Sustainability: a challenge for domestic households in daily life

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Abstract:
In the face of climate change, sustainability (with its three pillars of ecology, economy, and social affairs) ought to be a governing principle of all areas of consumption and production in every domestic household. Households as such may seem to have very little impact on climate change in the world, but these small economic and social units do exist in every society, engrave behaviour patterns in childrens' memories and decide about a family's everyday-life output of C[O.sub.2]. However, issues related to individual and social habits, information, education, economic resources and infrastructure create obstacles to sustainable practice in households.

The paper shows food-related obstacles towards sustainability in domestic households and tries to offer some solutions in the context of Home Economics in the Western World, based on experience of the University of Applied Sciences Osnabruck, Germany, which has created a centre for consumer information, nutrition, sustainable food production and post-harvest technology. The new, ecologically designed building was opened in July 2004 and houses the research institute for Home Economics and Nutritional Sciences at the Faculty of Agricultural Sciences and Landscape Architecture. The so-called WABE-Centre (Waldhof Action Benefit Experience) consists of three sections: the showcase and professional cheese production rooms, the multifunctional rooms for exhibitions, conferences and lectures, and the catering kitchen, which undertakes scientifically monitored and environmentally friendly production of ecologically grown regional food on a domestic scale for approximately 40,000 visitors to date.

Preliminary note

In Germany, Home Economics and Nutritional Sciences have existed as study programs since the 1960s; originally, they were established at Agricultural Faculties of Research Universities. The program is still called Oecotrophologie, based on the Greek words "oikos" (household), "trophos" (nutrition) and "logos" (science). Meanwhile, Universities of Applied Sciences have joined, and all in all round about 2,000 Home Economists and Nutritional Scientists graduate every year. By now all study programs offer Bachelor- and Master-degrees and do have their individual profiles. The University of Applied Sciences Osnabruck* is the only course in German-speaking countries relating Home Economics to Agricultural Sciences and focussing ecology and the development in rural areas (Leicht-Eckardt 2000a). There is cooperation between the Universities of Applied Sciences Osnabruck (Lower Saxony) und Munster (Northrhine-Westfalia), offering a Master course in "Sustainable Services and Food Economy", starting 2008. The WABE-Centre as a unique model at least in Western Europe is a newly built unit for research at the Faculty of Agriculture and Landscape Architecture in Osnabruck and a place for cheese production and consumer events; scientifically and practically, the centre is concerned with topics related to the food chain, ranging from production to waste management (Leicht-Eckardt, 2004).

Home Economics on a practical and scientific level in Germany are represented in various organisations, associations and

private and public institutions which all are members of the German Society for Home Economics (dgh). On an international level, 1,300 individual members and organizations as well as 58 nationwide home economic societies are combined in one parent organization, called International Federation for Home Economics (IFHE). It has existed for more than 100 years, and--as an NGO--enjoys accreditation at the United Nations, UNESCO, FAO and WHO. The main challenge for the IFHE was and is to clarify impending strategic and organisational questions with a view to its ability to survive in the future and to take objective-oriented decisions on Federation politics (see www.ifhe.org). Actually, a new IFHE-Committee "household technology and sustainability" was founded.

1. The role of domestic households: Consumption and Production

Sustainability according to the definition of the United Nations ought to be a governing principle of all areas of consumption and production for everybody, especially in the face of climate change. Still, many people are not aware of the problem, or just do not act according to their knowledge. Often, scientists just have a scientific approach to what people should do regarding sustainability, but do not apply their principles to their personal way of life, not being aware of their individual responsibility as leaders in societies: on the one hand, they try to convince people of the seriousness of the actual climate situation, and on the other hand, they are making excuses (mostly referring to their lack of time) for unsustainable personal decisions (as other people could do as well).

