Linking Social and Environmental Aspects: A Multidimensional Evaluation of Refurbishment Projects

Jenny Stenberg PhD, (corresponding author), jenny.stenberg@chalmers.se,

Liane Thuvander PhD, liane.thuvander@chalmers.se,

Paula Femenías PhD, femenias@chalmers.se

Department of Architecture,

Chalmers University of Technology

S-412 96 Gothenburg, Sweden

Phone: +46 31 772 2346

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Abstract

How do environmental and social aspects of the built environment interact? This question is studied in an evaluation of ten multidimensional regeneration projects, i.e. addressing social and environmental issues, of Swedish housing areas from the 1950s, 60s and 70s. The evaluation design was inspired by the case study evaluation method, based on rich empirical material consisting of an environmental matrix, statistical data on the housing areas, interviews with tenants and employees, and a smaller mass media study. For the analysis, the multidimensional evaluation tool MAIN^{tetra} was applied, resulting in the identification of two themes: social exclusion and organizational learning. The evaluation points to the need to really link environmental and social aspects to gain long-lasting effects, and to attain a comprehensive picture. The results overshadow optimistic confidence in the notion that holistic »environmental refurbishment projects«, even if to some extent addressing social aspects, will directly contribute to sustainable development.

Keywords: sustainable development, multidimensional, housing, stigmatization, social exclusion, organizational learning.

Introduction

With reference to the UN Conference in Rio in 1992, the Swedish Government allotted 660 million euro to Local Investment Programmes (LIP), a commitment initiated in 1998 and completed in 2006. The intention of the funding programme was to help municipalities carry out environmental improvements. The subsidy covered 30% of the environment-related costs, and the programme also encouraged inclusion of social aspects in the municipal package of measures.

More than two hundred programmes received subsidies, of which eighty-six were multidimensional in nature. These multidimensional programmes, which received subsidies of about 82 million euro, were implemented in housing areas dating from the 1950s, 60s and 70s that are suffering from problems related to stigmatization and social exclusion[1]. Accordingly, environmental challenges were addressed by including social aspects. In order to understand more about the advantages of multidimensional efforts, an evaluation of these programmes was commissioned (Stenberg et al., 2005) with the overarching question: What is the potential for sustainable development if social and environmental aspects are combined?

[1] Housing provided by municipal housing companies in Sweden is a bit distinctive to social housing in other European countries. In Sweden, the municipal housing companies have previously been largely responsible for social housing, but this role is rapidly changing as municipal housing companies – referring to the market economy – argue that they should act in the same way as private housing companies do (Sahlin 2001). This development has resulted in a general shortage of apartments for people with social problems in the municipality of Gothenburg. Simultaneously, the increasing problem of the stigmatization of certain city districts in Sweden has led to a situation in which housing companies, often collaborating in local partnerships with the authorities, explicitly strive for a decrease in the share of apartments for people with social problems, as the presence of such individuals adds to the level of stigmatization.

Last decades, Swedish governments have shifted their focus from environmental sustainability towards a broader view on sustainable development emphasizing also social and economic aspects. However, the Swedish building industry still mainly focuses on energy saving measures for which there are economical incentives. In »housing projects for sustainable development« social ambitions have been included to varying degrees. However, such issues have seldom been the focus of extensive evaluations – e.g., the renewal of Gårdsten in Gothenburg (Dalenbäck, 2005), the Western Harbour in Malmö (Larsson et al., 2003), and the passive housing in Lindås (Ruud et al., 2005). At the same time, several studies have pointed out the importance of integrating wider social aspects in the overall evaluation of housing for sustainable development (e.g., Svane et al., 2002; Botta, 2005; Glad, 2005; Baker and Eckerberg, 2007). Furthermore, in the field of policy research, the link between environmental and social aspects have been emphasized (Grant, 2001; Elander, 2002). In parallel, in the international debate on evaluation, researchers have pointed out the importance of expanding the scope of building and planning evaluation and assessment to include a broader perspective on the dimensions of sustainable development (see, e.g., Brown et al., 2003; Cole, 2005; Kaatz et al., 2006; Lützkendorf et al., 2006). The limited scope of current evaluation and assessment tools, which mainly focus on environmental and technical issues, renders them inadequate when dealing with social aspects such as planning processes, participation, social exclusion, behaviour patterns and organizational learning. Problems will arise when housing projects become models for sustainable housing without taking social aspects into consideration and these will influence how authorities design interventions and funding systems.

