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Strategies and scenarios for managing transition to sustainable food consumption: elements from the "Consentsus" project[1].

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1 Introduction: scenarios in transition management

Despite some criticisms (Berkhout, Smith and Stirling 2004, Meadowcroft 2005, Smith and Kern 2007) the new paradigm of system innovation and transition management has gained much popularity in Netherlands (Kemp and Loorbach 2006, Smith and Kern 2007), Great-Britain (with the ESRC Sustainable Technologies Program) and Belgium (Paredis 2007, Nevens & al. 2008) where it has been considered a convenient framework for designing and steering process of social and technological innovations geared at sustainable development. The approach stems form the observation that past socio-technical innovations have generally been necessarily altogether multi-actor, multi-factor and multi-level.

- Multi-factor: they involved governments, firms, NGOs, research institutes, trade unions and consumers;
- Multi-factor: they were the outcome of the interplay of many factors in interaction (technological, economical, demographical, social, regulatory, etc.);
- Multi-level: they implied changes at several levels of social and political reality. The system innovation and transition management literature generally refers to three levels of change: a micro-level of niches, a meso-level of structuring paradigms and rules (regimes) and a macro-level called landscape. comprising wider societal and cultural trends and characteristics such as individualization, globalization, etc.

"The socio-technical landscape relates to material and immaterial elements at the macro level: material infrastructure, political culture and coalitions, social values, worldviews and paradigms, the macro economy, demography and the natural environment. The second level, that of regimes (meso level), relates to dominant practices, rules and shared assumptions. At the meso level are the interests, rules and beliefs that guide private action and public policy - for the most part geared towards optimising rather than transforming systems. The niche level (micro level) relates to individual actors and technologies, and local practices. At this level, variations to and deviations from the status quo can occur, such as new techniques, alternative technologies and social practices." (Rotmans, Kemp and van Asselt, 2001, p.19).

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Transition management is a deliberate attempt to bring about such long terms changes in terms both of system improvements (improvements of an existing trajectory) and system innovations (influencing or triggering new trajectories) mainly by helping innovations still confined to the niche level reaching the higher (regime) one.

The management transition process is guided by long term (at least one generation but can go up to three generations) goals and visions. The goals refer to broad social objectives and the 'visions' represent particular ideas on how these goals could be achieved. They consist of "inspiring images" of the future state of the sector or domain. Goals and visions are defined in the context of "transition arenas", social settings gathering actors and stakeholders. This perspective has been put to work on several socio-technical systems such as energy (Correlje and Verbong 2004), mobility (Kemp and Rotmans 2004), housing (Paredis 2007), etc. The (still ongoing but effective) transition of the Swiss agri-food chain towards sustainability has also been analysed with the system innovation and system transition concepts by F-M Belz (2004).

It isn't unfair to consider that, so far, the transition management approach has been more production-oriented than consumer-oriented and that it has given more attention to innovations on the supply side than on the demand side of consumption. The Consentsus project aims at testing and assessing the potential of the transition management approach in focusing from start on the consumption side of sustainable development. Its main objectives are:

- to appraise from a scientific point of view the characteristics of scenarios and transition management, amongst others through an analysis from a substantive point of view (what futures do they show us, which driving forces…), a methodological (what methods and tools were used) and a political point of view (what consequences for policy-making);
- to evaluate their usefulness as tools for decision-making, and assess how the Belgian political community welcomes such approaches;
- to develop validated sketches of scenarios and transitions for Belgium in the field of sustainable consumption, relying amongst others on a panel of experts to help develop scenarios, the time horizon chosen being 2050;
- to contribute to the study of the field of sustainable consumption, by choosing consumption patterns – one of the most important drivers of development patterns in the industrialised world – as case study for scenarios and transition management.

For different reasons –among which the ambition to complement an already ongoing transition management process on sustainable agriculture in Flanders (Nevens & al. 2008) – it has been decided to take sustainable food consumption as case study. As we have already stressed, an important stage in the transition management process consists in working out –in a participatory way - a vision (or several ones) of the future from which to "backcast" to the current situation. This scenario-building process has just started and at the time of writing, the first expert workshop has still to be held[2]. Therefore, we will not be able to discuss original visions or scenarios. However, in order to get the most from the expensive sessions of "visioning" and scenarios building, it has seemed preferable to prepare the exercise by identifying beforehand some general abstract "strategies" or discourses" that would help elaborating alternative concrete, imaginative and inspiring scenarios and such that the visions

[2]Though it will have taken place at the time of the conference so we will probably give some first results during the oral presentation.

could boil down to concrete, fleshed out interpretations of these general high level and abstract discourses on sustainable consumption in general. This can be called a "top-down" approach to visions building. The paper will give a presentation of this top-down approach.
It is organized as follow. We begin with a short presentation of visions and scenarios in terms of Weberian ideal-types. We then proceed to the demonstration that a synthetic and formal approach to sustainable development, when interpreted in terms of consumption, leads logically to three main not mutually exclusive "strategies" or discourses, which we called the "efficiency" strategy, the "sufficiency" (or cultural dematerialization) strategy and the "de-commoditization" strategy. The three strategies are then briefly discussed from a general sustainable development point of view and also, but in a very tentative and purely illustrative way, in the perspective of food consumption. We proceed then with an analysis of what we call "eating events" and suggest a way to construct scenarios on "food consumption regimes" by combining different structural elements of the eating events in various possible ideal-typical original eating events, themselves being aggregated in diets, the different strategies being then characterized by the modal split of ideal-typical diets. We conclude with a short discussion of what seems to us a drawback of the SusHouse project and why we believe a top-down, structural approach could help preserving us from this kind of peril.

2 Scenarios as ideal types

There is a wide consensus on the fact that sustainable development calls for a new kind of applied scientific research characterized by interdisciplinarity, an adequate acknowledgment and handling of risks and uncertainties, a long term (or mixed time) perspective, the capability to connect the local to the global and the integration of different kinds of knowledge and different axiological standpoints through participation. We have looked elsewhere on the potential of different strands of applied modelling methods and tools with respect to these requirements (Boulanger & Bréchet 2006). Scenarios can be considered either as complements or as substitutes to these classical decision-making tools. As complementary tools, they could help preparing the construction of a quantitative model by guiding the selection and classification of variables (i.e. as target, control or exogenous variables), the representation of their relationships and by dictating the kind of experiments (simulation) to be run with the model. As substitute, they would offer an alternative when the system to analyse or to steer is too complex and insufficiently known to be reduced to mathematical or algorithmic formulas, an alternative acceptable as second best insofar as it allows dealing – albeit in a less secure and reproducible way- with complexity, non-linearity, uncertainty, etc.

As cognitive and/or normative representations of the future, scenarios are utopia and as such very close to Weberian ideal-types. Indeed, and to make use of another famous Weberian concept, there are many elective affinities between scenarios and Weberian ideal types as the following definition shows:

"*An ideal type is formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct...*" And Weber adds: **"***In its*

conceptual purity, this mental construct cannot be found empirically anywhere in reality. It is a utopia. » (Weber, 1997 [1903-1917], p. 88)[3].

In the Consentsus project we will start from given, theoretically based a priori point of views "one-sidedly accentuated" and make them "fleshed out" by experts during a couple of workshops. As already indicated in the introduction, these points of views consist of three strategies or discourses on sustainable development, namely the eco-efficiency, the de-commoditisation and the cultural de-materialisation strategies. Therefore, our approach is the exact reverse of Weber's one in building his ideal types. While he synthesises and abstracts from the "*great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena"* to form his unified analytical (and purely logical) construct we start from a normative unified abstract construct (e.g. "the eco-efficient society") and flesh it out in order to see with what kind of diffuse, concrete individual phenomena it is compatible with or will engender. Eventually, it is on basis of these individual phenomena that the plausibility, feasibility and desirability of social discourses and proposed strategies are to be assessed. This, scenarios are made of the same building blocs than ideal-types but their construction's process is exactly the reverse of the one used in the ideal-type formation. More precisely, whereas the ideal-type is a synthesis formed through a process of generalization, of induction from the individual phenomena, in the scenarios building process, the synthesis is given a priori and the individual phenomena are deduced (with additional assumptions) from this synthesis.

The identity Weber sees between the ideal type and the utopia is particularly relevant for a discussion of scenarios. In Weber's mind, utopia doesn't necessarily refer to the future nor even to a desirable state of the world. Weber explains, for example, that the idea of handicraft can be worked into a utopia, even without any idea of temporal dimension, just by:

"*….arranging certain traits, actually found in an unclear, confused state in the industrial enterprises of the most diverse epochs and countries, into a consistent ideal-construct by an accentuation of their essential tendencies. This ideal-type is then related to the idea which one finds expressed there. One can further delineate a society in which all branches of economic and even intellectual activity are governed by maxims which appear to be applications of the same principle which characterizes the ideal-typical "handicraft" system*."

