Basic Patterns of Sustainability

Reports from the Superbs project
6. Developing sustainability in Hågaby village

Per G. Berg

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6.1 Towards a More Liveable Physical Resource Management

Energy, water and waste are already being used in a more resourceful way. Transportation and land use initiatives are in a beginning phase, but enough good examples exist to motivate the description of their important role in the quest for a more sustainable lifestyle. The change towards a more liveable physical resource management has only just begun in our Baltic cities. It is reasonable to believe that this will be improved upon further in Hågaby, as technology and equipment are refined, as environmental fees and taxes increase, as the lifestyle and environmental values of the population slowly change and as the knowledge and insights increase among the residents.

6.1.1 Energy techniques and energy efficiency

The heat energy consumption in Uppsalahem’s rental buildings in Hågaby is on the average somewhat lower than the ordinary Swedish home (which is around 200 kWh per square metre). The heating and hot water need is thus about 180 kWh per square metre and year for the rebuilt apartments (Table 6.1). This is not extremely good, but the heat consumption was lowered by 30% for all buildings when they were rebuilt (at which time the buildings had very high energy demands). The newly built BRF Hällen has been estimated to use around 110 kWh per square metre and year, and this was confirmed as hot water and heating have been properly regulated and the houses have been able to dry out completely. The low heat energy need for BRF Hällen is probably primarily due to well insulated houses, to low-energy windows (see Figure 6.1) and to hot-water saving measures in laundries, bathrooms and kitchens.

Table 6.1. Comparison of heat and hot-water energy consumption (kWh/100 m²/year) in the rebuilt Hågaby rental apartments, the Hällen houses and houses in typical Swedish residential areas.

<table>
<thead>
<tr>
<th>Hågaby – rebuilt buildings</th>
<th>Hällen newly built houses</th>
<th>Swedish average</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,000*</td>
<td>11,000**</td>
<td>20,000***</td>
</tr>
</tbody>
</table>

*) Uppsalahem’s estimate for all rental apartments in Uppsal,
**) Actual measurement by Uppsalahem
***) Swedish National Energy Authority, 2000

Electricity consumption is somewhat lower than in the average Swedish household in Uppsalahem’s rental apartments. This is due to three main factors. The houses are ventilated by low-electricity outlet fans. The common laundry rooms are equipped with the most electricity efficient washing machines on the market. The outdoor lights are equipped with low-energy fluorescent tubes. An additional factor is the relatively low residential area per capita in Hågaby, which with normal light frequencies and

Monitoring Sustainability in Hågaby

In this chapter preliminary results from the model project will be outlined. In the booklet series from 1997 two scenarios were given for Hågaby, one for the year 2005 and the second for the year 2020 (Berg, 1997). What is the direction of change? What has been achieved in quantitative terms so far?

The outcome of the first four years of development (1996-2000) clearly demonstrate the power of plans and visions, but also the limitation of predictive methods. Some development has started strongly, for instance development of solar energy, waste water treatment and household composting. The local store and other organisational assets have emerged and materialised more than was anticipated from the start. Other ideas have been delayed due to rapid technical development – for instance intranet and individual heat measurements. Still other significant ingredients of sustainable community life have occurred unexpectedly.

In this first comprehensive report on the model project of Hågaby, the pedagogics of sustainable habitation are however rather clear. A description of some of the quantitative and qualitative results will now follow. They have emerged from the visions and plans carried out since 1996 – but also as an effect of the unique properties and dynamic evolution of the place and its people.
a limited space for electrical equipment probably contributes somewhat to a lower electricity need. Contributions to a higher electricity consumption are electrical engine heaters for cars and relatively high standard dish washers. In the newly built Hällen the houses have an even greater electrical saving potential. Firstly, the laundry cottage was supplied with hot water heated efficient drying fans, mounted in a specific drying room. The laundry machines were also somewhat more electricity efficient than those in Uppsala’s laundry rooms. Secondly, all houses are basically equipped with an extremely efficient mid-sized combined refrigerator and freezer, together with a spacious larder (2 m²) (Figure 6.2). The houses in Hällen were planned with many windows and window panes at angles which allow a lot of light into the houses. This will save electricity on the margin by lowering the need for electric light in the afternoons, in the mornings and on cloudy days. The ventilation is based on self-draft with a low electrical consumption fan. The outdoor lights are fewer than is standard and they are also equipped with low electrical consumption light bulbs. The cars’ engine heaters have a limited effect, which contributes somewhat to a lower overall electrical consumption. The local sewage treatment plant is a substantial consumer of electricity, not so much for the purification process as for the ventilation fans evacuating the plant’s biofilters to a specially constructed compost filter (which is designed to function as a smell trap).

For all buildings in Hågaby, technical and additional electricity savings can be achieved through thoughtful habits of the residents. An information campaign is planned for the coming years.

6.1.2 Local heat production from solar collectors
During the summer period (from May to September) solar collectors alone are used for heating water, but as they are not so efficient in the wintertime, most of the warm water needed is received from Uppsala’s central heating plant. Some 903 m² of modern solar collectors have been mounted on the central buildings in Hågaby (Figure 6.3). They provide 100 apartments, the neighbourhood centre, the school and the play schools with solar heated hot water mainly during the summer half of the year (Lindgren & Karlsson, 1999). This local heat production corresponds to approx. 15% of the annual need for heat and hot water.

The solar collectors are placed on three freely exposed roofs facing directly south but with a somewhat sub-optimal angle. 745 m² of the solar collectors are of a conventional plane type, however they are the result of developments over several technique development generations. The plane collectors are practically maintenance free and it is estimated that they will work without problems for at least 25 years. 158 m² of the solar collectors are of a new construction (Mareco concentrating solar panels). They consist of glass tubes in parallel rows, containing a heat absorbing fluid. The tubes are protected by a cover glass. Each tube has an aluminium reflector, which makes it possible to collect solar heat from unfavourable or suboptimal angles as well.

The heat is stored in a 70 m³ accumulation container. This container is equipped with a special floating lid, which prevents oxygen access to the container and subsequent corrosion. When the heat storage fluid expands, the lid will follow the expansion but still seal the tank so that it connects tightly to the water surface.

If we calculate that 15% of the total energy is produced by solar collectors and that there are a corresponding 150 households consuming 10,000 kWh total energy per year, then the total energy use for the system would be 1,500 MWh per year with 225 MWh produced by solar collectors. The actual measurements show that in reality, about 255 MWh was produced by the solar collectors and the actual consumption of energy in Hågaby was around 1,700 MWh.

If in the future the energy consumption is reduced to a possible 1,300 MWh per year, the solar collectors would cover about 20% of the total heat energy need.

6.1.3 District heating as a convenient and healthy life-support
About 85% of the heat energy needed in Hågaby is produced by the Energy Company Vattenfall. The systematic choice of district heating was made since it is comparatively resourceful and also uses a significant proportion of renewable energy.

The district heating plant in Uppsala was a forerunner when it was developed in the early Eighties. It has since developed its environmental profile further. The heat is produced (year 2000) from a mixture of 25% garbage fuel, 15% forest wastes, 5% mineral oil, and 55% peat. The peat comes from Mid-Sweden and has earlier been accepted as both renewable and ecologically sound. This may be true in an international environmental assessment. The local depletion of peat and the disturbance of valuable wetlands will, however, probably result in a change of the
6. Developing Sustainability in Hågaby Village

fuel system in the future, where the peat will be replaced with fresh bio-material.

The district heating plant has an advanced smoke purification system, which means that the plant produces very little pollution per capita in Uppsala. The filtration residue is—according to the company—continuously turned into glass, which leaches its toxic material extremely slowly as it is placed as a filling in roads.

6.1.4 Exergetic use of energy

It was previously demonstrated that energy use was systematically lowered through investments in low-energy lights, equipment and through construction and architectural measures. But different energy qualities were also deliberately used in order to obtain the appropriate energy source to suit each purpose.

Electricity is used for lighting, machines, and electrical motors but not for heating. Heat energy is sometimes used instead of electricity when there was a choice—for instance for the heat fan in the common drying room and in the use of hot water connections for the washing machines (Figure 6.4). Electricity conservation (Table 6.2) has also systematically been judged as more important than extreme heat conservation. A good example is the ventilation system, which in the Hällen quarter wastes some of the heat saved through insulation and special window glass and barrier gases. On the other hand, the electricity consumption is much lower than in ordinary Swedish houses.