Nearly everybody lives in a private household. The appearance of domestic households in the Western world is the background of this statement. Domestic housheholds are economic and social units aiming to fulfil their members' needs and requirements in accordance to resources available. Domestic households scaffold human society. In order to bring forward domestic households towards sustainability in their daily consumption and production, it is necessary to encourage household members to act according to their economic, ecological and social means. Households are producers as well as consumers of goods and services. Goods for example could be meals, clean floors or sewed stockings, services could be taking care for a sick person or gardening. Supply can take place inside and outside of households, e.g. watering of flowers in one's own or a neighbour's garden.

All household activities mean labor, physical and/or mental, have to do with people and/or goods, need resources and create a result (e.g., a clean floor) in mostly limited time (Landau, Stubler, 1992, p.16). All activities do have an impact--more or less, positive or negative--on the environment. It is worthwhile studying them, because we do have households everywhere, everybody is part of a household in a way, usually its activities take place on a daily basis, households act in habitual ways and pass them on to their children. Improvement on this level thus means a permanent enhancement of sustainability. To achieve this on to a practical level, household activities are divided up according to several categories, under which housework is taken seriously:

--To ensure quality of housing through living space design

--Supply of goods (through buying, producing goods and barter arrangements)

--Preparing food (which entails supply, storage, preparation and nutrition)

--Cleaning (applies to all household features such as rooms, furnishings and appliances)

--Washing (clothes, dishes)

--Textile work (tailoring, sewing)

--Gardening and taking care of pets

--Taking care of needy household members (e.g., a child or an elderly or ill person)

--Management of resources and waste.

In contrast with "normal" work established in our society and national economy, housework mainly takes place behind the stage: unpaid, mostly done on an untrained basis by women, not recognized by society and not included in the GNP. This renders individual approaches hidden secrets of ("my home is my castle and the way I do homework is not a topic to be discussed") and means that household members are often not familiar with the management of a private household according to basic rules of hygiene, ergonomics or financial matters. As a result, the uncertainty of people, their decreasing sense of self-

realization during homework on one side, and marketing and market offers on the other side lead towards more and more consumption instead of production in private households which mostly disregard sustainability aspects (Leicht-Eckardt 1995, p. 53).

Scientists look upon domestic households as unsteady and individually shaped units. The times when the term "private household" was synonymous with nuclear families have passed. The following criteria may provide an overview of the complexity of household appearances which influence the consumptive and productive behaviour of household members in and outside their domestic units:

--age, sex, physical condition, knowledge and abilities as well as motivation of household members

--number of household members

--social unit of household members (couple, patch-work family, single-parent family, non-relatives....)

--social and economic status of the household in society (poor or wealthy, unemployed or with regular income)

--implementation and phase of the household (just established, settled, outrunning)

--type of household according to resources and personal input (orientation towards service or consumption)

--place of living and infrastructure (rural or urban surrounding).

Apart from the variety of households and their members' behaviour, we are confronted with a development of society with the following trends in Germany and Western Europe. Social change is indicated by individualised working times and partly wide distances between home and working place, globalization, flexible working places throughout the world and availability of goods representing international labels. We do have a trend towards individualism with smaller households (in cities, there are about 50 % single-person-households), more orientation from young people towards "events" and "action", and we do face an overaged society with a more and more dominating "silver generation". As there are hardly any more families with more than one child, and as the divorce rate is high, we are also facing a lack of family members or young people in general who could take care of the elderly. On the other side, old people on average will never again be as wealthy as nowadays, and the retirement of individuals will not be possibly at the age of 60 or 65 anymore, but will start at 67 or even 70, due to a life expectation of 87 on average. Given the trend of moving towards cities (as they provide institutions for the needs of elderly people), we also have to make infrastructural progress in order to maintain rural areas and to address the needs of their inhabitants. So, who shall play the role of domestic households scaffolding society in future? And what about sustainability?