Likewise, even if our scenarios are meant to help defining future desirable states, they could as well refer to the present; let us say other possible presents. Time as such has no role to play here except for the fact that the transition will take time but the delineated society in which "all branches of economic and even intellectual activity" would be governed by the maxims of eco-efficiency, de-commoditization or sufficiency could as well be contemporary would-be worlds. Furthermore, in the same way that it is possible to build several scenarios of the same ideal type of eco-efficiency, for example, "*It is possible or rather, it must be accepted as certain*" writes Weber, "*that numerous, indeed a very great many, utopias of this sort can be worked out, of which none is like another, and none of which can be observed in empirical reality as an actually existing economic system, but each of which however claims that it is a representation of the "idea.."*

[3]. "Objectivity in Social Science" from which the definition is taken has been published with others papers in the volume "The Methodology of the Social Sciences" published in 1997 by Edward Shils. From now on we will refer to the online edition of this text at the following address :

http://www.ne.jp/asahi/moriyuki/abukuma/weber/method/obje/objectivity_frame.html

Hence, visions and scenarios are mental simulations, thought experiments through which we check the plausibility, consistency, feasibility and desirability (on basis of some clearly identified values) of strategies presented by advocacy coalitions or by experts as solutions to our most pressing issues on basis of many mundane and trivial consequences, but which are of the utmost importance for our happiness and wellbeing insofar as they shape our everyday life..

3 Towards efficiency in development: a decomposition analysis

The environmental objectives of sustainable consumption can be summarised in two concepts: dematerialization and detoxification. Dematerialization means reducing the amount of material required to satisfy social needs or, otherwise stated, increasing the productiveness of the used materials (Geiser 2001, p.204). Less material used means less natural capital drawn up, less resource depletion, and less material released as waste. Practically, this can be achieved by different means:

- Recycling,
- Reusing,
- Designing products that use fewer materials;
- Substituting non-material services for material intensive services.

Detoxification means reducing the toxic characteristics of materials used in products and processes. Practically this can be achieved by:

- Reducing the volume of toxic materials used in a process or a product;
- Reducing the toxicity of materials used by changing their chemical characteristics;
- Substituting more benign substances for toxic chemicals.

Dematerialization and detoxification are the environmental requirements of intergenerational equity because they preserve the environmental basis of future human activities if not the very existence of humans in the future. They are also fundamental conditions of the preservation of biodiversity.

Sustainability could thus be measured by an indicator of productivity of valuable resources (or of material efficiency) in producing human well-being.
This is the road taken by M. Common (2007) in measuring national economic performance without using prices. More precisely, he proposed to use as indicator of sustainable development the following ratio:

$$\mathbf{S_{it} = WB_{it} / GHG_{it}}$$

Where:

- S_{it} : the sustainability of country *i* at time *t*
- WB_{it} = the level of well-being in country *i* at time *t;*
- GHG_{it} = Green House gas emissions of country *i* at time *t*.

As indicator of well-being, Common uses the product of life expectancy at birth with the reported level of subjective well-being of the population. We will not discuss here this interesting (but debatable) idea and leave open for the moment the problem of measuring and evaluating well-being. On the other hand, we prefer to use the general idea of "Ecological Footprint" (without necessarily endorsing the way it is currently measured and used) as indicator of environmental pressure rather than the more limited GHG. We propose therefore to start with the following formula, where EF for "Ecological Footprint" replaces "GHG" and the time subscripts have been dropped:

S = WB/EF (1)

This formulation can be put in parallel with Nørgärd's (2006) decomposition of what he calls the "overall efficiency" of the production and consumption patterns. He demonstrates that "overall-efficiency" is the interplay of 4 "local" efficiencies: satisfaction efficiency, service efficiency, maintenance efficiency and throughput efficiency. The overall efficiency ratio between the final output (satisfaction) and the primary input ("eco-sacrifice") is thus disaggregated in a succession of interrelated intermediary ratios, as follows:

Overall-Efficiency
= Satisfaction/ Eco-sacrifice
= Satisfaction/Service * Service/Stock * Stock/Throughput * Throughput/Eco-sacrifice

The formula is best understood by starting from the last ratio, the **Throughput/Eco-sacrifice** ratio or throughput efficiency which expresses the productivity of the production process with respect to environmental resources. Then comes what Nørgärd calls the "maintenance efficiency" which refers to the durability, reparability, etc. of the stock of goods. The **Stock/Throughput** ratio is the converse of the goods replacement rate, i.e. the number of new goods entering the stock with respect to the size of the existing stock. The service efficiency refers to the number of services provided by a given stock of goods. This has mainly to do with the way the goods are appropriated and used. For instance, the **Service/Stock** ratio is higher for a taxi than for an individual car, because the former is used the whole day long by many customers, while the latter is most often used only twice a day by one customer only. Finally, the satisfaction efficiency refers to the satisfaction brought by the service. For instance, in the current traffic conditions in town, the mobility service brought by the individual car is less and less satisfying. As Nørgärd (2006, 18) observes:
"The reason for adding satisfaction efficiency … is that in the affluent part of the world, *marginal* satisfaction of increasing services from the market seems to be very low and declining, maybe even below zero."
Nørgärd's analysis of consumption efficiency shows how limited and partial are public and business policies that focus exclusively on the throughput efficiency ratio by aiming only at *decreasing the mass of materials in products*. This is only one part, and perhaps not the most important one, of the answer to the issue of sustainability of our production and consumption patterns. However it is probably the easiest to put at work in a capitalist and technology-driven economy (and culture) because it doesn't challenge their fundamental growth and production orientation. Actually, the more you go from the right of the formula to the left, the more you move away from what is taken-for-granted in our industrial societies and bring into question their deepest and unconscious cultural underpinnings. Indeed, going one step further than the eco-efficiency or "decoupling" policy, a more demanding ecological modernization approach would act also upon the "Stock/Throughput" ratio by encouraging more durable goods and struggling against the "planned obsolescence" of many so-called "durable" goods. This means (Geiser 2001) extending the useful life of multi-uses products[4], designing products for upgrading and adaptation but also for reconditioning and remanufacture and for repair and reuse.
Service efficiency expresses the rate of service acquired from the consumer's stock of goods (durable and non-durable). One effective way to increase service efficiency is to substitute services for products, like in the above mentioned example of the taxi vs. the individual car.

4 On the contrary, one-use products are those that are totally exhausted (except for wastes and pollutions) in the act of consuming, like food, fuel, drugs, etc.

Another strategy in this respect is to foster the sharing of products, as for instance in car sharing. More generally, where the use pattern of a product involves long periods of disuse or the acquisition costs are high, products may be shared among multiple users. Examples are numerous (Geiser 2001, 324): ladders, lawnmowers, washing and drying machines in residential areas; tool and equipment rental stores allowing customers to share the services of hardware and avoid individual purchases; video rental stores giving customers a wide choice of films by sharing the services provided by the individual DVD machines, etc.
Finally, the satisfaction/service ratio expresses the fact that the ultimate goal of consumption is well-being, happiness or needs satisfaction. Clearly, some satisfiers are more efficient than others in bringing satisfaction, or well-being. We will come to this in detail later.

Bringing together Common's and Nørgärd's analysis, we propose to decompose formula 1 in:

S= (WB/C) * (C/EF) (2)

Where **C** = Commodities. Thus **(WB/C)** refers to the productivity of commodities in terms of well-being and **(C/EF)** to the intensity of commodities in natural resources.

Formula (2) shows that sustainability can be improved by increasing **(WB/C),** by increasing **(C/EF)** or both, that is by decreasing the intensity[5] in commodities of well-being, by decreasing the intensity in resources of commodities or both.
Things can be disaggregated further. The term **(WB/C)** can be expressed as:

(**WB/Se) * (Se/C)**

"Se" refers to the notion of service as used by Nørgärd (like in the context of energy and not as used in the national accounting context). Indeed, what matters for the energy consumer is not energy as such (Kw/h) but the lighting, mechanical power, etc. brought by energy. Likewise, what matters for the user of a TV-set is not the TV-set as a thing but the services it provides in terms of TV-programs, etc. One way to define the notion of service in a need-satisfier framework is to define it as the interface between the satisfier and the need or as the "satisfying virtue" of the satisfier. **WB/Se** stands for the productivity of the services in terms of well-being and (Se/C) for "consumption efficiency", the productivity of commodities in producing services**.** The full formula then becomes:

S = (WB/Se) * (Se/C) * (C/EF) (3)

Formula 3 shows that there are three "pure" strategies to enhance sustainability:

1. Increasing the (WB/Se) ratio by decreasing Se while maintaining or increasing WB. This amounts to partly disconnecting well-being from services. It could be called the *sufficiency* strategy.
2. Increasing the ratio (Se/C) by decreasing C. It could be called the *de-commoditization* of services strategy.
3. Increasing the (C/EF) ratio by decreasing EF[6.] This strategy aims at decreasing the energy and materials content of commodities consumption. It is the well-known *eco-efficiency* strategy.

