

AN ALTERNATIVE VIEW OF INTEGRATED SUSTAINABLE DEVELOPMENT THROUGH A TIME-SPATIAL LENS

Per Assmo^a, Elin Wihlborg^b

^{a, b} Department of Management and Engineering, Linköping University, Sweden.

^a Corresponding author: per.assmo@liu.se

©Ontario International Development Agency ISSN: 1923-6654 (print)
ISSN 1923-6662 (online). Available at <http://www.ssrn.com/link/OIDA-Intl-Journal-Sustainable-Dev.html>

Abstract: The conventional monetary market oriented economic view of development is the dominant approach of development, despite its shortcomings and inability to include social and environmental aspects into long term processes of change. Essential values are often concealed or even excluded in conventional monetary analyses, which are fundamental for integrated sustainable livelihoods.

Using a time-spatial perspective, building on Hägerstrand's time-geography, this article aims to elaborate upon an alternative conceptual development approach. The time-spatial model open for an alternative constructive approach to analyze and physically anchoring socio-economic and ecological processes extended over time. Such a view thereby contrasts and reaches beyond the conventional monetary market growth strategy.

Combining the conceptual discussion with empirical illustrations from rural livelihoods in Sweden, the article highlight new alternative political-economic analytical tools and strategies to achieve sustainable sound integrated socio-, economic-, and ecological development processes.

Keywords: criticism, development, theory, time-geography

INTRODUCTION

The conventional view of development is based upon economic growth as the key to achieve a process of Tchange. Hence, this generalized view is the basic norm for the political organisation and administration

of the society. In the media we often hear that the economic situation hamper development goals in the society. When applied at local levels, municipalities try to achieve aspirations of local improvements into annual budgets and economic frameworks. In the contemporary public debate one find arguments that a good life include much more than can be valued in monetary terms. The ambition to think beyond the conventional economic framework exists. Yet, the public debate is largely still trapped in economic norms and thinking, which hamper the possibilities and potential to find and implement alternative political goals of societal development.

A fundamental dilemma with the conventional generalized perspective is that economic growth is based on theoretical models that simplify a complex time-spatial specific reality. As noted by for example Mellor (2010) and Assmo & Wihlborg (2010), the economy is a politically constructed part of the society. People's organization of daily activities to improve their livelihood is much more than what is generally calculated and thereby exposed in monetary values. And, these non-monetary values differ depending on specific time-spatial settings. Public policies must therefore be contextualised in its specific time-spatial setting, deriving from what the people concerned acknowledge and value as relevant processes of development. There is hence a need to find alternative structures and policies for societal processes of change.

With this perspective, this article discusses a new alternative way to view and analyse processes of change, through a time-spatial integrated concept that embraces the social-, economic-, and environmental dimensions of local development. Even if the empirical illustrations used in this article are taken from a specific small coastal community in western Sweden, the conceptual idea is relevant in analyses of alternative development strategies in different rural as well as urban time-spatial contexts.

A TIME-SPATIAL ANALYTICAL CONCEPT

The time-spatial argument used in this article is inspired by Torsten Hägerstrand's work on time-geography, which strived to find an alternative view and analysis of people's activities in relation to resources and constraints in processes of innovation. (Hägerstrand; 1953, 1964, 1970, 1974, 1985, 1993, 1996, 2002, 2009)

The use of a time-spatial approach can display that the neo-classical economic model used in contemporary development strategies is unsustainable, in an environmental as well as social meaning, and thereby also economically. Simply described, one finds that all movements by bodies in space demand energy. The longer distance we move bodies in space, the more energy we use. And, an increasing speed of the movement further increases the use of energy.

In a pre-industrial context, (farm) production was primarily local and conducted over long (seasonal) time period. The production system was based on the use of renewal resources in the form of soil, water and sun, available at that particular place. This production pattern was hence extended in time and compressed in space, using limited energy. The process was environmentally sustainable. The involvement of industrialization increased the transportation capacity of physical bodies between places, and thereby enhanced spatial expansion. The modern conventional global market economy enhances production and consumption over space (globalization). And, the market production process is built upon continuous productivity improvement – to increase production during a period of time – and thereby compress time. So, the conventional economic growth development model tend to exploit resources to gain short-term profit (time compression), at increasing distances (space expansion), without considering the long-term (time) environmental effects of the space used.

