

FACES

Towards Curing the Landscape

Interview with IEES board member Anja Bruell, Germany

by Andreas Schoenborn, Editor of the EcoEng Newsletter



Anja Brüll (born 1970) from Berlin, Germany, has been recently elected to the IEES board as its youngest and first female member. She studied landscape planning, biology and quality management in Berlin and Aachen and recently completed her Masters degree in landscape planning.

Anja Brüll is specialized in integrated water and matter cycling systems, ecological design, watershed management and sustainable planning. She has been working as a freelancer in various architecture and planning offices, among others as a practical trainee at the "Stensund Wastewater Aquaculture", Sweden. She is also a founding member of OICOS e.V., a newly founded network (see this interview).

Info OICOS: <http://www.oicos.de>

Info ETR model: http://www.tu-berlin.de/~Limnologie/literatur/lit_9501.htm

Info Prof. Frithjof Bergmann: <http://www.newwork.net>

On IEES and Ecological Engineering

A. Schoenborn: **Why did you want to be elected to the IEES board last February?**

Anja Brüll: I hope that I can contribute to some of its tasks in the future. I like the approach of Ecological Engineering to develop technology in accordance to ecological systems, not to dominate them.

AS: **What kind of tasks do you have in mind?**

Anja Brüll: I think I can contribute to the further discussion, how ecologically engineered systems could be designed and how they could be sustainably coupled with landscape processes. I am a landscape architect and planner. I think it is important to have some other input besides that of the engineers, to see things from a different angle.

AS: **What is Ecological Engineering in your eyes?**

Anja Brüll: For me it is the discipline at the interface between technical and ecological processes. I think Ecological Engineering creates systems which link the metabolic processes of natural systems with those of the society. That's actually [my] topic, too. What I'm specialized in is to develop sustainable city and land use patterns by watershed management or ecological design for example. I don't know too much about specific ecotechniques, but I work with the design of solar water and matter cycling systems. (...) I think architects, landscape architects and planners should know more about ecological engineering, because they directly can apply it.

AS: **What are you working on at the moment?**

Anja Brüll: I am working on three things at the moment: I am writing applications, thinking about founding my own company together with some colleagues and working at a so called "Biodome" project, in cooperation with Prof. Frithjof Bergmann (University of Michigan, USA). (...) One pillar of [his "New Work" concept] concept is the so called "Hi-tech self providing".

The idea is to develop modular glass domes, which could serve for fulfilling basic needs. They should be very easy to construct for people who have a lot of free time but little money, like unemployed people, poor people, or people in crisis regions. They could grow vegetables for example [or] produce their own fresh water. Of course it depends on the climate and it has to be adapted to the local culture and the local conditions.

[We envision] a variable kit of modules which for example in the desert could create more water and in the northern climate more energy and whatever is needed. (...) We are just thinking about concepts now, about what would be possible, what could be combined.

AS: **Is this your Phd work?**

Anja Brüll: No this is just freelance work. But I am thinking of writing a PhD about it in one or two years. The project is just in its preliminary phase at the moment.

What is OICOS?

AS: **Does this work have any connection to OICOS?**

Anja Brüll: It may have in the future. (...) What we'd like to do with OICOS is to promote such kind of projects and to connect people. We'd like to help to put the right teams together and promote such systems by public relations work.

AS: **Who is behind OICOS?**

Anja Brüll: OICOS has just been founded together with the Department of Limnology at the Technical University of Berlin. We are a group of people who are working with the concept of Prof. Ripl, the "ETR-Model" [Energy-Transport-Reaction Model]. We think that this model is a very good tool for decision making and designing, for different disciplines. (...) We'd like to transfer this knowledge and promote these ideas.

AS: **What kind of a model is that?**

Anja Brüll: It is a thermodynamic ecosystem model. It describes the interactions between energy dissipation, water household and cycling and loss processes in the landscape. I just call it a theory of landscape dynamics in analogy to the statics in architecture which allows to create stable buildings. With this model of landscape dynamics you could create sustainable landscapes or sustainable cities of course, and sustainable economies.

AS: **What is the outcome and what would be the benefits for, say, a city government?**

Anja Brüll: Well, any government needs guidelines for solving environmental problems. They need criteria for example where to put the money or what kind of laws or regulations to set up. Nobody really knows what sustainability is. There are different approaches (...) but they don't really come together. The ETR model is a good background to decide what really is sustainable, what could be coupled and what has an unsustainable effect on the other side. It gives a clear definition and ideas for solutions.

