesticides. MWRI also works with the Ministry of Housing concerning sewage effluents. '

Dutch influences

The Dutch Panel members proved a powerful resource when it came to reducing the effects of spot pollution. The Netherlands, namely, successfully treated extensive water pollution in the 1970s. These problems prompted the Dutch to enact laws to restrict pollution of surface water. The Egyptians were very interested in studying the experiences of the Dutch in terms of sewage-water treatment and the methods the Netherlands used to improve surface-water quality. Based on these experiences and other research, the Panel recommended a National Water Quality Protection Plan. The MWRI, in turn was able to establish its priorities and plans concerning water quality.

A second step in this initiative was communicating the priorities to other concerned ministries and co-drafting a national plan to ensure that plans from different ministries fit together seamlessly into a coherent action strategy.

A problem beyond Egypt

Since it shares its river with nine other Nile Basin countries, it's no surprise that Egypt has looked beyond its borders to identify quality issues and suggest solutions. In June 2001, the Advisory Panel Project organised a workshop in Cairo for Nile Basin countries. The meeting, 'Regional Nile Water Quality Protection' was intended to create awareness and cooperation in the field of water-quality management. Representatives from Ethiopia, Eritrea, Rwanda, Uganda, Sudan,

Kenya, Tanzania, the Congo, Burundi and Egypt attended, along with professionals from the Ministry of Water Resources and Irrigation, the Ministry of Agriculture and Land Reclamation, the Egyptian Environmental Affairs Agency and area universities.

The meeting was primarily intended to give participants information to create awareness of water-quality issues and protection initiatives. The group also discussed possibilities for a sustainable, long-term partnerships among Nile Basin countries to do combined research and knowledge development in the area of water-quality protection. As the workshop organiser APP helped participants come to an agreement to protect, preserve and raise public awareness in Egypt and other Nile Basin countries about improving water quality.

Consolidating water-quality issues

As the issues surrounding water quality became more complex, the Panel

recommended that the MWRI have a more formal structure to handle them.

'The Panel found that there was no definite structure in the Ministry to manage water quality', recalls El-Guindy. 'There were many different activities in the Ministry connected to water quality-research, quality monitoring, application of the legislation in various places in the Ministry, etc. But there was no definite structure providing coordination among all these activities and no overall responsibility.

'The Panel strongly recommended that a Water Quality Unit be established in the Ministry. The Unit's function would be to consolidate and coordinate between policy makers in the Planning Sector and planning projects, as well as monitoring programmes, research, legislation and stakeholder involvement. This last-how the stakeholders and other ministries can be involved with the Ministry in the whole process-was an especially important function.'



Filling in the gaps

The Panel proposed the new unit in January 2002 and soon after the Minister issued a decree putting it into effect. The Unit has many mandates. 'We still have some gaps in the water-quality legislation and the Water Quality Unit is charged with taking care of that', says El-Guindy. 'An Egyptian-Dutch project has already started to support and strengthen this Unit through capacity building, training the staff and so on. We consider the establishment of this Unit quite a Panel achievement.'



Changes in water technologies

The Panel and 27 years of technical advice

Ask nearly anyone about the joint Egyptian-Dutch Advisory Panel Project on Water Management and you'll hear the same thing: today's Panel is primarily a policy advisory body. There's no denying the technical underpinnings, however-particularly in the field of drainage-nor the continuing impact of water-related technology. Hussein El-Atfy, a long-time civil engineer, Panel advisor and the Undersecretary of State for the Minister of Water Resources and Irrigation's Office of Affairs, traces nearly 30 years of changing technology, the socio-economic aspects of water, and training, as well as these subjects impact on Panel efforts.

The Panel, the Ministry and the Egyptian Drainage Authority

No exploration of the Panel and Ministry's efforts in the area of drainage would be complete without understanding their relationship to the Egyptian Public Authority on Drainage Projects (EPADP), which has primary responsibility for Egypt's drainage system. El-Atfy worked for EPADP for several years, as well as its sister organisation the Drainage Research Institute (DRI), so he knows their activities well. This has helped him in his current role in MWRI and as an APP advisor.

Changes in the EPADP

Over the years, many aspects of drainage have evolved. Not least is the EPADP itself, which has changed a great deal since it was formed in 1974 according to El-Atfy. 'We started with a very small department and ended up with the Egyptian Public Authority on Drainage Projects', he says. 'It's a very big agency now. In the near future, you're going to see some institutional reform within the Authority in terms of upgrading the capabilities of the staff and the organisation. This will also involve farmers. Until recently, the Authority was responsible for the operation and maintenance of drainage systems. Now they are testing whether the operation could be transferred to the farmers, in the form of water user associations.'

Socio-economic changes in water issues

Socio-economic changes have also been widespread, particularly since completion of the High Aswan Dam. 'We moved from basin irrigation with one crop per year to perennial, which doubled the cropping and thus also the amount of irrigation water supply' says El-Atfy. 'This increase to almost continuous irrigation meant the subsoil or groundwater table started to rise. Once some of that water evaporates,

the salts come up to the soil surface. This process is especially problematic with high groundwater levels and high temperatures. So the salinity problems increased after the completion of the High Dam. To combat this, we started a drainage system, first with open drains and later with subsurface, or tile, drainage. Today Egypt's drainage system covers eight million acres of cultivated land.'

Effective drainage increased farm income—a major socio-economic change.