A crucial issue for Hägerstrand was his ambition to develop a more holistic notation system, which could

grasp and combine observations in its time-space context. Hence, the approach combines the dimensions of time and space and sees them as inseparable. Similar to Giddens (1990), Wihlborg (2008) and Assmo & Wihlborg (2007, 2010), one can argue that the approach, which views resources as constraints, is in distinct contrast to conventional economic analyses that view natural and human resources as exploitable resources.

The patterns of daily activity and what is seen as constraints of resources among the local population display the limits of the conventional monetary economy. A time-spatial analysis can thereby also analyse the structural possibilities and limitations for the local society as a whole. There are clear indications of the implications of (political) power in the processes forming the limits of the monetary economy. The time-spatial concept can therefore be related and extended to embrace broader perspectives of power.

A Politically Constructed Economy

The market economy is a political construction. What activities and resources that are given a price on the market depend on the institutional arrangements of property rights, prices and legal structures. Economic structures, which define conventional development in contemporary societies, are always politically constructed and are legitimate within specific time-spatial contexts. The power of the public official law defines what is allowed and decides what activities are to be included as part of the official monetary economy. The political system, through public policies and structures, decides what is included – and thereby also what is excluded – in the economy. In other words, the political system forms the economy. The economy is a political construction.

Political constructions are not general, but valid in time and space. The political construction, both in terms of formal and informal political arrangements, is legitimate only within a territory at a particular time. The importance of identifying the characteristics in a time-spatial context becomes crucial in the policy area of local development. It is evident that people in different locations value and appreciate things in different ways. Political systems have the power to define what can be regarded as valuable and productive, which thereby set the norms and structures for development and/or growth. There is hence a need to further uncover and understand the formal political structures and institutions in a specific time-space pocket, and its direct implication for the design of societal development.

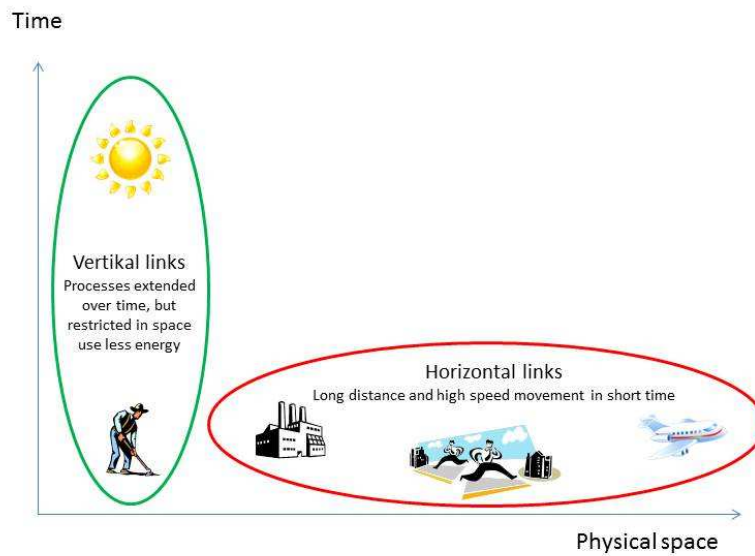


Figure 1: A time-spatial analytical concept

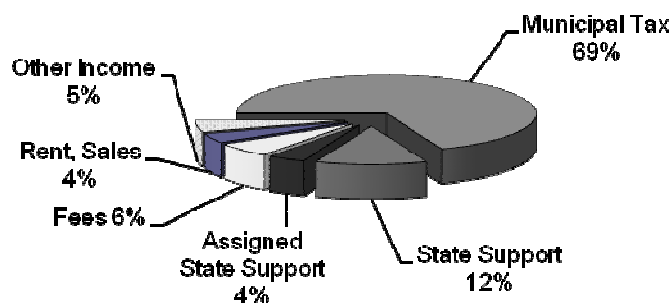


Figure 2: Average Annual Municipal Income (in percent), 2008

Source: The Swedish Association of Local Authorities 2010

THE LOCAL SETTING – MUNICIPAL POLICIES AND ADMINISTRATION

In the era of globalisation, societies are becoming increasingly interlinked and dependent on what is seen as the global economic market. In a mature welfare state like Sweden, this impression is further stressed by the fact that municipalities are, apart from being the institutional political structure, also often a large employer in the community.