The model defines sustainability by the term of landscape efficiency. This is the relation between circulated matter and irreversible losses. Irreversible losses are nutrients and minerals for example that get washed out from land to the sea and settle down there and [the vegetation and living communities] cannot use them any more. (...) This can be understood as a landscape ageing process. Living communities work against that by closing water and matter cycles. They optimize themselves and become sustainable. Human societies do the opposite they open the cycles and repress the regenerative capability of natural systems. But to judge that, you need meaningful units to look at. These would be watersheds on the landscape scale.

An example: at the moment [some European] governments promote decentralized rainwater infiltration systems. With the ETR-Model, you would see, that it is better to evaporate the water, because then you support climate stabilization instead of polluting the groundwater.

AS: **I once got a personal impression of Prof. Ripl at a conference. He gave a very imaginative and witty talk on landscape processes, which was also very funny.**

Anja Brüll: One of his funny examples is: If you try to restore water bodies this is like trying to cure the urine of a person but not the person himself. It doesn't make sense to cure the water body — you have to cure the whole landscape, the whole watershed. He has calculated that the biggest losses come from the land use, the non point sources, not from the treatment plants, and that the most critical losses are the basic cations, calcium or magnesium and not the nutrients.

AS: **So the model comes out with one parameter or so, about matter and whether it stays in the landscape or leaches out. And the coefficient or quotient says whether that use of the landscape is sustainable or not. Right?**

Anja Brüll: Yes. It would be a coefficient that allows to see whether the management of the watershed is sustainable or not. And the quotient says if there are more cycling processes or more linear processes. The losses are a sign for linear processes. If the water and the matter would be short-cycled on the land then you wouldn't have so many losses. (...)

AS: **The model is focussed on northern latitudes, isn't it?**

Anja Brüll: No. It's also transferable to arid areas, but you find other processes there. The problem in humid countries is that you have the leakage, especially of limestone, because the landscape is drained. (...) In arid areas you have the opposite problem because they irrigate the land with [water that] contains fractions of salt. Because there is much more evaporation than rain you get salinification of the land. (...)

AS: **Can you look at these processes in warmer countries with the same model?**

Anja Brüll: Yes, (...) I think it would work. It's a global model. (...) It's more a principle, how natural systems optimize themselves within the process of energy dissipation. The principle of energy dissipation is the same in all climates. It is just occurring in different patterns. I mean, it's just a model. Models are images, not the reality, but you can have a dialogue with nature with the help of a model. It's a way to explain how nature works. With its help, you can derive principles, guidelines, and finally design systems after that. (...)

An interdisciplinary network!

AS: **Who do you want to reach with OICOS?**

Anja Brüll: Everyone who is interested in these topics and is working with sustainable systems, land use systems and city development, cycling systems and things like that. It is supposed to be an interdisciplinary group.

AS: **Are there already ongoing projects?**

Anja Brüll: There is one student project at the moment, in Uckermark [an area north of Berlin] (...). They try to implement the ideas of sustainable land use in the agricultural area there. They made proposals to the farmers and the local council to recycle the greywater and the pretreated wastewater on the land, because they luckily don't have a central treatment plant, yet. Now they try to develop (...) a financial model behind it, too.

AS: **The critical point is, that you develop projects that can be realized. That's very difficult.**

Anja Brüll: It's so much work and it's mostly unpaid, to go to the responsible persons and tell them: We have good ideas and it would fit perfectly to your concept...It is very much work to raise financial support.

AS: **What do you think is the main obstacle for these projects to be realized?**

Anja Brüll: (sighs) [On one hand it's a] financial problem. The first question potential investors ask is: Is it profitable and can I make money with it? On the other hand it's a problem of mind. Thinking in interrelated processes is different from thinking in linear processes, which actually is the easier way. And then of course if it comes to wastewater recycling some people don't want to deal with wastewater this way. They think it is quite okay as it is now.

If you tell [people] that the soil is degrading and that there are high floods because the water retention capacity of the land has gone down (...) they don't see that at the moment. If you tell them, we have solutions for these problems, they say: well, we don't have these problems. We have enough water, and it's nice when it is a bit warmer and dryer in the summer. They don't realize that in the close future there will be really essential problems. They always think that [drinking water] is an issue for developing countries, for arid climates (...), but here, they think, that we have enough water and it doesn't matter.

AS: **It's raining all the time in Germany...**

Anja Brüll: Well, in Berlin it is actually pretty dry, compared to other parts of Germany. If you look carefully you can see many drought damages at the trees. There are more and more articles in the newspapers that (...) the drinking water is [getting] contaminated by nutrients, antibiotics, pesticides etc. which are washed down to the groundwater, due to wrong land management. The latest news was, that aluminium, which is very toxic, was found in the groundwater. It is a regular component of soils, but it gets dissolved because the soils are losing their buffering capacity. (...) But all these interactions are difficult to explain to the people. The whole view how everything is connected...

