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World Resources Forum 2011

Towards a Resource Efficient Green Economy

The 2011 World Resources Forum *revealed the need for effective steps towards a resource efficient green economy. These steps depend not only on technical knowledge, but also on institutional changes and social innovation – and therefore call for consideration of the social sciences and humanities perspectives.*

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"What do we need to achieve?" This was the initial question at both the recent *World Resources Forum (WRF)*, held from September 19 to 21, 2011, in Davos, Switzerland, and the concurrent SAGUF workshop on early detection and strategy in St. Gallen. Empa, the organiser of the *Forum*, was host of the SAGUF workshop for the first time. What can be learned from the international discussions on resource efficiency for our national agenda setting and action plans?

WRF 2011: the Implications of Global Resource Use

The *WRF* gathered more than 400 participants from all over the world in Davos, to share knowledge about the economic, political and environmental implications of global resource use.[1] The conference included a high-level opening session, three plenary sessions, five parallel scientific sessions, eight workshops, three side-events, and a closing session. Intergenerational dialogue was an important element of the programme, with three youth initiatives (*Oikos*, *YES* and a group of high school students from Austria, Switzerland and Liechtenstein, as well as a group of advanced level graduate students taking part in the *Solving the E-waste Problem [StEP]* summer school)[2] actively participating, co-organising, reporting and blogging.[3] The integration of participants was supported by plenary and workshop discussions, electronic voting and the social media.[4]

In the opening session, the keynote speakers addressed the question as to what policy makers and other stakeholders in the global sustainability debate must achieve. *Janez Potočnik,* European Commissioner for the Environment, stated that the era of plentiful resources is coming to an end as all resources are currently under pressure. So Europe needs to dematerialise – however, not necessarily to de-industrialise – and become a service economy. Potočnik referred to the publication of the *Roadmap to a Resource Efficient Europe,* which shall pave the road for decoupling and reducing the environmental impacts of consumption and production patterns (EC 2011). *Alice Kaudia* (Environment Secretary, Kenya) said that poor people need food security, water security, employment, energy, and community participation, or there will be numerous conflicts. *Bruno Oberle* (Swiss Federal Office for the Environment) as well as *Shaoyi Li* (United Nations Environment Programme, UNEP) stressed the importance of resource efficiency for achieving the goals of the green economy, referring to next year's *Rio+20* conference, where this topic will be discussed at the heads of state level.

The first plenary session examined the question as to whether the use of natural resources should be limited. *Jacqueline McGlade* (European Environment Agency) stated >

1 The full version of the chairman's statement, the meeting report and a press release is available at www.worldresourcesforum.org/outcomes-wrf-2011.
2 www.worldresourcesforum.org/youth-program-wrf-2011
3 www.worldresourcesforum.org/students-reporters-feed
4 www.facebook.com/WorldResourcesForum, http://twitter.com/#!/wrfdavos, www.youtube.com/user/WorldResourcesForum

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that quantifiable targets as opposed to qualitative ones can greatly aid policy making, and that improved accounting is essential for wise management. According to *Mohan Munashinge* (Manchester University), *Millennium Consumption Goals* should be implemented, targeting affluent consumers in order to address overconsumption driven by greed. For the poorer people the *Millennium Development Goals* (basic needs, such as access to clean water, health and education) should be fully implemented. Munashinge said that by targeting people directly, faster response can be attained than by waiting for leaders to take the first steps.

The second plenary session in its first part focused on the question how international and national policies can establish a resource efficient green economy. *Ashok Khosla* (Club of Rome, International Union for the Conservation of Nature) proposed to move away from copying methods that have worked in the past towards developing totally different approaches and ways of thinking, including leapfrog strategies, factor 10 to 50 approaches, in a systemic perspective. According to *Dajian Zhu* (Tongji University), we need social innovation and a performance economy that focuses on services instead of products.

The second part focused on how industry could achieve a resource efficient green economy. *Klaus Hieronymi* (Hewlett Packard) stated that raw materials strategies must address minimisation, the reduction or substitution of materials used, new technologies, the use of recycled materials and dematerialisation. *Hans Hess,* president of Swissmem, presented achievements of the Swiss mechanical and electrical engineering industries. *Jacqueline Aloisi de Larderel* (UNEP Resource Panel) said that we need measurement of the performance of resource consumption in a standardised form on all levels, including the private sector.