6.1.5 Resourceful water supply and use

Water is mainly supplied to Hågaby from the great Uppsala ridge, which supports more than 2/3 of the population of Uppsala with naturally infiltrated water. There is however also a local ground water supply in Hågaby, which through hand pumping, if needed, can provide all its inhabitants with drinking water.

Pure drinking water is conserved in Hågaby, through a number of different measures. The taps of kitchens and bathrooms are provided with flow limiters, which theoretically gives a 30% reduction in flows. The four laundry rooms are equipped with washing machines with extremely good water-saving technology and all toilets in Hågaby are equipped with some kind of water saving technology. Most toilets (in the central buildings and in 64 apartments) have two flushing modes, one small (2 litres) and one bigger (but still comparatively small) flushing volume (4 litres). In 14 apartments, urine sorting toilets of a simpler kind, are being tried, which save some water due to lower flush amounts. And in 22 newly built apartments, an advanced water saving system is used in urine sorting toilets with only a few decilitres flushed in the urination bowl. The other main bowl is flushed with 4 litres.

Pure district supplied drinking water is also conserved in 43 households by using local ground water for irrigation of agricultural plots near the housing groups. In the first year of establishment, a great amount of fresh water was also used for initial irrigation of lawns, bushes and tree-plantings. In the future, the effect of local use of storm water systems together with the local ground water pump, will result in considerably less irrigation in Hällen in particular than in ordinary residential areas in Sweden.

<table>
<thead>
<tr>
<th>Electricity saving in all of Hågaby</th>
<th>Additional measures in Hällen</th>
</tr>
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<tbody>
<tr>
<td>Only hot water radiators</td>
<td>Self-draft ventilation</td>
</tr>
<tr>
<td>Low electricity ventilation</td>
<td>Small coolers and freezers</td>
</tr>
<tr>
<td>Low electricity washing machines</td>
<td>Larders (small cool room for food storage)</td>
</tr>
<tr>
<td>Low electricity coolers freezers</td>
<td>Narrow houses (give more daylight)</td>
</tr>
<tr>
<td>Low electricity outdoor illumination</td>
<td>Large window surface (more daylight)</td>
</tr>
</tbody>
</table>
6.1.6 Community waste water treatment

Hågaby has two waste water treatment systems. The first is the ordinary municipal distant sewage treatment, used for 57 households, most of the laundry rooms, the central buildings and the schools. The second is an advanced research sewage treatment plant with the capacity to purify the sewage from 43 households including toilets, washing machines, showers, dish-washing and bathing. The waste water is sorted into a urine fraction that is stored for at least 6 months in concrete tanks.

The sewage treatment plant consists of two sludge containers coupled in series, three biological purification steps, one chemical saturation step for removing the phosphorous and two after treatment steps with a sand filter and a UV-filter unit. All steps can be sampled and manipulated to design the optimal purification conditions for the plant (Figure 6.5). The out-flowing water contains only about 50 indicator bacteria per 100 ml, which is considered to be swimming water quality.

The phosphorous values are normally lower than 0.2 mg per litre which is less than half the requirement for municipal treatment systems. The reduction percentage of all incoming phosphorous (including urine) is around 98.5%. The nitrogen values are less than 14 mg per litre, which on average is half the amount of municipal out-flowing water. The reduction percentage (including the urine sorting) is around 80%. Both BOD and suspended material are reduced by 98%.

The sorted urine from 14 of Uppsalahem’s rebuilt apartments and 22 newly built apartments in Hällen is primarily stored in two separate containers. When they are full – the urine is pumped to hygienisation tanks for at least 6 months storage. After that the urine is pumped to a special tractor pulled tank wagon. The urine is spread by a local farmer growing forage crops, only one kilometre from the storage tanks. The nutrient quality of urine is considered high: the nutrient balance between nitrogen, phosphorous and potassium is ideal for plant growth and the recycled human fertiliser is also comparable in uptake efficiency and growth yield (Johansson et al. 2000).

The hygienic quality of urine that has been stored for at least 6 months is considered as comparable with or higher than sludge. The sludge from the plant in Hågaby is collected by a sludge entrepreneur and transported to a central sludge treatment area of the municipal sewage treatment plant. After dehydration and hygienisation the sludge is ready for spreading in agricultural fields. The sludge from Hågaby should be particularly free from heavy metals and organic toxic substances, since the sewage pipelines and connections in the houses are of environmentally friendly plastics (polyethylene). This has, however, still not been verified through real analyses.

The research aspects of the sewage treatment plant will be further developed, as samples will be taken between the purification steps. This will probably also give some valuable information about the microbiological processes in municipal sewage treatment in general. One recurring problem is that of various laundry soaps and their effect on the microbial processes in the biological anaerobic and aerobic steps. Floating sludge affects both small-scale and municipal scale waste water treatment plants.

Another set of questions concerns the economy and the maintenance of mid-scale sewage treatment plants. For the Hågaby plant, the hypothesis is that a sustainable maintenance and economy can only be achieved if it is carried out by professional technical staff.

6.1.7 Community solid waste management

The principle of waste sorting is generally accepted as a main route to more resilient and sustainable handling of waste as raw material for new production in our modern society. At the same time, waste sorting, composting and recycling are challenged by politicians, civil servants and technicians for a number of reasons. Some consider it more efficient to burn most of the waste including the organic material and instead produce useful heat. Sometimes the economic efficiency of bottle, paper and can recovery is questioned – it may require too many employees or too much transportation. The central composting initiatives in the municipality are criticised because the compost fertiliser contains too much heavy metal and also unacceptable quantities of organic toxic substances. On the other hand, family composts are still somewhat too demanding for people in general. The commitment needed for successful composting all year around is still too high for many residents.

Waste sorting is carried out all over Hågaby. The main components are burnable waste, newspapers, white and coloured bottles, metal containers, plastic containers, cardboard and batteries. The sorting efficiency is slowly improving and works best in the newly built part of Hågaby – Hällen.

In Hågaby two automatic compost machines have been installed and are designed to offer users both easy and time-saving handling and maintenance, as well as a close
and aesthetically enjoyable experience. The results after
two years with the Ale-compost machine, in the eastern
part of Hågaby, are unsatisfactory. The compost process
functions acceptably but the olfactory (smell) and visual
aesthetics are still not working. The first cause for this is
that the machine lacks a mill for grinding the organic waste
into small residues with a large area for micro-organisms
to attach to. This results both in “lumpy” compost material
with recognisable original household waste parts, and also
in a smelly first stage for the compost machine. The second
cause is that the information about the routines concern-
ing the compost machine reach the tenants only through
printed messages at rather great intervals. The result has,
during the first years, been a low standard of cleaning and
order in the compost room, which is rather unattractive
for the users and which in turn induces a vicious circle of
misuse and negligence. There is also a high frequency of
disposal of inappropriate material for a compost: plastic,
paper, cloth fragments and even metal items.

The second automatic compost machine is a Joraform
type with two containers and a mill (see Figure 6.6). The first
container is the active primary composting compartment. The
second is used for maturing. Sawdust pellets are added to
balance the high nitrogen concentration with carbonaceous
material. Each user receives initial training in the basics
of composting, as well as in several small but important
practical matters. The compost bins in each house are
rather small (5-6 litres) which gives a comparatively fresh
waste fraction entering the mill and compost container.
The material takes only four weeks to process (it should
take six, but the production of organic waste is greater
than planned) and the result is a good-smelling (soil or
gemstone smell), well-fragmented and nicely-coloured end
product, with a lot of nutrient power and aerating properties
when added to soils. The compost room is tidy, hygienic
and smells good a majority of the time. Conclusions from
the experience so far is that sustainable handling of organic
household waste must contain the following components
to make it sustainable year after year: appropriate size,
appropriate technical details and appropriate information
and training.