AS: **That's the whole issue of holistic thinking. Even if you work with these topics it's difficult to consider all influences.**

Anja Brüll: The point is to figure out which are the most important determining factors. Therefore we need models that reduce complexity to a minimum, but hit the right points and have a broad relevance. On the other hand we need more interdisciplinary work. (...) I think a big problem is that science still is organized in sectoral fields. There is the soil scientist, the water scientist, (..) the climate modeller, but they do not really come together. (...) The university people are hard to animate to work together. There is not the force of the money behind it, that makes people form teams. In the business world, they are following this approach much more than in the sciences.

What's the benefit?

AS: **Does OICOS have any importance for developing countries? Can it be of any benefit for them?**

Anja Brüll: Yes I think so. However, the so called first world needs quite as much development as the third world. OICOS is meant to become an international network, but we have to grow slowly. There is interest in Russia and Mexico for the Biodome Project for example. (...) There are very close contacts to the Czech Republic, [to the USA, to Uruguay]. (...)

AS: **How big is the network right now and is it all volunteer work?**

Anja Brüll: I think it's about 30 or 40 persons. Yes, it's volunteer work at the moment. We have to find sponsors. We are setting up our homepage right now so that people can see what our topics are. (...) We took part in a competition this year and we have won the first price [see [Grit Bürgow's report](#) in this newsletter]. Therefrom we have some hope that more people are becoming interested in these ideas and will join the network. Then we can start to do some more professional work.

AS: **Would OICOS be an address for people from developing countries who want to come to Europe?**

Anja Brüll: Yes. What we'd like to have is a pool of positions for exchange students or practical trainees, or of certain diploma thesis or PhD topics, maybe jobs as well later. We could announce that on the website or arrange personal contacts.

Engineering must heed esthetic values!

AS: **If you look at ecological engineering as you have seen it in Aas, what is your point of view as a rather young woman in that community. Are there things that you like very much and things that you dislike?**

Anja Brüll: I like [the community] because I think it is a group of really engaged people. (...) As a planner, I would be more interested in practical features than in all these scientific numbers and tables. For example: Are these systems easy to manage? Are there hygienic problems? What kind of products can I gain out of them. How much do they cost and so on.

I am also missing esthetic aspects. How do these systems look like? What kind of landscapes could you create with them? Another point is that everything was about wastewater (...). Wastewater is something that people dislike and don't want to deal with. There could be other themes. Maybe one could also choose other names, like "nutrient recycling systems" or ... "clearwater creators".

There could be much more focus on the production rather than the treatment: how wastewater could serve for the production of a temperate climate as a landscape service or renewable resources as a product for example. In the Institute for Cereal Processing in Potsdam [Germany], they make wonderful pigments out of algae. Such kind of things could also be a good field for ecological engineering.

AS: **One of the results in Aas was that we now have many nice systems but there hasn't been a breakthrough in applying them. Do you have an idea how this could be solved?**

Anja Brüll: I think we need to have much more publicity for these kind of things. I think wetlands are good systems but they are not so extraordinary [what would Joe Swamp say to that..., AS]. They could be designed as recreational areas for example. There should be more remarkable projects like big glasshouse systems or land-art-like watersheds where you can really demonstrate the ideas in a very attractive way to the public.

And then the problem is that these systems have to be profitable, otherwise no one believes that they are really a solution for the future.

AS: **And in order to prove that, you have to build them...**

Anja Brüll: (laughs) This is kind of a vicious circle...but you have to start somewhere. We have to find those few persons, who have the money and want to do something useful with it. And here you need to formulate your goals very clearly and transform your visions into pictures. It takes engaged people to build these first systems. And this takes a lot of personal energy... But I don't see another way.... (...)

The importance of wilderness!

AS: **In connection to that, is there something, which is very important to yourself, personally?**

Anja Brüll: While thinking of all these serious problems the society has and will have in the future, it is very important to me to have these places, where I can find calmness and unity inside myself. I mostly get that in wilderness areas where I can feel the intelligence and dignity behind nature. I think it is important to sit down sometimes to watch and let things be as they are... and not run around all the time with the will to do something, to design, to built, to change...

Sometimes I am afraid, that Ecological Engineering with which you maybe could recultivate deserts and settle down on mountain tops, enables human beings to overgrow the last free corners of the planet - although in a sustainable manner. But I am optimistic, I hope that intensively managed sustainable systems will reversely lead to more wilderness. I am sure there will be natural limits and that there will be an optimal point between cultivation and wilderness.

AS: **Anja, I thank you very much for this interview.**

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