

# Family meals and disparities in global ecosystem dependency. Three examples: Ghana, Russia and Sweden

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## Abstract

This article highlights globalization in terms of dependency on local and global ecosystems when it comes to family diets. In an exploratory case study, one typical meal in three household settings in different parts of the world: Ghana, Russia and Sweden, is examined. Food paths are traced to compare the scale of ecosystem dependency. The result shows that ecosystem dependency varies greatly with implications for environmental impact. The Swedish household, as opposed to the Ghanaian and the Russian, is not dependent on local ecosystems for food provision, but increasingly on global systems. Opportunities and constraints for lowering environmental impacts related to diets in different economies are discussed. It is concluded that it is of great importance to create awareness in high-income countries of the dependency on the global ecosystem and the resulting environmental impacts. It is in these countries that opportunities are available for change towards more sustainable diets. It is suggested that further research need to explore in greater depth how ecosystem dependency differs and how that translates into broad spectra of environmental impacts, considering other dimensions of sustainable development as well.

**Keywords** Family meals, ecosystem dependency, sustainable diets, Ghana, Russia, Sweden.

## Introduction

It is an extraordinary challenge to create awareness of the connection between everyday habits, impacts on local and global ecosystems and resulting global envi-

ronmental change.<sup>1</sup> During the whole production chain of goods and services, resources are used and pollution is generated. Households in low-income countries depend on resources derived from ecosystems in the near environment more often than those in high-income countries.<sup>a</sup> On the other hand, households in high-income countries are becoming increasingly disconnected from their local resource base. Through the global trade system, they can consume resources from far away and thus they are to a lesser degree constrained by the health of the ecosystem in the near environment. This has enabled such households to overconsume and thus become the main contributors to global environmental degradation.<sup>2</sup>

In this paper, we present an exploratory study comparing how the scale of ecosystem dependency differs between family meals in a low-, lower-middle- and high-income country: Ghana, Russia and Sweden (according to the World Bank's classification). Our purpose is to create awareness of everyday food habits and ecosystem dependency and, moreover, to generate research questions for more extensive and in-depth research projects. This paper will give examples of how family meals in three types of economies differ when it comes to ecosystem dependence. One is in a rural society in a developing country, Ghana; the second is in Russia, where dramatic changes in the economic system have recently occurred; the third is in an urban Western affluent society, Sweden. After describing the household settings, we will examine one typical meal in each household and the consequences for the dependency on local and glo-

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<sup>a</sup>The World Bank classifies economies according to gross national income per capita into low-income, middle-income (subdivided into lower-middle and upper-middle) and high-income economies (more details are available at <http://www.worldbank.org/data/countryclass/countryclass.html>).

bal ecosystems during the production of these meals. With this as a point of departure, we will discuss opportunities and constraints for lowering environmental impacts related to diets in the different societies.

### Globalization, dependency and environmental impact

The concept globalization has many dimensions such as economic, social, ethical, cultural and spatial, all of which can depend on enhanced integration and interdependence between ideas, people and places. Giddens<sup>3</sup> defines globalization in terms of overcoming special constraints as 'The intensity of world-wide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa' (p. 64). Focusing on trade and economics, Stiglitz<sup>4</sup> defines globalization as 'the removal of barriers to free trade and the closer integration of national economies' (p. IX). He argues that it has the potential to enrich everyone in the world, but that it is not working today for many of the world's poor: neither for the environment, nor for the stability of the global economy. Indeed, living conditions vary vastly in different parts of the world and the disparities are increasing.<sup>5</sup> Households in high-income economies are the main contributors to environmental degradation, through, for example, emissions of greenhouse gases causing climate change that will in its turn cause disturbance to ecosystems.<sup>6</sup> In converting household consumption into energy use, food can count for over

20% of the total.<sup>7</sup> This figure is based on the energy used in the whole life cycle of foods, from production to preparation. There is, without doubt, a good reason to direct attention to food provision in different socio-economic settings, particularly at the household level where everyday habits are shaped and constraints are first-hand experiences.