6.1.8 Five levels of food production for the community

The technical revolution in agricultural business continues
in Sweden. The scale continues to increase and the global
food market is becoming more and more important. At the
same time many consumers question today’s modern food
production system – not least for environmental reasons.
Is the food healthy? Is it produced with energy-demanding
fertilisers? Are the animals treated well? Has the food been
transported over very long distances? Has the food been
produced by poorly paid labour? This is the type of envi-
ronmental or ethical questions raised by many concerned
consumers today. At the same time as many people would
probably like to try products with fewer biocides, less
genetic engineering, less transport and produced under
circumstances where the producers were fairly treated,
it is still difficult to find these products and they are still
rather expensive. The time needed for producing one’s own
food is also rather great, unless the cultivating activity has
some extra value.

In Hågaby the residents have access to cultivation land
on four local levels:
- All residents in Hågaby can grow their own salads,
  spices and carrots in their own private gardens. This
  is the first level (see Figures 4.4 and 4.6).
- The second level is represented by the garden plot
  areas, mostly placed adjacent to the various house
  groups (Figure 4.4).
- The third level is just at its beginning and can be
  outlined as larger common plots where half-rational
  cultivation is carried out, producing for instance
  potatoes, cabbages, beans and zucchini. This level
  can expand in the future, but it is dependent on the
  level of co-operation and on half automation.
- The fourth level is the “local import” of vegetables,
  meat, eggs and bread to the local shop from farmers
  in the country-side around Uppsala.

The “fifth level” is the common food market products
in ordinary stores and shops. Even at this level, people
have a certain amount of choice and can choose products
that are environmentally beneficial or ethically sound in
some other way.

6.1.9 Development of larders and root-cellars

Another way of increasing the quality of everyday food is to
increase the local storage capacity of the homes in Hågaby.
A long-term plan to install root-cellars has still not been
initiated, but the technique is well-known and appropriate
sites where they can be built have already been identified.
In Hällen food storage in individual houses has been
improved by including air or soil-air cooled larders in all
houses (Figure 6.2). Together with the energy efficient
cooler/freezer in the kitchen, the larder contributes to a

![Figure 6.6 Compost machine for 30 households (100 people). The amount of recycled organic waste per capita. A. Addition of
waste and sawdust pellets. B. Mill. C. Primary process chamber
(70 °C). D. Mixer. E. Secondary process chamber. F. Emptying
hatch. G. Ventilation tubes.](image)
lower consumption of electricity while maintaining a bigger food storage capacity at different cool temperatures. For big consumers of frozen food an additional freezer (box) has been installed.

6.1.10 Transportation system evolution
Transportation of people and goods may be the outstandingly most important resource demanding activity in our modern communities. On the average, each Swede travels 40 kilometres every day (Berg, 1996). Most of that travel is by car. There are few low density areas in Sweden where a person can lead a reasonably good life without a car. On the other hand there are a number of ways to decrease the car-dependence in cities and towns of economically buoyant regions. One strategy is to substitute some of the distant mobility for local mobility. But what types of travel can we decrease? Surprisingly enough, it is not work-travel that dominates (about 25% of all travel) or even service travel (around 20%). More than half of all travel is related to leisure purposes!

In Hågaby several factors affect the overall need for transportation. A location only 4 km from the city centre, near three local suburban centres and close to a varied and exciting landscape contributes to fewer and shorter trips by car. The transportation infrastructure consists of a main bus and car road and a great number of comfortable bicycle or walking paths. Except for walking or bicycling, residents use the municipal buses, private cars or shared cars. Bicycling is particularly convenient in Hågaby, which also contributes to a relatively low transportation volume from and to Hågaby. There are still no direct figures on the "travel-profile" of Hågaby residents, but this will hopefully be done during the year 2002. There is a high frequency of bus-travellers (more than 90% of all residents use the bus, but only for roughly 20% of the transport needs) and many bicycles (more than 300). Service trips are short and more than 40% of all households have someone working full or part-time in Hågaby. The residents also use the near landscape for leisure. All this suggests that the average travel length is in the range of 10-30% lower than the Swedish average (Table 6.3).

6.1.11 A resilient balance between local and distant life-support
One main criticism of the affluent society is that it consumes non-renewable resources at a frighteningly high rate. A reaction to this has been to suggest local recycling and the use of renewable resources instead. The propositions have often come from alternative groups wishing to try out new techniques on a very local scale. Slowly but steadily the municipal scale has developed large scale solutions aiming at reducing emissions, recycling material and substituting toxic for harmless materials in housing, schools and workplaces. It is therefore time to combine the best from the local level, with the advantages of the central level.

In Hågaby we are consciously seeking a resilient balance between local and centralised life-support for energy, water, food and material. The local level may be of limited quantitative importance (see Table 6.1 in the beginning) but it is an important little part. If needed, it would be comparatively easy to increase the community life-support. For the time being it is important to find an appropriate level of local commitment to the environment (Table 6.4), which is mainly contributing to a good everyday life in Hågaby.

6.1.12 Healthy houses
During the 1980s the sick building syndrome was discovered (Akimenko et al. 1986). In Sweden the quest for insulating houses without proper ventilation for foundations, walls and roofs led to an explosion of sick houses. The causes were mouldy surfaces secreting allergenic gases as well as emission from new materials in houses. One result of this period was a fast technical development in construction techniques. Another was the renaissance of older building methods and use of materials. In Hågaby in general and in Hällen in particular a number of measures were taken to produce healthy houses which were at the same time environmentally friendly and resource efficient (Table 6.5).

Table 6.4 Commitment to the environment. Comparison between residents’ opinions in the Hågaby model and ordinary Swedish residential areas. The table shows the percentage of residents considering environmental investments in the residential

<table>
<thead>
<tr>
<th>Hågaby model</th>
<th>Small house area (1930-1950)</th>
<th>1950’s multi-family house area</th>
<th>1960’s million programme area</th>
</tr>
</thead>
<tbody>
<tr>
<td>96%</td>
<td>63%</td>
<td>45%</td>
<td>47%</td>
</tr>
</tbody>
</table>

Table 6.5 Examples of building materials chosen in Hällen that were: health supportive, environmentally friendly and resource

<table>
<thead>
<tr>
<th>Health supportive materials</th>
<th>Environmentally friendly materials</th>
<th>Resource efficient materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Wooden floors</td>
<td>-Ecofiber insulation*</td>
<td>-Wood construction of houses</td>
</tr>
<tr>
<td>-Non-plastic wall-paper</td>
<td>-PVC-free floor sealing</td>
<td>-Energy glass with coating**</td>
</tr>
<tr>
<td>-Water soluble roof-distemper</td>
<td>-Roof tile (made of clay)</td>
<td></td>
</tr>
</tbody>
</table>

*) Recycled paper soaked in boron salts. **) Kappa energy glass with barrier gas (Bokalders and Block, 1997)
6. DURABLE ECONOMIC RESOURCES

Hågaby has mainly been rebuilt. By re-using the existing basic structure of the foundations, walls and roofs, many of the old windows, old but still functioning pipes, roads and equipment, new lumber - metal ore and refined metals, bricks and concrete have been saved. Uppsalahem public housing company has thus been able to reduce the energy and materials’ costs substantially. The new houses of BRF Hällen have been built to be especially durable as long as they are maintained properly.

The household economy of the Uppsalahem tenants and of the residents in Hällen has been another important economic issue. The preferred principle for both groups has been to establish somewhat higher monthly costs than would be needed from the beginning, but then to maintain very even and predictable costs. In this section examples of informal economic co-operation will also be given.

6.2.1 Experimental and normal costs in Hågaby

Hågaby is an experimental area but with fairly normal investments. This means that selected extraordinary expenditures have been made in the planning process and also to some extent for investments in special technology. The building company JM Byggnads and the public housing company Uppsalahem AB as well as the tenant owned association have also spent extra money indirectly by diverting time for extra communication and investigation. All these costs are to a great extent investments for the future, which will pay off in later projects and in accumulated values in the high quality apartments of Hågaby.

In a broader sense, all costs were therefore “normal”, even investments in new technology (Table 6.6). Investments in solar collectors (about 1 million out of 3 million SEK) came from NUTEK (The Swedish Technology Development Office). The government also supported “the environmental investments” of the local research sewage treatment plant by a third (460,000 SEK), which is a joint effort between Uppsalahem AB and BRF Hällen. Uppsalahem and BRF Hällen also invested about 600,000 SEK in the local sewage treatment plant shared by 21 rental households and 22 Hällen households.

