

More than just mediators

C.S.P. – Consulting and Service for plant-based raw materials GmbH, based in Dresden, Germany, aims to bring together supply and demand for bio-based resources. The potential is enormous, they believe, but so are the hurdles they have to face.

■ Ms Tetzner, Mr Gäbler, where did you get the idea for your venture?

G. Gäbler: Nearly all over the world we see that farmers who grow renewable resources don't approach major industries on their own initiative. In most cases – at least in Europe and the USA – large dealers act as a go-between, either forcing manufacturers' price expectations on the producers, or speculating with the raw materials. On the other side are the industrial representatives who know nothing about agriculture, and who are not interested in questions of cultivation and harvesting. What they want is to have the resources delivered punctually so that they can integrate them in their production schedules – all year round. For various reasons the processing industry is not prepared to utilise large amounts of plant-based raw materials. Therefore we at C.S.P. aim to be the link between farmers and industry – with all the challenges and problems that entails.

■ What in particular are you thinking of?

G. Gäbler: Manufacturers will not come on board unless they have security of supply, which is often even more highly valued than price stability. They are accustomed to seeing prices fluctuate widely. But when they have converted their facilities to manufacture new products, it is not acceptable to them for a resource to be unavailable. This is the reason we decided to operate on a global scale from the start. If you have a single harvest each year – as here in Europe – and if this is inaccessible because of bad weather or because a competitor was quicker, claims for

The C.S.P. team (f.l.t.r.): Marlene Hoppe, environmental engineer and project assistant, Evelin Tetzner, managing director, and Günter Gäbler, plant specialist and authorised representative. The team works with a network of international experts on its projects.

Photos: S. Richter



recourse can very quickly follow. Alternatives are needed within the financial year to compensate for the loss.

■ You act as mediators between agriculture and industry. Where exactly does your work begin and end?

G. Gäbler: It begins with the cultivation systems. When using biomass, particularly in an international context, the aim is to find plants and cultivation methods which do not negatively impact on local populations – especially in terms of food security. We look instead for solutions which expand the range – plants which can be industrially processed but at the same time improve soil fertility with their residual root mass. And enable the population to generate an additional income. This is why we also work on collaborative research projects such as the BiomassWeb. Our engineering and technology skills are also in demand. When it comes to transporting biomass you have a choice between two evils. Dried, un-compressed material involves hauling a lot of air around, whereas fresh mass contains a large proportion of water, which ends up costing more than the

raw material itself. Furthermore, biomass is highly perishable. Consequently we need to find processes to compact and store such raw materials. As this is usually coupled with dehydration, the issue of energy automatically comes into play. Our core objective is to create sustainable loops whereby a large part of the energy needs can be met by the residues and wastes that arise in the processes. There are effective technologies for this, which can be used in a local, decentralised way that is appropriate to specific local conditions. We always seek to utilise residues at the first level of the recovery cascade, thereby meeting the heat and electricity demand of a facility or farm. Shaping such cycles effectively – and thus sustainably – is at the core of our company's work.

■ You also manage your own projects in Africa. Do you think that continent could profit from the current trend towards bioeconomy?

G. Gäbler: Absolutely. In many African countries it is "in" to build with concrete – those who can afford it are very highly regarded because cement is expensive. But if concrete construc-

tion does not meet high standards, the quality of air inside the house tends to be poor; the concrete insulates so well that mould can quickly form. The traditional method of construction uses earth bricks, but these are not at all durable, particularly in tropical climates. In 2010 we had an opportunity, more or less by chance, to discuss the matter with Ghana's then Minister of Construction. The mud-brick building style, traditional in many Asian and African nations, has significant – scientifically proven – advantages in terms of indoor air quality: air and condensation can diffuse well through the walls; moreover, mineralised plant fibres improve brick stability. And depending on the proportion of fibre, the structural elements weigh much less than concrete and often less than typical bricks. This makes a huge difference, particularly in rural areas where the entire family is usually involved in building a house.

■ **Were you able to convince the Minister?**

E. Tetzner: First of all we had to prove to her that the process really works. So we were suddenly faced with the task of looking for the appropriate materials and making a prototype. Among other things we used fronds of the oil palm, large quantities of which arise as waste. At first we integrated wood shavings and sawdust, but the Minister asked us to refrain from doing so. A few years before, the Ghanaian government had decided on a reforestation programme for its rainforest. She feared that it would be counterproductive to open up new sources of income to the timber mills by creating demand for wood shavings. It is vital that such regional conditions are taken into account when planning new projects.

■ **Do you think that there is a general openness towards such projects?**

M. Hoppe: There is always a great deal of interest when such examples are introduced at conferences and workshops. However, to the best of our knowledge there have only been

Top photo: The bricks made of local earth are not weatherproof. Often enough, a series of tropical rainfalls can cause the houses to collapse.

Centre and bottom photos: The mud bricks were mostly made by hand – from cutting up the plant material with shears or a maize mill to preparing the mixture.