The three households we have chosen to analyse in terms of family meals and ecosystem dependence are concrete proof of the differences in living conditions existing in an increasingly globalized world (Table 1). Life expectancy in the three countries reflects differences in health status and mortality rates across cohorts. A woman can expect to live almost a quarter of a century longer in Sweden than those in Ghana. Moreover, purchasing power varies greatly, which in Sweden is 12 times greater than that in Ghana and four times greater than that in Russia. Meat consumption is another indication of purchasing power and is also an indicator of protein intake as well as essential vitamins and minerals. In Sweden, far more meat is consumed per capita compared to Russia and Ghana. Meat production is also known for being resource demanding.<sup>7,8</sup> Access to improved drinking water is particularly essential for healthy living: in Ghana a quarter of the population still lacks clean water. The greatest difference of all in the three countries is in total electricity consumption per capita. Electricity is generated today mainly by burning fossil fuels<sup>9</sup> with resulting emissions of CO<sub>2</sub>, the most significant, potent indicators of the differences in global environmental impacts caused by the lifestyles in the

**Table 1** Selected social and environmental indicators in the three countries

Country	Life expectancy in men/women, years (2002–05) <sup>a</sup>	Purchasing power/cap GDP US\$ in PPP <sup>10,c</sup> (2000)	Meat kg per capita (2000) <sup>b</sup>	Access to improved drinking water % population (2000) <sup>10</sup>	Electricity kWh per capita (1998) <sup>5</sup>	CO <sub>2</sub> emission metric tons per capita (1997) <sup>5</sup>	Mean household size persons (2002) <sup>a</sup>
Ghana	56/58	1 910	9	73	289	0.2	5.7
Russia	60/72	8 010	40	99	3 937	9.7	2.8
Sweden	77/82	23 970	70	100	13 955	5.4	2

Sources: <sup>a</sup>United Nations Statistics Division (<http://unstats.un.org/unsd/mi/mi-results.asp?cr>); <sup>b</sup>FAO Food Balance Sheet (<http://apps.fao.org/lm500/wrp.pl?FoodBalanceSheet>).

<sup>c</sup>PPP, purchasing power parity, is adjusted for cost of living differences by replacing normal exchange rates with rates designed to equalize the price of a standard 'basket' of goods and services. These are used to obtain PPP estimates of GDP per capita.

three countries. The environmental effect in Ghana, measured in this way, is far below the figures for Russia and Sweden. Finally, household sizes differ. The mean household size is two in Sweden, which is among the smallest in the world, while Ghana is among the top 20 largest in the world.<sup>10</sup> Small households demand more resources per person than large ones. For example, single-person households use more energy and water per capita than multiple-person households.<sup>11</sup>

These selected indicators of the social and environmental situation in the three countries from which we will present households highlight differences with great implications for everyday life in the households. Indicators of food provision and environmental impact, in focus for our interest, show especially large differences.

### Research projects in the three countries

The descriptions in this article of the three households and meals are based on data from projects in Sweden,<sup>12,13</sup> Russia<sup>14,15</sup> and Ghana<sup>16</sup> carried out between 1998 and 2002. The purpose of the Swedish project<sup>12</sup> was to explore opportunities and barriers in Swedish households for acting environmentally friendly in food provision as well as estimating environmental impact in terms of life cycle energy inputs of the food consumed. The approach was qualitative, participatory and longitudinal. The overall purpose of the Russian project<sup>15</sup> was to create an understanding of everyday living related to food provision, as a basis for relevant home economics curriculum development in a Russian society undergoing great transformation. A detailed survey of food provision was carried out in 105 urban and rural households in about equal numbers. In the Ghanaian project,<sup>16</sup> which was a pilot study, the purpose was to study food provision in households and environmental impact.

