

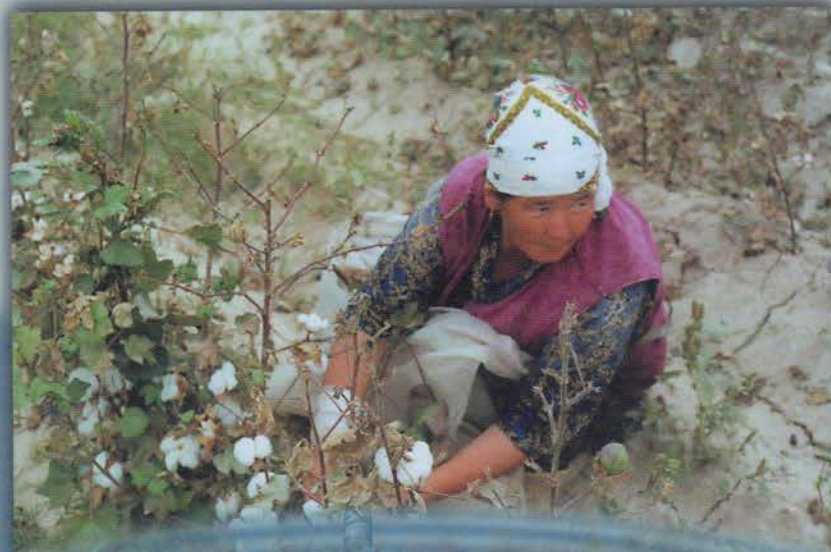


ALTEERRA

International Institute for Land Reclamation and Improvement / ILRI

Ripples

ILRI's Land & Water Activities for
the New Millennium



The Ripples of our Consultancy

The first area of our three-part mission is consultancy. And here it's sometimes quite easy to see the human consequences of our actions-even if those consequences may take decades to develop.

For example, we have only to look to agricultural lands in Egypt, where we offered advice in the '70s on how to implement an efficient drainage system. Thanks partially to our efforts the Egyptians have overcome salinity and waterlogging problems, so more of their lands can be used for crops. This has directly benefited the Egyptian people by helping to improve their food security.

We can say the same for our advisory efforts in the other areas we've served for years: Pakistan, India and Malaysia, among others. And if you're concerned that the ripples our consultancy causes in developing countries take too long to be felt, just consider the immediate effect we have on these countries' researchers. As Theo Boers points out in the article about the Indus Valley in Pakistan, those researchers we help to refine and improve their research and reporting methods immediately feel our impact.

And when we help scientists to improve their research methods, they can continue working efficiently on projects with which we are not directly involved. And our work will continue to impact lives in diverse ways for years - or even decades - to come.

Talk about a Ripple Effect!