Table 6.6 Rebuilding costs for rental apartment buildings in Hågaby compared to a theoretical new construction of the houses. Actual costs for building the new quarter Hällen. The figures were compared to current prices for new construction of ordinary

<table>
<thead>
<tr>
<th>Rebuilding costs for 77 rental apartments</th>
<th>77 MSEK*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical costs for building new rental apartments</td>
<td>87 MSEK**</td>
</tr>
<tr>
<td>Actual costs for building BRF Hällen</td>
<td>31 MSEK***</td>
</tr>
<tr>
<td>Average production costs in Sweden</td>
<td>33 MSEK****</td>
</tr>
</tbody>
</table>

*) According to Uppsalahem AB, including 17 MSEK for purchasing the houses.
**) In current prices for new production of apartments 1998.
***) Payments according to contract to the construction company JM Byggnads AB.
****) Average costs in Sweden 1997 to produce the same number of ordinary apartments.

Some costs that were previously considered by the building industry as extraordinary environmental investments, today have been incorporated into the “normal” building process. Wall paper without thick plastic layers, water based paint, low levels of formaldehyde boards or PVC-free watertight floor coatings are today standard ingredients for many building companies.

6.2.2 When is reconstruction worth the cost?

Is reuse and reconstruction always a good idea? That depends on a number of factors. If the reused material – for instance an old well-kept window – has very poor energy values it might be better to replace it with a new. The lower running costs will in the long-run pay for the new energy-efficient window. In Hågaby, some windows that were not too worn down, were kept in the rebuilding project. Only rubber weatherproofing was added to the restored two-pane windows. The energy outcome has not yet been evaluated. Reconstruction of roofs and walls that need a lot of effort, for instance by removing environmentally inappropriate material, may sometimes be more expensive than erecting an entirely new building. In some instances, this weighing of costs has led to a radical tearing down of material and in other instances, the original buildings were less affected. One evident conclusion from the rebuilding of the apartment buildings in Hågaby is that it is important to prepare for rebuilding prior to the primary construction of the houses.

6.2.3 The public housing company: “a successful bad investment”

Uppsalahem considered the rebuilding of Hågaby as a success in many respects. The residents are on the whole very content with their living spaces, the gardens and entrances look very tidy, personal and aesthetic. The residential area is successful as a demonstration project of various sustainability resources. The total investments of 90 million SEK would have been completely economically beneficial, if all the buildings were used as planned. The situation today, however, is that many of the premises in the central buildings of Hågaby are not presently being rented or have rents which are too low to balance the running costs like heating and depreciation. It is not so strange therefore that the company’s economists consider Hågaby so far as a “successful bad investment”. In the future, a number of measures will be taken to fill the office premises better. Some of the ideas include the establishment of public education or computer training as well as a rebuilding of some of the offices to apartments. If this succeeds, the assessment of the economic sustainability of Hågaby will probably change.

6.2.4 The building company: “potentially profitable environmental investments”

The new houses were built by JM Byggnads construction company. The goal for JM as well as for BRF Hällen was that the costs should be generally normal with a reasonable profit for the building company and reasonable living costs for the residents. On the other hand, both parties also calculated that some extra investments had to be made since this was an experiment. This meant that the construction
company accepted that more time for communication and system investigation were spent by their controllers and project leaders. The BRF Hällen were prepared that a huge amount of personal time would be needed from all of its members in order to succeed with the project. For JM the profit was also very small, but the final judgement was that the project may have been important for their future environmentally profiled projects. The architect of Hällen – Greger Wolter – actually designed the next JM housing project in Uppsala, which included several sustainability aspects that had been carried out in the Hällen project.

6.2.5 The residents: “noticeable costs and high habitational values”

So what do the residents of the new houses say? Was the result worth the effort? Were the costs acceptable? In the first year, no answer to this question was possible, since so much “do-it-yourself” construction indoors and outdoors remained. The residents were too occupied with finishing their houses and gardens to be able to deliver an opinion on the values of living in the place.

Two years after moving to the houses most residents admit that it was really worth all the planning and preparation work. The values of the houses in their context, by far exceed the costs spent. The running costs are considered rather high by most residents in Hällen. They are actually somewhat lower than comparable newly built ordinary houses of the same time period. The main reason for this is that a lot of details had to be finished by the residents themselves.

The tenants of Uppsalahem’s houses unanimously think that the rents are high (about 6300 SEK/month for 100 m²), but at the same time think that it is worth a lot to live in Hågaby. The place has such great additional value that the residents, even if they have a tight budget, give a high priority to residential costs.

6.2.6 Principles for a sustainable local economy in practice

Even comparatively low-income households can cope with the rents and fees in Hågaby. What is the reason for this? One reason is that many of the residents in the rental apartment houses had a chance to exchange apartments with each other during the first two years. This meant that small households in too big apartments could find a cheaper and smaller one, (while big families in too small apartments could find reasonable space for their families).

A corresponding process occurred during the planning period in BRF Hällen. In that instance, the size of each duplex unit was set by the individual economy as tested by the loaning bank. In that way the newly built houses and costs could be appropriately adapted to the economic capacity of each individual family. There were also some shared costs that could even out the differences between houses in BRF Hällen.

One reason for an extremely low moving frequency in Hågaby is that various aspects of an informal local economy have been evolving in the neighbourhood since the beginning. On the simplest level, neighbourly co-operation involves what could be termed the extended corner store and toolbox, a traditional practice in any maturing neighbourhood. Neighbours borrow missing cooking ingredients and tools. This is common in the small or close neighbourhoods in Hågaby. Mostly it involves only a few households living very close to each other. Another level of co-operation involves the “inheritance” of children’s clothes, bicycles, books and toys. This economic collaboration is based on a substantial trust between certain neighbours and may be beneficial for different reasons. The giver is relieved of accumulating clothes and things and the receiver is provided with otherwise expensive children’s clothes, that will require at least four generations of children to wear them out. Those two examples represent a number of conceivable neighbourhood mutual support events that will save time and money for the involved parties.

Still another system of co-operation involves co-financing for various useful things. In Hågaby, several neighbour groups have shared the costs of a car, a lawn-mower, a ladder, a TV-antenna or they have co-ordinated the purchase of sand, gravel, soil or even round rocks. A more formal co-operation concerns exchanging services and goods in a special local market. Such a local exchange and trading system (LETS) has not been tried as yet in Hågaby but that would further contribute to the household economy of the participants. In their best forms, such local economic systems may increase the economic activity, improve its diversity and create new production or refinement of ideas. The basis of all these more or less informal local systems is the difference between people, the different skills and the different knowledge that various human beings possess. These values are fundamentally economic (Table 6.7) and they may bloom in a context where people have a reason to communicate, like in a family or a mature neighbourhood.

6.3 TIMELESS BIOLOGICAL RESOURCES CREATE THE GENIUS LOCI OF HÅGABY

Hågaby and its surroundings possess unusually rich biological values. Although it is difficult to discriminate between natural, cultural or leisure landscapes, it may be particularly fruitful to apply these perspectives to what can be seen in Hågadalen – Nästen natural reserve (Figure 6.7). The rare species and the unusual biotopes are in practice the target of only a limited number of people, who think that the rents are high (about 6300 SEK/month for 100 m²), but at the same time think that it is worth a lot to live in Hågaby. The place has such great additional value that the residents, even if they have a tight budget, give a high priority to residential costs.

Table 6.7 Principles for creating sustainable economies for residents in Hågaby.