'Monitoring and evaluation programmes have proved that crop yields have increased an average of 20% thanks to the reduction of salinity in the soil', says El-Atfy.

'When we started drainage and for a long time, the farmers had doubts about the system. In the beginning they were afraid and they didn't want the new drainage system. Farmers are intelligent by nature and after they realised the benefits of drainage they began asking for it.'

Early Panel involvement

Egypt has had a long history of irrigation and normal types of drainage. But Dutch Panel members and other Dutch experts brought in a whole new perspective. 'The Dutch had a lot of experience with subsurface drainage and drainage under Dutch conditions', says El-Atfy. 'This experience taught us a lot. But the partnership was really beneficial to both sides. They have their experiences and we have ours and we could use both to develop our solutions.'

'The Dutch, of course, don't have as much of a problem with salinity because all their rainwater helps wash the salt out of the soil. Dealing with salinity was knowledge that was very specific to our climate—one in which the Dutch hadn't had much experience. This cooperation

allowed us to gain from each other in these and related areas: design, materials, maintenance and measuring system performance. We exchanged ideas and experiences related to all of these matters and we've been able to adapt technologies for each kind of circumstance.'

Expanding the applicability of drainage envelopes

Drainage envelopes provide a typical example. These are placed over subsurface drainpipes so that loose sediment doesn't get in and block water's progress through the pipe. The Dutch had great success in developing envelopes for use in their densely packed soils. But they ran into a problem in Egypt. 'The soil in Egypt is very different from that in the Netherlands', says El-Atfy. 'So some of the drain-envelope technology that worked in the Netherlands, didn't work here. It had to be adapted. First we tried using gravel envelopes, but gravel is very difficult to maintain in loose soils. So eventually we switched to synthetic materials that are manufactured locally. This evolution was based on the experience of the Dutch in using these materials.'

Evolutions in technology

Other technologies have also evolved greatly over the last 30 years. In each case, Egypt and the Netherlands worked closely to develop and adapt the best technology for Egyptian conditions. They systematically tested new technologies in several pilot areas designed to mimic different conditions. 'We carried out research for technologies in installation, pipes, pipe materials used in subsurface drainage, etc. all to test the new technologies in these pilot areas', says El-Atfy. 'For example, in the area of pipe materials, we changed from clay pipe to concrete pipe to plastic pipe (PVC) within this period. It was a big evolution. We also tested trenching machines-there are

different types for different soils. This is the type of technology transfer that was going on between Egypt and the Netherlands.

'We also discussed research studies, how you can check system performance in drainage. And we determined design criteria-the optimum depths and so forth for existing technology. All these technical matters were raised and resolved. We implemented a lot of the recommendations and today I think we have the latest technology in the design and implementation of drainage systems.

'This has given Egypt a very good reputation in drainage. Egypt has had a good irrigation system for a very long time but in the last several years we have also had a good reputation in drainage works. And a large part of this was due to joint cooperation on the Panel.'

A focus on applied research

Much of Egypt's drainage success can be traced to its insistence on applied research. Here, too, the Egyptian Public Authority on Drainage Projects plays a critical role. The National Water Research Centre, however, also needs to be mentioned here. The Centre was started in 1975 with 11 institutes in different fields of water management. One of these institutes, the Drainage Research Institute, serves as the EPADP's research arm. The set-up ensures a close link between research and implementation of water initiatives.

'Research and implementation work together', confirms El-Atfy. 'The beauty of this is that our focus is on applied research. When we find a problem in a certain pilot area, we test the alternatives and end up with the proper one. The Egyptian Public Authority on Drainage Projects can also raise drainage problems for the Institute to carry out applied

research on in the pilot areas. It's quite a practical, efficient system.'

Improved water efficiency in the rice fields

Again, you don't have to look far to find examples of this applied research. El-Atfy talks eagerly about an Egyptian sub-surface drainage system that provides improved water efficiency in the rice fields. 'In summer you have areas in which farmers grow rice, cotton and maize', begins El-Atfy. 'The problem is you need standing water to grow rice, but not to grow cotton and maize. So you want to leave water standing on the rice fields but drain the land used to grow cotton and maize.'

'Under the old system, water collectors flowed into an open drain. This meant we could either drain everything-rice, cotton and maize alike-or leave them all standing in water.' Some farmers improvised solutions, inserting make-shift plugs into the drains to keep the rice fields flooded. But this often prevented drainage of the maize and cotton fields. And it damaged the drains, producing even more problems.

To solve these issues, Dutch and Egyptian experts designed a modified layout so that each type of crop was served by a sub-collector with gates. The farmers can

then choose to close these gates, which serve as divisions between the rice, cotton and maize. 'When a farmer grows rice in some of these crop areas', explains El-Atfy, 'he can just go and close the sub-collectors and leave the main collector free. So the main drainage collector can drain the other crops while the rice is still within the closed system. This allows you to grow maize, cotton and rice next to each other without problems. And in the meantime you save water safely.'

Pilot testing of this solution proved that the system saved up to 30% of the irrigation water previously used to keep rice fields flooded. In addition, the system eliminated unnecessary drainage, soil salinity and waterlogging, reduced evaluation costs and improved the soil environment.