Research Design

Method and Material

The evaluation was designed as a case study (Yin, 1994; 2000). As it was a summative evaluation conducted during a very short time period, the normal requirements for richness of data could not be satisfied. It may be more appropriate to consider the case study design as inspired by case study research.

The original commission by the Swedish Environmental Protection Agency may be summarized in four main questions: (a) What environmental impacts did the projects have and how did the results relate to goals? (b) To what extent were the tenants involved and engaged in the process of change? (c) Did the projects lead to the housing areas becoming more attractive? (d) Were the environmental and social effects permanent? The present evaluation included ten regeneration projects, mainly municipal housing areas, (Figure 1–2) selected from the total set of eighty-six multidimensional projects. The ten projects were selected on the basis of their complexity, i.e. their focus on both environmental and social aspects, the comprehensiveness of their data and their location, i.e. they should be situated in a large or medium sized city.

The Empirical Material

The empirical material consisted of four different types of information. First, an environmental matrix was formed using reported environmental data on: energy, traffic, water, waste water, domestic waste, building material, chemicals and

biological diversity. Each of these categories included: (a) information on efficiency improvements or system conversions, (b) descriptions of technical measures, (c) descriptions of management-related measures, (d) descriptions of tenant involvement, and (e) the data (energy etc.) before and after the project was implemented.

Second, statistical data were compiled on the housing areas covering an eight-year period and concerning tenants' age, sex, native country, income, education and occupation (from Statistics Sweden) as well as statistical crime data (from the police). Furthermore, data was used from the housing companies involving: the number of vacant apartments, annual movements, and »satisfied-tenant indexes«.

Third, interviews were conducted with tenants and employees. It included fifty-eight qualitative interviews with seventy-eight persons, and focused generally on project implementation and specifically on tenant involvement in the process or tenant opinions on project outcomes. When visiting the areas, the research team also studied the physical environment and places where people gathered, e.g. a youth recreation centre, to better understand the social sphere.

Finally, a mass media study analysed how the housing areas were described in daily press before and after the LIP-projects. A full text analysis focused on: the thematic categories discussed in the articles (crime, accidents, social aspects, public sector, physical planning, trade and industry, environment, nature, culture and sport); and the tone conveyed in each article (neutral, negative or positive).

Theoretical Framework for Analysis

As this assignment entailed a broad range of evaluation questions related to the environmental and social sphere, there was a need for a multidimensional evaluation tool. The theoretical background to the analysis is based on the idea that sustainable urban development embraces four different but overlapping, main fields of knowledge about the city, its tenants and its surroundings (Figure 3[2]), as follows:

- We need to study and understand the city's ARTEFACTS, i.e. man-made works of art, instruments, machines, buildings and physical networks;
- Additionally, we must have knowledge of the INSTITUTIONS, i.e. formal and informal relational webs of all sizes and directions, formal and informal norms, information systems and codified knowledge;
- To that we must add knowledge of NATURE, including all kinds of natural elements from the ecosphere and the lithosphere;
- Last, but not least, we need knowledge on how tenants and employees, think and feel, given that actions are controlled by our MIND, i.e. ethics, worldviews, knowledge, skills and other human attributes.

The MAIN^{tetra} was chosen for its relative advantage over both simple triple bottom models of sustainable development and other conceptual frameworks with a larger

[2] The theories about the four-dimensional MAIN^{tetra} has been developed by Kain (2003) and earlier put into practice in two pilot studies in Sweden (Kain et al., 2002; Kain et al., 2005).

set of »fields«. The MAIN^{tetra} facilitates a better understanding of knowledge about a complex and confusing reality. The four well chosen knowledge fields are positioned in a tetrahedron that illustrate how each of the fields relations to the others – i.e. when trying to understand the reality of a given problem, it is necessary to deal with a combination of fields of knowledge than on the fields of knowledge per se. The use of the fields *institution* and *mind* helps to clarify varying stakeholders responsibilities as well as their abilities to act while the more commonly used field »social« is more vague in that sense.