Sweden is divided into three administrative levels, being the national, regional (county), and local (municipality). There is a constitutional local autonomy (RF chapter 1; §1). Political representation is elected at each level. Sweden has to some extent a decentralised political system, with local governments having a substantial political and economic power at the municipal level. (Montin, 2008 and Wihlborg & Palm 2007)

Irrespective of the location, population size or type of dominant economic activity, each municipality is responsible to supply its population with a number of services. Many activities are compulsory, stated by national law, while others are “voluntary” and can be decided by the local municipal government. Municipalities organise and implement various activities such as; children day care, compulsory education, social welfare services, elderly care, environmental protection, garbage service, rescue service, water and sewage and energy distribution.

Each municipality decides largely on its own how the available economic resources shall be distributed. Depending on a number of factors, the municipalities in Sweden naturally have large differences concerning the capability to provide the different activities and services to its population. However, irrespective of the financial situation, the municipalities are obliged to provide the services decided by the central national government. Most of the activities and services provided by the municipalities are financed through municipal tax, state support and fees for various services. The largest share of the total income tax is allocated to the municipality. Hence, the most important income source is the municipal tax, paid by the inhabitants. In a mature welfare state like Sweden, the municipalities are substantial employers in the local society. In some cases, especially in smaller communities, the municipal government is often the largest employer.

As discussed by Wihlborg & Palm (2007), the municipalities in Sweden have different roles. The municipality is the legal actor that decides upon the use of land within the municipality. The municipality has substantial power of the community, however, the municipality is also to follow and implement the

national laws imposed by the state. The municipality forms the local democratic structure, where people elect its representatives to govern the local society. The municipality include several departments responsible for different socio-technical systems that are to be provided to the inhabitants. The municipal organisation is hence also most often one of the major employers in the municipality, providing numerous jobs in different sectors.

These different roles can sometimes cause conflicting interests within the municipality’s organisation, and perhaps more importantly, between the municipality and the people. One such example, which is highlighted in this study, is the different roles the municipality carry related to energy use among the households.

Socio-Technical Systems

The organisation of energy supply is an example of a socio-technical system implemented and owned by the municipality. A socio-technical system refers to technical system that to a large extent are dependent and integrated into the social and economic systems that enable them to function. As for energy supply, the municipality commonly organise this socio-technical system through a municipal owned limited company.

These companies shall within an allocated budget, run the system, through charging fees for the services provided. Being a publicly owned, the company shall follow the democratic decisions made by the elected politicians, and at the same time function as an ordinary company on a free market. The company shall thereby also be transparent and make all decisions in local democratic order.

The example of energy supply illustrates a typical example of conflicting interests. The municipality shall, according to state regulations, enhance a sustainable development policy, including reduction of energy use and implementation of renewable energy sources. At the same time, the municipality run an energy supply company that shall distribute energy to a competitive price, through the use of costly technical systems that has been developed during a long time.

AN ILLUSTRATION OF ENERGY USE AMONG HOUSEHOLDS IN FISKEBÄCKSKIL

This article is part of a research project named “Radical changes again - governing transformation of local infrastructural systems” financed by the Swedish Research Council (FORMAS). The case study area used as illustration in this article is a small village named Fiskebäckskil situated on an island along the west coast of Sweden. The Fiskebäckskil village is administratively part of Lysekil

municipality, a comparatively small community with a total population of about 15,000. Fiskebäckskil is an old picturesque fishermen's village with many houses of cultural and historic value. The main reason to select this village for the survey was primarily related to its limited size with about 1,000 permanent residents, and the fact that almost every household live in separate houses.