World leaders in research

Such successes, says El-Atfy, have made drainage researchers in Egypt known throughout the world. 'I'd say the staff capability in research might be among the best known in the world when it comes to drainage', he says. 'I'm talking here about both the Egyptian and Dutch staff. We know that the Dutch have their experience. They are famous for having built lands below sea level. And through this they have had to keep the land productive. So we know that they have



very good experience in these things. And together we have tackled very specific research areas in the last 25 years. And we have gradually implemented these research results to provide real and lasting benefits to the country.'

Improvements in training

Given their expertise in research, perhaps it's not surprising to discover that the Egyptian-Dutch partnership has also provided good opportunities to upgrade and promote the level of staff working in the field of drainage.

'The Drainage Research Institute and the Egyptian Public Authority on Drainage Projects were instrumental in the design and implementation of training in both research bodies and the implementation agencies', says El-Atfy. 'Training was either in Egypt or in the Netherlands. When I started doing drainage work, I attended ILRI's International Course on Land Drainage in Wageningen (the Netherlands). And every year, two or three people from Egypt attend this course. So from the beginning the

Netherlands has provided training that's very famous among the people who work in drainage.

'There is also an Egyptian counterpart Training Centre located in Tanta, which is run by the Egyptian Public Authority on Drainage Projects. They have programmes to train engineers, builders and even private contractors in drainage issues. This is one output from the joint venture between the Dutch and Egyptian governments on drainage, and this came about through the Panel.

'We are now also starting to organise drainage courses for neighbouring countries in Africa and the Middle East. Our Egyptian staff is also doing consultancy work in other countries with conditions similar to ours-Pakistan, India, etc. These consultants are mainly drainage engineers and other experts. So one lasting impact of this cooperation is our continuing good reputation as drainage experts.'





Spreading technical expertise

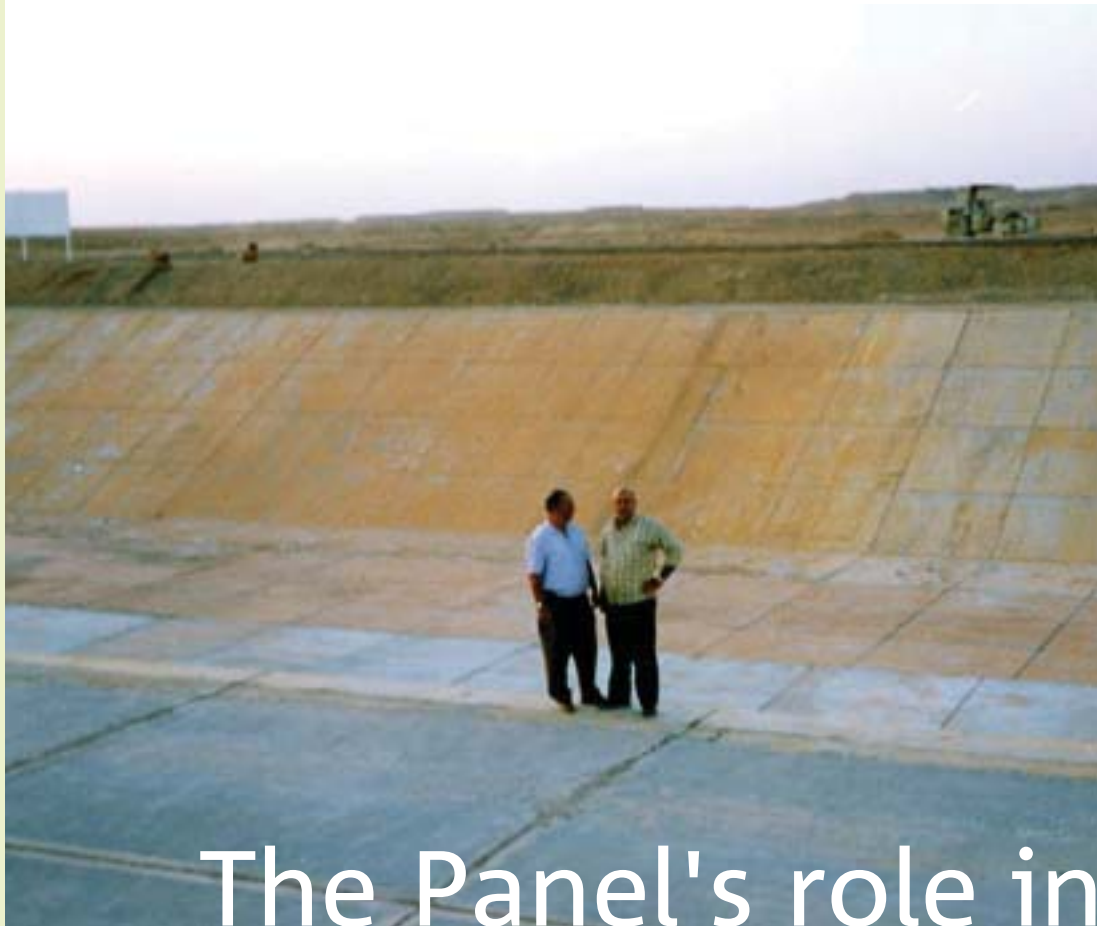
The partnership is not shy about sharing its results more formally. 'We've published many technical reports about drainage under this cooperation', says El-Atfy. 'We have already published two famous books- The History of Drainage in Egypt and the Manual for Drainage. Egyptian and Dutch experts jointly developed these.