Departing from the many and varied evaluation questions, two evaluation areas – environment and social – were defined. The areas were subsequently divided into fifteen topics (eight environmental and seven social) (Figure 4). The titles of the environmental topics are identical to categories in the matrix, discussed above. The titles of the social topics were based on the evaluation questions as well as on related theories (the theories are discussed in Stenberg, 2004).

The empirical material consisted of quantitative data and qualitative information concerning both evaluation areas – although the environmental area contained more quantitative data, and the social area more qualitative data. In the analysis, quantitative and qualitative materials were integrated, in other words analysing the relation between environmental data, statistical data, interview statements and findings of the mass media study.

The breadth and the variety of the qualitative material presented an analytical challenge, but at the same time the richness of data permitted discussion and evaluation of the links between the two disparate evaluation areas. As a result of the analysis a number of subgroups were identified that represented the links between the fields of knowledge in the MAIN^{tetra} (Stenberg 2008).

Results

Environmental Aspects

The evaluation focused on environmental issues that were addressed in all ten cases: i.e. energy, water and domestic waste.

Energy savings were achieved through the installation of energy efficient equipment in laundry rooms and apartments (refrigerators, low energy lightning, motion detectors etc.). Other measures comprised additional insulation of roofs and facades, replacement of windowpanes, new control and supervision systems, installation of solar collectors, individual measurement of energy use and a switch-over to green electricity.

Water issues mainly concerned efficiency measures such as installation of water-saving equipment in the bathroom, kitchen and laundry rooms and individual measurement of water use per apartment.

Waste water measures concerned local maintenance of surface water, preparation for urine separation, treatment of waste water using plant filters or installation of oil separators for car washing.

Owing to the introduction of *domestic waste* sorting, most projects reduced the amount of residual waste. In several projects, new recycling buildings were built. One project installed kitchen waste mills and a few projects arranged sorting of environmentally hazardous waste and the re-use of furniture.

Traffic issues concerned installation of efficient engine pre-heaters, decreased transport and emissions due to improved placement of waste bins, the prohibition of car use, as well as conversion to electric propulsion for vehicles involved in property management.

Chemical issues concerned the introduction of environmentally friendly products, a general decrease in the use of chemicals, and application of the Swedish Chemicals Inspectorates' list of proscribed materials.

Biological diversity measures included minimization of paved surfaces and increases in the number of biotopes through, for example, allotments or schoolyard gardens.

Building material measures, not included in the table, entailed changes in management routines such as a requirement for environmental declarations when

purchasing new material or prior to selective demolition. It also included sorting of building material, and energy gains made by re-using building material.

To obtain comparable figures across projects, environmental effects were calculated per tenant/year for the housing areas (Figure 5–6).

Did the measures provide lasting results or did they diminish over time? Technical measures comprised both adjustment of technical systems (often short-term effects) and replacement of technical systems (often long-term effects). Measures related to the refurbishment process, such as the handling of building material, were selective efforts. However, changes in purchase demands, the introduction of local surface water systems, new control and supervision systems and individual debiting of water end energy use should provide more long-lasting results. Nevertheless, individual debiting is no guarantee of a long-lasting reduction. If tenants increase their need for comfort or improve their financial situation and if this is combined with poor feedback on savings, tenants' behaviour and consequently environmental gains may be negatively affected. The same applies to sorting of waste. According to the empirical material, successful introduction of the technical system and correct operation by the tenants not only depends on the system's design, but also on how conscious tenants are of its benefits.

In conclusion, it was found that environmental aspects are an important element of the refurbishment projects. Most of the projects have been successful, although not all of the identified goals have been achieved. When trying to consider the

environmental aspects separately, it has not always been easy to distinguish them from the social aspects. Success and the sustainability of the results achieved seem to be connected, to a certain degree, to how familiar tenants are with the goals of the measures.