### Households and meals

We have selected typical meals from three households from the projects described above. The methodology used in all three projects is descriptive and explorative case study design, with the household as the unit of analysis and food management processes as an embed-

ded unit of analysis.<sup>17</sup> In the Swedish project, 10 urban households were intensively studied over 3 years. A variety of both qualitative and quantitative methods were used. This included combining household self-reports, in terms of assessment and record keeping, with informal interviews. The records kept by the households were food diaries, noting food purchases, meals served, ingredients used and their origin. Life cycle assessment, in terms of energy inputs, were computed for food items commonly used in the households to estimate environmental impact.<sup>13</sup>

In the Russian project, informal interviews and observations were carried out in five households as a pre-study to the survey<sup>14</sup> mentioned above. A complementary study to investigate food paths was undertaken later, using research methods such as on-site observations in shops and interviews with key people in the food chain. The description of the Ghanaian household was also obtained in a pre-study using the same methodology as in the Russian project. On-site observations and interviews were carried out at marketplaces and in supermarkets as well as with wholesale dealers in order to study the origins of foodstuffs.

The three households presented in this article were selected because we believe they represent typical households within special strata of each population regarding food habits and family resources in general. The Ghanaian extended family is typical for a family living in a rural area in the coastal region of Ghana. The single-parent family in Russia is typical for such a family living in an urban area of north-east Russia. In Russia single-adult households make up one-third of the total (more details are available at <http://www.gks.ru/eng/>). Similarly, the Swedish household is typical for an urban household in terms of income, size, housing conditions and food habits.

### Ghana

There are 10 members of the Ghanaian household we studied: a man and his wife in their late 40s, five children, ranging from age 6–20 years, a grandchild who is 18 months old, the man's nephew aged 15 years and the woman's mother aged 72 years. The household lives in a typical rural setting in the outskirts of a village. The man's main occupation is carpentry although he alter-

nates this with farming activities. The woman is a fishmonger, smoking fish for sale. Resources available to this household are income from the sales of stools and coffins made by the man and fish sales by the woman, and products from the farm. Future security is at risk in the household, simply because whatever income received is used for the immediate demands of the family, such as paying school fees and, providing clothing and health care. There is dissatisfaction in this household because of insufficient resources: savings are out of the question. The most important goal for this household is that all children should be educated to the highest level for them to be in better occupations than their parents. Fortunately, two of their children are out of school after going through basic education; the other three, as well as the nephew, are still in school. During the day, only the woman's mother and grandchild are left in the house. All the family members sleep in two rooms, the five older children and the grandmother in one room and the husband and wife and two younger children in the other room. In front of the house, there is a veranda and a large yard with many trees, which give shade to family members during the day and also serve as a sitting and dining area for the children, the man, and his friends when they visit. Two separate, partly completed buildings serve as kitchen and bathroom respectively. The man is trying to complete an additional room, as the demand for privacy and space is of great concern.

The children walk a distance of 2 km daily to school and back. The man has his carpentry shop under one of the trees in the yard. The woman, however, goes daily to the beach, a distance of about 20 km, to buy fish to smoke. Neighbours are a great asset to the family, helping them when the need arises. Neighbours' children help with the carpentry work and at times women in nearby households also help with the fish-smoking, always voluntarily. Family members come to visit once in a while and may help them out; however, as accommodation is a problem, they normally will not sleep overnight. The free time for this family is normally on Sundays, when they attend church or visit friends.

The selected meal from this household is composed of fufu (made from plantain and cassava), groundnut soup and chicken. Fufu is the staple food above all in

this part of Ghana. Preparing it well gives pride to the women of the house, who spend considerable time cooking and pounding it. Chicken is included in small quantities and the groundnut soup is considered both delicious and nourishing. It is made of groundnut paste, ginger, onions, pepper and dried fish. All the food is cooked on a mud stove fired with wood, situated in a small shed in their yard, and food preparation is the sole responsibility of the women. The smoke from the fire frequently causes respiratory and eye irritation among the women and the young children who accompany them. The wood is collected in the vicinity of their farm. Although the household has electricity, they use it only for lighting; they have no electrical appliances such as refrigerator or freezer.