'We have also written about certain drainage related topics, such as reuse of drainage in irrigation, which is a policy of the Ministry (MWRI). We do this to increase the water-use efficiency and optimise the limited water resources we have. So we are recycling the water and reusing the drainage water. Along with these activities we have a system to monitor the water quantity and quality in the drainage system. And we have written about these issues so others can benefit from our experiences.'

Challenges for the future

After almost 30 years, Egypt and the Netherlands have overcome many water challenges. Yet despite cutting-edge technology, excellent results and world-renowned expertise they have not been lulled into a false sense of security. They are already looking towards future challenges. As El-Atfy notes: 'Drainage is a dynamic process. And each water infrastructure project needs a lot of investments. The challenge is how to sustain water resources and how to increase user participation. It's very much a matter of integration now. How do you integrate irrigation and drainage while keeping in mind the social, economic and ecological/ environmental aspects?'





Expanding
habitable
lands

The Panel's role in

Egypt's Mega Projects

When it comes to expanding its habitable lands, Egypt could be called the anti-Netherlands. The Dutch became famous, of course, for reclaiming land from the sea, extracting water to make a place for people. But Egypt, in an effort to provide room for its expanding population, is reclaiming land from the desert. And a large part of that effort involves adding water.

Today, the majority of Egypt's 70 million people live in just five percent of the available land—mostly in the Nile Delta and Valley. With its three so-called 'Mega Projects', Egypt hopes to increase the inhabited area to some 25 percent of the country by 2017.

And since reaching that goal depends to a large extent on providing an efficient water infrastructure in the new lands, the Egyptian-Dutch Advisory Panel Project on Water Management will continue to play an important role.

Integrated land development

Egypt has begun Mega Projects in three areas: Toshka in the South Valley, the El Salam Canal area of Sinai and Al Oweinat in the western desert. Dr. Ahmed A. Goueli, Secretary-General of the Council of Arab Economic Unity and Egyptian member of the Panel, is also the project manager for one quarter of the enormous Toshka project. This encompasses 100,000 acres or about 40,000 hectares of land. 'All these projects involve huge areas, that have been largely set aside for agricultural use', says Goueli. 'However, the projects are based on integrated development, rather than just on agriculture. The projects support agricultural production, agribusiness, services, industries, tourism and a number of other activities. These Mega Projects are intended to promote production of food, as well as bringing more jobs and more space for redistribution of our population.'

A varied population

Not surprisingly, Goueli says that the population will be as diverse as the activities there. 'The people who live on the land will be a mixture of small farmers, university graduates, small investors, medium-sized investors and large investors', he says. 'There will also be people engaged in agribusiness there-to provide irrigation facilities, packing material and many other things. There will also be food processing and food preservation businesses, handling of food and the logistics of this.'

The role of the Panel

The Egyptian government, of course, has had to invest heavily in the projects. It is responsible for all the major infrastructure that will make it possible for future settlers to live comfortably there. In the arid climate, this naturally includes water-related infrastructure-canalisation, water harvesting and distribution, water

treatment, etc. The government has depended on the Panel Project to help with many of these issues. 'The Panel's role is to give advice and to help to make integrated water management on the projects a reality', says Goueli. 'These are new areas that require careful water use, handling and irrigation. At the same time they are trying to ensure the maximisation of the water resources in agricultural production. So their role is very important.'

The role of other governmental bodies

The Panel cannot advise in a vacuum, of course. The government must provide other infrastructure, transportation, logistics, and social services such as schools, hospitals, communication and others. The complex links between various aspects of the governmentally sponsored Mega Project infrastructure requires careful coordination among a number of agencies.

'The people responsible for my development project have worked very closely with the Ministry of Water Resources and Irrigation (MWRI)', says Goueli. 'It is a major agency in the implementation of the irrigation infrastructure. We have also work in close cooperation with the Ministry of Agriculture. They have an experimental station close by our land and we rely on their experience and knowledge. We also have a lot of interaction with the Ministry of Housing, the Ministry of Electricity, the Ministry of Communication, the Ministry of Transportation, the Ministry of Finance, the Ministry of Planning and several other ministries. We have a governmental coordinating committee for this project, and this committee meets regularly with the private sector.'

The role of private investors

While governmental money and expertise are traditional sources of support for Egyptian project, the Mega Projects have introduced a new source to the mix: the private investor. 'There used to be a very strong tendency for the government to support government farms as one way of development in Egypt', explains Goueli. 'Under this scenario, lands were developed so that the government could continue production. But since the economic reform of the '90s, the government has not participated in agricultural production and trade. So this has become an area for the private sector. In the Mega Projects, the government's responsibility is to extend the Mega Project infrastructure and provide services like extension and research. The private sector has to complete other aspects of the job.'

As with any new project, Goueli says that attracting private funds has been largely an exercise in public relations. Potential investors must first be made aware that the government is no longer a hands-on investor in private initiatives-that these now belong to the private sector. Investors must also become convinced that these investments will be worthwhile. Goueli says that only those who don't mind taking on some risk were initially open to hearing this last message. 'Private investors first became involved in the Mega Projects when they started in 1998', he says. 'These investors had to have faith that the water would come because the infrastructure was not finished at that point. There had even been some investors who were involved in the planning phase. These investors had to have a long-term vision and to be comfortable with risk. They had a vision in mind and understood that this was a long-term investment.'