The focus of this field study survey was to analyse people's activities and perspectives concerning domestic energy supply and consumption for heating the house and warm water production. For this purpose, about 30 percent of the total number of houses/households was included in an interview survey. The main reason to focus on the energy issue is related to the fact that the residential sector accounts for about one third of Sweden's total energy use, and of that portion around 60% is used for heating up houses and domestic hot water production. (Naturvårdsverket 2008).

In Sweden there are a number of techniques used to heat up domestic houses and produce warm water. Among the most conventional, and still commonly used technologies are; (a) An oil burner (oljepanna) located in the house, which heat up water that is circulated around the building through a system of radiators. (b) Radiators (including a geyser that heat up water) installed in the house, powered by direct electricity.

A more recent technology is the construction of a municipal owned central heating plant (fjärrvärme) that through an underground pipe-line system delivers hot water into the respective connected buildings in a certain area. The energy used for the central heating plant can come from various sources including national hydro energy supply, nuclear energy, fossil fuels, as well as more local sources of bio-fuels, and burning of waste. The central heating plant, and the pipe-line distribution system, is owned and implemented by the Lysekil municipality through its limited energy company named, LEVA i Lysekil AB.

Other types of domestic renewable energy sources used by households have become increasingly common in recent years. These include the following.

Underground water heating system

(Bergvärme) A system where a hole is drilled into the rocky ground on the private property where warm underground water comes up due to pressure. The warm water is circulated into the house (with an electrical pump) and back into the ground. This system is suitable in many areas of Sweden, also in Fiskebäckskil. The heating system is costly to install (about 13,000 – 20,000 Euro), but reduces the energy

cost for the with more than 50 percent. The system is privately owned and independent.

Fuel wood burners

A popular way to complement the heating system in houses in Sweden is to install various forms of wood stoves and fire places. To many people, these systems also have an aesthetic value. In rural areas, and small communities where people have access to fuel wood, this can be a substantial part of the heating system.

Wood pellets Burner

(Pellets are small pieces of compressed wood material). This system technically functions like a conventional oil burner, but instead uses wood pellet. Wood pellets are sold and distributed by private companies.

Solar Panels

A system where panels are placed on the roof of the house, using sun to produce energy. The system is comparatively costly to install, in relation to its production capacity. The system is privately owned and independent from external connections.

The Local Views on Domestic Energy

The survey shows that the most common domestic energy source in Fiskebäckskil village energy is still the conventional oil burner, and electricity heated radiator systems. A main reason to this situation is probably that a majority of the houses are of older origin, with the heating system installed a long time ago. According to the respondents, it is expensive to change the heating system, especially in older buildings. Many households are therefore reluctant to change and improve the heating system, as long as the current system(s) work.

Among those who have installed a more recent improved heating system, the underground water heating system is the most popular. Even though most people highlight the fact that this system includes a high initial installation cost, they still prefer this system. The most common comment in this matter is that this system makes the household independent and self-sufficient, and does not need to rely on the municipal energy company or other private distributors. Secondly, a large majority of the respondent regard the underground water heating system as being environmentally friendly based on a local renewable energy source. Thirdly, the respondents regard this system as a long term investment, where the initial high installation cost, is calculated in relation to the comparatively long running cost.

Other domestic energy sources that are popular among the households in Fiskebäckskil are various forms of fire places, wood stove/burners. Some of these systems are actually very old and installed

when the older buildings were erected, as the main heating system available at the time. The older respondents describe, however, that many of these older systems were removed during the 1950's and 60' and replaced by the "new" oil and electricity based heating systems. Though, a substantial number of the households have in recent decades re-installed the older wood fire facilities. The main reason to this is aesthetic, but many also claim that the use of the wood burning facilities reduces the overall cost for heating up the house. However, most of these respondents also disclosed that they bought the fire wood from farmers in the nearby communities, and that the price of fuel wood did not make it cost effective. (Being located in the outskirts of the west coast archipelago, there is extremely limited access to fire wood).