5 The intensity in resource R of a production P is the inverse of the productivity of the resource R in production P. In others words, productivity is measured by the ratio P/R and intensity by the ratio R/P. The more productivity, the less intensity and vice versa.

6 Note that Nørgård's last two ratios are aggregated in our (C/EF) formulation. This means that we don't make a distinction between Nørgård's maintenance efficiency and throughput efficiency.

Before discussing them, it is necessary to note that formula 3 is not complete. It leaves aside the ecological footprint of the consumption of non-commercial satisfiers. Indeed, the proposed decomposition makes a partition between two kinds of satisfiers, commodities and non-commodities, but takes only into account the environmental load of commodities, as if non-commodities were necessarily environmentally neutral. Of course this is an oversimplification and it must be stressed that in the future, if non-commodities consumption should gain in importance, one should certainly scrutinize the tacit assumption that it is in fact as eco-efficient as required.

4 The Three strategies

4.1 The eco-efficiency strategy

If the three strategies have the potential of contributing to more efficiency in the use of natural resources in the wellbeing production process, we limit the extension of the eco-efficiency strategy to those actions taken to decrease directly the intensity in materials (including the non-renewable sources of energy) of the production, use and disposal of *commodities*, all other things remaining equal. By "commodity" we mean "goods, services and experiences which have been produced solely in order to be sold on the market to consumers…(and) produced by institutions which are not interested in need or cultural values but in profit and economic values." (Slater, 1997, p. 25).

The concept of **eco-efficiency** was coined by the World Business Council for Sustainable Development (WBCSD) in its 1992 publication "Changing Course". The WBCSD objective was (and still is) to produce and consume more goods and services while using fewer resources and creating less waste and pollution.
According to the WBCSD, eco-efficiency is achieved through the delivery of "competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing environmental impacts of goods and resource intensity throughout the entire life-cycle to a level at least in line with the Earth's estimated carrying capacity."

Eco-efficiency is what mottos such as "Factor 4"(Von Weizsäcker, Lovins and Lovins 1998) which calls for halving the use of resources whilst doubling wealth, or "Factor 10" (a 90% reduction of resources uses) are about. The fact that the eco-efficiency strategy claims to be compatible with capitalism is made clear by the choice of "Natural Capitalism"((Hawken, Lovins and Lovins 1999) as title for the book published one year after "Factor 4" by two of its authors. In "Natural Capitalism" they criticized Factor 4 for focusing too narrowly on eco-efficiency, i.e. "only a small part of a richer and more complex web of ideas and solution" (p. *x*). They argued that "Without a fundamental rethinking of the structure and the reward system of commerce, narrowly focused eco-efficiency could be a disaster for the environment by overwhelming resource savings with even larger growth in the production of the wrong products, produced by the wrong process, from the wrong materials, in the wrong place, at the wrong scale, and delivered using the wrong business models" (p.*x-xi*).

"Natural capitalism", they said, is based on four strategies:

1. Radical resource productivity: as in former eco-efficiency but at a larger scale;
2. Biomimicry: redesigning industrial system by imitating the functioning of natural eco-systems organised as closed-loop systems where materials are constantly reused;

3. Service and flow economy: changing the relationship between producer and consumer and shifting from an economy of goods and purchases to an economy of services and flows.
4. Investing in natural capital.

With the introduction of a strategy of "service and flow", natural capitalism puts on the agenda an important principle which was lacking in Factor 4. In some way, this strategy can be seen as a kind of embryo of a full-fledged "de-commoditization" strategy. However, let us repeat that the proposal doesn't constitute a departure from capitalism but its reorientation of notably by "making markets work" (title of chapter 13).

The "natural capitalism" concept has been warmly received amongst engineers and firms managers concerned with environment or with their public image. It has given rise to further developments in engineering, design, etc. For example, the closed-loop model of the natural eco-systems is at the core of the "industrial ecology" concept and the idea of biomimicry is nowadays being pushed as far as possible in "green chemistry and engineering" (Doble and Kruthiventi 2007) where former chemical process that needed high temperatures and pressures (and therefore consumed much energy) are progressively replaced with bio-transformation and catalyse occurring at ambient temperature and pressure. Still more spectacular are recent innovations in chemistry based on the imitation of the way living organisms make basic materials such as teeth, hair, skin, shells, bones, tusks, etc.

One recent and popular expression of the eco-efficiency strategy is to be found in the "cradle-to-cradle" movement which claims to go beyond eco-efficiency and "leave aside the old model of product-and-waste, and its dour offspring 'efficiency' and embrace the challenge of being not efficient but effective with respect to a rich mix of considerations and desires" (McDonough and Braungart, 2002, p.72). The fundamental concept of "cradle-to-cradle" is the abolition of the very idea of "waste" by making the case that what was once a waste to dispose off in a way or another, now becomes food for some living system.

This shows that the idea of eco-efficiency has evolved since its adoption by the WBCSB. The level of demands has increased steadily going from simple end-of-pipe solutions (if not mere "greenwashing"), to greening (eco-efficiency, product stewardship) and now beyond greening to "cradle-to-cradle", eco-effectiveness, etc. Of course, it remains to be seen if actual practices have followed tat the same pace…
The important thing is that, whatever their differences, all versions of the eco-efficiency strategy share the following characteristics:

- Confidence in technological innovation;
- Business as the principal actor of transformation. The emphasis is on firms designing new products, shifting to new production processes, investing in R&D, etc. more than on the retailer or the consumer, let alone the citizen.
- Trust in markets (if functioning well);
- "Growthphilia": there is nothing wrong with growth as such. Moreover, with "cradle-to-cradle", growth is *per se* conducive of sustainability.
- No special role for the state except for making market function as they should do (removing barriers to market efficiency) and for providing the right incentives through taxes, subsidies, etc. Actually, the role of the state varies according to the version of the eco-efficiency discourse. It can be as minimal as just guaranteeing optimal functioning of markets or a bit more active by engaging in "smart regulation"(Jänicke 2008). It is in the "transition management" approach to ecological modernization, that

the government has the most important role but in a context of general "reflexive governance".

The eco-efficiency strategy in food consumption would mean maximum dematerialization and detoxification at the different stages of the food chain, which implies considering (Green 2003):

- Inputs to farming (water, chemical, seeds and machinery);
- The agricultural production sector (including fishing),
- The food processing industries and the associated packaging industries;
- Food distribution (including wholesaling and retailing and the transport associated with them);
- Equipment for food storage and preparation;
- Food 'services" (restaurants, canteens and take-away);
- The households activities of shopping, cooking and clearing-up;
- The disposal and recycling of food packaging wastes.

At every stage, the strategy would look for more reducing, reusing, recycling, repairing, and substitution. This would be left to the different actors provided that the state gives the right incentives and information to do so and remove the market barriers which prevent the realization of a technico-economical optimum taking external costs into account.
It is most likely that the eco-efficiency policies from the middle of the food chain upwards will be largely dependent on the kind of food production system that will emerge. Green (2003) distinguish three (the magic number three !) possible system of food production in the future: the ongoing of the 'conventional industrial' system based on advanced breeding techniques and major inputs of chemical fertilizers and pesticides; a "new industrial" system based on crop management using genomics and other resource productivity enhancing technologies; the "organic" system with low capital and inputs intensity but high labour intensity. Actually, only the two last systems have the potential of meeting the eco-efficiency requirement. Pure eco-efficiency strategies at the distribution and consumption stages of the food chain would consists of e.g. biodegradable (if not even eatable) packaging, intelligent storing and cooking enabling more energy and resource efficiency (less waste), virtual shopping (les travelling), etc.