Democracy and Participation

The evaluation identified three interlinked topics relating to democracy and participation: information, dialogue and participation. These topics where further evaluated in relation to three environmental topics that were present in all ten cases: energy, water and domestic waste.

In Sweden, the cost of energy and water usage in rented apartments is traditionally included in the rent. When the municipal housing companies, as part of the LIP projects, decided to introduce individual measurement and proper apportionment, this new procedure gave rise to a great deal of discussion concerning the amount by which rents should be reduced. The housing companies' aim was to influence tenant's awareness of their actions and support changes in behaviour, i.e. reduce resource use. These changes in behaviour would also reduce costs for the housing companies, and presumably, lead to lower rents.

The case studies demonstrated general difficulties in communicating with tenants on these issues. Even the majority of tenants attending information meetings did not understand the implications of the new systems being proposed. Not only did tenants mention this as a problem, but also several housing company employees

expressed the view that the need for correct information had been underestimated. Full understanding of the ways in which the theoretical framework was deployed in the analysis, is assisted by recognition that the results are based on linkage between the fields of knowledge *artefact* (heating and the water systems) and *mind* (individuals' knowledge and opinions about the systems) as described in the MAIN^{tetra}.

Tenants would have preferred transparent systems with immediate feedback on resource usage, e.g. a display in the apartment, instead of just a bill. They argued that they not only wanted to monitor their resource usage, but also to check that the housing company did not overcharge them. This lack of trust was expressed by many tenants, although more prevalent among tenants no native to Sweden. Returning to the theoretical framework, these results are an example of further linkage between the knowledge field *institution* and the other two identified above i.e. including perspectives concerning the implementation of the systems vis-à-vis the tenants.

The evaluation demonstrates that the housing companies largely relied on technical systems to influence tenants' behaviour patterns in respect of energy and water usage. Most of the employees did not put great effort into checking whether the information actually reached the tenants and were not prepared to engage in dialogue with tenants about the new systems. In addition, the tenant's active participation in these development processes was quite rare with notable

exceptions. Clearly, this lack of focus on information, dialogue and participation caused many problems.

The sorting of domestic waste is of great importance to housing companies in Sweden, as the costs of unsorted waste increases in response to national political measures. The provision of refuse chutes in the entrance staircases is typically the standard in Swedish housing. The case studies showed that it was not easy for tenants to give up this convenience and be required to transport their waste to recycling buildings and sort it into up-to twelve different fractions.

The projects concerning the sorting of domestic waste involved a comprehensive information campaign and the involvement of tenants as active »ambassadors« to engage their neighbours. Generally, the results from these waste sorting projects were positive: The more information and participation, the better the results. Many of the tenants expressed the view that sorting domestic waste is a normal activity that everybody must do for the environment. These tenants were even content with the dismantling of the refuse chutes as this eliminated garbage odours in the staircases. However, some housing areas experienced major problems with the sorting of domestic waste, as tenants left their unsorted waste inside the recycling building. One housing company eventually set up surveillance cameras and imposed fines for such behaviour.

The advantage of local dialogue processes is that these combine the top-down perspective with the bottom up view of the residents. When considering the

implementation of innovations in energy, water or domestic waste management, it is important that both environmental and economic aspects and also individual-level prerequisites and their influence on implementation are fully considered.

The evaluation provides one example of the consequences of *not* undertaking full dialogue with tenants. In this case, the housing company installed kitchen waste disposers in all apartments. The organic waste was taken to a municipal biogas digester to produce bio-fuel for different kinds of vehicles. However, most of the tenants did not use the kitchen waste disposer, as the system required water, and the housing company charged the tenants for water use. In fact, the annual cost of water was not more than the cost of a cinema ticket, but this nonetheless discouraged use. As a result, the tenants threw the organic waste into the sorting container for mixed waste.

Organizational Learning and Patterns of Behaviour

In order to put knowledge into practice, to achieve environmental goals and to obtain lasting results, knowledge needs to be incorporated into the organizations involved, i.e., the housing company employees, on the one hand, and the organizations influencing tenants, such as the family and other social networks, on the other.