The third plenary session dealt with the question as to where to go from here. According to *Ernst Ulrich von Weizsäcker* (UNEP Resource Panel) there has been a trend of relative decoupling of the gross domestic product (GDP) from global material extraction, which is however mostly due to overcoming an early-day "clumsiness" rather than goal-directed policies. If we want absolute decoupling, we need to replicate the economically successful increase in labour productivity and reduce resource consumption in the developed world. In addition, we must help developing countries to leapfrog towards a lower level of resource consumption. *Marilyn Mehlmann* (Global Action Plan) introduced the concept of "flat world thinking", where resources "magically appear and can be used without any restrictions", and recommended "round earth thinking" with corresponding policies such as legislation and awareness raising. We need to empower people, invite them to experiment with a new behaviour, and to demonstrate our own commitment. According to *Reinhard Bütikofer* (European Parliament) an international dialogue between policy makers and other stakeholders is required to overcome the existing global governance structures, which are based on soft-law bodies with no international platform for setting rules. The *WRF* plays an important role in this context as it allows one to share best practices.

The scientific sessions covered a wide range of topics such as supply security, efficiency and sufficiency, assessment methods, resource use indicators and targets, the social dimension of resources, and communication and education. Educating "cross-function thinkers" who are able to think in entire value chains in order to reach the full innovative potential for generating change within the framework of business, politics and society, was considered important (Rohn and Teitscheid 2011). Among many others, several of these sessions addressed the issue of (potentially) critical raw materials such as lithium, phosphorus or rare earth elements (for a definition of "criticality" see EC 2010 or NRC 2008). Du and Graedel (2011) presented a new comprehensive methodology to quantify the degree of criticality of metals, which has been applied inter alia on the case of rare earth elements. Knöri et al. (2011) proposed a framework integrating agent-based behaviour and material flow models in order to consider the dynamic interactions between different possible future critical metals demand and supply configurations.

The workshops addressed issues related to sustainable resource use and poverty eradication, resource impact assessment, bioeconomy, efficient resource policies, sustainable business and the material footprint of products and services. For example, in the workshop *Closing Resource Loops – Distinguishing Good from Bad in the Secondary Commodity Market,* organised by Empa and the *StEP* summer school students, ways to trace and certify critical metals from recovery processes were identified.

In the closing session a draft chairman's statement was discussed with the participants. These asked to address additional issues, e. g., that values, emotions, mindsets, and underlying driving forces for consumption, such as status, should also be considered in addition to quantified data and indicators. *Yonglong Lü* (Chinese Academy of Sciences) announced that China will host the next *WRF* from October 14 to 17, 2012, in Beijing. The Swiss Academy of Engineering Sciences (SATW) will support *WRF* 2012, as it already did for *WRF* 2011.

The Outcomes of *WRF* 2011 in a Nutshell

The *WRF* reached a consensus that there is an urgent need to take effective steps towards achieving a resource efficient green economy. Concrete roadmaps should be established. Data and indicators should be improved. Housing, sanitation, food and mobility are key sectors. Critical metals require urgent attention, because many technologies in the energy, information & communication and transportation sectors rely on them. In turn, the evaluation of metals' criticalities requires methodologies, which include economic issues as well as social and environmental ones. Circular economy approaches do not only require technical, but also institutional changes and social innovation. It was felt that, although change is underway, the implementation of activities should be accelerated with the greatest sense of urgency, and that the existing fear of change should be transformed into action. The *WRF* called on governments, businesses and civil society to take imme-

diate action to double the current level of resource productivity by 2020 and reach at least a fivefold increase by 2050.

The discussions at the *WRF* revealed that there is room for improvement and creativity regarding resource efficiency. There was a common feeling that resource intensity and the associated environmental and social impacts urgently have to be mitigated, and that the process of transformation towards a sustainable society in this respect is far too slow. The need was emphasised to involve key players in the economy and policy circles in this transformation.

Information Alone Is Not Sufficient

Obviously, change is needed – and the discussions revealed that to achieve change it is not sufficient to have all the information. As behavioural models show, individuals need to be aware of a problem, but they also need to have an intention to solve it, and need to feel to be able to do so, at least as a contribution. Only then will an individual experiment with new behaviour and – once it has proven to bring a benefit – adopt and integrate it into his or her lifestyle. Politicians are no different. Knowing this, we find it in fact remarkable that in decades of scientific work on sustainability and resource management the two worlds of "hard" (technical) and "soft" (behavioural) scientists have rarely met and worked together. The same is true for educational programmes, which sometimes fail to combine the two. Yet, this may prove to be the missing link in attempts to connect the dots – the dots between knowing what is at stake and doing something about it.