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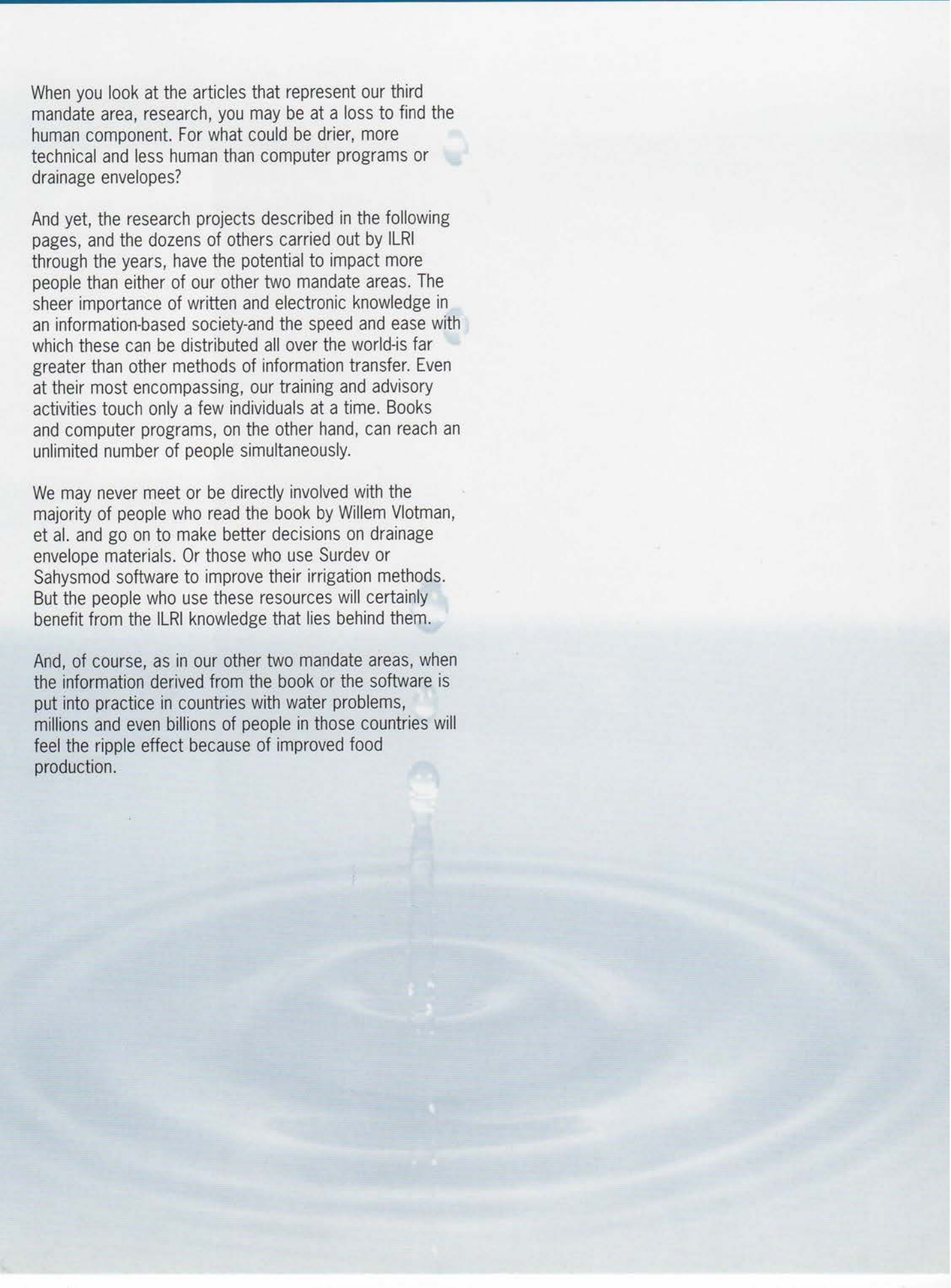
The Ripples of our Research

When you look at the articles that represent our third mandate area, research, you may be at a loss to find the human component. For what could be drier, more technical and less human than computer programs or drainage envelopes?

And yet, the research projects described in the following pages, and the dozens of others carried out by ILRI through the years, have the potential to impact more people than either of our other two mandate areas. The sheer importance of written and electronic knowledge in an information-based society-and the speed and ease with which these can be distributed all over the world-is far greater than other methods of information transfer. Even at their most encompassing, our training and advisory activities touch only a few individuals at a time. Books and computer programs, on the other hand, can reach an unlimited number of people simultaneously.

We may never meet or be directly involved with the majority of people who read the book by Willem Vlotman, et al. and go on to make better decisions on drainage envelope materials. Or those who use Surdev or Sahysmod software to improve their irrigation methods. But the people who use these resources will certainly benefit from the ILRI knowledge that lies behind them.

And, of course, as in our other two mandate areas, when the information derived from the book or the software is put into practice in countries with water problems, millions and even billions of people in those countries will feel the ripple effect because of improved food production.



Necessity is the mother of

Book tackles drain-envelope problems



It's a simple concept really. To make waterlogged and saline fields useable you have to drain the land. And in the saline case, irrigate the drained lands so that excess salts are flushed out and crops can grow. Crops that will sustain lives and that will give countries the food security they need to remain independent.

