

Higher Education's contribution for sustainable development: The road to take, Leo Jansen
Accepted essay for GUNI: Higher education in the world 2008. New challenges, changing roles:
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The road to take.**

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❖ **Sustainable development and the obligation of Higher Education.**

All men and women are in development and are part of a development on their place and level in society. Sustainable development (SD) as a process requires from each of them on their place, competences to handle the complex challenge of change with great uncertainties, many actors, conflicting interests and rigid barriers in self interest and short term thinking on each level and on each term (Weaver et al, 2001). SD does not unroll by itself but should be guided by long-term analyses and goals. This requires a double role of Higher Education (HE): deliver graduates having the attitude, knowledge and competences to give lead in this process and to develop and deliver the knowledge to support SD with its research.

Social learning (Wals, 2007) is a framework to develop the necessary competences, as SD in itself is a learning process on all levels and on all terms. The characteristics of SD demand integrated system changes in the long term. To gain broad support for these changes involvement of all relevant parties is a requisite. SD is a learning by doing process in which social challenges are met step by step by social parties involved, supported by joint disciplines in science and technology in a cooperative effort. The cumulative effect of such interacting system changes in different domains and at different levels (micro – meso – macro) may lead to a transition of society in SD. Thus HE is a key player in social learning, delivering its contribution thereto in education and research (Kibwika, 2007).

❖ **From environmental care towards transition for SD.**

The process of SD did not appear overnight. First warning signs were given e.g. in "Silent Spring" (Carson and Darling, 1962), followed by the club of Rome in 1972. The OECD launched important principles such as "Normative forecasting" (Jantsch, 1968).

In its visionary report "Our Common Future" the WCED (Brundtland, World Commission on Environment and Development, 1987) connected the challenges of saving the environment and the fight against poverty. Yet a continuous deterioration of the environment at large and an increase of the gap between the rich and the poor take place. In terms of "Planet, People, Prosperity", environmental protection covers "Planet", whereas SD integrates all three.

Blockages to change.

Change in culture and structure towards a sustainable future may touch positions and powers of individuals and institutions. This implies resistance expressed in poor attitudes, in inabilities and in defensive actions. The background is the stress between the need of (bureaucratic) certainties to keep society running and the need of flexibility for change. This comes to expression in e.g. lack of willingness to take long-term risks, insufficient innovative power and a rigid disciplinary organisation of science.

The main remedy to cope with these drawbacks is to shape conditions for developing broad supported future views as interests on the long-term convergence much stronger than rat races on the short term.

Attitudes

Besides resistance to change urgency to change is not felt, in particular in the developed nations where direct deterioration of health and environment has to a large extent been overcome. Developing nations however have still existential urgencies on ecology and economy. A very fundamental barrier is the lack of willingness to accept a fair global distribution (of environmental capabilities) as a condition for common survival. SD requires cooperation, which goes beyond search for individual certainties.

Abilities

Many groups such as the Factor 10 club (1995, 1997) (Robèrt et al, 2002) developed visions on a sustainable future and on a path thereto. However responsible governments show a lack of ability to develop long-term integrative visions towards a sustainable future. The good of bureaucracies of providing certainties in expectations of civil parties and in responsibilities in a democratic control, conflict with the need to

handle the uncertainties of fundamental change and cooperation into which the bureaucracy is just one of the partners. Nation-states operate in enlarging and changing worlds under historically fashioned rules of the game, which reflects in the laborious implementation of international treaties like "Kyoto".

❖ **The operational challenge of SD.**

The main challenge of SD is to initiate evolutionary change in an unsustainable world. The evolution concerns renewal of integrated systems: systems renewal, transitions, to meet requirements of a growing population with a growing prosperity. This will imply learning for SD on all levels and in different modes of learning, formal – non-formal and informal (Dam-Mieras & Rikers, 2005). The learning should be guided by developing competences; to develop SD oriented visions in civil society, to integrate future orientation in public policy making and in public debate, to transform structures of society for SD and to break through barriers.