In many cases technical systems were the principal means to achieve environmental goals, particularly concerning energy- and water-saving. There are examples where a technical measure alone gave positive environmental effects. In

one project, new light-switches were installed that kept a low light volume as long as the button was not depressed. This solution saved energy without requiring behavioural changes and without jeopardizing the tenants' safety after dark.

In most cases, energy and water solutions were treated as a matter for housing company experts. Consequently, the tenants' influence with regard to these topics was less than their influence over, e.g., the function and design of the external environment. However, there were examples where employees stressed the importance of communicating with tenants concerning technical issues. In one project, the property manager followed the tenants' energy and water use through a remote supervision system. When the use was higher than usual, the manager spoke directly with the tenant to discover the reason, and give the tenant a chance to change their behaviour. This case shows how a technical system can support learning and save energy. However, typically technical systems supported top-down control and inhibited tenant's control over the learning process, individually and as a group.

The advantage of a technical system is that it remains after the project is completed or tenants have moved on. It provides a way to »crystallize knowledge« in organizations; one might say that technical systems make it clear the ways in which knowledge has been incorporated in an organizational learning process.

This is in contrast to the inability of tenant's to provide any example of lasting results of knowledge transfer gained through the LIP projects in their organizations or social networks. Any knowledge developed through the projects seems to have been dispersed when tenants moved from the housing areas, even though these individuals probably brought their insights to their new housing areas. This lack of organizational learning represents an oversight in the development of an »environmental culture« in which the new tenants could be integrated. This is probably even more important in housing areas with a high tenant turnover, i.e., in areas similar to those studied.

The problem of dispersed knowledge is also relevant to housing company employees. After the LIP period, several housing companies re-organized, some staff moved on or were given new job assignments. Generally, the housing companies seemed to have difficulties in drawing conclusions from the projects and in transferring knowledge to their local organization.

As regards the sorting of domestic waste, there have been considerable changes in tenants' behaviour patterns. None of the tenants sorted their waste to any great extent before the LIP projects. However, the evaluation suggested that the housing companies had mainly influenced those tenants who were easily converted – those with a positive attitude towards sorting waste. Additionally, the numbers of tenants sorting waste tended to decrease after the projects were completed. To inspire more people to change their behaviour, and to gain lasting results, working

methods need to be changed, so that they lead to organizational learning that affects not only tenants' behaviour patterns, but also housing company systems.

Organizational learning is also a matter of knowledge transfer between organizations, which may take place, for example, when employees develop local partnerships with different actors. The evaluation provides a good example in which an ice-rink was established as a result of informal synergetic effects, but it also identified examples of missed opportunities. For example, opportunities for important environmental and economic savings were overlooked when a heat-recovery project from a swimming hall was not implemented as the municipal official in charge of the building did not make use of information he possessed.

In summary, the evaluation demonstrated shortcomings regarding organizational learning. Nonetheless, the employees recognised the importance of dialogue as a complement to technical systems in influencing peoples' behaviour patterns and in the attainment of lasting results. Hence, the potential for learning from social processes was underestimated and, most importantly, no *planning* occurred in relation to the means by which the employee and tenant organizations should learn from the LIP projects.

Social Life and Stigmatization

How then did the case study areas develop with regard to attractiveness, social life and stigmatization? Most of the areas had, in previous periods, neglected building maintenance, and environmental subsidies were applied for as part of a regular

renewal, although this required a greater focus on environmental issues. Neglected maintenance, together with other factors, contributed to the perceived picture of the housing areas: empty apartments, media stigmatization for social problems, unsafe environments and high crime rates, and mainly occupied by foreigners.

Promoting a housing area through a »grand environmental project« may be one way to increase its attractiveness. Tenants as well as employees, agreed that the areas' attractiveness had increased greatly – and the effect seemed to remain.. The positive improvements to the external physical environment were evident when studying earlier photos of the areas.