4.2 The de-commoditization (or de-commodification) strategy

De-commoditization of consumption consists in substituting non-commercial goods for commercial ones and non-commercial services for commercial ones. In short it means substituting wherever possible non-commodity satisfiers for commodities. De-commoditization is the reverse of the "commoditization" process described by Manno (2002:70) as the "tendency to preferentially develop things most suited to functioning as commodities – things with qualities that facilitates buying and selling – as the answer to each and every type of human want and need". It is also slightly equivalent to what Hirsch called the "commercial bias" or "commercialization effect" characterized by the fact that "an excessive proportion of individual activity is channelled through the market so that the commercialized sector of our lives is unduly large."(Hirsch 1977, p.84).

Manno operates a useful distinction between goods and services with high commodity potential (HCP) and those with low commodity potential (LCP). The commodity potential is a

measure of the degree to which a good or service carries the qualities that are associated with and that define a commodity. As an example, Manno considers the need children have for playing. At the most commercial end of the scale, it can be satisfied with mass-marketed toys such as Barbie dolls which are inexpensive, marketed worldwide, whose production and distribution is energy and waste intensive. In the middle of the scale, one finds locally produced, handcrafted toys, dolls and games usually made from renewable materials and with local or culturally idiosyncratic designs. Finally, at the far-end of the commodity-potential scale are activities and games that don't necessitate commercial objects.

Table 1 shows some if the main differences between HCP and LCP goods and services as well as the negative and positive effects of commoditization.

Table 1. Differences between HCP and LCP goods and services

Attributes of goods and services with high commodity potential	*Attributes of goods with low commodity potential*	*Negative effects of commoditization on development*	*Positive effects of commoditization on development*
Alienable, excludable, Patentable Simpler to establish property rights and prices	Openly accessible, inalienable, difficult to establish rights, widely available, difficult to price accurately	Accelerates decline of sense of community Skills and capacity for managing "commons" decline	Release individual and corporate entrepreneurial energy Ability to manage individual property and promote personal gains improve
Standardized, universal, uniform, adaptable to many contexts	Particular, customized, decentralized, diverse, dependent on context	Reduces cultural and geographic diversity Not necessarily suited to particular ecosystems Crowding-out of locally appropriate options	Allows rationalization of production, economies of scale and transfer of skills Greatly increase (human and capital) productivity
Autonomous, depersonalized, Use independent of social relationships, primary relation between consumer and product (product oriented)	Embedded, use or practice occurs in a web of social and ecological relationships (process oriented)	Promotion of individual consumption reduces the efficiency gains made possible by sharing, increases flow of material and energy. Excessive autonomy undermines social relationships	Minimizes the complications of relationships. Advances freedom of individuals
Mobile, transferable, easy to package and transport	Rooted in local ecosystem and community	Propensity for mobility increase flow and export of energy and material	Enhance trading , foster development of markets
Contributes to production efficiency More is produced per unit of currency expended	Contributes to consumption efficiency More satisfaction per unit of material and energy expended	Neglects the potential for achieving sustainability through increased satisfaction with less material	Increased production efficiency create more wealth and greater availability of materials goods and services
High capital intensity, low energy productivity, low labour intensity, high labour productivity	Low capital intensity, high energy productivity, high labour intensity, low labour productivity	Eliminates jobs, encourages replacement of workers with fossil-fuel energy	Increased productivity fees capital to invest in new productivities activities, creating new jobs.
Economically efficient, the most exchange value for a given investment	Sufficient, optimal service for minimal expenditure of material and energy	Reduces capacity to develop low-impact lifestyles	
Contributes to GNP,	Contributes little to GNP	Public policy goals	GNP represents accurate

GNP growth measures commoditization		become tied to growth in size of economy rather than improvement in quality of life	measure of economic activity and is closely related to improved quality of life
Source Manno (1999)			

One would add another crucial difference missing in Manno's analysis: HCP goods and services are demand-oriented. If the corresponding needs are missing they are being created through marketing and advertising. The reverse is true of LCD goods and services: they are needs-oriented, even if the demand doesn't exist because of poverty and destitution. In that case, the demand can be created by public allowance or any social program. So, the poor can be excluded from the consumption of HCP goods and services, which is less the case with LCP ones. The process of commoditization is self-supported. Actually, the market economy acts as a "milieu" exercising selection pressures on satisfiers that are more favourable to commodities than to non-commodities, giving the latter less opportunities to survive. This doesn't mean that one cannot find localized niches for less commoditized ways to satisfy needs but these, by definition, remain marginal.
"Given the selection pressures of commoditization, however, unless public policy deliberately intervenes, HCP goods and services inevitably outcompete LCP goods and services…Commoditization pressures act over time to gradually and inexorably expand the number of commodities available, the geographic spread of their availability, and the range of needs for which commoditized satisfactions exists." (Manno 2002:72-73).

It follows that de-commoditization is more or less synonymous of de-marketisation, a partial decoupling of consumption from demand. According to Harvey and al. (2001, p.4):
"… a useful distinction (is) to be made between demand and consumption, process now too frequently conflated. Demand signifies the concerns of suppliers in markets and thereby focuses upon the possibilities and terms of commodity exchange. Consumption refers to a much broader set of social practices whereby people utilise services and products which are only sometimes acquired by purchase in a market and which are deployed in the context of social values which transcend the confines of instrumental and rational calculation".

Decoupling consumption from demand, limiting the influence of markets amounts to increasing the influence of others systems or organisations through which we satisfy our needs and aspirations, that is, others "modes of provision". A comparison of the different possible modes of provision is given in Table 2. The relative importance of the different systems of provision in society in general and in the production, distribution and consumption of food in particular depends on the technology available, the environment and the cultural system of the society. As is well-known, modernity as described by Marx, Weber, Durkheim, Tönnies and de Tocqueville is characterised by the supremacy of markets and bureaucracies at the expense of communities and families.

Table 2. A typology of modes of provision*. Source: Harvey and al. (2001)*

Mode of provision	*Manner of obtaining service*	*Who does work*	*Who pays (if anyone)*	*Principle over which service is obtained*
Market	Commercial purchase	Paid employees	Consumer	Market exchange
State	Claim to entitlement	Paid employees	State (tax payer)	Citizenship right

Communal (cooperatives LET)	Personal interconnections	Neighbours or acquaintances	No money involved	Reciprocal obligations
Domestic	Household Do-it-yourself	Members if household	No money involved	Family obligation

From a de-commoditization point of view, sustainable consumption would correspond to a shift in the "modal split", the extant distribution of the different modes of provision through population. If we group together the domestic and the communal modes of provision under the general heading of "communal sphere", we may illustrate the de-marketisation (or de-commoditization) strategy with the help of an equilateral triangle as in figure 1.