Systems renewal for SD is a complex social process, which encompasses not only radical innovations in technology, but also changes in behaviour, organisation, institutions, power relations and many other non-technical aspects. The latter may be even more decisive for implementation than the availability of "technology". Characteristic for systems renewal is – the long-term future orientation - for a variety of stakeholders in - fields of conflicting interests - in an environment with large uncertainties.

Already the recognition of "needs" and their definition as a starting point for innovation for sustainability, as set out in the Brundtland definition of sustainable development, deviates from the more traditional engineering and business approach for innovation, which departs from production and consumption in existing structures.

Our Common Future:

*“Humanity has the ability to make development sustainable – to ensure that it meets the **needs** of the present without comprising the ability of future generations to meet their own **needs**”*

*“Meeting **essential needs** requires not only a new era of economic growth for nations in which the majority are poor but an assurance that those poor get their fair share of the resources required to sustain that growth ”.*

SD as a societal transition process comprises of a manifold of innovation programs and projects of different origins, different (scientific) environments, different scopes at different levels often loose from each other on the micro scale (niches), on the meso scale (regimes) and on the macro scale (landscapes) but inspired by a general orientation. Transition is described as “the result of developments in different domains, as a set of connected changes which reinforce each other but take place in several different areas, such as technology, the economy, institutions, behaviour, culture, ecology and belief systems” (Martens and Rotmans, 2002).

Cooperation

The systems approach in the transition requires transdisciplinary cooperation of clusters of societal parties viz. citizens, consumers and Non-Governmental Organisations; corporations and other production organisations; governmental institutions and organisations involved in science and education.

This was experienced in a learning by doing setting in The Dutch Sustainable Technology Development (STD) programme (Weaver et al, 2000), established as a programme for long-term technological innovation in support of SD against the backdrop of a policy commitment by the Netherlands.

The players are operating in different arenas, driven by different currencies having different roles in the process of SD. The AIRP project (Hinterberger, 2003), developed a set of SD principles and delivered a methodology to set up and evaluate SD-oriented Research and Technology Development programs / projects.

❖ **Demands on HE in the process of SD.**

A major condition to initiate system changes is the availability of competent players who are able to develop options for SD and to initiate and manage change processes. This capacity development has to be congruent with sustainability principles as far as possible (Weaver & Jansen 2004). Thus, any program directed towards SD depends on the extent of understanding for SD in society and on the awareness of its urgency. Both understanding and awareness, elements of the context of education and research, are necessary but not sufficient conditions to initiate and execute SD oriented programs. In research the design is dependent on its context, and the outcomes on the design. On its turn the outcomes influence the context for further research.

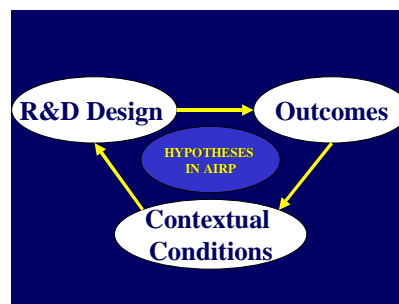


Fig 1. Research for SD in its context.

❖ **A future option for HE.**

The learning process for SD is a common and interactive undertaking. Institutions of HE are expected to take the lead in conceptualisation being agents of change. A future option for HE as a key player shaping the process of SD together with other players may meet the demands of a society in SD by:

- Education of graduates:
 - To be leaders, champions in the process of change, and / or
 - To be dedicated to keep “every day business” running, fostering the process of change.

- Contributing to life long learning (for SD) in formal and informal learning, training activities, participation in processes of change.
- Participative research,
 - Involving participants in social, spatial and technological planning and
 - Engaging students to acquire competences for transdisciplinary research
- Institutional research for SD meeting societal challenges, sectoral, regional, institutional:
 - Business induced, integral, transition and system oriented.
 - Product oriented on all phases: optimisation, improvement in and renewal of production and consumption systems,
 - Process oriented e.g. on participative decision-making, the relation between representative and participative democracy, new forms and bodies of international cooperation (new rules for new games).

