

‘It’s all about sharing knowledge in networks of scientists and non-scientists’

Jan Erik Wien, geo-information scientist

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09 On 1 November 2009 Alterra became coordinator of LIAISE.

Made by Alterra, 2000-2010

85

Alterra and games – an unlikely combination at first glance. But Alterra is in fact one of the leading research institutes in Europe in an international network of organisations working on digital tools or games for policy evaluations. These computer programs bring science and policy together. Jan Erik Wien and his colleagues are increasingly asked to create this kind of a tool, which helps people talk about certain measures, or demonstrates the effects of a policy.

by Martin Woestenburg

As project leader, Wien has already worked on about twenty of these policy evaluation tools, each of which is a different program adapted to the users’ needs. NitroGenius, for example, is a computer game in which farmers, policymakers, scientists and others involved with the nitrogen issue can gain insight into various aspects, such as how a farm’s nitrogen emissions could be reduced. EURuralis is a discussion support system in which players can ‘virtually’ set European policy and look at what effects these policies would have on demography, ecology, economy, policy, technology and climate change. The tool explains the results, invites discussion and supports in this way the interaction between policy and science. And in the European Seamless project, a flexible framework has been developed with which models

can be coupled relatively quickly and new agriculture policy options can be calculated. Through the development of this framework, policy questions can be answered more rapidly.