All the dinner ingredients are of local or regional origin. Plantain and cassava are grown on the farm, and the chicken reared in their back yard, fed mainly on food residues. It is the work of the young boys to kill the chicken and this is done the same day as it is consumed. Farming is carried out without pesticides and fertilizers simply because they are too expensive. Groundnut paste, ginger, onions, pepper and dried fish are bought at a market a few kilometres away. The women walk to and from the market for shopping. At the market, most products come from the same region but some of the dried fish may be imported from a neighbouring country. Tomatoes may originate from the region around Accra, which is about 200 km from where the family lives. Farming practices here may entail use of fertilizers, although in small amounts. The transport from Accra is made on an overloaded pick-up bus. Most food is sold without packaging and the customers bring their own basket when they shop. Old newspapers are used to wrap up some of the food. At the market, there is a large variety of locally produced foods, such as fruits, oil and staples.

The garbage that results from the dinner is mainly composed of food leftovers. Whatever is left of this when the chickens have been fed is lumped together and thrown away as landfill in areas near the house. Here, waste from the carpentry work and fish smoking are also deposited, and these areas get flooded during the rainy season. Once in a while the garbage is burned to prevent mosquito breeding, which is a health hazard to the whole household.

## Russia

In the Russian household, situated in a comparatively small town in the north-western part of Russia, there lives a single mother in her 50s and her 16-year-old daughter. They live in one of the many high-rise blocks in the area. The mother works as a librarian but from time to time has several extra jobs to make ends meet. This makes her totally exhausted at these times. She cannot expect any monetary support from her ex-husband, who is living on a very limited unemployment benefit. The daughter is attending a teachers' training college. Their apartment has one bedroom, which the daughter occupies, and the mother sleeps in the living room. The kitchen is small but well equipped, with a gas stove, a refrigerator and a gas heater for hot water. About 45-min walk away the family has a plot, a 'dacha', where they grow vegetables. The mother carries the harvest home or transports heavy loads, such as potatoes, with the help of friends who own a car. In the apartment, there are pickled fruit and vegetables stored away in many places.

There are well-stocked food shops in the neighbourhood and open food markets for vegetables, tubers and other foodstuffs. However, the mother feels she can seldom afford to buy fresh fruit and meat. She is well aware of the importance of eating a well-balanced diet but her food budget is very limited. Nevertheless, she tries to have at least one animal protein-containing foodstuff a day. The most common substitutes for meat are liver, eggs, poultry products (mainly minced chicken) and fish. It is worth saying that the per capita income in the household is lower than the defined minimum living standard. That means that almost all income is spent on buying food that cannot be produced by the household, and for paying the rent. The harvest from the dacha is the base for the family diet. They are almost self-sufficient throughout the year when it comes to potatoes, tubers and other vegetables. Waste generation is limited in this household, about two small plastic bags per day and some food leftovers, mainly vegetables and potato peels. All waste is thrown away, unsorted, down the apartment block's refuse chute.

A typical meal at night could be fried liver with buckwheat, boiled beetroot, and white bread with jam and tea. Pig's liver is a comparatively cheap food. It is either

imported or locally produced. The imported liver comes deep-frozen from Finland, Ireland or the USA, transported by truck and ship. Locally produced liver is from pig farms of different sizes, varying from five to six up to as many as 30 000 animals, and is sold chilled. Small-scale farmers feed their animals with vegetables they grow themselves, and with grain and mixed fodder bought on the local market. The pigs on the biggest pig farms are fed by grain of Russian origin enriched with protein, minerals and vitamins. The protein-rich part of fodder may come either from the south of Russia (as the remains of sunflower oil production) or from the USA, the Netherlands or Germany (the remains of soy oil production). Imported liver is much cheaper than the locally produced.