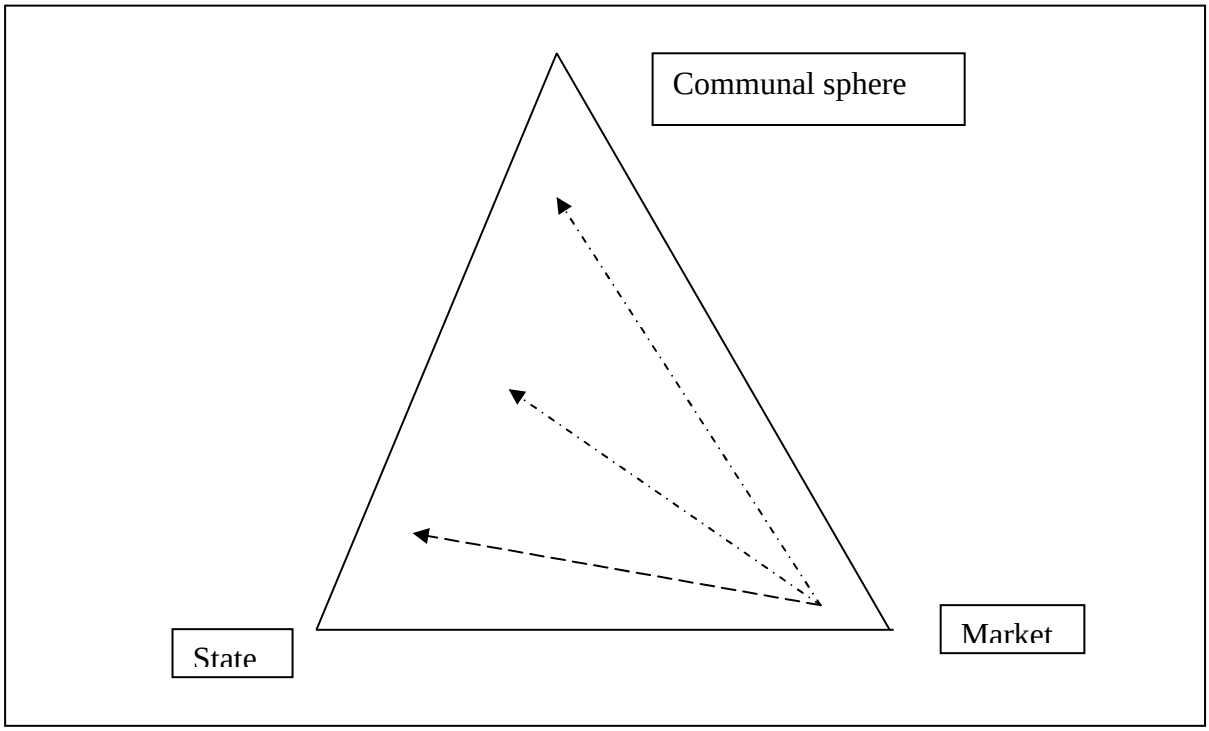

Figure 1. The modes of provision triangle

Let us call "consumption pattern", the proportion of energy and materials services consumed by households (shares of households' time-and-money budgets) respectively in the form of commercial commodities, of public services and goods and of communal goods and services. Every consumption pattern could be symbolized by a point in an equilateral triangle, the distances between each point and the three sides of the triangle expressing the proportions of consumption occurring under the market, the state and the communal mode of provision[7]. Points situated at the angles are pure state, market or communal consumption patterns, all other involve, though in very different proportions market, state and a community components. One calls "modal split" the most frequent consumption pattern in a given society (Gershuny 1983). In consumer societies, the great majority of consumption (hence the modal split) concentrates in the right bottom area.

[7] The idea of using equilateral triangle for this kind of display comes from Kolm (1984). Note also that the same representation can be used for every good and service taken separately. Indeed, pure "commodities" in which there would be no intervention at all of the state are very rare. The same could be said of public or communal goods and services. Therefore, the modes of provision can be said to have a fractal dimension

Indeed, the consumer society resulted from an historical trend (maybe still ongoing) of commoditization, i.e. of transferring the provision of services or goods from non-market systems of provisions to the commercial one. But, as Warde put it:

"The history of consumption might be written as a process whereby activities shift between spheres – from the household to the market, and sometimes back again, from the market to the state, and sometimes back again." (Warde, 1997, p154).

De-commoditization consists in bringing some activities back to the non-market sphere, the public and communal sectors. Needless to say, this will not be an easy strategy to follow in an age of almost religious faith in the virtues of the market and of distrust in those of the state and perhaps still more, of the community. Indeed, much of the activity of the European commission has consisted in taking goods and services away from the public sector and committing them to the market. However, things could have gone otherwise: from the public sector to the communal ones.

4.2.1 Examples of (totally or partly) de-commoditized modes of provision

4.2.1.1 Product Service Systems: a first step towards de-commoditization?

As explained above, the idea of substituting flows of services for stocks of goods can be considered a first step towards a de-commoditization of the production and consumption patterns. The "Product Service Systems" (PSS) program supported by the UNEP (2002) aims at fostering a shift from individual product ownership to a management arrangement of utility provision with a mix of products and services. The PSS "encourage collective activities by advocating systems of leasing, sharing and/or pooling of resources as well as alternative institutional structures that enable these kinds of arrangements. They recommend more intensive use of products and tools for consumption as well as more producer-consumer interaction"(Briceno and Stagl 2006, p.1543). PSS initiatives can be business-led or consumer-led. Not surprisingly, the latter appear to be more concerned with sustainable consumption than the former...
So far, it doesn't seem that the PSS have been really satisfactory from the environmental point of view. Furthermore, they have also proved unsatisfactory from the human and social perspective though they are supposed to take into account the social context of consumption (UNEP 2002).

4.2.1.2 Local Exchange and Trade Systems: what potential?

"Local Exchange Trading Systems (LETS) also known as LETSystem**s** are local, non-profit exchange networks in which goods and services can be traded without the need for printed currency. LETS networks use interest-free local credit so direct swaps do not need to be made. For instance, a member may earn credit by doing childcare for one person and spend it later on carpentry with another person in the same network. In LETS, unlike other local currencies no scrip is issued, but rather transactions are recorded in a central location open to all members. As credit is issued by the network members, for the benefit of the members themselves, LETS are considered mutual credit systems." (Wikipedia).

The potential of LETS (Local Exchange and Trade Systems) as systems of provision has also been assessed by Briceno and Stagl (2006) through a survey of the (unfortunately very limited) empirical literature on these systems. This potential for sustainable consumption can be inferred from facts such as the following:

- For 62% of members of a surveyed LETS, more than 20% of the transactions are innovative ideas, offering new concepts and services. Examples include artwork, health services, repair work, Internet services, house-chore help, etc.
- Seyfang's (2001) survey on the Kwin LETS gave the following information: 91% of participants agreed with the fact that development should involve less consumption but greater quality of life. 77% felt that LETS was a greener economy than the mainstream economy. 40% felt their quality of life had increased with LETS and 31% felt more able to live a greener lifestyle. 23% claimed to have been more environmentally aware of their localities through LETS. 45% of the members bought recycled or second-hand equipment from within the scheme, 25% directly reduced consumption and 37% of traders got property repairs.
- From another LETS, Seyfang (2001) reports that maintenance and repair work was the third largest good or service bought, consumed by 31% of the members.
- In general (Williams 1996), there are many programmes of tools and big-equipment leasing, laundry-machine sharing, car and transport servicing and collective workshops.

In sum, LETS encourage the localisation of the economy, decreases transportation pollution and costs and change consumption patterns. They foster sharing, pooling, reusing, recycling and repairing. Moreover "they promote and develop new skills and self reliance and are thus effective in meeting many needs of humanistic and social nature that have been neglected in the mainstream economy." (Briceno and Stagl 2006).

4.2.1.3 Public Services

Not so a long time ago, an important proportion of households' consumption was provided by public services, or by state-owned or partly state-owned firms. It was the case for electricity, water, telephone, broadcasting, television, etc. Before the reign of the individual car, most if not all, travelling by train, bus, ship and airplane was provided by public enterprises.

Generally, the public services used to be organised and managed at the highest institutional level. But local authorities can also be providers of goods and services to their populations. For instance, it is often the case in cities big enough to need and afford an urban transportation system.

Many public services in Western societies have been dismantled under the pretext that they were less efficient than private, commercial services. However, there is nothing definitive in this and sustainable development might make necessary to reverse the trend, notably because it entails a redefinition of efficiency which takes into account environmental concerns.
On the other hand, many goods and services which cannot be efficiently provided or managed at the state government level could be so at a lower institutional level. Notably the risk of bureaucratisation and of corporatism is more easily controlled when working at the local level. Indeed, there is a tendency to revisit the notion of public service in the perspective of a "new municipalism":

"*A new municipalism is emerging, and characterised by attempts to expand municipal sovereignty, democratise municipal governance, and strengthen the role of municipalities … Municipalities across the country are increasingly taking responsibility for public concerns abandoned by the federal and state governments, and passing local minimum wage laws, employment and housing regulations, bans of the use of pesticides and genetically modified organisms, and establishing public cable, wireless internet, and energy services."(Manski and Peck,p.166)*

In sum, the-commoditization is giving more importance to the public (especially, perhaps, local authorities) and the communal sectors (families, neighbourhoods, communities) in providing for more needs and wants definition and satisfaction. But de-commoditization is not a yes-or-no process. It refers to a whole range of transformations, from the less to the most radical. For instance, the re-settlements of small retailers in the city centres at the expense of big supermarkets at the periphery can already be seen as a weak de-commoditization measure.

Modes of provision can be mixed as if, for example, "rather than providing completed final services, the state might – as for example in the care of the very young and very old people – provide the material equipment and infrastructure, building and furniture, books and toys, and medical equipment, together with 'intermediate services' in the form of professional advice, which would then be used by community groups to provide the final services themselves, using their own direct, unpaid labour." (Gershuny 1983, p.41).

One of the most striking features of the recent transformations in the food sector is its rapid and pervasive commodification. Cheng, Olsen, Southerton and Warde (2007) have analysed through time diaries, the change in patterns of food consumption in UK between 1975 and 2000. From figures on the increase of time passed eating out, the decrease of time devoted to preparing meal and eating at home and the reduction of the allocation of time for entertainment and visiting, they conclude that commodification has indeed increased. Furthermore: "The vast range of alternative sources of a meal, prepared and delivered by paid workers and distributed in accordance with the logic of commercial competition and exchange, is testimony to the rapid generalized development of a mode of food provisioning which has moved beyond the domestic sphere". (Cheng et als. 2007: 54).