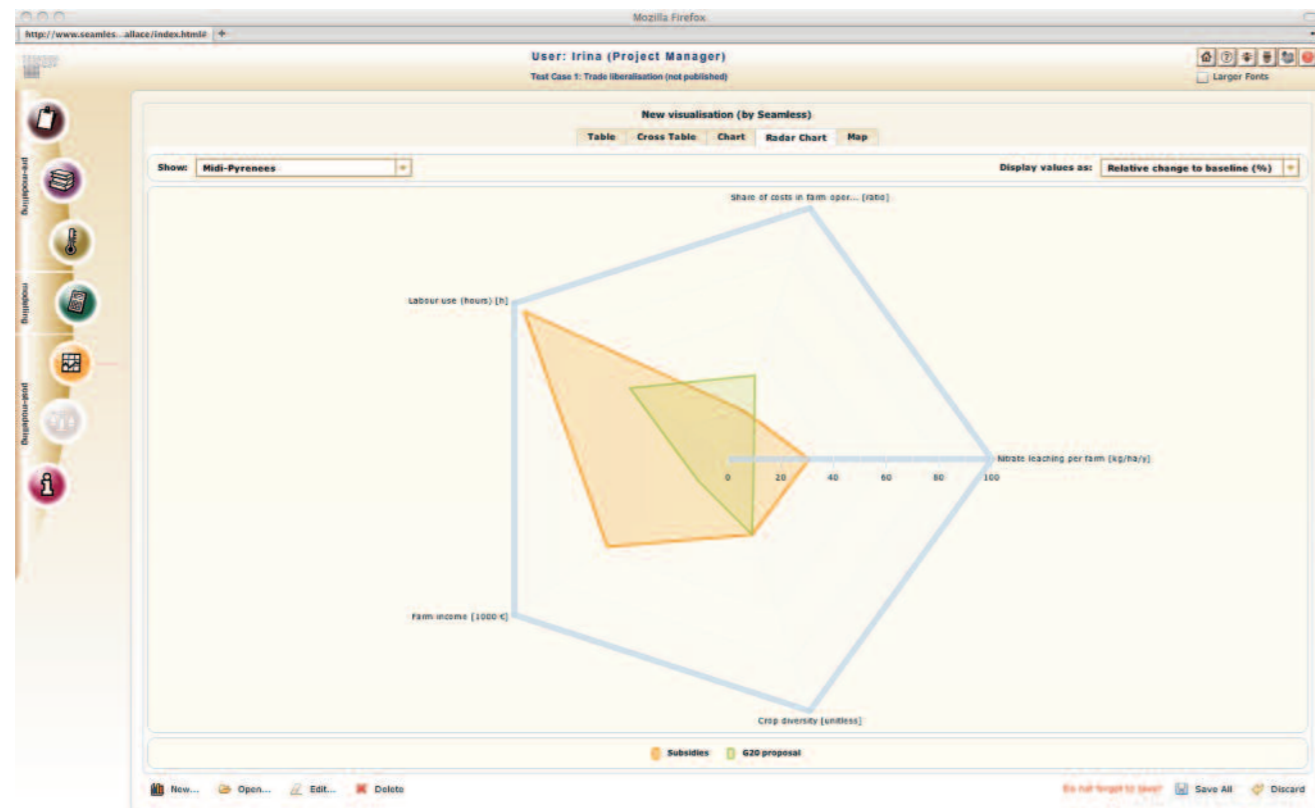
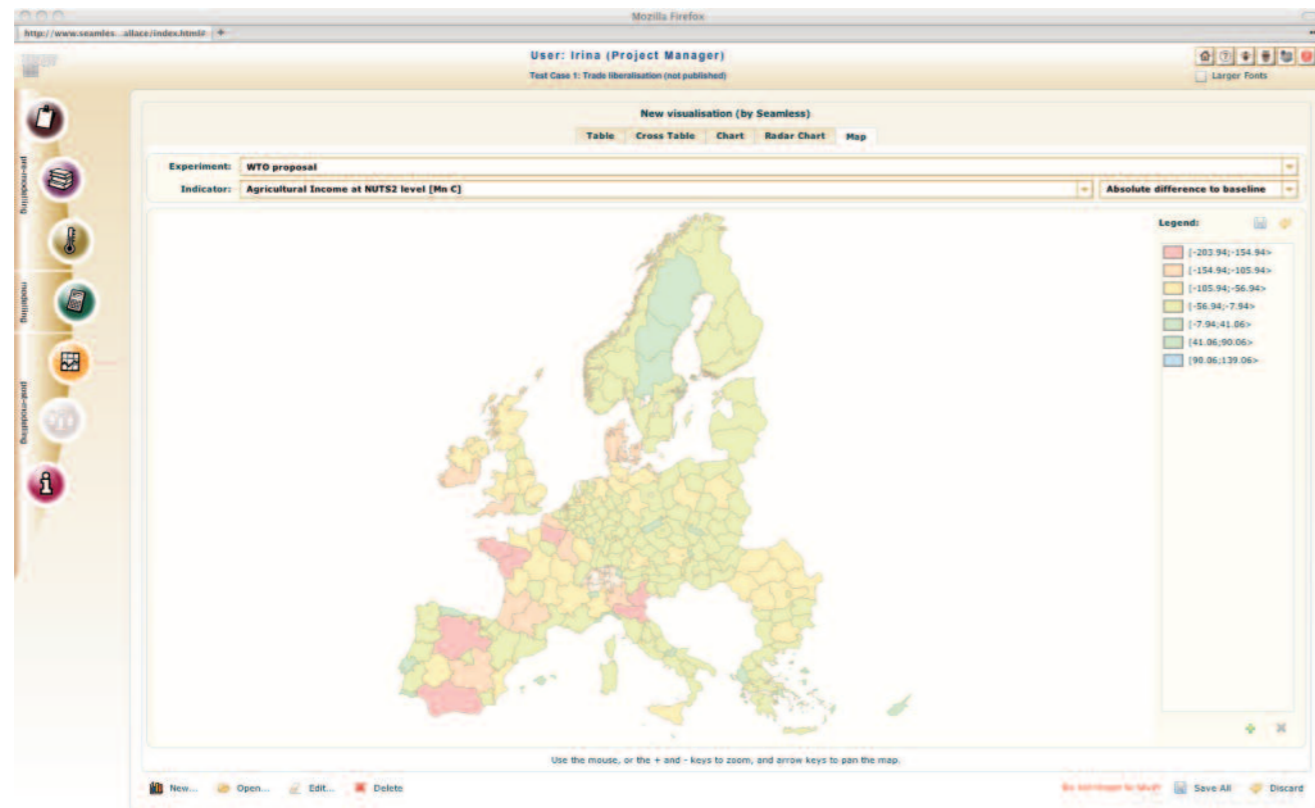
The job of Wien and his colleagues is to make the scientific information and knowledge stored in various databases and models accessible in a user-friendly way. This means that databases, models and indicators are linked in such a way that policymakers gain insight into and answers to complex, integrated questions. The world encountered by players of NitroGenius, for example, is a simplified version based on the very complex nitrogen cycle. ‘If you simplify models, they calculate faster’, explains Wien. ‘This was crucial for NitroGenius because players don’t want to wait very long to see the effects of their actions. For EURuralis we ‘pre-packaged’ all the results of the model calculations.’ This means that the policy buttons that the users can push in the program lead to various future scenarios, the results of which were calculated, analysed and described beforehand. ‘In Seamless, however, calculations are performed with complex, large models. This tool is intended for use by modellers and model users.’

Alterra is now a key player in this type of mostly European-focused, policy-supporting tools. Wien explains: ‘On 1 November 2009, Alterra became coordinator of LIAI-

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Wageningen,
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21.10.2009
14:22:20 h





Screen shots of the SEAMLESS Integrated Framework.
 Above: visualisation of the effects of policy in a map of Europe.
 Below: comparison of various indicators and policy variations in a spider diagram.