Raising awareness of the Mega Project's potential

Goueli knows whereof he speaks, since a large part of his job up to this point has been attracting these private investors. His section of Toshka involves a large pilot farm project, and private investors have been footing the bill for the drip irrigation systems, local canalisation, buildings, packinghouses, and other communal facilities on the farm. To date, Goueli and his team have booked considerable success, since they have raised £300 million Egyptian from private sources to fund this pilot farm. But it has not always been smooth sailing. 'It has sometimes been difficult to attract investors for these ventures', Goueli admits. 'We have had to promote this strongly. Our main investor is El Waleed, a group of Egyptian shareholders. But now that the private sector has achieved some successes on our farm, we are attracting more investors. Our pilot farm in that respect is a showcase for investors.'

Scepticism raises its ugly head

Indeed, the pilot farm under Goueli's supervision has proven effective when it comes to showing potential return on entrepreneurial investment. But it's faced a lot of scepticism along the way. The 1,000-acre farm was established two years ago. Goueli and his staff'-approximately 150 scientists, foremen, farmers, and agricultural and civil engineers-planned carefully in order to enhance the land's productivity. Among other things, they examined the economic feasibility of different crops and employed the latest scientific advancements in soil and water analysis, seed selection, agricultural practices, farm management techniques, and follow-up. They intended to grow high-value crops such as strawberries, artichokes, grapes and potatoes as well as other fruits and vegetables. Despite the state-of-the-art procedures,

many doubted that the crops would flourish. 'The project was quite a challenge', says Goueli. 'Everyone said, "You can't do profitable business down there. Crops will not grow. Agriculture will not be profitable."'

Results knock it down

Goueli and company had more faith in the project's potential. But even they were surprised with what happened in the first two years of the project. 'The soil is in very good condition so we have had very good performance', he says. 'That was quite a happy surprise.'

In fact, yield on the Toshka farm has been both abundant and early. Goueli: 'We discovered that agricultural production is more rapid compared to other parts of Egypt and other competing countries in the Mediterranean. For example, our grapes can be harvested at least one month earlier than anywhere else in Egypt because of the climate here. Of course, this gives us a great advantage and a good marketing window.'

'We also grow very good crops. They are in very good condition and have a high quality. We have grown crops that are not usually grown in this type of area and

they have grown well. We have incorporated a more-or-less integrated process management and this has produced better results than we anticipated.'

Future challenges

Although much of the project has proceeded faster than expected, Goueli says there are still major challenges to overcome. Among the larger ones is logistics. The Toshka area is removed from key resources. The Sudan border is 60 kilometres away. This means the project is located far away from labour centres and markets. 'You have to transport your exports quite a distance', says Goueli, 'and this, of course adds to the cost. We are currently working on these logistics questions. Our current priority is to export more of our high-cash crops-the grapes, strawberries, artichokes, potatoes and other early-harvest produce-to Europe and the Middle East. We will have to resolve some of the logistics issues to make the venture even more profitable.'





Accomplishments
big and small

Dutch Panel member answers our questions about water

Chris Kalden, a Dutch member of the Advisory Panel Project on Water Management (APP), is not ashamed to admit that he's very fond of water. 'In my view water is one of the most fascinating elements in our world', he says. An employee of the Dutch Ministry of Agriculture, Nature Management and Fisheries (LNV) for nearly 20 years, Kalden is currently Secretary General of LNV and serves as the main policy advisor to the Minister. Seven years ago, he was the Director of Rural Development Services in the Netherlands, a position that has traditionally included a role on the Egyptian-Dutch Panel. Kalden has been an enthusiastic APP member ever since. Below the APP veteran answers questions on gender equality, Panel friendships, the reason the size of the Netherlands makes the Dutch-Egyptian partnership stronger and more.

A difference in water attitudes

Question: What is the main difference between the Egyptian and Dutch views of water?

Answer: 'In the Netherlands we tend to take the availability of enough high-quality water for granted. If anything, we sometimes have too much of it coming down from the skies or flowing down our rivers. And although the management of water and water resources is of strategic importance, only a small percentage of the Dutch realise this themselves on a daily basis.

'In Egypt, on the other hand, water is a scarce commodity. It's a large country, but the vast majority of the people live in the small area of the Nile Delta. Efficient distribution and use of water is a critical factor, since the Nile is not an endless source of water. The percentage of the population that literally depends on the availability of water is much higher than in the Netherlands. I feel that Egyptian government and society recognise the strategic importance of water.

'The long history of the water system in Egypt is one of the reasons the Panel's work fascinates me. Even in Dutch circumstances it is difficult to change essential elements in the way water management is undertaken. In Egypt it is

much more difficult. I admire our Egyptian counterparts for their ambition and for the success they have had in this field.'

Water running through their lives

Question: Why is it more difficult, in your opinion, to make water-related changes in Egypt?

Answer: 'In the Netherlands specific groups of people and specific organisations deal with water management. But in Egypt a much larger part of the population has daily interaction with water management. At the mesqa (private field channel) level people are directly busy with the water supply. In the Netherlands interaction with water is at a further distance from daily life. Let's say that five percent of the Dutch population has direct interaction with water management. In Egypt it must be much more. I'm not sure how much but there must be millions of people living in the rural areas in the Nile Delta. So a large proportion of the population has a direct stake in the present situation.