Note that if the decrease in the time allocated to cooking and eating at home has been observed in almost every OCDE countries, there exists exception. French households keep on devoting higher proportions of their time to preparing and eating meal at home. Moreover the mean time has not decreased between 1970 and 2000. 95 minutes per day it was in 1970, 96 minutes it still is in 2000. Compared with the 66 minutes in Netherlands, the 54 minutes in UK and the 50 minutes in Norway (Régnier, Lhuissier et Gojard, 2006), this shows there subsist important cultural differences in food consumption patterns. However these data don't account for the huge commoditization process incurred by the products themselves. Referring back to Manno's comparison between HCP and LCP goods, agricultural products have undergone a massive shift from LCP goods to HCP ones. Products that were formerly highly diversified, locally rooted, perishable, non-standardized, hard to transport and non immediately usable have become standardized, universalized, easily transportable, disconnected of ecological and cultural contexts and ready to heat, or to eat. In fact, fresh products are nowadays just one, and perhaps not the most important kind of food available for consuming alongside with appertized tinned food, industrial deep-frozen food, cooked or raw ready-to-use under vacuum, dehydrated, freeze-dried or ionized and industrially cooked ready-to-heat meals. For instance, the market share of ready-to-heat meals has increased with

50% since 1997 (Tischner and Kjaernes 2007). New innovations are steadily arriving on the supermarkets' shelves like finger-food and "drug-food" - called "functional food"[8]- which might be considered the climax of food commoditization, except maybe for the nutritional pill. It is important to remark, however, that the overall environmental impact of all these changes is unclear.[9]

4.3 The sufficiency and cultural de-materialisation strategy

The sufficiency strategy consists in:

a) Getting the maximum well-being from each unit of material service consumed (sufficiency).
b) Minimising the role of material services in the production of our wellbeing. (cultural-dematerialization)

The extant high level of consumption in western societies (and more and more in non-western societies as well) could not stand without a socio-cultural conception of well-being and happiness that foster the pursuit of "materialistic" values ('indulgence', 'pleasure", 'comfort') more than non-materialist values of self-control, spirituality, simplicity, etc. It follows that "…interventions aimed at reducing consumption will be most effective if they bring about higher-level changes in the socio-economic-cognitive system – i.e. by changing cultural values or worldviews." (Brown and Cameron, 2000, p.34).

As Kate Soper (2007) argues, this amount to re-think collectively the "good life" and define together an "alternative hedonism". The kind of value system (and of cultural change) corresponding to the adoption of this "alternative hedonism" discourse might be analysed with Sorokin's typology of "mentalities". In the 4 volumes of its *magnum opus* "Social and Cultural Dynamics" published in 1937-41, the American (formerly Russian) sociologist described and analysed the manifestation through history and across countries of three fundamental "mentalities", i.e. paradigmatic conceptions of:"

a) the nature of reality;
b) the nature of human needs and ends to be satisfied;
c) the extent to which these needs and ends are to be satisfied;
d) the methods of satisfaction". (1957, p.25).

More precisely, he assumed that:

> 1) Reality can be apprehended as nothing more than what the organs of the senses can perceive or, on the contrary, as something behind (or beyond) the perceived world. In the latter case, what the senses perceive is only a misleading appearance (if not pure illusion) hiding the true reality which is immaterial and transcendent.
> 2) Needs may be viewed as purely (or mainly) sensual or mainly as spiritual "like salvation, of one's soul, the performance of sacred duty, service to God, categoric moral obligations and other spiritual demands which exist for their own sake, regardless of any social approval or disapproval" (p.26). But Sorokin considered also the possibility of a mixed conception "like the striving for superiority in scientific, artistic, moral, social and other creative achievements, partly for their own sake and partly for the sake

[8] For a useful discussion of functional food see Lawrence and Germow (2003).

[9] For a synthesis of main trends in food consumption and a discussion of their impacts, see Michaelis & Lorek, 2004, pp15-23.

of human fame, glory, popularity, money, physical security and comfort, and other 'earthly values' of an empirical character" (p.26).
3) Concerning the extent to which needs are to be satisfied, different levels are possible from the most luxurious to the barest minimum.
4) Sorokin distinguished three strategies for satisfying needs: two "pure" strategies and one mixed. The first consists in modifying the milieu in order to yield the means of satisfying needs. The second consists in modifying oneself: "one's body and mind, and their parts – organs, wishes, convictions, or the whole personality- in such a way as to become virtually free from a given need, or to sublimate it through 'readjustment of self'". The mixed strategy consists in acting both on the self and on the environment.

On this basis he distinguished two "pure" mentalities: the "sensate" and the "ideational" one and a mixed type he called "idealistic". These different mentalities manifest themselves in all cultural productions of society: art, science and philosophy, law and justice, and personality.

If Sorokin is right in his typology, the mentality of un-sustainable growth corresponds clearly to the passive sensate "mentality" and the sufficiency and cultural de-materialization strategy would consist in shifting to an active, if not, ascetic ideational one, perhaps after a transition phase of idealistic culture. This is not deny that all human life is based on materialism but as Wilk forceful stated (2001:258): "I certainly agree with Miller that all human life is based on materialism, but I firmly believe that not all materialism is equal".

Table 3 ***Sorokin's theory of mentalities***

The ideational, sensate and idealistic mentalities according to Sorokin					
	Ascetic ideational	Active Ideational	Active Sensate	Passive Sensate	Idealistic
Reality	Ultimate reality, eternal transcendental	Both with emphasis on eternal non-material	Sensate, empirical, material	Sensate, narrow and shallow	Both equally represented
Main needs	Spiritual	Both with predominance of spiritual	Manifold and richly sensate	Narrow sensate	Both equally represented
Extent of satisfaction	Maximum	Great but moderate	Maximum	Maximum for narrow sensate needs	Great but balanced
Method of satisfaction	Mainly self-modification	Both with prevalence of self-modification	Mainly modification of environment	Utilisation (exploitation) of environment	Both ways

The de-materialisation strategy could also be stated in the language of cultural theory. Cultural theory (also known as grid-group theory) has been put at work on several occasions on sustainable development and consumption issues. For instance, Thompson and Rayner (1998) clustered attitudes to sustainable development in terms of Cultural Theory and Dake and Thompson (1999) found from a household survey in Britain that lifestyles and consumption patterns were correlated with these cultural types. Likewise, Jackson and Michaelis (2003) link different attitudes, values and beliefs related to sustainable consumption and the environment to the traditional, individualist and egalitarian types of cultural theory.

Table 4. Cultural theory categories and sustainable consumption

	Traditional/hierarchy	**Individualist/market**	**Egalitarian/community**
Example	20th century civil service or large company	stock exchange, Silicon Valley	monastery, professional association
Goals/moral goods	stability, order, solidarity	liberty, opportunity, efficiency	equality, fairness, solidarity
Social role of consumption	communicate/affirm status/role	self-expression, affirm individual identity	membership of group, affirm collective identity
Problems with consumption	tastelessness of mass consumption; loss of traditional foods, crafts, social structure.	market distortions and barriers constrain freedom of choice: insufficient consumer information/empowerment	inequity between consumers; exploitation of workers; unfair terms of trade.
Diagnosis of environmental problems (Thompson and Rayner, 1998)	population growth, irresponsible behaviour by firms, individuals	lack of market signals reflecting environmental goods/costs	profligate consumption, pursuit of power/self-interest by firms, individuals
Preferred solutions for sustainability	regulation, pollution control, better planning	internalisation of environmental costs, better frameworks for technological/business innovation	public/stakeholder dialogue leading to shared goals/solutions
Preferred mode for sustainable consumption	consuming responsibly	consuming efficiently	consuming less

Source: Jackson and Michaelis, 2003, p.44.

Finally, Michaelis and Lorek (2004) use cultural theory as a heuristic device for categorizing consumption patterns (see figure 2 below) and for structuring scenarios of changes therein.