<table>
<thead>
<tr>
<th>Economic principles among all Hågaby residents</th>
<th>Economic principles in the tenant association BRF Hällen</th>
</tr>
</thead>
<tbody>
<tr>
<td>High even monthly costs with small increases.*</td>
<td>Long saving time (several years).</td>
</tr>
<tr>
<td>Informal economic activities important.</td>
<td>High deposit share (30% of total cost).</td>
</tr>
<tr>
<td>Reduce car travel to save monthly costs.</td>
<td>High share of do it yourself construction.**</td>
</tr>
<tr>
<td></td>
<td>Common property development.***</td>
</tr>
</tbody>
</table>

*)Instead of low initial costs and rapid increase of rents
**All indoor surfaces and outdoor planning was done by residents
***Shared maintenance of common outdoor surfaces and shared investments of common tools and other equipment
however many in historical and future perspectives. More popularly known and appreciated are the open views of the agricultural and grazed valley, the secluded glades of the Nästen forest and the winding river ravine. These environments compose the ever lasting rhythms, fragrances and atmospheres of the place – its *Genius loci*.

### 6.3.1 Nature’s treasures protected for the future
In the autumn of 1998 the natural reserve of Hågadalen Nästen was declared by the municipality and by the county council. It was the end of more than twenty years of struggle to delimit, to define and to describe one of the biological treasures of Uppsala. Its value was particularly underlined by its closeness to the city, its great biotope diversity and its richness in species. For more than a century Uppsala residents have thus travelled the few kilometres to the old valley, an agricultural valley with a three thousand year history.

For more than a century, the residents of Uppsala have sought the forest glades and the river’s ravines for rest, pleasure and recreation. Ever since Linné’s days in the 18th century, the valley and the wetlands of Nästen forest have attracted students interested in the flora and fauna of mid-Sweden. The botanists, zoologists and the ecologists at the University of Uppsala are still visiting the places in Hågadalen Nästen, that contain more than 130 red-listed (rare) species. In connection with the formation of the natural reserve, comprehensive maps and descriptions of the biological values of the site have been amply publicised.

### 6.3.2 The cultural imprints of the landscape
Great botanical and zoological values can also be noted all over the grazed hills around Hågahögen (the Håga mound). This is maybe where the landscape appears most magnificent. This is also perhaps a place which holds a strong argument for the symbiosis between people and nature at its very best. The open grazed land allows one to choose any path. The agricultural valley presents the grandeur of the landscape, with the winding river green and the protecting forest glades on both sides of the valley.

The views from Hågahögen also offer us links to the ages when the great ice pulled back and moulded the landscape. It connects us to the generations of farmers who have sowed and harvested during more than 100 generations as the river withdrew from the valley. Today the tradition continues. The small forest glades are protected and planned for the grazing of young cows or sheep. North of the Hällen houses, a small meadow is harvested using old methods in order to entice the grasses and herbs of that typical habitat. The agriculture continues –in the future possibly with less biocides. The grazing of sheep is evolving over increasing areas around the impediments of Hågahögen.

### 6.3.3 The closed and open nature invites the leisure-people of Uppsala
It may be the very contrast between the open valley and the closed areas of the Nästen and river forests that attracts the hundreds – sometimes thousands – of people who come to Hågaby to strengthen their bodies, rest their tired muscles and find peace of mind. At least eight paths and roads lead to and from Hågaby and they are all of great importance to the people in the nearby suburbs, and in general to people from all of Uppsala. The main entrance to Hågaby is maybe not the main road, but rather the old, nowadays pulled down, railway banks that are frequently visited by walking, running, biking and skiing people. Many people also enter Hågaby via the small walking bridge at Eriksberg on the other side of the valley. For those who want long tours, the paths through the Nästen forest lead to lake Ekoln, 6 km south of Hågaby (Figure 6.7). Those who want to continue on the paths can continue through beautiful landscapes all the way to Stockholm, 70 km south of Uppsala.

The small scale cultural landscape is also of great value in Hågaby. Major important miniforests are situated north of the main road as well as in the school park with old great oaks and elms. To the north and south of the residential houses of Hällen, common greens have been planted and mowed for the resident’s celebrations, outdoor meetings and children’s play. South of Hällen, as a wind shield and an identity border, a winding series of hills and slopes have been designed from soil that was left over when the new houses were built. This undulating hilly border continues south of the tenant’s houses and also south of the large football field in Hågaby.

The last but not the least part of the cultural landscape of Hågaby is represented by the common grounds and private gardens of Hågaby’s residents. They constitute a

rich variety of garden tastes and green skills and are very beautiful to pass by as one is travelling through the village by foot. Close to the private gardens are also the garden plots assembled in six plot areas for the resident’s potatoes, flowers and berries. The cultural landscape also includes the special flora and fauna around the tombs, grounds and other signs of human life over the centuries and the millennia in Hägaby (see 6.6).

6.4 THE ORGANISATION OF COMMUNITY COMFORT

Suppose we have enough energy, water and soil, as well as houses, tools and skilled people. We may also have access to forests and green water fronts for our pleasure and comfort. We could still not lead a sustainable life without control, without organisation, without rules - formal and informal. Hägaby demonstrates appropriate balances between local and distant services, between private and public spaces and between local and distant mobility and communication. A good community organisation will strengthen the social glue and better prepares its inhabitants to face the world.

6.4.1 Local and distant services

One main reason for making efforts for the local common good, is to make everyday life easier for the inhabitants. If services are more affluent than wanted or used, they become a burden taking both time and costing money. But at a certain level, local services – like a corner store, a café, a barber shop, a restaurant and a second hand shop may support life in the neighbourhood by saving unnecessary travel, money and time for the residents. If they are generally accepted or even popular these service places will also function as social generators, inducing meetings and casual acquaintances.

The local food shop in Hägaby, Tant Gröns Skaf-feri (“Aunt Green’s larder”), has most basic foods and also a special assortment of environmentally beneficial commodities like laundry soap, notepads and children’s clothes. It also functions as a distributor of products from local agriculture like meat, eggs, and green groceries. The shop is appreciated (by 97%) and is also actually used by most people (96%) in Hägaby. It is important, although only about 15% of the food (on the average) is bought at the local shop.

The above examples can be seen in Hägaby but there are also two other, specific institutions which facilitate communication between residents. The first is the residential host, which (from 1996 to 1999) was Uppsalahem’s fixed link to the tenants. The host initiated repair work, reacted to complaints and organised moving, but was also involved in projects for the future, suggested by the residents. In practice, the residential host in Hägaby proved to be an important communication force, which helped the residents clear up misunderstandings and misconceptions. The residential host also brought together ideas and interests just by knowing that they existed among the residents. The residential host system was phased out in all of Uppsalahem’s appartments in Uppsala from the year 2000.

Another communicating and socially beneficial role is carried by the growing activities of the neighbourhood council that was formed during the year 2000. It is composed of interested persons among Uppsalahem’s tenants, Hillen’s residents, the schools and the small entrepreneurs in Hägaby. The council’s role is mainly as a forum for communication of problems and good ideas. A great majority (more than 90%) are positive to the formation of a local forum.

The local services of Hägaby play an increasingly important role for its residents and small companies and associations. It is crucial, however, to underline that they represent just one small part of residential life in general. Most shops of quantitive importance are situated around two kilometres from Hägaby in three local suburban centres with more comprehensive services – like banks, post offices, larger stores, cafés and restaurants, video stores, drugstores, health centres and dentists. In the suburb as a whole, one can also find more restaurants, paint shops, a glazier, a few garages and a number of other small businesses. It is the combination between the small but select neighbourhood services (see Table 6.8) and the larger quantitative services that creates a sustainable situation.

6.4.2 Community and townscape schools and workplaces

A key sustainability factor for the Hägaby neighbourhood are the pre-schools and the school. Most small children and about half of the school children go to the local preschools and school respectively. This contribute to a sense of neighbourhood both for the school children and for the residents. It is important, however, that many Hägaby children go to the local townscape schools, which can be said to “protect” the neighbourhood from too much local life.

Work-life is also divided in a similar way between the local and the central levels: there are some local offices and home work places for (mostly) part-time work, but most workplaces lie outside of Hägaby. Yet more than half of the households (55%) in Hägaby have someone working in a local office or at home - from a few days a month to full-time. About 40% of the households have someone in the household who regularly works in Hägaby full-time or part-time. A future work situation where a person would work one or two days in the neighbourhood and the other

Table 6.8. Local services in Hägaby. Some services are especially important to residents while others need to have visitors from other parts of Uppsala in order to maintain their activity.