Buckwheat comes from the central or southern parts of Russia. Transport patterns are complicated: first by railway from the producer to big wholesale traders, situated for instance in St. Petersburg, and then by truck to smaller wholesale traders into the local town and finally to retailers. With this pattern, transportation distances can be as long as 2000 km. Buckwheat is sold either already packed or by weight. In the latter case, there is the opportunity to use one's own plastic bags, left for instance from the previous purchase. This is common when packaging cost is not included in the price. Buckwheat is one of the most common substitutes for potatoes as a garnish, although potatoes are considered to be the major staple food after bread.

The beetroots served are grown at the household's dacha. After harvesting, beetroots are often on the menu, as there are no facilities in the apartment for long-term storage. However, pickled beetroot is stored in as large quantities as the limited space will allow. The jam is home-made from apples and lingonberries. The apples were a gift from a colleague at work. Lingonberries were picked in the forest.

The bread is bought in a shop, baked at a local large-scale bakery and made of flour produced at the mill situated at about 16 km from town. The grain is transported by railway from central or southern parts of Russia or from the southern part of Siberia. The tea is imported from India or Ceylon and packed either in the country of origin or in St. Petersburg and in Moscow. Tea is delivered by ship to St. Petersburg and by truck to the town.

## Sweden

In the Swedish household that we chose to study, there are four members, a man and a woman in their mid 30s and two children, aged 4 years and 1 year and a half respectively. They live in one of the biggest cities in Sweden. The man and the woman both work full-time and they feel, most of the time, that they have enough money for living expenses and are saving to buy a house. When the parents are working, the children stay in a day-care centre in the neighbourhood. Presently, the household lives in an apartment with a fairly large living room, two bedrooms and a kitchen. They own their apartment, which is situated in a rather quiet area of the city, well serviced with small shops. They also own a car that the man uses for getting to work, which is about 15-min drive. He usually also uses the car to take the children to the day-care centre and picks them up, and for bulk shopping. The woman gets to work by tram, about 30-min ride into the city centre.

It is a busy period of their lives, and there are times when they feel exhausted, if the children are sick, for example. But, generally, they seem to cope well and get time to enjoy life. They are in close contact with neighbours and friends who often help out with baby-sitting. Their relatives live quite far away but come to visit several times a year. Food, as in most households, is an important theme. They are concerned and knowledgeable about nutritional and health aspects and they feel it is particularly important that the children get enough fruit and vegetables. They seldom reflect over the environmental consequences of their food choices, although, at least in theory, they have adequate knowledge to do so. Food supply is abundant and in their neighbourhood they can find over 4000 food variants. Season has no meaning and consumption of exotic products such as bananas or litchi fruits is part of everyday life. They focus their environmental ambitions on separating household waste. Just outside the entrance to their apartment house, there is a recycling station where they deposit their waste, and they also separate organic household waste. The municipality, or a company responsible for recycling, picks up waste almost daily. The non-sorted waste is either deposited far away from the city or incinerated in a plant with flue-gas cleaning outside the city.

For a meal during the weekend, when they have invited some neighbours to come and eat with them, the menu consists of pork meat, French fries, frozen vegetables, canned pineapple with sauce and red wine. They choose pork meat because they are used to eating that and the price is low compared to other types of meat. French fries they buy ready-made and store in the combined refrigerator/freezer in the kitchen. They all like French fries and feel it very easy to just heat up in the electric oven. In the freezer, they also have a stock of frozen vegetables. To cook the vegetables, water is boiled on the electric stove and the frozen vegetables are immersed in the boiling water. The sauce is made of ready mixed powder to which milk is added and the mixture is then heated on one of the hotplates on the electric stove. All household appliances are run on electricity provided through the national grid, so there is no indoor pollution from cooking food. After the meal they serve espresso coffee, made in the newly bought coffee machine, of which they are very proud. The man and the woman prepare the meal together after putting the children to sleep, just shortly before the guests will arrive.