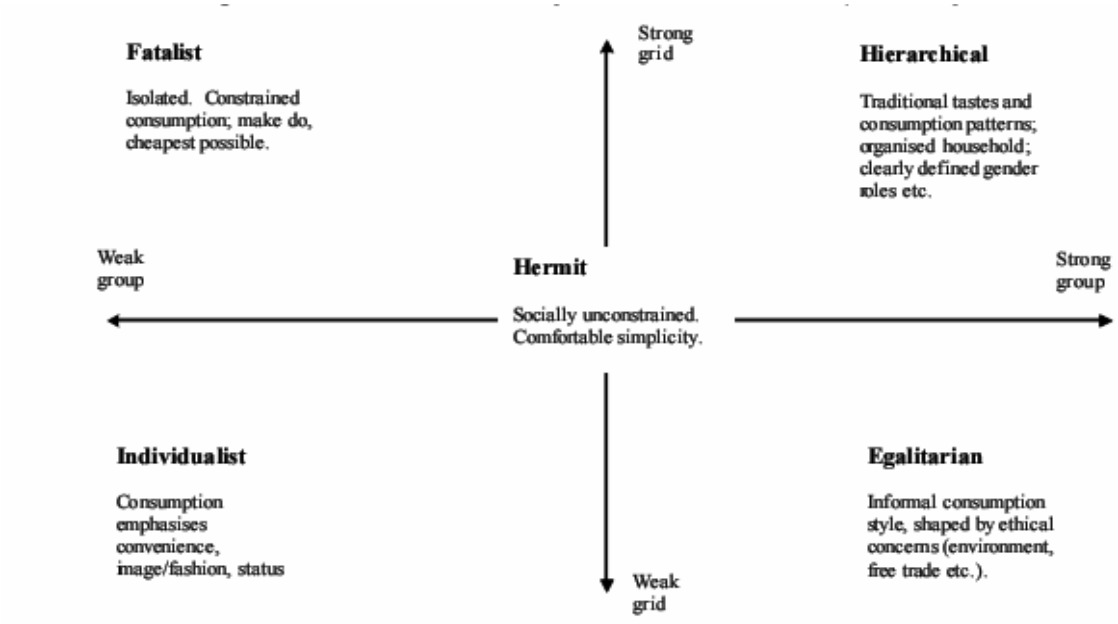

Figure 2. Consumption patterns according to cultural theory. Source: Michaelis and Lorek (2004), p.67.

At present, in western societies, only a small minority is really endorsing the sufficiency principle. It is advocated mainly by very small (even if burgeoning) groups of activists in name of "de-growth" or of voluntary simplicity and also by a handful of scientists be they psychologists (e.g. Kasser), sociologists (A.Etzioni, amongst others), economists (e.g. F. Hirsch, T. Scitovski, R. Frank, R.E. Lane, R. Layard) or philosophers (K. Soper), etc.

But, very recently, it has become an official national strategy in at least one country in the world: Thailand. This country officially fosters what is called a "sufficiency economy philosophy". Its main principles are summarized in the following box.

"Sufficiency Economy" is a philosophy that stresses ***the middle path*** *as an overriding principle for appropriate conduct by the populace at all levels. This applies to conduct starting from the level of the families, communities, as well as the level of nation in development and administration so as to modernize in line with the forces of globalization.*
*"****Sufficiency****" means moderation, reasonableness, and the need of self-immunity mechanism for sufficient protection from impact arising from internal and external changes. To achieve this, an application of knowledge with due consideration and prudence is essential. In particular, great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fibre of the nation, so that everyone, particularly public officials, academia, businessmen at all levels, adhere first and foremost to the principle of honesty and integrity. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable to create balance and be able to cope appropriately with critical challenges arising from extensive and rapid socioeconomic, environmental, and cultural changes in the world."*
Source:UNDP Thailand Human Development Report 2007.

Western populations have in general a highly "materialistic" nutrition in the sense that they eat generally too much with respect to their real biological needs considering their lack of physical activities and, in particular, too much meat, fat and sugar in the form of bottled drinks.. Conversely, they under-consume vegetables and fruits. This food consumption pattern lead to public health problems linked to overconsumption of sugar and fat and to spreading overweight and even obesity: high blood pressure, coronary heart diseases, certain types of cancers, diabetes mellitus type II, strokes, tooth decay, osteoporosis.

5 From strategies to scenarios

After having defined these general strategies, the next step is to work out scenarios of alternative food consumption futures based on each of the identified discourse or strategy. So doing we expect uncovering their full potential for sustainable development as well as their internal and external limits and tensions or contradictions. Afterwards, it should be possible to build more realistic scenarios by mixing elements of the three strategies on the basis of the appraisals of the strengths and weaknesses of each strategy taken separately. More precisely, structural elements of the three images will be combined into one or several coherent narratives. The process will be expert driven combining explorative and normative elements.

This approach will hopefully allow us to make valuable conclusions about how 'sustainable' these strategies actually are (or how their logic can be applied in sustainability research).

However, an important question has been left aside, so far. What exactly are we going to envision? The three general strategies must first been translated in the language of food consumption and the language of food consumption itself must been more precisely defined.

5.1 Scenarios of what?

What are we talking about when we talk of sustainable food consumption? Actually, this question is not specific to food consumption, it arises with all kinds of consumption. In fact, it is consumption that poses problem, not food, or clothes, or leisure, etc. Yet, this doesn't imply that all domains of consumption might or should necessarily be dealt with in the same terms, with the same conceptual apparatus.
The concept of practice put forward first by Bourdieu (1980) then by Giddens (1984) and (but in a slightly different meaning and context) McIntyre (1984), has been recently revisited by Schatzki (1996, 2001) and Reckwitz (2002) and is gaining more and more support as unifying concept for all kinds of consumption. Warde (2005), whilst acknowledging the rudimentary and heterogeneous state of theories of practice advocates that they have the potential to help sociologists get out of some pervasive misleading and artificial dilemmas which have plague social sciences, notably the oppositions individualism-holism, homo oeconomicus-homo sociologicus, realism-relativism. Reckwitz (2002, p.249-250) gives the following definition of practice:
".. A 'practice' (…) is a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge…. A practice is thus a routinized way in which bodies are moved, objects are handled, subjects are treated, things are described and the world is understood".

Therefore, practices are altogether "doings" and "sayings", activities and their (cultural) representations. However, so far, it is unclear how the concept can really help in analysing and understanding consumption. Did we need the concept of practice to be aware that many activities in everyday life are routinized, that as symbolic animals, humans don't just act or behave but talk about their behaviours and develop mental representations about them?
Actually, few- if any- applications of the so-called practice theory in consumption analysis have led to new information, new data, new insights or new hypothesis. Gram-Hanssen (2007) is a good illustration of the fact that the practice's conceptual apparatus doesn't shed new light nor bring new perspectives on already well-known phenomena such as inconspicuous consumption. But, as Warde (2005: 137) observes, consumption as such is not a practice but "a moment in almost every practice". Therefore it would follow that the right subject-matter is not consumption as such but practices, consumption having to be looked at only from the practice of which it is a moment.
Unfortunately, this is not so easy to put at work especially on topics such as food consumption. In their recent analysis of UK time diaries from 1975 to 2000, Cheng, Olsen, Southerton and Warde (2007) and contrarily to Warde's own recommendation, analyse the evolution of eating as a practice *per se*, not as a moment in other practices. By the "eating practice" they understand eating and drinking at home, food preparation, entertaining and visiting, and eating and drinking away from home. So they concentrate on a restricted class of

eating events, generally more or less "traditional" meals and overlook others practices of which eating is only a moment and generally not the most important one, like when dating a girl, or nibbling while watching TV, or receiving colleagues or friends, etc.

Indeed, as Tischner and Kjaernes (2007) put it: "Still, practices that involve eating are also very diverse. They may, for example, include the practices of making and consuming family meals, of maintaining health, strength and functionality as part of doing other things – work or leisure activities, as well as socialising with others, of pausing and resting, of celebrating, etc." Yet, from a sustainable consumption perspective, all these eating moments might be important. For instance, a growing part of calories intake in USA comes from several (up to 20 per day) but very short eating events (almost nibbling one) at work, while waiting for a train or a subway, while watching TV or a movie, etc. As a matter of fact, the latter kind of "eating practice" is considered to be one of the most important factors of obesity for teenagers and housewives.
So, instead of focusing on practices, we would prefer talking of "eating events" understanding by this all occurrences of foods intake during a day.

5.2 From eating events to food regimes

Food consumption is an incredibly complex topic when looked at in a transition management perspective. If one wants to unfold all the environmental impacts of every eating events one would need to know:

- What kinds of agricultural products have been ate and in what quantities (meat, cereals, vegetables, fruits, etc.);
- From what kind of production system they come (referring for instance to Green's typology of 'conventional industry", "organic farming" and "new industry"). In fact, this is already a shortcut for the exact amounts of water, pesticides, fertilizers and fossil fuels used to produce them;
- What kind of transformation they have undergone alongside the food chain from the producer to the final consumer;
- What quantity of waste (including packaging) has been generated from their growing up to their disposal by the final consumer and how they have been disposed of;
- The total distance they travelled during their whole life-cycle and the transportation modes used;
- The total distance travelled by the consumer for its acquisition (going shopping or eating out) and the transportation modes used.