Only very few households have installed solar panels on the house. The main reason to this limited interest is primarily the cost, and the relatively low production capacity. Another interesting point highlighted by the respondent is the fact that many of the older houses are protected according to the national culture and historical heritage act, which by law prohibit changes of the exterior of these houses. (Swedish Planning and Building Act - Boverket, 2004).

In short, the underlying factors that influence what local energy heating system the households in Fiskebäckskil can be summarized as; (a) Self-sufficient, in terms of having a privately owned heating system that is not dependent on external suppliers. (b) Financial, in terms of cost for the current (older) conventional system compared to install a new more environmentally friendly system. (c) Environmental, related to arguments of installing a system which use local renewable energy sources.

Concerning the question of underlying factors that might play a negative role related to the household's energy systems, one could identify the following main comments; (a) Dependency, in the meaning that people often have a critical viewpoint of being dependent on energy companies, irrespective of being private or publicly owned, due to that they cannot control price increases and regulation. They also lack control (and to some extent information) of what kind of resources being used to produce the energy, which reduces/hinder the possibility to decide upon which kind of energy they actually buy. (b) Bureaucratic systems with many regulations are often mentioned as a negative component in relation to the implementation of domestic energy supply systems. Various application forms and certifications need to be accomplished and accepted to install underground water heating systems, and even different forms fire places. (c) A common problem is related to the

Property tax system where the value of the house (upon which the property tax is based) is increased if domestic heating systems are installed. The same problem occurs if a house is renovated with improved insulation, or if triple glass windows are installed. Many respondents claim that they are actually being taxed for doing energy saving improvements! (d) Subsidies to renovate the house can be applied for in various forms. Even if many claim that such subsidies can be positive, the application procedure is seen as bureaucratic.

An interesting point mentioned above is the negative impact of the property tax system, which can hamper environmentally friendly improvements of the domestic energy system. The argument that the central/external systems are often too bureaucratic and difficult to understand, with limited possibilities to make individual choices is also often mentioned.

The Official Municipal View

The Swedish central government energy policy enhances the use of environmentally friendly and renewable energy sources. The Swedish energy policy aims to achieve ecological sustainability, security of supply and competitiveness. A main objective is to produce 50% of the energy from renewable sources by 2020. Through the decentralised political structure in Sweden, Lysekil municipality (as all other municipalities) implement the vision into strategies suitable at the local level. The issue of energy is thereby part of a broader scope of sustainable development strategies enhanced by the municipality. (Naturvårdsverket, 2008)

The main form of central policy documentation adopted by the municipality to ensure that the aims and objectives are being met at a local level is the 16 national Environmental Quality Objectives, outlined by the Environmental Protection Agency. With these objectives in mind, the vision and strategies are developed by and for the municipality. (Adolfsson, 2001 & Skill 2008) Lysekil municipality's approach has an explicit focus on environmental protection. This is not to say that issues of social and economic concern are less significant parts of and sustainable development approach, but rather that these issues are less prominent in this case. In previous years, Lysekil municipality worked according to the so called Agenda 21 to be incorporated into municipal strategies towards sustainable development. Officials reveal that the municipality has now taken progressive steps towards within their planning and goals for the municipality. For example the Municipal climate and energy advisor argue that;

"We are now moving towards being a more sustainable municipality with great enthusiasm.

Previously we had an Agenda 21 office but this was ended 5 years ago. We have however taken a more active role in promoting a more sustainable municipality and are always thinking of new ways in which we can achieve this, for instance we are now looking into the option of wave energy. ”

Lysekil municipality has successfully managed to move beyond the formality of using Agenda 21 as a tool, to implement a more contemporary approach in which sustainable development goals and objectives are designed and integrated into almost all activities. From a practicality standpoint, Lysekil's success in achieving its active stance on sustainability can perhaps be owed to its relative small size, which makes it easier to communicate and engage the population. In its energy plan valid for the period until 2012, Lysekil municipality highlight the fact that the municipality has, due to its geographical location, possibilities to use sun, wind, water and a central heating system using excess water from a refinery.