SE, the Network of Excellence Linking Impact Assessment Instrument to Sustainability Expertise, a European network of fifteen research institutes and universities in nine countries. This is the culmination of our work over the past ten years. We coordinate this network and are thus a key player in the area of ICT tools for policy evaluation. Through this role we are also asked more readily to participate in other projects.'

Wien has worked on digital tools for policy evaluation since he began at Alterra. He believes Alterra achieved its key position in Europe thanks to the decision made in 2000 to invest in the development of ICT. 'It is unique in Europe that a research institute like Alterra has been working for years with a team of professional geo-information scientists. There are fifteen of us now working on the development of the tools, and we keep a close eye on trends in both the research and the ICT fields.'

A lot has changed in the past ten years – not surprising at a time in which computers are obsolete by the time they've been unpacked and software programs require almost daily updates. 'The ICT component is becoming increasingly important in the research process', suggests Wien. 'People have also become more used to ICT. We used to all use paper maps, but now you look up what you need on Google Maps and you end up with a whole bunch of additional information as well.'

The information and communication technology that Wien and his colleagues design has become more complex and important in two ways: appearance and content. Game users have become more demanding with respect to appearance and user friendliness; what is called user interface in ICT terms. 'The first policy evaluation model was applied by researchers themselves, on their own computer. Now users all want their own access via internet. The user interface used to be a thin layer around a model, now it consists

A SEAMLESS project meeting in Prague.



Prague, Czech Republic
 17.05.2007

of various interactive applications for the different users.’ Interaction has thus become increasingly important. People want to see the results of their actions immediately on their screens, and this means that Wien and his colleagues have to make sure that these actions are quickly visible. Moreover, this has to look very slick, because people have become spoilt in the current world of gaming. ‘We hire special interaction and interface designers to satisfy the users’ high expectations.’

‘The information in games is also more complicated nowadays’, explains Wien. Many different databases and models are often coupled in the tools, which means that software developers have to get computer programs to talk to each other. This creates technical problems, if the programming languages are not compatible, but also semantic problems, for example if two models use different names for the same variable.

It is in this combining and integration of various models that Alterra has played a leading role in recent years. ‘The Open Modelling Interface is a standard developed in the water sector to technically couple models’, explains Wien. ‘We have played a major role in expanding this standard to the environmental sciences and applying it in various European projects.’ Wien believes this is why Alterra was granted the coordinating role within LIAISE.

The current emphasis on ICT has significantly changed Wien’s work in the past ten years. ‘We used to play a more supportive role, in which we created user interfaces that functioned like a veneer over a model, for example. Now we have a much more stimulating, integrating and mediating role between the research institute and geo-information.’

Wien himself is hardly ever at his computer writing software any more. He spends most of his time making sure that everyone involved with the tools gives their input: the policymaker and the user, the scientist and the information supplier, the model builder, the interaction designer and the designer of the user interface, and in the midst of all this the geo-information scientist from Alterra. ‘It is much more of an iterative development process, in which you work with prototypes and feedback.’