2. Sustainability and consumer education

The changes of household and social structures in Germany are not yet integrated in educational curricula. Traditional knowledge in the field of Home Economics does not meet the household members' demands any more. There is a gap between daily life and the challenge of daily decision making in domestic households on one hand and the curricula for lectures in Home Economics on the other. These lectures are not obligatory at most German schools (varying from state to state and type of school), and consumer education or sustainability are not integrated in most of the curricula. In addition, problems arise as teaching staff are old on average, Home Economics as a course is often taught by women (not accepted by boys, esp. those with gender specific immigration background) or untrained staff, or lessons take place in normal classrooms which do not allow for practical exercise. Families of four people (which was the average size in the 1960s) are no longer standard, and neither do household members normally meet for three meals a day at one table, nor do traditional techniques and abilities (e.g., for the production of a cotton napkin in textile work) appear meaningful to any youngster. New challenges, for example, are how to clean or cook quickly whilst implementing ergonomic, hygiene and ecologic demands, how to compare sensoric, economic, ecologic and physiologic features of home made and industrially prepared convenience-food as a basis for sustainable decisions; strategies for debt avoidance should be a compulsory component of Home Economics and consumer science at school.

Sustainability as a topic nowadays is--if ever--only discussed in natural sciences, but not as a topic related to daily life. So, in Germany probably as well as in other Western countries, we do have a big step to make, as issues related to education, economic resources, individual and social habits, information, and infrastructure create obstacles to sustainable practice. First steps for example are made in German and English politics to gain more sustainable informed and well nourished children, as obesity and indebtedness of children increase. The school system in Germany changes towards all-day-courses, so lunch in school canteens becomes obligatory and is supported by a nationwide program concerned with nutritional quality and fitness-enhancing activities of schoolchildren; this program also encourages the use of organic food and offers advice from the

scientifically based German Society for Nutrition (DGE). But management and rules for lunches at school vary from school to school (according to type, size, area and state). There is a wide range of supplies from outsourced catering (e.g., from central kitchens offering the same meals as for care homes) up to freshly cooked meals at school kitchens integrating pupils' contributions (e.g., in the preparation of sandwiches). As meals at school are not yet customary and participation is mostly still optional until now, many pupils do not use this chance for a warm meal.

Unfortunately, there is hardly any pedagogic connection between school lunch, food culture and lectures, even though this would be a very good chance to inform pupils about the food chain from its origin to waste management, thus establishing sustainability patterns at school as well as at the childrens' homes. How else should they know about how to act according to sustainable needs, as on average, they do not get any further stimuli from parents or the media on this topic?

3. Food and nutrition in daily life: sustainable?

The necessity of a substantial and systematic approach to the establishment of sustainable habits for activities in daily life might become more evident through the reflection of ones's own nutritional habits. This point of view often is forgotten, although we can speak of a female approach to sustainability regarding private households' business as an important part of the society (Biesecker et al., 2000).

We do have daily "food intake" at home, outside, at the office, on the street, while walking or waiting, and often it is just "feeding the hungry stomach" instead of really "having a meal". For the first time in mankind's history, we do have not only undernourished people in the world, but also obesity as a problem in developed countries, where people have a choice, what, where, how, how much and when they want to eat: The range of options offered by industry and markets exceed our needs significantly, and advertisement as well as marketing do have great influence. Education and information can support nutritional behaviour, but mainly, habits are founded in domestic households and families in the context of regular meals in the same surrounding.

We can decide spontaneously what, where, how and how long we eat and drink, having the chance to get "good(ie)s" nearly at any time and everywhere--at least in cities. We perhaps have no breakfast, just a sandwich in between for lunch, and balance this individually with a wonderful three course dinner in an upper class restaurant. On the whole, we may have three meals regularly (and maybe some bites or biscuits in between) per day, and we may spend half an hour each time we eat and drink--but sometimes maybe just five minutes, perhaps individually balanced with a couple of hours for dinner in nice atmosphere, sitting comfortably with friends.