It is probably impossible to build credible scenarios at that level of details and precision. The only solution is to use shortcuts, i.e. qualitative categories to which it is possible to attach crude estimates of environmental impact. We could, for example, propose the following categories for the different attributes of eating events:

1. WHAT[10]:
   a. Animal protein + fat (meat, fish, poultry, egg, milk, cheese)
   b. Starch + plant protein + fibres (rice, pasta, bread, dried legumes, seeds, potatoes)
   c. Starch + carotenoids + ascorbic acid (green vegetables, fruits, berries, roots)
   d. Plant fat + plant protein (nuts, olives, avocado)
   e. Fat (cooking fat, spreads, cream, fatty sauces)

[10] The what category is from Atkins and Bowler 2001, p 299.

f. Sugar + fat + alcohol (sugar, alcohol, ice cream, sweets, chocolate, biscuits, sweet desserts, soft drinks)
g. No nutrients (Water, coffee, tea, unsweetened light beverages)

By combining these basic categories, one could build ideal-types of meals or snacks, for instance:

- a + b + c = complete meal;
- a + b = incomplete meal;
- b + c = vegetarian meal;
- a or b or c = high quality snack;
- e and/or f = low quality snack.

2. FROM WHICH AGRICULTURE
    a. Conventional agriculture;
    b. New industrial agriculture (GMO, Clones…);
    c. Organic agriculture.
    d. Home Grown

3. WHAT FORM?
    a. Fresh product;
    b. Frozen, freeze-dried;
    c. Ready to heat;
    d. Ready to eat.

4. WHERE?
    a. IN
        i. Coming from:
            1. Supermarket,
            2. Local retailer,
            3. Shopping cooperative
            4. Food service,
            5. Producer,
            6. State stores (for instance with meat stamps)
        ii. How?
            1. Taken away;
            2. Home delivered.
    b. OUT:
        i. Not for profit private food service: canteens (workplace, school, hospital, prison..), friends, neighbourhood's restaurants…
        ii. Commercial food service
        iii. State owned restaurant

By combining these categories one can build hundreds of theoretically possible different eating events.
Examples:

- home-delivered ready-to-eat vegetarian meal from new industrial agriculture;
- Low quality snack based on frozen products from the organic agriculture ate at the canteen ;
- Etc.

Of course, some combinations would look less likely than others but in scenario construction one should not too quickly discard logically possible combinations just because they look rather odd today. They could nevertheless present a high sustainability potential and should then be carefully examined. However, practically the scenario-building process will come out with a limited set of ideal-types of different meals and snacks based on some more plausible or more interesting combinations of building blocs.

At a second level, these ideals-types of eating events could in turn be combined together in order to form ideal-types of *diets*, for instance by combining a morning, a noon, and an evening typical events. These types of diets would probably be associated to subgroups of the population like the teenagers, the active single, the two-adult two-children family, the single retired, etc.
Finally, general pictures of whole food regimes (in the sense of transition management) would emerge as "modal splits" of ideal-typical diets. In the context of the Consentsus project we would come with one or several "eco-efficient" food regimes, one or several "de-commoditized" food regimes and one or several "sufficient" ones.

6 Conclusion: drawbacks in scenario building

To conclude, it might be interesting to compare this top-down approach with the one followed in the SusHouse project. The SusHouse project (Quits and al. 1998, Young and al. 2001) is a very ambitious scenario building exercise aimed at creating sustainable households, based on a factor 20 improvements in environmental efficiency by the year 2050. The starting point is the assumption that technological, cultural and structural changes are necessary to have a chance to reach the Factor 20 objective. Three household functions have been studied: clothing care, shelter and "shopping, cooking and eating". Every function has been studied in three European countries. The "shopping, cooking and eating" function has been studied in Hungary, the Netherlands and the UK. The approach was the following: the experts groups helped by stakeholders from industry, government, universities and public interests groups formulated normative scenarios of possible developments of these household functions for the year 2050, including technological, institutional and cultural innovations. The scenarios are then evaluated as to whether they enable to reach the target, whether they are economically credible and are acceptable to European customers. The scenarios have been called 'Design Orienting Scenarios" (DOS). In their final format, they comprise a "vision" (a short overall description of the DOS, a storyboard (sometimes supported by visualizations) intended to provide a snapshot of a household living according to the scenario and proposals for PPS (Product Services Systems). Eventually, five DOS have been identified:

1. Local and green
2. Hi-Tech eating
3. Super-Rant and neighbourhood food centre
4. High-Tech Rural Gardens
5. Virtual Shopping.

Each research group provided its own' 'national' version of all or some of the DOS.
Afterwards, the different versions are synthesised forming a common unique DOS.
Table 5 shows the summary of the final DOS "Local and Green".

Table 5. The « Local and Green » Design Oriented Scenarios from the SusHouse Project.

Core idea	**Local production and consumption of organic food.**
Differences in 2050: shopping	For shopping household members go to the local corner shop for speciality ingredients, but we get regular bulk food from the local food co-operative or direct from the local farm. (The regional wholesalers and food processors supply our local food co-operative and corner shops. Local farms supply them in turn).
Differences in 2050: storing	There is less food imported from abroad, and therefore less need for refrigeration in transit. Food is only available when it is in season. This could lead to more freezing, or to more use of passive storage e.g. cool boxes or cellars for apples and potatoes.
Differences in 2050: cooking	At meal times we either prepare food in our own kitchen, or the households in our street share the cooking, or we eat at the local corner-eating house.
Differences in 2050: eating	The food the household eats is what can be grown locally in our region (no more than 100 miles away). We can only get fresh food that is in season (e.g. apples in Autumn, lamb in the Spring, etc.). This means that some 1999 food products are unavailable but there are locally-grown alternatives (no oranges, lots of blackcurrants). All our food is organic, i.e. grown with high reduction in the use of pesticides, in a way that encourages biodiversity.
Differences in 2050: clearing away and waste	There is less packaging waste because some food is bought direct from the farm. As the food has to travel less, there is less need for protective packaging.
Environmental assessment	· Elimination of pesticide use. · Massive reduction in food transport. · Reduction in home cooking. · Reduction in packaging.
Consumer acceptance	1. Liked: · Seasonality. · Communal arrangement. · Sociability. · Organic. · Locally grown food. 2. Disliked: · Lack of choice.
Economic analysis	· Collapse of pesticide industry. · Localisation of agriculture supply. · Food processing conducted locally/regionally. · Large supermarkets replaced by small local shops. · Market advantage for local organic retailers. · New market for organic 'eating-houses'.
Strategies	**Local – and Seasonal Food** 1. Government Actors: · Bring in distance taxes (different taxes for different modes of transport) and boundary taxes. · Local planning legislation to protect and maintain agricultural land and the move to smaller numerous farms. · Promotional marketing by government. · Place VAT on 'luxury' imported foods · Food Standards Agency should instigate interaction between farming and consumer groups so that both parties became aware of needs and requirements of each other. 2. *Financial/Retailing Actors:* · Establish Local/Regional credit card to local people shopping locally.

(Source: Young and al. 2001, p.125.)

The SusHouse project has really done a genuine pioneer work and brought very interesting and valuable results. There is a lot of positive lessons to be drawn from it. However, it is not always totally convincing. For example, not surprisingly, the "Local and Green" DOS exhibited the highest potential of reduction of environmental impact. But, as the authors confess: "To some degree this was a reflection of the methodology, with several important streams of data either not readily available, or not satisfactorily incorporated in the assessment structure." (Young and al. 2001: 124).

Why "not surprisingly"? Because, from the documentation available, one get the feeling that both the research team and the experts had from start a prejudice in favour of the local and green scenarios. Or, at any rate, they were probably sceptical about market and hi-tech solutions and they didn't even consider the possibility of a more active role of the state or other public authorities in food provisioning. However, if one really assumes that any technological, cultural and institutional plausible innovation likely to bring us to the desired goal is worth considering, there is no reason to neglect *a priori* institutional changes that would bring the public sector back in the provisioning system and playing a role it has already played in the past, at several occasions. The most likely explanation is that they didn't even think about it because of the deeply liberal "Weltanshaung" of our time. Scenario building is an activity particularly vulnerable to unconscious preconceptions, wishful thinking and the defence of vested interests. We are certainly not immunized against these flaws but we believe the best way to avert them is to identify carefully all the logical possibilities and to explore all of them with an equally open mind and critical lucidity. This means giving the same opportunity to the different strategies (and to all the possible modes of provision, not only those for which we have some sympathy) to show up their full potential while being equally critical with all of them.

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