<table>
<thead>
<tr>
<th>Services primarily for residents in Hägaby</th>
<th>Services equally important to visitors as to residents</th>
<th>Services mostly used by visitors to Hägaby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community food shop</td>
<td>School (Grades 1-9 )</td>
<td>Restaurant</td>
</tr>
<tr>
<td>Local bus-service to city</td>
<td>Local offices</td>
<td>Swimming pool</td>
</tr>
<tr>
<td>Day-care centre</td>
<td>Assembly hall</td>
<td>Sports hall</td>
</tr>
<tr>
<td>Common green areas in the village</td>
<td>Barber shop</td>
<td>Gym</td>
</tr>
<tr>
<td>Neighbourhood centre</td>
<td>Football field</td>
<td>Horse stable</td>
</tr>
<tr>
<td>Neighbourhood forum</td>
<td>Nåsten forest</td>
<td></td>
</tr>
</tbody>
</table>
days at a central work place will be a reality for most of the work force (and maybe also the students) in just a few years in Sweden. This development is driven both by the IT-evolution and its home applications as well as by changing human preferences. As time becomes more and more valuable, fewer people with a choice will spend a lot of work-travel time on the bus, on the train or in a car.

We still don’t know, but suspect that this will also be the case for residents of Hågaby.

6.4.3 Balance between private and public space

In the planning of Hågaby, a balance between individual and social spaces was sought. The rationale of this was the hypothesis that a person is a social and an individual being who is always moving between the two (see chapter 4.3.5). Another way to put this is to say that to be social you have to have your own territory. Both the new and the renewed areas of Hågaby thus exhibit a number of private spaces with semi-public spaces or public thoroughfares between them. For the rebuilt buildings, private outdoor spaces could be achieved to some extent by adding two gardens or private plots outside the two entrances. If possible, all apartments got at least some space towards the west and the evening sun. In Hällen, all the houses’ gardens face south or west whereas the entrances face the north or the east. Because they are duplexes, all families possess private outdoor spaces in three directions.

Between the buildings, semi-public common greens extend the private gardens and function as meeting-places, common playgrounds and celebration areas. Outside the housing groups in all of Hågaby, there are larger common greens for sports, recreation or larger celebrations. Other private spaces can be found in apartments and in special garden plots close to each house cluster. The most important public outdoor space is the walking road running through all of Hågaby.

There are also a number of common premises where the residents and the local working people can gather for meetings, handicrafts, sports, seminars, festivities and reflection. The Neighbourhood Center is a small glassed-in information and communication room at the very centre of Hågaby. It has just recently been planned and will, when it is finished, display the actors and specialties of Hågaby. The room also has a collection of books and brochures about Hågaby and its surroundings, as well as an information computer, with homepages to associations, information from the neighbourhood council and other valuable knowledge. Håga hall is the biggest common indoor space and can assemble up to 250 people. The residents’ room is smaller with room for 40 people and can be rented by the residents for meetings, parties, cinema and seminars. Hällen has a smaller assembly room for up to 25 people as well as a studio in one of the old barns in the area. The studio is used for carpentry, table tennis and as an exhibition hall during the summer time, whereas it is used as a garage and a storage room during the winter. The common and the private spaces also include roads and paths.

6.4.4 Hierarchy of roads and paths

A main road for buses and cars runs through Hågaby north of most of the buildings. An additional Woonerf street (see chapter 4) runs parallel to the main road, but between the houses. This is the main neighbourhood street where all modes of travel exist, but where pedestrians and cyclists have the main access to the common space (see Figure 4.4). The main road and the village street are supplemented by a network of cycling and walking paths through the entire small community. Those small lanes are important for local mobility in Hågaby – they make movement easy for all residents, including people in wheelchairs. There are also small private paths and sidewalks associated with the private spaces of residents (see Figures 6.8 and 6.9).

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Figure 6.8 Public, semi-public, semi-private and private spaces in Hågaby. Map showing distribution of space by Dorota Włodarczyk, Technical University of Gdansk who made the original analysis. All households in Hällen (A), Eken (B), Linden (C), Björken (D) and Stugbyn (E) have access to private and semi-private space.
At the edge of the built-up area lies a rich network of paths leading to the Nåsten forest and down into the valley or across the Håga river rapids. Most of these pathways are public as they belong to the natural reserve or are in other ways always open to the public for recreational purposes. The two main recreational entrances to Håga were previously mentioned. The first is the old railway embankment, which serves as a main bicycle and running road to Hågaby, especially from the large student areas near Hågaby, Flogsta and Studentstaden. The second main access to Håga is from the main suburb of Eriksberg via a walking bridge over the Håga river and across the agricultural fields and the grazing hills around Hågahögen (the Håga mound).

In the small forest areas north of Hågaby, as well as in the great Nåsten forest, hundreds of paths both large and small, turns any berry or mushroom picking expedition as well as any hunting or leisure walk into both an adventure and an opportunity for relaxation.

6.4.5 Development of the community’s transportation nodes and modes

Transportation is one of the great unsolved planning areas where environmental impact is still increasing. It is also quite difficult to affect the need for travel and goods transfer on the local level. Many causes are structural like city zoning, the development of road networks, pricing policies of public transport, and generalisation of the economy. But there are things that really can be done on the local level. In modern Sweden most travel is done for leisure purposes (more than half of all trips) and they are done by car. If local communities were more attractive to their inhabitants and if neighbourhood relations were somewhat more important, leisure travel would also change accordingly.

Another type of travel that may be affected by organisational measures in the local community are communication induced travelling. There is strong evidence to suggest that as distance telecommunications develops, travel frequency is also increasing. Could it be that increased, very local communication would produce a similar effect? Would stronger local communication hence also increase local mobility and compete somewhat with distant travel? Is it even possible that people who had the option would decrease their everyday travel to less than five days a week?

Travel options in Hågaby include the municipal bus line, private cars, shared cars and bicycles. The bus stops serve most households in Hågaby and more than 90% of the households use the bus line in some way. The dependence on cars is still very great not the least for weekend shopping. About 80% of the households have one car. There are slightly more than 300 bicycles, which on the average is 2.8 per household (this implies that all inhabitants over 5 years of age have a bike). A great majority of the residents in Hågaby are positive to guest-bicycles and to utilising the 2 local bicycle repair persons, at least sometimes. All apartments have good bicycle storage premises (during the winter) and access to bicycle parking (but less than a third have rain shielded parking) and a central automatic bicycle pump has also been installed.

Almost 10% are involved in some kind of car-sharing, which is interesting since organised car-sharing has not started yet. 11% have stated an interest in Neighbourhood car which is now running. Car pooling is of interest to 20% of Hågaby’s residents. Informal car-sharing has been working for several years, whereas carpooling e.g. neighbourhood car has taken many years to prepare. Other interesting “wheel” ideas include co-travel, mini-bus to the local suburban centre, motorised bicycles, electric vehicles, as well as pull carts and bicycle carts.
6.4.6 Emerging communication within the community and to the world

Communication is of increasing importance for the residents of Hägaby. More than half of the households (56%) wish to improve their internet communication. As many as 32% are interested in a community intranet. Such an intranet could be organised within the framework of ordinary internet but could also, in principle, be partly independent or optionally protected from the internet. The investments, convenience and security will influence the choice of system in the end.

Almost 40% of the residents see some advantage in having a local telephone network with short numbers complementing the ordinary system. At the same time there is a significant 26% minority who directly state their lack of interest for the Internet! The high interest for a neighbourhood council and the support of the former residential host, as well as the positive attitude towards neighbourhood co-operation and acquaintances (see below), shows that residents wish to improve their internal communication within the neighbourhood.

6.5 AN INCREASE IN THE COMMUNITY GLUE IN HÅGÄBY

The community of Hägaby is a mixture of relations directed outwards from the neighbourhood to the world and an emerging network of relations within the area. The present state of this habitat is characterised by settling and connecting. Most residents have moved to Hägaby during the last four years (since 1997). One fifth has lived there for only two and a half years. The demographic structure is a little unbalanced with about a third of the population under 15 years. The elderly group (over 60) comprises only 4% and students only 2% of the population. Recent immigrants to Hägaby comprise only a few percent, but the number of mixed immigrant-Swedish families is significant (7%). The economic situation for families are roughly normally distributed (personal observation) on the average. At least 10% are single mothers with children. The special emphasis on gardens and interest in the environment has brought a significant selection of “environmentally interested” residents to Hällen. But Uppsalahem’s tenants are also especially interested in gardening and the landscape.