The projects also influenced social life. Tenants often started talking to each other developing social capital, and some of the interviewees said these improvements remained after the projects had been completed – although others maintained that the projects only caused conflicts. Examination of crime statistics did not reveal a correspondence between crime and attractiveness. According to the interviewees, attractiveness was related to how the areas were »talked about« and, even more importantly, how they were presented in the mass media. However, the results from the media study were quite different from those of the interview findings. The media image did not change during the period of the LIP projects or afterwards.

Statistics on the reduced number of empty apartments showed that the attractiveness of the areas had increased. This result was clearly also related to the

general under provision of housing in Sweden. However, in nine of the case study areas, empty apartments were eliminated, while there were empty apartments in other parts of the municipalities involved.

As previous research has shown, coincidence between ethnic and economic housing segregation may result in a stigmatization that causes »ethnification« of social problems, such as crime (Molina, 1997; Andersson, 2002; Ericsson et al., 2002). It could be discussed if the actors involved in the LIP projects, in their pursuit to change their areas image from »problematic« to »environmental«, in fact contributed to increased ethnic and economic housing segregation.

As Figure 7–9 illustrate that the proportion of tenants born outside Sweden decreased in the majority of the housing areas studied, while the share simultaneously increased in the related municipalities. As is obvious from the first figure, this development is to some extent related to the total turnover of tenants in the housing area, a consequence of populating empty apartments or demolishing buildings. However, statistics on the number of empty apartments and demolished buildings show that this can only partially explain the changes in ethnic and economic housing segregation. According to the interviewees, it was clear that the number of people with social problems decreased during the LIP projects. Most of the tenants noticed this change and welcomed it. The housing company employees confirmed this impression and maintained that it was a strategy considered necessary as the target areas were burdened with greater social problems than the average for the municipality. This social change was actually

expressed as vital by some of the employees; they described regeneration of the physical environment as an approach that could enable social changes.

The changes in ethnicity, however, were not nearly as obvious to the interviewees. When asked, the tenants admitted that the share of people born outside Sweden probably had decreased. The employees had not given this effect much consideration. Some of them even refused to discuss it, maintaining that they were convinced that the best way to work towards ethnic integration was to ignore talk about ethnicity and to act as if racial prejudices did not exist in the housing market.

The evaluation showed that housing employee passiveness may have contributed to ethnic housing segregation. The evaluation did not include any study of how the share of inhabitants born outside Sweden varied between the study municipalities. One important question was whether the strategies used in the LIP projects corresponded to any municipal integration strategy to increase ethnic and economic housing integration in the municipality as a whole. However, it seems that no such strategies exist in the municipalities.

As discussed in the section on democracy and participation, above, one of the immigrant tenants was so indignant over the way the housing company dealt with the changed energy and water systems that she considered leaving the housing area she had lived in with her family for twenty years. Yet such thoughts did not only arise from those tenants who used a great deal of energy and water, as the

employees tended to think. They also arose from a serious lack of trust in the housing company and its representatives. Apparently tenants born outside Sweden were more likely to mistrust housing company employees. Considering such mistrust among immigrants towards municipal housing companies, it may of concern that employees sometimes »produce images« of immigrants that are far from reality:

> There were a lot of poorly educated people from countryside villages, and they were not really aware of how one should live in an area like this. Because they'd had a little farm where they'd lived with all their relatives, never moving around. Then they were supposed to live in a housing area with apartments like this – where you can't exactly throw your garbage out the window.

Discussion and Conclusions

In summary, the evaluation demonstrates the necessity of linking environmental and social aspects in order to attain long-lasting impacts and to attain a comprehensive overview – positive effects tended to decrease after the projects were completed. The evaluation showed that changes in technical systems need to be accompanied with information for the tenants. However, it seemed that the housing companies had only reached those tenants who were easy to convince, leaving unmoved those who are generally more negative towards environmental measures.

The positive effects observed to arise from changes in technical systems and economic incentives can be explained by the fact that their introduction initiated a learning process. The housing companies, however, had not *planned* for a learning

process to take place and therefore failed to learn – as an organization – from employees and tenants involved in the projects. Nor did the tenants' organizations, families, communities, other social networks, plan for how they could become involved in organizational learning as part of the LIP projects.