Generalized, this means: Times, duration and ways of having meals in the Western world vary individually on many occasions. In general, our personal daily concerns with sustainability do not appeal to our mind in this context. Only on very few occasions are we aware of the value of food, of the work related to growing food and preparing a meal, of the price related to social and infrastructural as well as environmental backgrounds of production, storage and transport, and of the difference between surroundings of having a meal or just "intake food". We do not really wonder what happens to the rest of food we leave on plates, tables or buffets (which is supposed to be waste), or consider processes or sustainable effects somewhere in the world, before we get a piece of meat or exotic food. We certainly do not relate undernourished people and our habits of nutrition in daily life. We take food supply for "normal" and "granted", consume goods and services according to our individual needs (physically), infrastructure and resources (time, money) and sometimes even have nutrition as a sort of side aspect in communication with others or--coming up more an more--computers (earlier TV). We often do not concentrate on what we do when we eat, as the example of eating and drinking has shown. Our varying consumption patterns damage our planet, as we do not think about where ingredients come from. Unfortunately, home economists and nutritional scientists as well as fighters for sustainability often are no exception. We egoistically follow our needs, sometimes with consciousness and excuses: But how shall we convince others to contribute to our plan of saving the world with sustainability? How can we demand straight personal and political action in daily life, even if it's only nutrition?

4. Challenges for home economists and nutritional scientists

At least at Universities for Applied Sciences, science normally treats topics of daily importance, using a systematic approach, providing surveys, and working out structures. Managing such processes means to set up goals, to establish a program and organization as well as a system of documentation, information, control, continuous improvement and evaluation. This means acting according to principles of management systems and to survey the quality of structures, processes and results (Leicht-Eckardt et al 2008, p. 155 f). In the field of sustainable food and nutrition, all levels need to be taken into account; structural quality as an issue for example includes rooms (e.g., their size, proportion, lighting, and air conditioning), technical equipment (e.g., appliances, tools) and staff (e.g., their size, knowledge, abilities, motivation, working times). Structure is a prerequisite for process quality, which is relevant for all courses as, for example, supply, storekeeping, production, delivery of services and waste management. Normally, the result quality is taken into account first and foremost, as there is little direct contact between producers (of goods and/or services) and customers, and as the latter normally are not aware of or interested in backstage processes or necessities. It is helpful to bring all levels of quality to the surface to make people understand what is happening before consumption and so to learn about sustainable consequences of one's decisions in daily life. This leads towards a

philosophy of sustainable management which covers structure, process and result and thus manages ecological, economic and social aspects.

In the area of nutrition, this means for Home Economics and Nutrition Science not only to start investigations about how to integrate organically grown food into menus of domestic households or school lunches (actually quite popular in Germany and also recommended on a political level, as mentioned above), but also to regard all levels along the food chain, for example the features of

--Places of production: e.g., the conditions for growth of plants and animals, infrastructure, transport, kitchens

--Supply: e.g., the place of supply (supermarkets, local shops, markets), distances between suppliers, their personal relations

--Work: e.g., working conditions, including ergonomic and hygiene aspects

--Technology: e.g., appliances (and their type, size, programs and resource consumption)

--Resources: e.g., natural resources (such as energy, water in modus operandi and bound as (raw)material, for example in appliances or tools), social (staff) and financial (costs and prices) resources.

To put these theoretical demands into more concrete forms and relate them to nutrition in daily life, some examples for sustainable practice in private households might be useful, again based on Western European habits:

--Buying food in local or regional venues

--Planning of menus and food supply according to region and season

--Using tap water instead of bottled mineral water

--Washing potatoes and vegetable not in running water, but in a basin

--Using remaining temperature of electric hotplates and ovens

--Using recycling paper whenever possible

--Switching off lights when leaving a room

--Reducing waste, producing compost, separating and collecting recycling material.

All these consumption habits were quite familiar to domestic households of earlier generations who had suffered from war and related restrictions and limitations. The challenge is to get across to everybody's mind, heart and hands that sustainable behaviour does not only consist in conscious acting and the lack of certain goods, but also in the creation of better living conditions for everybody (Leicht-Eckardt, 2007 and 2008). As many people regard this change to be impossible, we do need trendsetters as well as politicians and scientists who start to celebrate highlights of sustainability in their private lifestyle in a positive way, so that sustainability in daily life becomes fashionable and becomes normal for everybody in due course. This approach works already, manifest for example in the world wide Slow Food movement (www.slowfood.org). Changing individual consumption patterns in the Western world is nothing less than a necessity for mankind's survival on earth, as domestic households enormously contribute to climate change. Politicians and governments are encouraged to take up this challenge. Home economists could, for example, contribute on scientific and applied levels by linking up nationwide figures on climate change with different types of households, thus supplementing existing efforts--such as the development of consumer information and school curricula on sustainability-related topics and the fostering of competences and motivation for all household members towards sustainable nutrition, (Schneider, 2007)--with statistical evidence.