The central heating system is built on collaboration between Lysekil municipality Energy Company, named LEVA I Lysekil AB, and the Preemraff refinery located in the municipality. Preemraff is the largest refinery of oil products in Scandinavia, and one of the most modern in Europe. It is also one of the largest private employers in the area with more than 600 employees. The collaboration is basically that Preemraff sell the excess of hot water being produced during the cooling process in the refinery. The municipal company LEVA i Lysekil AB develops and own the pipe-line system, through which the heated water is distributed and sold to the customers in the municipality. (It might be of interest to note that the volume of heated excess water from Preemraff is enormous and would, if connections to a complete regional underground pipe-line system existed, have the capacity to supply a heating system also to the nearby cities, including a total population of about 150,000 people! However, a large part of the hot excess water is currently still pumped back into the sea).

Lysekil municipality highlight certain overall goals related to energy, which include; (a) Local responsibility to reach the national aims within the energy sector (b) Actively work to reduce the amount fossil fuels and electricity used for heating up households. (c) Enhance the transformation towards a sustainable energy system. (d) And, that the Municipal energy support system shall be safe, economic, effective and environmentally friendly.

To achieve these overall goals, the municipality identify work within the following sectors; (a) Juridical, e.g. to implement national laws, regulations and local restrictions. (b) Economic, e.g. to use taxes

and subsidies (c) Information, to communicate and provide information to the population.

The municipal energy plan describes a number of ways towards which the municipality shall aim. These include, for example, further investment in the central heating system in collaboration with Preemraff, development of facilities to use natural gas from Preemraff, development of a bio gas plant in the municipality, wind energy with development of an additional 13 wind mills along the coast (2 already exist), and the exploration of possibilities to utilise wave energy. The municipal plan also includes components concerning the use of wood pellets and implementation of underground water heating facilities.

ANALYTICAL DISCUSSION – THE PEOPLE VERSUS THE LOCAL GOVERNMENT

As described in the previous section, the municipality set an interesting an impressive goal, striving to be more or less self-sufficient of energy. The municipality thereby explore various ways to reach this goal. Interestingly, one find that most of the solutions explored for the socio-technical energy system are primarily large-scale, organised and implemented through the municipality.

The focus on the collaboration with Preemraff refinery is understandable in the light of being an important employer, which supplies enormous volumes of energy in form of excess hot water and natural gas. A critical viewpoint is, however, that the refinery is actually not using local renewable energy sources. The exploration of wind and wave energy is, on the other hand, more suited to the environmental goals. These ideas are basically large scale investments, which require a large scale solution, with a substantial number of users.

Interviews with various officials and technicians at the municipality clearly display that there seems to be contradictory views concerning what methods and solutions are the most appropriate in the community. What can be regarded as a technical-economic perspective appears to be dominant, with advanced large-scale solutions that could cater for the majority of the population. It is obvious that the collaboration with Preemraff is in this case an important influential factor. What could be described as the more socio-ecological perspective highlight solutions that are based entirely on local renewable energy sources, and have thereby to some extent a slightly more differentiated small-scale oriented focus. In short, one can see that the municipality's different roles as democratic institution, public employer, energy company owner, information provider and legal administrator creates a complex and often conflicting reality.

Even so, Lysekil municipality has managed to agree upon an energy plan and strategy to enhance a sustainable society. Or as the municipal energy and climate advisor expressed it in an interview;

"...we know what we want as a municipality, but we don't know what the people want; and this is what we need to invest time and effort in to find out..."

The Local View

The field survey display that the local population in Fiskebäckskil have a broad perception concerning the concept of a sustainable environment, which is not narrowed to a local view but rather viewed in a global perspective. The general opinion among almost all respondent was also that they, through small everyday lifestyle choices, could take active steps towards achieving a more environmentally friendly use of energy. The following quotations can illustrate this standpoint:

"I think you have to use your energy in a more thoughtful way if you want it to be sustainable."