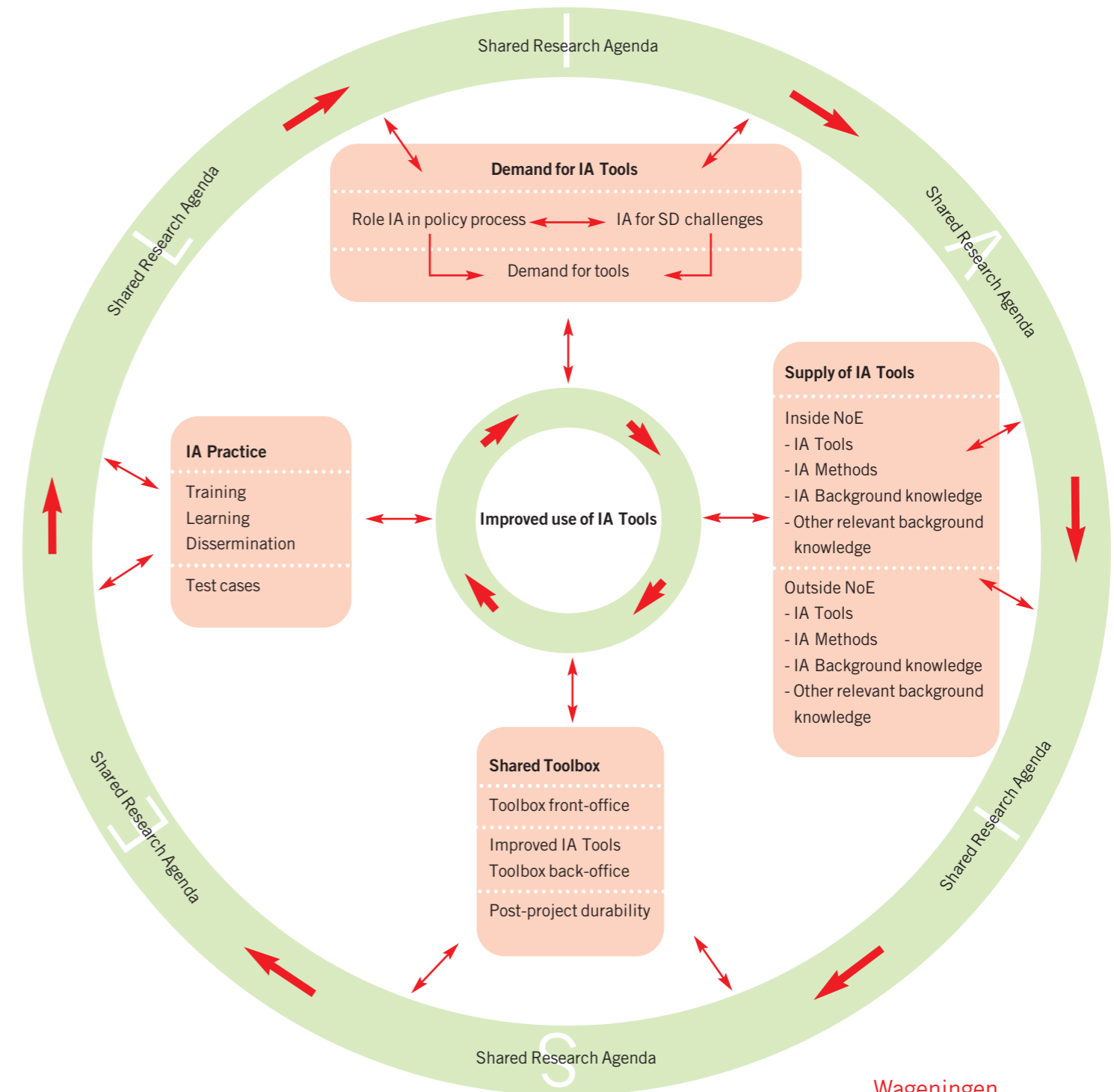
Wien expects to see more of this in the future. ‘Even more non-scientists will be involved in the development of our products. Open innovation is the new trend. Philips, together with other companies, for example, had consumers involved in a project called ‘Living Tomorrow’, so that the company could use the feedback to improve their products. As a research institute, we too have to move in this

direction. The old triangle of knowledge transfer – research, education and guidance – no longer exists. ‘Now it’s all about sharing knowledge in networks of scientists and non-scientists.’

Wien expects ICT people to play a leading role in the development of knowledge-based systems that provide quick, cheap and adequate answers to questions posed by policymakers, farmers and nature conservationists about policy for specific sectors. ‘The digital component is also very important. Kodak was the global leader in photography, but completely missed the digital revolution. This could also happen to a research institute like Alterra. That’s why you have to know what the trends are and look carefully at what the market wants. People want to share information faster and they want answers to their questions. With good ICT you can supply this faster and cheaper.’

It pays to invest in ICT, Wien believes. ‘The tricky thing is that developments in ICT are very high paced. So you need a group of people who enjoy conducting research from an ICT perspective. New trends include mobile knowledge-based systems, in combination with positioning, such as mobile telephones that access information about your current location or precision agriculture in which farmers fertilise or spray based on satellite images, digital maps and models.’

The big problem with ICT is that it is largely invisible. Wien: ‘People often can’t see what kind of a tool is hidden underneath. This only becomes clear when the application is viewed on a computer screen. The user interface is normally all they see. Even though creating this kind of interface is only a very small part of a knowledge-based system, it is what everyone talks about. But through the iterative development process and intensive interaction with users, we have been able to make this more apparent.’



Wageningen,
Head Office
27.11.2009
17:30 h

The components of the LIAISE Network of Excellence (NoE); the figure shows how the development of impact assessment (IA) tools contributes to bringing together the fragmented research field and the practical application of the instruments.

> Chairman of the Executive Board Aalt Dijkhuizen signs the LIAISE contract in the presence of Alterra director Kees Slingerland and Jan Erik Wien. This contract is the Grant Agreement for a European FP7 project (FP7 stands for Seventh Framework Programme).

Jan Erik Wien, geo-information scientist