'We're talking about a bigger involvement and bigger responsibility for farmers and farmer groups. For example, the Panel is busy with the water boards and water associations. So you're asking people to do more than just benefit from the system that has been in place in Egypt for a couple of millennia. You also ask them to take responsibility for the system. If it's all for free it's not so difficult. But it's going to cost water users either time or money. 'These are a few of the complicating factors in the changes being undertaken by the Egyptian government in the field of water management.'



QUESTIONS

A Panel of water lovers

Question: What are the most important characteristics of APP?

Answer: 'I think that the most important characteristic is the participants shared interest in water issues and the collective knowledge on a whole range of water-related aspects. This leads to respect for each other's points of view, to an interest in learning from one another and to a good atmosphere within the group. And I cannot stress enough the meaning of a good, congenial atmosphere.'

'It's certainly helpful that we take five full days for our deliberations. It's not a "quickie", there is time to reflect and time to discuss. Another remarkable characteristic is how well our female colleagues from Egypt are represented. They have a lot of input into what goes on. The complete equality between men and women is a great asset in the work of the Panel. So far we (the Dutch) have not managed this balanced representation! It's my impression that in the field of water management emancipation in professional circles in Egypt is ahead of the Dutch situation.'

An egalitarian atmosphere

Question: Why do you think the Egyptian Panel members are so far ahead of their Dutch counterparts when it comes to gender equality?

Answer: 'A considerable number of participants in the Panel are female directors of Institutes. Samia (Dr. Samia El-Guindy, director of the APP Central Office) herself greatly influences how the Panel works. In Egypt, women have managerial responsibilities in technical situations. That's the basis of it. They are not part of Panel discussions because they're women, but as the directors of specific institutions- for instance, the Groundwater Sector, but

others as well. I think it's a strong point for the Ministry (the Ministry of Water Resources and Irrigation-MWRI) that it appoints women to high positions, including high technical positions in a field that is predominantly made up of men.'

'These women are appointed to their jobs. They are related to the Panel on the basis of their jobs and not just because people like them. They have a functional role in the working of the Panel. I very much appreciate the informal interaction between the Dutch and Egyptian Panel members and among the Egyptian Panel members themselves. There is much more openness and frankness in the discussion than I anticipated when I first joined the Panel. You see that in the male-male interactions too.'

(Smaller) size matters

Question: What makes the Dutch good partners for Egypt?

Answer: 'Of course, the Netherlands has a lot of expertise when it comes to water issues. And although the geographical, climatic and cultural differences are great, Dutch expertise is still relevant to our Egyptian counterparts. It's also significant that the Netherlands is not a major player in world politics.'

I know that the Egyptians greatly appreciate our financial support in the framework of development cooperation, but even there we are not amongst the biggest players in Egypt.'

Question: What does country size have to do with it?

Answer: 'We have a very modest budget for co-operation, almost negligible if compared to, say, the Americans. The Dutch are there for the expertise we have and not for the large amount of money we bring. The Netherlands is an



interesting partner because it's much easier to be on equal footing than it would be between, say Egyptians and Americans or Egyptians and Germans or maybe even Egyptians and Canadians'.

'The Dutch bilateral co-operation has no political bias and the Panel members have no other interest than serving the Panel. I think that the small scale of the Netherlands, our interest in water issues, our knowledge infrastructure all make us an interesting partner, whether we invest money or not. That's probably one of the reasons the atmosphere in the Panel is as relaxed as it is.'

Strong support and knowledge

Question: What makes the APP so effective?

Answer: 'I think it's because although it is government linked it's also outside of the regular governmental structure. People know that Panel advice is based on knowledge and an interest in the problems Egypt is facing in water management. There's no obligation to follow Panel advice, but in most cases it would be foolish not to'.

'The Panel has earned its reputation over a long period. It is seldom the case that such an institution is given the chance to operate for so long. The Dutch Ministry of Foreign Affairs deserves credit for that.'

'A very important element in the effectiveness of the Panel is the high

quality of the secretariat, both in Egypt and the Netherlands. They make sure that the work is done and that the high standards are kept. They also deliver a fair share of the work themselves. They are truly the lubricant in the machinery of the Panel.'

Responsibility for Egypt's future

Question: What's so great about water anyway?

Answer: 'Being a Dutchman I've always been fascinated by water and its effects on the ecological, sociological and societal aspects of life. The statement "where there's water there's life" is really true, not just in the Netherlands but also in other parts of the world. I've always been involved with water, first of all from the environmental point of view, and later in a broader sense. I served as a resource person for ecosystems and also sustainable use of water. I've been involved in organisations such as Wetlands International, which is a global organisation that deals with wetlands.'

'I'm not a technical person in the field of drainage or irrigation. But I am interested in water and am qualified in policy-making and the development of policies that bring about a lot of changes in the role of government towards society-like that you see in Egypt in the field of water management. The changes in Egypt are enormous in that respect and I feel almost as if I'm part of a group that's discussing the future development of Egypt.'