To realise such options the development of visions and derived strategies by institutions of higher education is indispensable. In these strategies solutions have to be found to solve the tension between accountability, which often results in short term thinking, and flexibility which is essential in a process of change. In HE the necessity of some bureaucracy has to be matched with the merits of a centre of creativity.

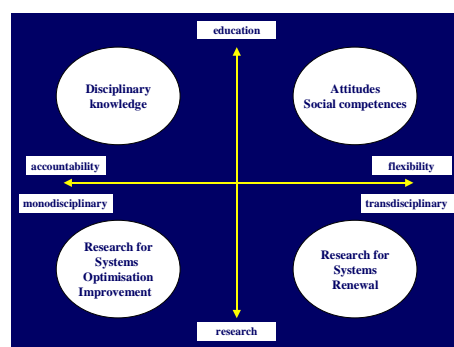


Figure 2: Fields of tension in HE in SD

❖ HE in SD demands.

Guiding lines in finding a path of transition for HE in SD are:

- Research and Education are not separate worlds but interact, are complementary and are intermingled in the interaction with society.
- Core requirements to graduates are sound education in their discipline, ability to position their discipline in the context of SD and the attitude and competence to cooperate with other disciplines and “non-scientific” key players.
- SD is not a stand-alone disciplinary specialism, but must be integrated in all operations, activities and departments.
- Matching HE research with societal problems.

Demands On Education.

The options for future HE reflect in:

- Demands on the education of graduates.

All graduates have to be able to practise their profession under (future) conditions of SD (Jansen et al, 2006). They should have awareness of possible implications outside their field of study. The more SD determined students have to be offered opportunities to acquire the competences for inter- and transdisciplinary operations.

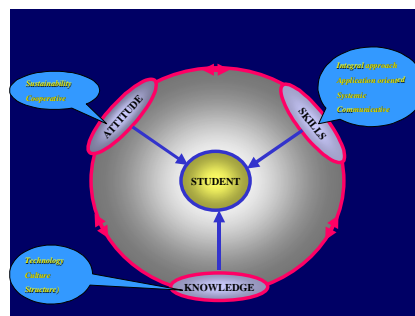


Figure 3. Demands on graduates.

In the Delft University of Technology this was developed in a learning-by-doing process (Jansen et al, 2006)

- Demands on the teachers.

It is self evident that demands on graduates translate themselves into similar demands on teachers. However, many teachers have not been educated to meet these demands. A minority have developed themselves in this direction. Moreover the system of career development and the disciplinary organisation in science are hampering achievement of scientific competences for SD. HRM of institutes should build in these qualifications in the profiles for new appointments and career development and offer teachers opportunities to achieve qualifications for SD.

At the TU Delft "The individual Interaction Method" (Peet et al, 2004) appeared to be successful to connect courses to SD as a follow up of disciplinary reviews produced by the Foundation "DHO, Dutch Network for Sustainable HE"

In the Dutch universities for professional / vocational education lectureships (abt. 270 by 2006) with knowledge circles of teachers were established with the aim to enhance the quality of teaching, to professionalise the teaching staff, to break through compartmentalisation, to strengthen capabilities for applied research and to foster knowledge circulation (Daniels, 2006). The competences to be achieved are also useful in education for SD whereas some 20 lectureships are more or less directly related to SD.

- Demand on the institutions.

Integration of SD in HE demands rethinking of the education system, its values and its norms. *"It is critical to address the need for example to change mindsets, build a new vision of purpose and inculcate new competences for training and research among the academic staff", (Kibwika, 2006).* Above all it may be expected that boards of institutes of HE recognise the necessity and urgency of SD, are convinced of the role of HE in SD and support initiatives to integrate SD in HE. In a framework of vision and strategy, curricula and terms of graduation should be adapted to new realities, and adequate forms, methods and means of education developed. Facilities and means (finances, time, personnel) to meet these demands should be made

available by development of an adequate structure and attitude to perform leadership and coordination.