"I started using a new heating system for my home which uses rock energy (underground water heating system). This is expensive to install but cheap to run, and it is clean energy straight from the nature"

The local community have their own understanding and solution of energy systems, which is closely linked to their everyday lives. (Assmo & Wihlborg, 2010) This attitude amongst the local householders can be linked to the individualised construction of an understanding based on practice as opposed to theory. The people's interest in taking initiative to make certain choices pertaining to their everyday lives highlight that there is a practical understanding of environmental concern amongst the residents of Fiskebäckskil.

The way interviewees responded to the question of what it means to be environmentally friendly reflects this active stance, as the general response was expressed through lifestyle choices that they not only thought were recommendable but were also actively practicing, such as the use of alternative domestic energy systems for heating. One respondent expressed it as;

"...the municipal district heating system is probably the most efficient in the town on the other side of the fjord. But in smaller places like here in Fiskebäckskil rock energy is more effective and efficient."

CONCLUDING COMMENTS AND POLICY IMPLICATIONS

Lysekil municipality has taken on an active approach to address issues energy among its population. The municipality's agenda is actively pursued as a goal

and an ideal, making Lysekil municipality as being in the forefront of working towards a sustainable energy strategy. There seems, however, to be conflicting views within the municipality. The economic-technical oriented perspective tend to be dominant, where the environmental solutions are found in advanced large scale technical solutions that are economically sound in a long term investment perspective. This might be related to the fact that the municipal energy company, and its collaboration with the major private employer Preemraff, have an interest in such solutions. The promotion of large scale technical solutions provides employment as well as income to the municipality through the fees collected from the energy user.

Interestingly, the survey clearly shows that the local population prefer other solutions to save energy and be more environmentally friendly. They prefer primarily domestic renewable energy sources, such as the underground water heating system. The main reason, apart from being a local renewable energy source, is that this system is largely independent self-sufficient and privately owned and thereby controlled by the property holder. The comparatively high installation cost is rarely said to be a main hindering factor. Another common argument was related to the property tax, which increased if the house was renovated and improved to reduce energy consumption. This was by almost all respondents seen as a negative and hampering factor.

So in short we find that there are conflicting views between the local and official perspective regarding the most suitable ways to reduce energy consumption and transform towards renewable energy sources.

An Alternative Time-Spatial Meaning of Development

Individuals act and relate to the structures or incentives given by the institutional arrangements, based on political constructions, in time and space. By including a time-spatial value perspective in the political (economic) structure, one could identify and find energy saving processes to achieve a sound environmental-economic sustainable development process accepted by the people concerned.

The illustration in this article points out the conceptual importance of applying a time-spatial perspective to find integrated explanatory interpretations for local development. This approach can contribute to, and open for, an understanding of time-space location to analyse the connection between the structuration of everyday life in relation to environmental as well as economic pre-conditions.

A true meaning of sustainability must integrate social, environmental and economic aspects.

However, in conventional development arguments, economic growth model is generally seen as the underpinning aspect that can yield social and environmental sustainability. A major problem with this conventional view is that sustainable economic growth can only be obtained through a sustainable diverse social and natural environment. There is thus a demand to formulate new social and economic structures, based on a time-spatial perspective, that promote processes of change based on the conditions given by nature within the specific time-space pocket. From such a perspective we could open for a political re-construction of the society to achieve integrated environmental, social and economic sustainability. There are openings for political re-constructions of institutions to turn the conventional economic model into more vertical processes more, in harmony with natural processes of change.

There is a hence a need to find other ways to understand value and analyse how local people address problems of resources and constraints, in their everyday lives. Environmental problems might have a global character. But even if the problems need international attention, the solution to global environmental problems must start locally!