Appendix

PHASES OF THE PANEL PROJECT AND MEETINGS

Phase	Period	#	Date	Meeting	Location
I	1976-1977	1	January 1976		Cairo
		2	May 1976		Utrecht
		3	May 1977		Cairo
II	1978-1979	4	January 1978		Utrecht
		5	January 1979		Cairo
		6	September 1979		Wageningen
III	1980-1982	7	September 1980		Wageningen
		8	February 1981		Cairo/Aswan
		9	September 1981		Utrecht
		10	April 1982		Alexandria
IV	1983-1985	11	September 1982		Wageningen
		12	February 1983		Aswan
		13	September 1983		Lelystad
		14	March 1984		Ismailiya
		15	September 1984		Wageningen
		16	February 1985		Aswan
		17	September 1985		The Hague
V	1986-1988	18	February 1986		The Fayoum
		19	September 1986		Paterswolde
		20	February 1987		Ismailiya
		21	September 1987		The Hague
		22	February 1988		The Fayoum
		23	September 1988		The Hague
VI	1989-1990	24	March 1989		Luxor
		25	March 1990		Cairo
VII	1992-1996	26	September 1992		Wageningen
		27	May 1993		Taba
		28	April 1994		Port Saïd
		29	March 1995		Alexandria
		30	April 1996		Maastricht
VIII	1996-2000	31	May 1997		El Arish
		32	May 1998		Middelburg
		33	May 1999		Luxor
		34	March 2000		Rotterdam
IX	2001-2004	35	April 2001		Siwa
		36	May 2002		Haarlem
		37	April 2003		Aswan
		38	2004		Netherlands

MEMBERS OF THE ADVISORY PANEL

EGYPTIAN PANEL MEMBERS		
Name	Function	Years
Dr. Mostafa El Gabaly	Former Minister of Agriculture Chairman of the Panel	1976-1988
Dr. Mahmoud Abu Zeid	Minister of MPWWR Chairman of the Panel	1981-present as of 1988
Dr. Osman El Ghamry	Dir. Gen. Technical Office EPADP Director DRI	1976-1978
Dr. Ahmed Shukry	Former Prof. University of Alexandria	1976
Dr. Mahfouz Abdallah Hassan	Prof. Cairo University, Faculty of Agriculture	1976-1984
Dr. Ahmed El Goweily	Prof. University of Zagazig, Faculty of Agriculture	1976-1979
Dr. Elahmedi A.R.G. El Din	Chairman EPADP	2002-present
Dr. Moh. Hassan Amer	Director DRI	1977-1978
Eng. Ahmed Fahmi	Director DRI	1979-1984
Eng. Fathi Zayed	Chairman EPADP	1986-1990
Dr. Ibrahim El Assiuti	Chairman EPADP	1979
Dr. Yehia Moheiddin	Prof. Cairo University	1980-1981
Eng. Moh. Amin Makhoulf	Dir. Agr. Economic Institute of MOA	1980-1990
Dr. I.M. Antar	Chairman EPADP	1980-1986
Dr. Moh. Mahmoud Gasser	Dir. Soil and Water Research Institute of MOA	1982-1988
Eng. Gamil Mahmoud El Sayed	Director DRI	1984-1985
Dr. Youssef Hamdy	Director Office of Minister PWWR	1984-1986
Eng. Ahmed Mazen	First Under-Secretary MPWWR	1986-1987
Dr. Nabil El Mowelhy	Director SWERI, MALR	1992-1994
Eng. Sarwat M. Fahmy	Head Irr. Dept. of MPWWR	1986-1988
Dr. Abdel Hady Rady	Director SWERI, MALR	1987-1990
Dr. Safwat Abdel Dayem	Chairman EPADP	1988-2000
Dr. Samia El Guindy	Chairman EPADP	1989-1990
Eng. Moh. Hassan	Chairman EPADP	1992-1993
Eng. Ali Abu El Soud	Director DRI/Chairman EPADP	1992-1998
Eng. Fouad Ramadan	Dir. APP Central Office	1992-present
Eng. Abdel Rahman Shalaby	Chairman EPADP	1994
Eng. Yehia Abdel Aziz	First Under-Secretary MPWWR	1995
Eng. Mohamed Fathi	Chairman EPADP	1995
Dr. Bayoumi Attia	First Under-Secretary MPWWR	1996-2000
Eng. Abdel Moneim Shalaby	Chairman EPADP/Head Irr. Dept. of MPWWR	1996-1999
Dr. M. Bahaa El Deen Saad	Chairman EPADP	1999-2001
Eng. Hussein Elwan	Head of Planning sector, MWRI	2000-2001
Dr. Ahmed Taher	Head of Irrigation Sector	2000-2001
Dr. Shalan Nasr Shalan	Head of Planning Sector, MWRI	2002-present
	Head of Irrigation Sector, MWRI	2002-present
	Director, SWERI	2000-2001
	Director, SWERI	2002-present