The conclusions of the *WRF* are in tune with the opinions expressed by key stakeholders, such as UNEP, the European Commission and the governments of the countries most active in the organisation of the *WRF:* Switzerland, Germany and China. This is true for the largely untapped potential for the involvement of social scientists and the humanities (see also de Leeuw 2005) as well as for the need for concrete roadmaps, with quantifiable targets and indicators. As *Rio+20* approaches, we need to get the data right. We must agree on the state of the environment and the state of our resource base at a global level, and then use these data to manage our resources well by designing and implementing the proper policies whilst agreeing on how to best measure progress (see also de Leeuw 2011). Both elements were incorporated in the first proposals for a *Global Action Plan on Sustainable Consumption and Production,* at the time of the *Rio+10* meeting in Johannesburg in 2002. The proposal failed and was replaced by a ten-year framework of such initiatives.[5] Now, ten years later, the concept of *Sustainable Consumption and Production (SCP)* has almost disappeared from the global policy agenda, although it might have the potential to deliver some of the essential answers, as was made clear in the *WRF* discussions.

The *WRF* aimed to translate the latest scientific insights on resource efficiency into concise messages that would be suitable for inclusion in global policy making and hence implementation. The resulting message was not new, but many felt it did not *have* to be new, as the analysis of the situation and the recipes to improve it have in fact not changed. Despite the progress that has been made in the decades after Stockholm (a generation!), one cannot help to remain concerned and worried, as the majority of the conference participants indeed said they did.

5 www.un.org/esa/dsd/dsd_aofw_scpp/scpp_tenyearframprog.shtml

Will the Policy Recommendations Be Heard this Time?

The expectations for *Rio+20* are certainly not high. *WRF* participants were not so much concerned about a lack of technological progress or a lack of knowledge about the policy options to choose, but rather about the chances that their messages will be heard this time.

Frequently, promising scientific work and conferences end with the publication of a report and its presentations to peers. Lobbying to get the recommendations implemented is often not considered part of scientific work. Due to the inherent systemic characteristics of the policy process such as short election cycles, politicians tend to pick the low hanging fruits and shy away from implementing clear roadmaps, with solid mechanisms for reviewing progress. Sometimes – as in the climate change debate – they explicitly refer to uncertainties in the scientific world, a lack of consensus, or a lack of clarity about the impact of the policy measures under consideration. So, what is it that would prompt policy makers and their negotiators to take action?

The WRF called on governments, businesses and civil society to take immediate action to double the current level of resource productivity by 2020 and reach at least a fivefold increase by 2050.

As one Davos participant paraphrased Albert Einstein: "Not everything that can be counted counts, and not everything that counts can be counted." In fact, policy makers and business leaders are human beings and decide on the basis of individual and collective emotions, underlying drivers and resistances to change. Coming to grips with what these are exactly, and how to address them might well be the most important way to bridge the gap over the next few years, and, hopefully, beginning with the earth summit.

Next Step: Natural Sciences and Social Sciences Working Together

An analysis of how to get the message of the *WRF* and similar conferences into the >

heads of decision makers would be a logical next step after the successful ending of this year's conference, and in the preparations for the next one.

The new *WRF Association* (announced by its president *Xaver Edelmann,* starting in January 2012) aims to work with centers of excellence on resource efficiency around the world. The *WRF Association* might consider reaching out to centers of excellence for the social sciences and humanities as well, and mobilising representatives of psychological, sociological and philosophical disciplines. Both worlds have made tremendous progress and could benefit from working together on this issue.

A task force delegation (*Rainer Kündig, Otto Smrekar, Pierre Dèzes,* Swiss Academy of Sciences, SCNAT) attended the *WRF* on behalf of the Swiss Academies of Arts and Sciences. It is intended that their expanding network of resources experts will become a partner of the *WRF Association*. In this respect, SAGUF could play an important role, as it is already a member of two academies, SCNAT (natural sciences) and SAGW (humanities and social sciences), and can thus take on a bridging function to facilitate necessary encounters.