The production chain for the ingredients of the dinner spans around the globe and involves numerous processes and labour inputs. The pork meat is usually bought fresh and may be domestically produced but may also be imported from countries such as Denmark or the Netherlands. Animal breeding is carried out in enterprises of up to several thousand animals and if the meat is domestically produced, it has usually been transported about 400 km by truck before reaching the retailer. The pigs are fed on a diet based on a mixture of cereals and protein-rich by-products from the oil industry. About two-thirds of the Swedish cereal production is used for animal feed, and the protein-rich parts of the feed, emanating from soybeans and rape seeds are usually imported from Brazil or Europe, with a distance of 11000 km, and transport is by ship. The meat is sold in portions ready to cook and is refrigerated and packaged in polyethylene and styrofoam.

French fries are bought deep-frozen and the low-cost variants are increasingly imported from countries such as Belgium or the Netherlands. Refrigerated trucks carry the French fries from the producer to the retailer,

a distance of 1000 km. The products may be stored for up to 2 years in refrigerated storage before being sold to the consumer. The frozen vegetables have global origin. For example, broccoli may emanate from countries in South America or Asia, depending on the season. They are sold in plastic bags and usually transported by ship. Packaging weight is usually 10–20 g per kg product for both French fries and frozen vegetables.

Canned pineapple is imported from South-east Asia, a distance about 18 000 km from Europe. Canned products are stored at room temperature, so no refrigeration is needed. Packaging weight per kg pineapple is 350 g metal and 40% of the content in the can is water with added sugar. Sauces are usually bought as powder concentrate to which water or milk may be added during preparation. Ingredients for the sauce mix come from Europe. Wine is imported from south Europe, the USA, South Africa or South America, and sold in glass bottles each weighing 700 g.

## Discussion

### The three households and globalization

The households we studied, their living conditions and the chosen meals, mirror by and large the aggregate picture obtained from the statistics shown in Table 1: the big Ghanaian family with responsibilities for the extended family and their great need for resources that are scarcely available; the food insecurity in the Russian household embodied in the hard labour on the dacha producing what is essential for survival in the winter; the feelings of security and hope for the future in the affluent Swedish household. In the Swedish household, the income was sufficient to buy all needed products and services.

In line with Stiglitz's<sup>4</sup> assessment that globalization so far has not worked for the poor, the Ghanaian household is evidence. In Russia, globalization has led to transformation to a market economy and a greater exposure to global economic forces, but this has resulted in economic hardship for most households, even if real income has risen slightly.<sup>4</sup> The supply of consumer goods on the market has risen sharply, so also food products. However, the choice is still very limited for most households as they lack the economic means to

purchase what is offered. Also in line with Stiglitz's general observations is that in neither Ghana nor in Russia has greater economic stability been achieved. Tracking livelihood changes in individual households in northern Ghana, Whitehead<sup>18</sup> concludes that climate changes, government economic policy, and changes in local and national markets have created a highly constrained and unpredictable living situation for households. It is not far-fetched to assume that this development is highly affected by global forces.

When it comes to the spatial dimension of globalization, on the other hand, as expressed in the Giddens's definition,<sup>3</sup> we can conclude by analysing paths of foods chosen for the meal in the Swedish household that spatial constraints are more or less overcome. With food paths traced to several parts of Europe, North and South America, South-east Asia and South Africa, food provision has indeed become globalized. In other words, using Giddens's terminology, food provision has become disembedded, that is, lost touch with the physical, social and ethical context, and we would add, ecological context.

### The three households and ecosystem dependency

Our household descriptions show clearly that the Ghanaian household is directly dependent on the local and regional ecosystem, and their knowledge and skills related to food provision are essential for surviving. All the ingredients have local or regional origin, including the fuel used for cooking. The whole family is involved in the production and preparation of the food: growing mixed crops on the farm, raising and slaughtering chickens, as well as smoking fish. The additional ingredients for the meal are bought at the market close by. Food provision in this household is embedded in the local context. The meal does not generate much waste that is not biodegradable in the environment. The transformation of resources seems to be close to the vision of the eco-cyclic society, promoted at all levels in the industrial world. Nevertheless, the meal is impacting on the environment:<sup>19</sup> use of wood for cooking fires causes deforestation and smoke from the fire is causing health hazards; use of petrol for food transport to the local market causes air pollution.