With the attempt to support sustainability in the fields of agriculture and nutrition and to combine scientific insights with practical efforts, the University of Applied Sciences Osnabruck established a new type of centre for applied research.

5. The WABE-Centre of the University of Applied Sciences Osnabruck

In order to tackle food-related obstacles, the University of Applied Sciences Osnabruck, Germany, has developed a concept for a centre for consumer information, nutrition, sustainable food production and post-harvest technology. The new, ecologically designed building was financed by a regional public-private partnership (with the state of Lower Saxony), which brought together the Ruth and Klaus-Bahlsen-Foundation (located in Hanover) and the University of Applied Sciences Osnabruck. The Centre opened in July 2004 and houses the research institute for Home Economics and Nutritional Sciences at the Faculty of Agricultural Sciences and Landscape Architecture. WABE is the acronym for Waldhof-Aktion-Bildung-Erleben (Waldhof-action-education-experience). 'Waldhof is the name of the venue; 'action', 'education' and 'experience' highlight the WABE-Centre's offers. As 'Wabe' in German means honeycomb, the centre's name also alludes to the design of the building and to the multiple educational activities which take place there. The officially so-called "WABE-Centre, Klaus-Bahlsen-House" consists of three parts: the showcase and professional cheese production rooms, the multifunctional rooms for exhibitions and lectures, and the catering kitchen. The building as well as the surroundings are barrier-free and designed to meet ecological standards for architecture, technology and management.

As part of the University of Applied Sciences Osnabruck, the WABE-centre supports the furthering of information on and theoretical knowledge about sustainable nutrition, food production and consumption and its steady integration into daily life.

The WABE-Centre promotes the idea of sustainability in the scientific and practical areas of food production from the farm to the table, and it focuses on scientifically based information and applied education related to all aspects of the food chain and nutrition in domestic households and artisan productions. Waldhof, the land on which the WABE-Centre was built, is the ecologically run research farm of the faculty, about 2 km away from the faculty campus north-east from Osnabruck centre. The Waldhof-farm was certified in accordance with Bioland regulations in 1998; today, about 43 hectars of land belong to the farm.

The honeycomb-shaped parts of the WABE-Centre represent the three focal points of the centre's work to the public as one coherent set of activities:

--Events: In the central seminar-room and the multifunctional group-rooms, events (conferences, meetings, receptions, exhibitions etc.) can be held with up to hundred participants.

--Cheese-production: The WABE-Centre has its own cheese-making facilities where different types of cheese are regularly produced. A viewing area allows visitors to follow the professional cheese production and to try to make cottage cheese themselves.

--Catering: Participants of events are catered by the WABE-kitchen with tasty, seasonal, mainly vegetarian meals with regional and ecologically produced ingredients, prepared with careful use of resources.

The WABE-Centre, meanwhile a quite well known and accepted regional institution, offers information and practical experience to consumers, multipliers and producers. Regional producers who work in agricultural food production, professional kitchens or small food processing enterprises are one of the target groups. Continual improvement in the quality of all services and products, as well as the sustainable use of water and energy in the WABE-Centre, have been acknowledged with the award of the Quality Management and Environmental Management Certification DIN EN ISO 9001:2000 and DIN EN ISO 14001:2005 respectively. Information on forthcoming events, presentations of current projects and results of scientific project work can be found on the homepage (www.WABEZentrum.de). Up to now, approximately 40,000 visitors were in the WABE-Centre, which offers a variety of events for different groups following registration, e.g.:

--Events about farming and nutrition for school classes and other children's groups.

--Guided tours of the WABE- centre and Waldhof with ecological catering

--Seminars and workshops, e.g. workshops on potatoes, cheese and wine.