In a first step, SAGUF will initiate a working group trying to identify and establish suitable links. First discussions and expert workshops are planned for the year 2012, and a specific session and respective key talks will eventually be offered for the *WRF* in 2013.

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Nachruf auf Pierre Fornallaz (1924–2011)
Der wachträumende Ingenieur als ein visionärer Wegbereiter von nachhaltiger Entwicklung

Vom „Erwachen" im Ingenieurberuf, wo ihn die industrielle Praxis mit grundsätzlichen Fragen jenseits bloßer Sachkenntnis konfrontierte; von den Versuchen dann als ordentlicher Professor für Feintechnik an der ETH Zürich (1968 bis 1981), Antworten auf eine Sinnfrage zu finden: Technik für oder gegen den Menschen?; vom Umdenken und ungleich schwierigeren Umschwenken hin zu einer nachhaltigen Entwicklung durch das Momentum aus praxisorientierter ökologischer Forschung und verantwortungsbewusstem gesellschaftlichem Handeln; vom Elan der Pioniere, die im auslaufenden 20. Jahrhundert *gegen* die Gefährdung unserer Lebensgrundlagen durch menschengemachte Naturzerstörung kämpfen wollten und *für* die dazu notwendige ressourcenschonende, umwelt- und sozialverträgliche Fortentwicklung des technischen Könnens, besonders zur Nutzung der Sonnenenergie – davon berichten die autobiografischen Notate von Pierre Fornallaz *Gedanken zu meinem Weg* (Erstveröffentlichung 2008, nachzulesen unter *www.flexibles.ch/Nachhaltigkeit/Pierre%20Fornallaz/Gedanken_zu_meinem_Weg.pdf*).

Sein Weg führte Fornallaz in den Boomjahren des Umweltschutzes 1970 bis 1973 mit zahlreichen Gleichgesinnten in Vereinigungen wie die Arbeitsgemeinschaft Umwelt an den Zürcher Hochschulen (AGU, gegründet 1971) und später die SAGUF, die 1972 als Schweizerische Arbeitsgemeinschaft für Umweltforschung angetreten war. Auf der weiten Wegstrecke, die Pierre gemeinsam mit uns in der SAGUF zurückgelegt hat, war er als Mitglied beeindruckend aktiv, gewählt in Vorstand und Ausschuss, Präsident (1980 bis 1985), und auch fortan wussten wir über die Jahre seinen Rat wie den eines Dorfältesten zu schätzen. Dem Nachfolger im Präsidentenamt hat er inspirierend zur Seite gestanden und uns durch sein umgängliches Wesen manch „spitze" Diskussion erleichtert. Seine umwelt- und gesellschaftspolitischen Voten waren sowohl von praktischer Erfahrung des Ingenieurs getragen als auch von Traumvorstellungen eines ganz untypischen Unternehmergeistes beflügelt.

Der ETH-Professor Fornallaz ließ sich nach 13 Jahren vorzeitig emeritieren, um das Zentrum für angepasste Technologie und Sozialökologie (Ökozentrum) in Langenbruck mitzubegründen und mitzugestalten. Diese Einrichtung ist nun 31 Jahre alt geworden und beweist, dass eine nachhaltige, ökologische und soziale Wirtschaftsweise von der konkreten Utopie in etwas wirklich Gegenwärtiges übergehen kann. Das Wiederlesen eines 1994 in *GAIA* (3/5: 289–296) unter der Kopfleiste *SAGUF Special* erschienenen Fortschrittsberichtes von Fornallaz führt einem heute ernüchternd vor Augen, wie lange doch der Weg bis zu den seinerzeitigen Zielen sich hinzieht – *mission impossible*?

Am 4. September verstarb Pierre Fornallaz im 88. Lebensjahr. Wir verdanken ihm den fortwirkenden Einfluss auf das Denken in der SAGUF, die ihm ein ehrendes Andenken bewahren und seines Credos eingedenk bleiben wird: Die Präferenz für Solarenergie in ihren zukunftstauglichen Wandlungsformen ist nicht nur eine Frage der Technik, sondern vor allem eine Frage der Kultur.

Frank Klötzli, ehemaliges Vorstandsmitglied der SAGUF und Präsident (1985–1994)
Otto Smrekar, Delegierter des Beirats im Vorstand der SAGUF