REFERENCES

- [1] Adolfsson, S. (2001) *Sustainable Development in Swedish municipalities. To know, to be able, to want and to do*. Kalmar University.
- [2] Assmo, P. & Wihlborg, E. (2007) *Beyond the Economic Meanings of Development - A Discussion of Political-Geographical Constructions of Societal Development*. In: University Väst Research Report 2007:04. Grafikerna Livrena AB, Kungälv, Sweden
- [3] Assmo, P. & Wihlborg, E. (2010). Home: *The Arena for Sustainable Development – A conceptual discussion*. The International Journal of Environmental, Cultural, Economic and Social Sustainability, Volume 6, Issue 1, pp.319-332. Common Ground Publishing.
- [4] Boverket (2004) *Legislation – The Planning and Building Act*. Boverket (National Board of Housing, Building and Planning). Karlskrona.
- [5] Giddens, A. (1990) *The Consequences of Modernity*. Cambridge: Polity Press.
- [6] Hägerstrand, T. (1953). *Innovationsförloppet ur korrologisk synpunkt*. Meddelande från Lunds universitets Geografiska institution, avhandlingar 25, Lund.
- [7] Hägerstrand T (1964) *Urbaniseringen som världsproblem*. In: IVA meddelande nr 139, Stadsbyggnadsfrågor. Stockholm: Esselte AB.
- [8] Hägerstrand, T. (1970) *What about people in Regional Science?* (Regional Science Association Papers, vol. XXIV:7-21. Reprinted in: 'Om tidens vid och tingens ordning' G. Carlestam och B. Solbe (red.) Byggeforskningsrådet T21. 1991.
- [9] Hägerstrand, T. (1974) *Tidsgeografisk beskrivning – syfte och postulat*. Svensk geografisk årsbok, 86-94. Nr 50, 86-94
- [10] Hägerstrand, T. (1985) *Time-Geography: Focus on the Corporeality of Man, Society, and Environment*. (Reprint Science and Praxis of Complexity) New York: United Nations University.
- [11] Hägerstrand, T. (1993) *Samhälle och natur*, (NordREFO 1993:1). København: Nordrefo.
- [12] Hägerstrand, T. (1996) Att äga rum. *Svensk geografisk årsbok* nr. 72, s. 105-112.
- [13] Hägerstrand, T. (2002) Tid och kultur. In: *Spänningsfält. Tekniken, politik och framtiden*. Sturesson, L m fl (red.) Stockholm: Carlssons förlag.
- [14] Hägerstrand, T., Kajsa Ellegård & Uno Svedin (red.) (2009). *Tillvaroväven*. Formas, Stockholm
- [15] Lysekils kommun (2008) *Energiplan Lysekils kommun 2008*. Lysekil Municipality.
- [16] Mellor, M. (2010) *The future of money: from financial crisis to public resource*. Pluto. London
- [17] Montin, S. (2008) *Moderna kommuner*. Malmö: Liber förlag.
- [18] Naturvårdsverket (2008) *Miljömål. 2008. Sweden's Environmental Objectives in Brief*. Naturvårdsverket. Stockholm.
- [19] Skill, K. (2008) *(Re)creating ecological action space: Householders' Activities for Sustainable Development in Sweden*. Linköping Studies in Arts and Science, No. 449, Linköping University.
- [20] Wihlborg, E. & J. Palm (2007) *Hur kan kommuner styra socio-tekniska system? Exempel från bredband och energisystem*. Perspektiv på tekniken nr 2. Linköpings Universitet.
- [21] Wihlborg, E. & K. Skill (2004) *Jämställd, hållbar framtid: Idéer och vardag i samspel*. Rapport 5422. Stockholm: Naturvårdsverket.
- [22] Wihlborg, E. (2008) *Hållbar utveckling hemma – en kombinerad begreppslig diskussion*. I: Ellegård, K. & J. Palm (red.) *Vardagsteknik: energi & IT*. Stockholm: Carlssons förlag.

ABOUT THE AUTHORS

Professor Per Assmo graduated from the School of Business, Economics and Law at Göteborg University, Sweden. He currently holds a position as senior researcher at the Department of Management and Engineering, Linköping University. He is also academic disciplinary leader at University West, responsible for the International Programme for Politics and Economics (IPPE). Professor Assmo is visiting professor at Rhodes University, South Africa.

Professor Elin Wihlborg holds a position as senior lecturer in Political Science at Linköping University and is associated to the division of Physical planning at Luleå University of Technology. Professor

Wihlborg is also a visiting senior researcher to Oslo University in Norway and Institute for Future Studies in Sydney, Australia.