All these factors have created common interests for both ideological reasons (Hällen) and for a number of practical reasons. The area has a number of social generators, a high number of weak relationships (about 15,000 “recognition relationships” among 350 residents – see below), a significant number of small entrepreneurs who work and live in the neighbourhood (around 20 small enterprises). There is also an emergence of community associations, informal community networks as well as a number of new social and play activities being planned. It would be fair to say that Hägaby is slowly on its way to becoming a stronger neighbourhood.

6.5.1 Social generators: children, shops, school and communication’s fora

Some organisational functions will, in particular, generate new contacts between children, between children and grown-ups, between youngsters and the elderly and between the adults themselves in the local community. Children will, by themselves, give rise to acquaintances between various parents thus exposing family structure to other families. In Hägaby, of 350 people, 120 are children up to the age of 15. There are between 20 and 50 small groups of children playing, talking or socialising.

Most of these friend-groups are formed by children who live close to each other (within 100 m). Several are also formed however at comparatively long distances in the neighbourhood, which is particularly true for the older girls (>500 m). The shop, Tant Gröns Skafferi, is a major force for getting to know neighbours all over the community. The shop is in the middle of Hägaby and most people in Hägaby use it – at least a few times every month. The school (which is a Waldorf or Steiner school with nine grades so far) is another important local arena or forum where parents and children from different parts of Hägaby meet and learn to recognise each other. The school is also a contact surface to other parts of Uppsala and to many of the children’s grand-parents.

The residential host for Uppsalahem’s tenants was supported by more than 80% of the residents and the neighbourhood council is important for more than 90% of all the residents. The residential host generated many new contacts between many of the tenants, Hällen’s residents and the small enterprise owners. The same function characterises the neighbourhood council, which is supported by more than 70% of all residents.

6.5.2 Weak relations strengthen the modern community

Modern people, seldom have their strongest relationships, including relatives, in the neighbourhood context. Increased mobility in settlements and of labour markets in today’s society often scatter generations, family friends and good friends. Visits in urban contexts to these deep relations are well planned, intensive and rather short. So if the deep relations are often distant relations, does that mean that the neighbourhood has lost its purpose?

On the contrary. Sociology repeatedly shows that numerous thin bonds or weak relations in a neighbourhood context are often very important (Anderson-Brolin & Lindén, 1974; Cooper Marcus & Sarkissian, 1986; Shaffer & Anundsen, 1993). In Hägaby, most members of households state that they recognise between 50 and 100 other people in the community. If this represents weak relations and we use the lowest number, it means that there are 350 x 50 = 17,500 such thin bonds in this small community. A strong majority think that the relationships are important and that they may (still) increase, without the emergence of any major social control problems. If the relationships were even more numerous (with a theoretical maximum of more than 100,000 “recognising relationships”) it could actually become a social problem.

So far, the thin bonds are valuable as a security factor, as a latent social support network and as a practical everyday habitational “partnership forum.”
6.5.3 Local and guest companies
There are many small part-time enterprises in Hågaby. There are more than 25 small companies in Hågaby. There are massage therapists, psychologists, bicycle repairmen, paint artists, metal artists, musicians, small IT-based companies, a barber, teachers and a number of people working part-time in the local offices. More than 70% of the people working in Hågaby also live there.

There are also small enterprises and work-places with guest entrepreneurs, important to the economy of buildings, premises and equipment, that is used to a smaller extent by the inhabitants of Hågaby. The restaurant, the swimming-pool, the modern gym and the sports hall are all examples of such valuable external entrepreneurial enterprises, helping the economy of the whole community. A special sports club of great importance is the archery club (Sturarna) that has used one of the basement floors of the big central buildings to create an indoor arena for members, residents and visitors.

The local and guest companies, although they represent a minor quantitative part in the life of the residents, play an important role in the communication between adult residents, workers, children and visitors of Hågaby. New opportunities could arise if the residents and the company representatives could meet and communicate more in the neighbourhood council.

6.5.4 Community organisations for mutual visions
Several small associations – again of little quantitative importance – contribute to the social glue of the community. There are six small agricultural plot associations in Hågaby, connected to the six plot areas corresponding to the seven quarters of Hågaby. Those mid-sized plots, as well as small kitchen gardens outside back doors are of considerable interest to more than half of the households in Hågaby. There is thus a strong basis for a long-term common interest in local gardening and the cultivation of vegetables and flowers.

Other adult associations have included dancing, singing, an orchestra and historical research. Another common type of association are those concerning occasional or more permanent activities for children. Most play is informal, but there have been recurring theatre events, football games, parties, singing and musical groups, and it is reasonable to think that these and other activities for children will continue to occur. In the near future, associations will develop cinema and activities with pets for the children.

6.5.5 Informal community networks
Perhaps the most important activities which occur are all the private and semi-private networking which goes on between neighbours. There are many hundreds of such borrowing, assisting, co-operating and supporting in other ways, loose informal networks in Hågaby. There are informal “dog-walking-associations,” “leisure-walk-to-the-forest groups,” “skiing-in-the-valley-neighbours.” There are also all those associations that, however thin their initial bonds were, may end up with rather strong local bonds, despite predominant trends in the modern urban culture.

6.5.6 Emerging social activities
There are also visions for what can be done in Hågaby, in a well-balanced neighbourhood. These ideas include among other things a sauna-club, a hammock discussion group, a local library – one for children and one for adults, orienteering, a film club, an environmental group and other not yet known ideas. The community will also have a number of excursions, musical events, coffee shop happenings, seasonal and other celebrations, plays and markets. They all contribute to the social fabric that human life can create at its best. In turn the national and international markets are supplied with responsible, communicative and empathic citizens (Etzioni, 1993; Putnam, 2000), contributing their share to the global wonder.

6.6 HISTORY AND CULTURE OF THE PLACE
Every place on the globe has its own special history. Hågaby is no exception. A visitor to the place will find a growing record of human life and experience, imprinted from several thousands to only several years ago. This imprint can be more or less exposed, more or less known to its inhabitants and subsequently to guests coming to the area. In the case of Hågaby, the findings are particularly rich: the geological record reveals a place that was seemingly left by the ice well suited to human habitation. The Håga valley was and still is a place with a continuously fertile soil, rich forage and ample wood fibre and ground water. The place is, in a very deep sense, a truly sustainable place. It has continuously sustained human life, and kept human cultures alive for more than three thousand years. It may continue in the future to sustain human life at a modest level for at least 100 generations to come.

The historical and cultural resources of Hågaby may seem very extensive or even specialised for this particular place. But I am convinced that most places suitable for habitation have exciting stories to tell their appropriators. Homo sapiens, always find the good sites. They are where life flowers, develops, and emerges into real culture at recurring periods, presenting new versions of sustainable eras in human history.

6.6.1 A human habitat for 3000 years
More than 100 generations have experienced the river, the valleys and forests of Hågaby. More than 100 generations have grown their crops, tended their animals and travelled on the river. The richest finds were made in the beginning of the last century, in fact partly by the previous Swedish king Gustav IV Adolf. As a nineteen year old archaeology student, he excavated the Håga mound in 1902. Together with his fellow students and professor he found the burned remnants of a short man in an oak chest, his bronze and gild sword, a golden clothes buckle, razor and tweezers. The mound was constructed of stones and turf and was – in modern times – dated to 900 to 1100 BC (Burenhult, 1999). At that time the Håga river was a sea bay covering large parts of the valley. Accurate ancient traces have also been found in the area that are 2,500, 1,500, (Iron age) and 1,200 years old (Vendel age). As the landscape continued to rise most parts of the valley dried out and revealed a
rich soil that could support ample crops, moist meadows and a rich forage grassland.

The first proven house amalgamations were already formed during the iron age and eventually the small hamlets of Häga, Norby and Gottsunda were established (Päiviö, 2001). In the 17th century and also later when Linnaeus took his famous walks, during the 18th century, most of the valley was meadow while the Nästen forest was out-land forage area. In the 1860s the wetlands near the river were diked and prepared for agriculture on a larger scale. During the last century, the military used the valley for practising and in the 1960s, nature and other landscape values in the valley were threatened by road projects.