Furthermore, rooms in the WABE--centre can be rented for conferences, workshops and seminars as long as they fit into the WABE-spectrum. This has become a sort of fashion for regional enterprises, with special events for selected groups of managers regarded as highlights.

Figure 2: Waldhof farm

As an experimental centre for students of Home Economics and Nutritional Sciences, the WABE-Centre provides the facilities for research activities, whilst being a platform for various student projects dealing with farming, sustainable food production, nutrition, consumer behaviour, etc. Mostly, the sustainable approach to food and nutrition is reduced on the level of organic food supply. The WABE-centre, capable of measuring the consumption of energy and water on each appliance separately by meter, focuses on the resource management related to preparing meals (Leicht-Eckardt, 2005 a)--until now mostly a blank area of the food chain which also had become obvious in the study about energy consumption in kindergardens (Leicht-Eckardt, 2002). The holistic approach of the WABE-Centre to sustainability includes the monitoring of all resources, human and other; this entails, for example, the tasks to

--establish and define characteristics of the processes along the food chain as part of quality management and continuous improvement;

--determine of working time and ergonomic burden;

--measure electricity, gas and water consumption based on sustainable resource management (including usage of a solar cooker if possible);

--calculate the costs for producing different qualities and quantities of food and meals.

The reference figures for the target groups of the WABE-Centre mainly focus on domestic households and small farms. For example, the figures monitored by the WABE-Centre of resources needed to produce bread or noodles (such as energy, water, human burden, technical equipment and finances enable farmers to calculate the costs for the production of noodles or bread themselves, and they thus enjoy the benefit on the farm instead of keeping on selling eggs or grain (Bockisch, Leicht-Eckardt, 2006). This research also enables the WABE-Centre itself to calculate costs for staff and other resources and to monitor the sustainability-related consequences of preparing meals in varying quantities and of different standards with a range of technologies and modi operandi for visiting groups. Related surveys are mostly part of students' projects and thesis work and thus integrate scientific reliability with applied research, presenting results to the public on various occasions (e.g. at the potato festival in autumn, or at conferences, exhibitions, etc.). In addition, this work helps integrate the principle of sustainability into the households of students who also occupy key positions in their families and amongst friends, and who, one would hope, may continue the philosophy of sustainability in their later jobs.

Hopefully, more and more institutions along the lines of the WABE-centre will be founded all over the world at universities or scientific institutes, linking theoretical knowledge and practical application on a domestic scale in order to convince households that it is also their responsibility to reduce the negative impacts on the world's climate change. As a model, the WABE-Centre is documented in the German Yearbook of Ecology (Simonis 2005). This is one approach to extending eco-management towards sustainable management in the field of home economics, and it links the domestic households' consumption with market structures and sustainable strategies (Leicht-Eckardt, 2007 and 2008; Linne, Schwarz, 2003 ;Muller et al, 2007).

With the experience of the WABE-Centre on the increase, further reference figures of C[O.sub.2]--balances of domestic households and small rural enterprises along the food chain will become available, which will underline arguments from politicians and scientists about the necessary contributions of domestic households towards sustainability in daily life. On the other hand, these issues can be integrated into vocational training in the field of Home Economics and Nutritional Sciences (Leicht-Eckardt 2005 b) This household-oriented view supplements the efforts towards sustainability on technical level. For example, house owners have been encouraged and financially supported to use solar or wind energy for heating and warm water supply to optimize their C[O.sub.2]-balance (Leicht-Eckardt, 2000 b). At present, we finally have scientifically based figures that include household activities and help us improve this balance and to become aware that the regular preparation of meals and drinks is a significant factor in this process. Further on, with such close monitoring and awareness of the consumption of energy and water, all behaviour patterns, not only those related to the food chain, hopefully can be geared towards sustainability, both in and outside the particular surroundings of domestic households, including all household members. We also should not forget that, due to global markets and climate change, our local and regional behaviour with its individual ecological backpack or footprint affects people everywhere--and the world as a whole (Schmidt-Bleek 2004).

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