Bad news then that, literally, the smallest thing can bring the process to a halt. The culprit is sediment—sand, grit and mud—that can quickly clog the perforated pipes used in subsurface drainage. Especially in countries that have light, sandy soil. The solution, too, seems simple. Cover the pipes so that sediment stays out but water can still pass through. Yet finding the so-called 'drainage envelopes' with the right balance of permeability and impermeability used to be a matter of trial and error. Error that could have dire consequences for the fields in which it occurred. ILRI's Willem Vlotman, a drainage and irrigation expert who has spent many years in Pakistan and Egypt, has co-authored a book that should make finding that balance easier. The book is currently at the publishers and should be released later this spring.

A book born of need

The idea to write the Handbook on the Design of Envelopes for Subsurface Drains came to Vlotman nearly nine years ago when he was working on the Netherlands Research Assistance Project (NRAP) in Pakistan. Part of NRAP's purpose was to investigate proper design and installation methods for horizontal subsurface drainage systems in Pakistan. Although drainage envelopes are a standard part of drainage design and though most envelopes effectively protect pipes, those in Pakistan did not.

'What we found in Pakistan was that some of the design procedures that everyone thought were fixed and well established, basically failed', recalls Vlotman, who served as an ILRI advisor on the project. 'They constructed the drains and within a day or two they were full of sediment. This caused major problems. So they asked us to investigate why.'

While researching the Pakistan drain envelope problem, he discovered that resource material was often difficult to find. 'There was a lot of knowledge about drainage envelopes', he says, 'but results were very scattered. Plus, a lot of the people who were experts in the field were getting close to retirement age. To me it seemed that we were about to lose a lot of the knowledge that had been collected over the years. That's how the idea came for writing a book and doing it together with some of the other experts in the field.'

Expert co-authors

Those experts were co-authors Lyman S. Willardson and Willy Dierickx. Willardson, a professor emeritus at Utah State University, is considered one of the world's leading drainage experts. Vlotman also knew him well from his student days at Utah State. 'Dr Willardson is most interested in determining when an envelope is needed and has developed some criteria and formulas for that', says Vlotman.

Dierickx is the head of the Agricultural Water Management Section at the National Institute of Agricultural Engineering in Belgium. He specialises in both laboratory research and field-testing on drainage envelopes. 'Dr Dierickx, developed a method to measure the effectiveness of envelope materials', says Vlotman. 'His experiments involve putting envelope material on top of cylinders and then guiding water through at different water heights and different pressures to see if material will wash out. He's a real expert on synthetic envelopes.'



then started co-operating and we tested lines in the field. We actually put specific drain lines in the ground to try to find out what the real problem was; what was causing them to clog. We did it with material that we knew would fail. And we did it with material that we knew would work fine—at least in the short term.'

Recommending the right solution

The book is divided into two parts. Part one reports the findings of Vlotman, Willardson and Dierickx, who enhanced the existing research through laboratory work and their field-testing in Pakistan and, later, Egypt. In doing so, they came up with a new set of design criteria for drain envelopes.

This first section is intended as a hands-on manual. Those designing subsurface drainage systems can find out 1) if they need to use drainage envelopes and 2) if they do need envelopes, which kind will be most effective for their local conditions. Basically only mid-range soils require an envelope. Fine soils with a heavy composition (more than 30% clay) don't need envelopes because they are cohesive. At the other end of the spectrum, coarse soils produce sediment that is too large to pass through the perforations of the subsurface pipe drains.

The first section also makes recommendations on when and how to use the three main categories of envelope materials: gravel-based, synthetic fabrics and organic materials, which are made of coconut, jute or other fibres. Vlotman is a strong proponent of synthetics because they tend to be cheaper and are increasingly more effective. The book also describes the best construction methods to use for each type of envelope.

The second part of the book contains resource materials and their original sources. This satisfies the first rationale for the book: gathering the diversity of available knowledge on drainage envelopes into one volume so it won't be lost to the future.

Available soon

The book can be ordered from the ILRI sales department or on the ILRI Web site. <http://www.ILRI.nl>

And as for Vlotman? He's already considering a sequel. 'I would like to write a sequel every year, primarily using the Internet', he says. 'I hope to start a section on ILRI's Web site where people can come with questions and tell me about new problems and envelope materials as these arise.'