The natural reserve has now limited the development of Hägaby to the existing housing areas and put strong restraints on the exploitation of the area for many decades (or even centuries?) ahead. The succession of land maintenance and the continuous development of the small-scale habitation, one of the communities in the city, may thus be of great interest to follow over time. Will the historical record support the present and future habitation? Will the feeling of context in time and place strengthen the living conditions in present-day Häga?

6.6.2 Clothing ornaments, house foundations and other ancient historical traces

In an attempt to reconstruct the historical events of the place, some of the residents of Hägaby have formed a small historical association. The objective of this (so far) very informal interest is to expose some of the events that have formed the place, from the oldest representative signs to the modern history of the buildings and the emerging habits of its present people. One of the first results has been the reconstruction of probable bronze age clothes and a golden clothes' buckle for exhibition and presentation in Hägaby. A seamstress has produced a woman's dress and a metal artist has copied and partly reconstructed the beautiful buckle, made by casting bronze and covering it with a thin gold layer (see Figure 5.4). Valuable advice was received from researchers at the Stockholm Historical museum, from an archaeologist specialised in ancient clothing and from an Uppsala expert on ancient techniques.

In the vicinity of the Häga mound a few contemporary house foundations have been thoroughly excavated by archaeologists from Uppsala University and their students. One of the (large) boat-formed foundations was found to be an open assembly hall, probably without a roof, facing the Häga valley and earlier, probably in a very protected hill slope position, with forest shielding to the north. The other large foundation was interpreted as a cultic house due to its size and to several small indentations in a large "sonic" stone which were found during 2001. The area around the mound has a great number of small burial hills and also heaps of split stones.

The land where the new experimental houses of Häl-
len were built also revealed ancient traces. Three house foundations and five fence holes from the older iron age (500 years BC) and one from the newer iron age (500 years AD) were found by archaeologists (Göthberg, 1999). A funny coincidence was that the latter house had the exact dimensions (7x25m) and was oriented in the same direction as the newly erected, modern eco-houses (Figure 6.10) (the long side towards the day and evening sun – south west).

6.6.3 Agrarian history of a fertile valley

The geological record of the county of Uppland (where Uppsala and Hägaby are situated) implies a withdrawing sea, revealing an increasing amount of fertile land. The Häga valley has probably been used for grazing or cultivation for three thousand years. To start with, the shore meadows which formed as the river withdrew from a rising landscape, were used for cultivation and the forest glades provided the grazing land.

The maps representing the more recent agricultural history (depicting land use and property boundaries from 1635 to today) have been investigated by agronomist Eva-Lotta Päiviö, at the Swedish University of Agriculture, Department of Landscape Planning (Päiviö, 2001). The maps show a gradual increase in the cultivated area, decrease in grazing land and royal hunting parks and also changes in methods used to fertilise the soil. In the mid-nineteenth century, nitrogen fixing crops (clover) were introduced whereas earlier, the depleted soils lay fallow with some grazing animals (adding manure). The historic maps clearly show where the main Hägaby hamlet was situated during the last 360 years, and also the main roads and bridges over the river connecting Hägaby to the rest of Uppsala.

The economic maps of modern Hägaby reveal a combination of intensively cultivated land and extensive sheep
gazing at the historic patches of meadows around the Håga mound. A new and growing element in the agrarian landscape is represented by the small and mid-scale garden and plot crops attached to the present habitation of Hågaby.

6.6.4 Social history of the mentally disabled
For 73 years (1923-1996), Hågaby was a home for mentally disabled people in Uppsala and Uppland (Svensson, 1995). The history of this municipal institution is also the story of a society with a dawning conscience after the last turn of the century. Discussions were heated both in the Swedish parliament and in Uppsala’s city council at the beginning of the 20th century. What should be done with people with severe special needs? One hundred years ago, even children with dyslexia or left-handedness were sent to special places in the country-side or were sorted into the same category as the elderly or physically disabled.

The history of the Håga home, founded in 1923, reflects an evolving democracy and gender history, the dawning of popular movements and a changing social order in Sweden. When compared with earlier history and new care paradigms of the 21st century, the institutional history of Hågaby is indeed valuable and will in a few years time be displayed to visitors using statistics, pictures, films and personal stories. A special book was published in 1995 about the history of the Håga home (Svensson, 1995).

6.6.5 Modern history of military exercise, infrastructure and protection of nature
The present appearance of Hågaby has been affected strongly by events only in the last eight decades. Events which did not change the area but which preserved it. Normal city development would have added both expressways in the valley and intensive suburban exploitation beyond the present hamlet. A number of modern historical phenomena have, however, halted such a development. Apart from the home for the mentally retarded, the main protective forces have been the military (!), the local railway traffic and the struggle for long-term protection of the natural, cultural and leisure values of the place.

The railway between Uppsala and its smaller, culturally improved neighbour town Enköping, was built as a private railway at the beginning of the last century (Runblad, 1986). It was a main link during more than 80 years and carried passengers up to 1982, when it was finally shut down by removing the rails. The most convenient way to travel to Hågaby during most of its history was to take the railbus to Läbyvad at the northern point of the Håga community. Several politicians from various parties recently expressed strong regrets over the shutdown of the Enköping railway. Today it is the “bicycle expressway” to Hågaby and earlier, it may have contributed to the hesitation to build an expressway through the entire Håga valley. The interchange was planned to be at the very entrance of the present community.

Another very strong inhibiting factor, both for preventing new motorised infrastructure and an extensive building boom in Hågaby, was the military’s use of the area, especially after World War II, as a target area for rifles, canons and other military weapons. The result of this use was several small wounds in the Nästen forest glade but overall, the military presence stopped a larger exploitation of the landscape. The military was removed by the struggle to protect natural landscape values in the early 1980s. The conception of a natural reserve materialised in 1998 (Uppsala KSK, 1998), but has had a more than 100 year history, including popular leisure life visions of protecting the resource for future generations.

6.6.6 An emerging local culture and growing awareness of the spirit of the place
As communities develop, their local culture also evolves. Emerging ceremonies and community habits characterise the people of any community. Celebrations and seasonal feasts create a recurring framework of the social life. Music and art, stories told by neighbours create a typical community mood and internalise habits concerning neighbours’ networks and small interest associations. In Hågaby this is evident from a growing number of seasonal celebrations, feasts with more and more people, local arts, music, theatre and handicraft, much of it connected with the school. Although the cultural ingredients in the habitat are only to a small extent geographically connected to Hågaby, a cultural identity is clearly forming in conjunction with the surrounding parts of Uppsala and the city itself. Uppsala is home to many great national historical moments, several architectural acme, knowledge breakthroughs at both its Universities. This is of course an overwhelming treasure of culture contributing to all residents’ everyday life. Still the cultural fragments at the local level, however small, have a unique importance for defining a platform from which to watch the world, from a cultural standpoint as well.

Of all the aspects of history that are gradually revealed in Hågaby, the landscape’s record and background is at present the most interesting for its residents. For more than 80 % of the residents, the general history of the place has, however, contributed to the decision to choose Hågaby as their home habitat. It is also more and more evident that as history is presented piece by piece, the values of place are deepening for the settling adults and new roots are forming for their growing children. So far the moving rate has been low (less than 2% per year), but too little time has elapsed to make conclusions about the importance of the place history and its present evolving culture. The continuing hypothesis is, however, that history will be indispensable for anyone who wants to affect the future of their home place.

6.7 CONCLUSIONS
The state-of-the-art situation in Hågaby clearly shows that the community is rapidly strengthening its sustainability according to the spirit of the Habitat agenda. This can be monitored in quantitative data with regard to lower energy and water consumption, waste sorting, waste reduction as well as with hard figures on community co-operation and increasing numbers of relationships between residents, numbers of neighbourhood networks, interest groups and small associations. The transportation and communication resources are already fairly strong but will be a further support to modern sustainable life in the community with
6. Developing Sustainability in Hågaby Village

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Per G. Berg, Uppsala, January 2002

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A personal note