This new attitude of HE should be reflected in the in- and external communication policies and in the recruitment of students, in innovating forms and methods to transfer knowledge to public, e.g. use of distance education, participation in cultural events, etc. The links with business and public organisations could be strengthened whilst respecting the principles of autonomy (Haddad, 2007).

Meanwhile standards, like the AISHE (Auditing Instrument for Sustainability in Higher Education) certificates (Roorda, 2001, 2004), may serve to measure the comparative progress on integration in institutes of HE. The "Observatory on engineering education" (AGS, 2006) identifies the top 16 universities that are already underway in reaching SD targets.

- Demands on the stakeholders in society.

Recognition of the necessity and urgency of SD by stakeholders, public and private, is an essential condition for co-evolution of HE and society in SD. Although the reach of institutes of HE is worldwide, most of the interactions with society will take place at the regional level. This pleads for an interaction between HE and society in a regional framework in networks of knowledge in which institutes of HE in a region cooperate. A vehicle for such exchange is the initiative of UNU to establish RCE's (Regional Centres of Expertise for SD (Fadeeva, 2007), (Dam-Mieras & Rikers, 2005) functioning as regional connection points for knowledge interactions on SD issues among stakeholders in society (knowledge institutes, governmental institutes and bodies, community based organisations and companies). On this route HE may expect from its societal partners:

- Willingness to establish a vision on their role and position in the process of SD.
- Their understanding of essential competences required to operate in SD.
- Opportunities for training "on the job" to develop explicitly abilities and competences for (transdisciplinary) cooperation.
- To "reformulate" and identify SD problems in a coherent transdisciplinary way.

- Their demands on the profiles of graduates.
- Inclusion of SD graduation terms in the accreditation of HE (by law?).

Demands On Research.

The most intriguing element of research for SD is research on systems renewal. This comprises longterm transdisciplinary societal research but:

In the economic system this type of research is regarded to be of public interest and is expected to be funded by government. Corporations may be interested in development of concepts but participate in funding only when and to the degree that economic interesting results come within scope.

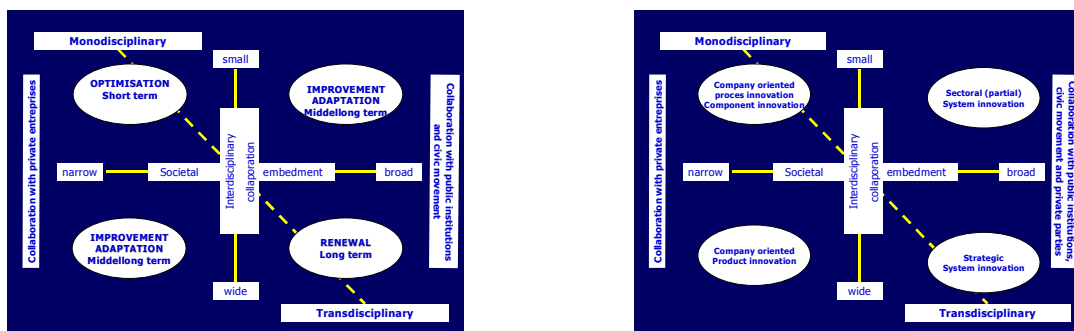


Figure 4,5: Modes of research in HE.

Figures 4 and 5 show how SD oriented activities fit into a co-ordinate system of the axes: interdisciplinary cooperation versus social embeddedness.

In this context support is expected from HE-research in the design of those phases of systems research in which private corporations are not (financially) interested (right hand quadrants in fig. 4 and 5) (Jansen et al, 2005). This requires a clear vision of HE on the role of science in the process of SD. In particular this comprises a vision on the nature of research in general and on short, medium and long-term orientations of research. Or in brief to embed SD strategically in the mainstream research of all departments to fulfil expectations from the outside (Mulder & Jansen, 2005).

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