DUTCH PANEL MEMBERS

Name	Function	Years
Ir. F.E. Schulze	Director ILRI	1976-1982
Prof. Dr. N.A. de Ridder	Co-chairman of the Panel Deputy Director of ILRI	1983-1990
Ir. W.C. Hulsbos	Co-chairman of the Panel Deputy-Director Euroconsult	1976-2000
Prof. Ir. A. Volker	Independent Advisor, Co-chairman of the Panel Senior Engineer Ministry of Transport, Public Works and Water Management	1976-1990
Ir. J.H. Koopman	Professor of Delft Technical University Director Government Service for Land and Water Use	1976-1979
Drs. E.P. Riezebos	Lecturer Wageningen Agricultural University	1976-1985
Prof. Dr. R.H.A. van Duin	Director RIJP	1976-1979
Dr. Ir. J.H. van Kampen	Director Department of Rural Engineering RIJP	1979-1990
Ir. N. Molenaar	Director Government Service for Land and Water Use	1981-1990
Dr. Ir. J.A.H. Hendriks	Director ILRI	1983-1985
Prof. Dr. W.H. van der Molen	Professor Wageningen Agricultural University	1985-1990
Ir. G.A. Oosterbaan	Director ICW/ Staring Centre	1987-1990
Ir. C.D. van der Wildt	Representative Ministry of Transport, Public Works and Water Management	1992-present
Ir. I.A. Risseeuw	Representative Government Service for Land and Water Use	1992-1993
Ir. H.J. Wesseling	Representative Delft Hydraulics	1992-1994
Ir. R. van Aart	Representative ILRI	1992-1996
Drs. P. Slot	Chairman Board ILRI, Independent Advisor	1994-2000
Prof. Ir. E. van Beek	Representative Delft Hydraulics	1995-1996
Drs. C.J. Kalden	Representative Ministry of Agriculture, Nature Management and Fisheries	1997-present
Ir. J. Boeve	Representative Union of Water Boards	1997-present
Ir. J. Faber	Independent Advisor, Co-chairman of the Panel	2001-present
Dr. J.P.R.A. Sweerts	Representative of Rabo Bank	2001-present
Drs. H. J. Tankink	Representative of Ministry for Economic Affairs	2001-present

Egyptian - Dutch Executed Projects (1976 - 2004) (* projects initiated by the Panel)

PROJECTS	BUDGET IN MILLION EURO	PROJECTS	BUDGET IN MILLION EURO
ADVISORY PANEL PROJECT PHASES I-IX (1976-2004)			8,98
Land Drainage		Channel Maintenance	
• Drainage Technology and Pilot Areas*	2.3	• Aquatic Weed Control	3.4
• Drainage Research Programme*	2.4	• Grass Carp Project	2.3
• East Bahr Saft drainage*	4.5	• Delta Breeding Station	1.9
• Drainage V	4.5		
• PVC raw materials*	1.4	Planning	
• Drainage Executive Management*	8,6	• Strengthening the Planning Sector Project*	3.2
• Drainage Executive Management Project (Phas-IV)*	6.3	• Lake Nasser Flood and Drought Control*	2.9
• Institutional and Technical Support Project for Strengthening of EPADP (INTESP)*	3.3	• National Water Resources Plan*	4.0
Reuse of Drainage Water		Hydrology Study	
• Re-use of Drainage Water*	3.6	• Hydraulics Studies	4.2
• Re-use Monitoring Programme*	0.41	• Hydraulic Research on Nile and its Structures (IV)	0.2
• Monitoring and Analysis of Drainage Water Quality*	2.2	• Nile Basin Capacity Building for River Engineering	2.0
• National Water Quality Monitoring Network*	0.3	• Strengthening the Training Capacity HRI	1.8
Fayoum Water Management		Institutional Development	
• Fayoum Water and Salt Balance Study*	0.8	• Water Board Project*	3.4
• Batts Pumping Station*	2.5	• Manual Channel Maintenance	1.3
• Fayoum Water Management and Irrigation*	2.5	• Strengthening the Water Quality Management Unit*	3.1
• Fayoum Weed Control	3.4	• Strengthening the Groundwater Sector*	1.9
• Fayoum Water Management	15.8	• Institutional Reform Unit*	0.4
Groundwater Management		Others	
• Hydrological Training Programme*	1.9	• Training for ESA (phase I) Egyptian Survey Authority	1.0
• Development and Management of Groundwater Reserves*	3.4	• Training for Managers Egyptian Survey Authority (ESA, phase II)	1.1
• Vertical Drainage Study*	0.2	• Satellite Image Data Sets for Inventory of Land-use	
• Feasibility of Groundwater Development*	0.5	• & Groundwater Development*	0.34
• Pumps sets	0.6		
• Environmental Management of Groundwater Resources Project*	2.0		
• Control of Waterlogging and Salinisation*	1.1		
Total			± 122.50

List of abbreviations/definitions

APP	Advisory Panel Project on Water Management & Drainage
CMRI	Channel Maintenance Research Institute
DGIS	Directorate General for International Co-operation, The Hague
DRI	Drainage Research Institute
ECRI	Environment and Climate Research Institute
EPADP	Egyptian Public Authority for Drainage Projects
Fe	feddan (4200 m ²)
HRI	Hydraulics Research Institute
IIP	Irrigation Improvement Project
ILRI	International Institute for Land Reclamation and Improvement
INTESP	Institutional and Technical Support Programme, EPADP
IRU	Institutional Reform Unit (MWRI)
IWRM	Integrated Water Resources Management
M&E	Monitoring and Evaluation
MALR	Ministry of Agriculture and Land Reclamation
Mesqah	Field water course (privately owned)
MWRI	Ministry of Water Resources and Irrigation
NDP	National Drainage Programme
NWRC	National Water Research Centre
NWRP	National Water Resources Plan(ning)
OFWM	On Farm Water Management
RIGW	Research Institute for Ground Water
RNE	Royal Netherlands Embassy
RTC	Round Table Conference (on institutional reform and donor co-ordination)
TA	Technical Assistance
SWERI	Soil Water and Environment Research Institute (MALR)
WB	World Bank/ Water Board
WWF(3)	(Third) World Water Forum (March 2003, Kyoto, Japan)