The final process was performed with a two-pivot block machine.

isolated instances thus far. A large number of different plant-based resources could be used, and many approaches are being tested. Ultimately it is vital to carefully investigate the effect the fibre has on the building material, how it behaves and how it should be processed. Much research and development is still required, particularly if we plan to use it widely – in housing construction programmes, for instance.

E. Tetzner: A civil engineer at the University of Dar es Salaam in Tanzania has developed hollow blocks by embedding empty plastic bottles into combinations of other materials. This is an interesting approach which also could help to deal with the problem of waste. Different ideas abound but so far none is being implemented on a major scale. Apart from research, there is the question of transferability, even from one village to another. Naturally the local population must be convinced of the advantages of any new technology which departs from its traditions. Besides, in Africa, it is not a case of buying standardised bricks from a building supplies store. The producer adapts his mixture to the amount of money the customer has.

M. Hoppe: It is also important in each case to define where the bricks will be utilised – in the city or the rural areas? What materials and technology are on hand? How can the materials be processed and what are the available options?

E. Tetzner: Until now we have always succeeded in interesting policy-makers in our projects. They are often keen to get support for their substantial housing schemes. But not enough people are willing to implement these projects with us. Few medium-sized German



Photos: C.S.P. GmbH

companies are prepared to come to Africa. And at the local level we are confronted with the cement industry lobby which does not necessarily welcome such innovations.

■ **Apart from building materials – in which other areas are you active?**

G. Gäbler: It all depends on the requirements of our partners. In most cases we meet future partners at special events. When it appears that a specific raw material of a specific quality is needed, we are able to say, based on our experience, where this could come from. Some companies exclude certain countries or regions and we have to adapt our recommendations accordingly. This is often the case with Africa and particularly with Sudan; the financial embargo imposed by the USA keeps companies away, despite Sudan's immeasurable resource riches.

■ **Are there certain resources which you consider especially promising?**

G. Gäbler: Currently we see major potential in plant fibres such as hemp, linen, nettle, banana and pineapple, jute and sisal. The long fibres are almost always suitable for textiles – certainly for the manufacture of rope – and the short ones for fleece, as fillers or reinforcing fibres for injection moulding granules. From textiles to brake linings, the range of applications is enormous.

■ **What about income opportunities for developing countries?**

E. Tetzner: We are currently working on an itinerary for an African company which is interested in manufacturing banana fibre, a waste product of banana production, for textiles. With the University of Zittau, we have found a method of extracting the fibre using relatively simple technology. With this technology, even small farmers could produce fibre of a reliable quality, enabling them to directly supply



Photo: S. Richter

Plant fibres like those of bananas represent a promising raw material, also for smallholder production.

major companies which demand quality consistency. Besides, the production process generates a residue, a suspension, which can be used in small biogas facilities, which in turn could generate the power needed for drying or to drive motors. This cascade of processes delivers a whole range of high-grade resources. And the most promising thing with regard to smallholders is that they can indeed produce equivalent resources on the smallest plots of land, in a decentralised fashion.

■ **This all sounds very promising. With corresponding national strategies, can we expect a boom in biomass use in the years to come?**

G. Gäbler: We have a long way to go yet. We believe that many strategies are conceived at the negotiating table and disregard the stark realities. If manufacturing did convert to the bioeconomy, masses of raw materials would be needed, requiring thousands of hectares of arable land. This huge land requirement can't be met at all in Germany or in Europe; this aspect, however, is often not taken into account in the strategies.

E. Tetzner: In Europe we promote agriculture and other sectors entirely separately. There is little chance of involving farmers in publicly financed bioeconomy projects. But it is the farmers who have to conduct trials on their land, come to grips with the demands placed

on the resource and see if the project can work. Further, the provisions of agricultural policy are so restrictive that they often stand in the way of projects. We know, for instance, the case of a bio-refinery in Germany that has difficulty in securing supplies of grass, because grassland management is so strictly regulated within the EU. Overall funding policies need to become more balanced and more flexible if they are not to exclude entire regions and sectors.

G. Gäbler: It is also tricky that we have to deal with diverse sectors and types of industrial companies. The energy sector is relatively straightforward, as the individual tiers are clearly defined. But when it comes to the material use of plants, we have to deal with partners who have quite disparate competencies and responsibilities. It is virtually impossible to find overarching solutions involving several ministries. The result is that major industrial enterprises often leave such projects well alone. They work exclusively with their own resources or they opt out altogether.

■ **Aside from these framework conditions – how does your work differ from dealing with “conventional” raw materials?**

E. Tetzner: Contact with the farmers is extremely important: it can make or break a project. We must be able to rely on our local partners' making their raw materials available to us long-term – even if these are “only” waste. This calls for planning and co-operation from the start, since these projects can have a lead time of three to five years. At the same time we have a tremendous responsibility towards small-scale producers in particular. It is not enough to guarantee them a good price because this could encourage them to convert their entire production although they might be forced to buy food later on, when prices have perhaps skyrocketed. The farmers must be enabled to keep on producing their daily needs. Furthermore, we try to find solutions which enable them to work with the equipment and technologies that are available locally.

Silvia Richter conducted the interview.