The Russian household, in spite of living in a high-riser in town, is also surprisingly dependent on local ecosystems, with the whole yearly supply of potatoes and vegetables produced on the dacha. This is also common among other households in the area.<sup>14</sup> If the pork liver consumed in the meal is locally produced, the dependency on local ecosystem is even more pronounced. The lack of ecological logic in pricing is shown by the fact that the domestically produced pork is more expensive than the imported. That can be explained by the fact that in Russia pork production is less subsidized by the state than the imported pork, making production costs high. Waste from food and packaging is negligible. The Russian household depends on global ecosystems for transport of feed to the pigs and delivery of buckwheat to retailers, flour to the bakery and tea from Ceylon.

Our analysis shows clearly that the Swedish household, as opposed to the Ghanaian and the Russian ones, is not dependent on local ecosystems for food security, but increasingly on global systems. Since Sweden became a member of the European Union in 1994, with the goal of free trade within the Union, the availability of food products from other parts of Europe has increased dramatically. This is also true for foods from other parts of the world and finished products, as well as inputs during the production chain or, for example, pork feed, which is similar to the situation in Russia. The ecological cost of this truly globalized diet is mirrored in the CO<sub>2</sub> emission per capita, which is five times that of Ghana!<sup>20</sup>

In Sweden, the seasonal variation of available foods, traditionally of great importance in such a climate of great seasonal variations, has lost its meaning. In Russia, seasonal variations strongly influence family diets. This is also true to some extent in Ghana. In Sweden, food seasons are 'stretched'<sup>22</sup> over the year with the help of food from distant places, as well as preserving techniques such as deep freezing, commonly and increasingly used in Sweden. Also in Russia, preservation techniques have stretched food seasons. However, traditional pickling and salting, still common in Russia, are far less taxing on the environment than deep freezing, which is one of the most energy-intensive preservation methods.

## Challenges and opportunities for change

What can be learnt from the three households in differ-

ent parts of the world, their typical meals and the differences in scale of ecosystem dependency? Firstly, the environment impacts are probably much more visible when being dependent on local ecosystems, such as in the near environment of the Ghanaian household. In Sweden, where food systems are disembedded in space and time, the awareness of the connection between food provision and the dependency and the impact on the natural environment is lost. Even food preparation, the only process still carried out in the Swedish household, is odour and smoke-free and thus disconnected from the impact on local ecosystems.

The loss of feedback to individual households of the environmental degradation caused by their own food habits, as in the Swedish household, is a serious barrier for changing family diets towards more sustainable ones. Environmental impact needs to be made visible and understood. This is an extraordinary consumer educational task, which needs to be combined with incentives promoting seasonal, locally and organically produced food, such as different pricing systems, effective labelling and legislation. Households in high-income countries also need to respond to the challenge. There are some new, promising trends in the Western world in opposing globalization of food markets.<sup>21</sup> Local alternative food markets are developing in many countries, such as community-supported agricultural groups,<sup>21</sup> farmers' markets<sup>22</sup> and delivering systems for organic foods.<sup>23</sup> These trends are originating from not only ecological but also social and temporal concerns – a desire to acquire food in a social and cultural context, within seasonal variations. There is also an increase in the interest in organically grown food, from both the producers' and the consumers' side.<sup>20,24</sup> What we are witnessing might be a growing insight about the unsustainability of an increasingly global food production system when it comes to the quality of both food and environment.