In most cases, tenants and employees considered that social life and stigmatization had changed for the good. This was in contrast to the results from the mass media study, which show that the image conveyed by the mass media was more or less the same as before the refurbishments. The evaluation also showed that ignoring the ethnic dimension in the environmental projects may have led to an (unconscious) increase in ethnic segregation in the municipality. Additionally, interviews showed that the number of addicts and others with social problems decreased in the study areas. This was, however, a consequence of conscious policy by the housing companies.

It is clear that linking social and environmental aspects resulted in an extension and broadening of understanding by revealing interesting and complex interconnections between the different aspects. In particular, two themes were brought into focus: social exclusion and organizational learning. The results for social exclusion largely correspond with findings from policy research on the relationship between social exclusion and environmental attitudes and behaviour, e.g. they warn about the exclusion of certain groups in the operation of urban governance partnerships (Elander, 2002), and also maintain that the implementation of environmental policy may be more effective if measures take

into account social exclusion as a factor in designing environmental policies and conform to the prerequisites of different social groups (Grant, 2001). In the present evaluation, however, these issues were also discussed in parallel to the theme of stigmatization, implying a more comprehensive understanding of the means by which housing company employees carried out the refurbishment projects.

Furthermore, the results for organizational learning overshadow optimistic confidence in the notion that »environmental refurbishment projects« contribute to sustainable development. If the actors fail to focus on the process perspective, i.e. on planning how organizational learning is to take place, knowledge acquired from the projects will not remain for future generations.

These conclusions are important when considering »exposed suburban metropolitan housing areas«, as these areas have great potential for energy savings, but also suffer from a number of problems, among them ethnic and economic segregation. Actually, it is not unusual that »environmental projects« in such areas are put forward as examples of holistic and good practice in urban development in general, without considering fundamental and negative social impacts. The use of good practice examples significantly influences the ways that authorities design interventions and funding systems in respect of the environment. In relation to this, it seems extremely valuable to consider and further develop multidimensional evaluation tools – including social aspects – for planning processes and national funding programmes. This may be regarded as

particularly important if considering the earlier mentioned changing role of Swedish municipal housing companies, reducing their responsibility for social housing in the name of market economy.

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Figure 1. Ten projects were chosen that focused on both environmental and social aspects – nine involvning municipal housing companies and one partly a tenant owner association (Norrliden in Kalmar).

Figure 2. The LIP-project Ringdansen in Norrköping; some of the highest buildings in the area, 2a) before and 2b) after renovation. The project focused on eco-cycle adaptation, such as changes in the energy, water and sewage distribution systems, in the outdoor environment and control and reporting systems, as well as on tenants' participation in the process. Ringdansen was the most extensive project with respect to total cost and level of physical change in the outdoor environment. One measure to increase the attractiveness of the area involved changing its name from Navestad to Ringdansen. Photos: Jenny Stenberg.

Figure 3. The MAIN^{tetra} – sustainable urban development embraces four main, but overlapping, fields of knowledge about the city, its inhabitants and its surroundings (Kain, 2003).

Figure 4. The evaluation areas »environment« and »social« formed fifteen topics.

Figure 5. Energy use in the housing stock. The energy use per tenant and year for heating and domestic hot water supply decreased in most of the housing areas, comparing pre- and post-refurbishment data. For projects without a bar in the diagram there is no data. Source: Statistics Sweden and the housing companies.

Figure 6. Water use in the housing stock. The water use per tenant and year decreased considerably in most of the housing areas, comparing pre- and post-refurbishment data. For the project without a bar in the diagram there is no data. Source: Statistics Sweden and the housing companies.

Figure 7. The number of tenants in the housing areas involved in LIP projects. Source: Statistics Sweden.

Figure 8. The share of tenants born abroad in the housing areas involved in LIP projects. Source: Statistics Sweden.

Figure 9. The share of tenants born abroad in the municipalities involved in LIP projects. Source: Statistics Sweden.