Another promising trend is the rapid expansion of 'fair trade',<sup>b</sup> typically products from tropical areas such

<sup>b</sup>'Fair-trade' labelling schemes encompass both environmentally friendly production methods and socially responsible trade, for example, long-term contracts, direct trading routes, democratically run producer groups and cooperative organizations, advanced credit and guaranteed minimum prices. The aim is to create more equitable and favourable conditions for small-scale producers in low-income countries, mainly tropical countries.



as cocoa, coffee and tea but now also commonly bananas and orange juice. Goodman and Goodman<sup>25</sup> claim that fair trade seeks to translate the social, economic and spatial distances between growing food and eating it (p. 114). In doing so fair trade recontextualizes everyday practices in the worlds of both consumers and producers in the local context of 'place'.

The increasing fair trade is an indication of the increasing desire of affluent consumers in the North to reconnect and develop more ethical ecosocial relations with producers in the South. Buying fair-trade food products enables households in high-income countries to 'act at distance' to contribute both to environmental conservation and socioeconomic development. It could be argued, for example, that if the Swedish household in our study chose fair trade-labelled cocoa, the major agricultural export commodity in Ghana and a product that cannot be produced locally in Sweden, they would contribute more to sustainable development, in all its dimensions, than if they abstained from buying these products with regard to the high life cycle energy inputs that would be embedded when finally consumed in Sweden.

It is obvious that the power and opportunity to change food habits impacting less on the environment lies in the hands of the consumer in high-income countries. But will Swedish households change their food habits? Both external and internal barriers must be overcome. External barriers today are the high price of organic and fair-trade foods, the limited supply and the sometimes uneven quality. The high price reflects the environmental and social costs of production included in the price. However, there are also a number of other suggestions for changing food habits towards ones with less impact on the natural environment that could be quite feasible in the Swedish household. Just lowering consumption of meat bred on imported feed in favour of local legumes, for example, would mean lower cost as well as lower environmental impact. Buying local fruit, vegetables and tubers when in season, and avoiding buying exotic foods transported from far distances would also lower costs.<sup>7,8</sup> Also, internal barriers such as lack of knowledge and commitment must be overcome. However, awareness or knowledge about environmental degradation does not necessarily lead to positive attitudes, and positive attitudes do not necessarily lead

to green behaviour.<sup>26,27</sup> A change can first be expected when both material and immaterial barriers to action are low enough for inexpensive actions that are ready at hand. Nevertheless, becoming aware of a problem is a necessary step in a change process.

It is clear from the description of the Ghanaian and Russian households that their options for change are more limited. The constraints and hardships of everyday living are substantial, and make changes difficult and sometimes impossible. Proposals relevant to the Swedish household are out of reach or simply unnecessary here. Waste amounts and meat consumption are already low, and the households are already using environmentally friendly transportation modes. It is important to recognize this when discussing global opportunities for change. It is equally important to remember that it is the right of these households to enjoy a higher standard of living in terms of economic development and adopt a Western lifestyle if desired, be it a result of globalization or not. Any development must, however, consider the limited assimilative capacities of ecosystems.

### Implications for future research

The findings of this explorative study suggest a great disparity in global ecosystem dependency of family diets in Ghana, Russia and Sweden. We fully realize the complexity of issues related to ecosystem dependency and implications of environmental impact. Further research would need to explore more in-depth how ecosystem dependency differs and how that translates into broad spectra of environmental impacts. Our findings are, however, useful for the development of instruments for a broader study in the three countries, as well as in other countries. In Ghana, such a study is being planned. Both urban and rural households should be included. This might yield unexpected results regarding food provision and ecosystem dependency, as in the case in this study regarding the urban Russian household. We also suggest that other dimensions of sustainable development covering both economic and social dimensions should be included in the investigation as they are always interlaced with environmental issues. Interesting research questions, generated by this study, is if an increased awareness by demonstrating dramatic

disparities in ecosystem dependency of family diets, such as the ones found in this study, could motivate consumers in high-income countries to choose diets impacting less on the environment, and if informative labelling of foods indicating scale of global ecosystem dependency and environmental impacts could be a forceful tool for a change towards more sustainable family diets.

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