

Environmental policy integration in urban spatial planning: the approach of Rotterdam

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Abstract

An integrated approach to spatial planning and environmental policy has not yet been adopted by many national, regional or local administrations. However, such integration is likely to provide a better streamlined planning process incorporating the environmental improvements and the physical developments in the urban areas. Within Europe some attempts to integrate spatial and environmental planning can be found in western countries like the Netherlands. In this paper we review the local policy concerning spatial and environmental planning on the experience of the city of Rotterdam. We discuss two methods for an area-oriented planning approach which have been applied in Rotterdam.

Keywords: spatial planning, environmental policy integration, urban planning.

1 Introduction

Since the early 1970s, in many countries environmental protection programmes have been instituted to reduce pollution. Nowadays, more often, local governments try to combine spatial planning and environmental objectives as a more effective strategy for improving the quality of life in urban areas and conserving natural resources (Miller and De Roo [1]). In the current political and scientific debates this process of incorporation of environmental objectives in development sectors is more broadly referred as to an environmental policy integration process (EPI) (EEA [2]). However, EPI has not yet been institutionalized in the urban planning practice by many local administrations (EEA [2]).

Due to the increasing social demands for better quality of life in the cities some municipalities like Rotterdam developed new planning tools that support



EPI process. Such a tools incorporate physical planning, land uses and environmental measures. The approach developed in Rotterdam is based on a concept for an area-oriented environmental policy which foresees more decentralized process of planning. This is a policy approach developed in the Netherlands that allows decisions concerning urban environment and development to be taken mainly by local actors concerned with the area while acknowledging the specific local qualities of the urban area under development.

It is remarkable, that relatively many of the Dutch municipalities have been using and are presently still using specific methods for an area-oriented environmental policy (De Roo and Vissers [3]). Such methods have been designed to help finding solutions to conflicts of different policy sectors which have impact on the quality of urban life. Municipality of Rotterdam have developed two specific methods for an area-oriented environmental policy. These are the right place for the Environment (Milieu op Z'n Plek: MOZP) and the Guidance for Local Area-Typology and Environmental Quality (Locale Geiedstypologie en Omgevingskwaliteit: LOGO).

The aim of this paper is to discuss two are-oriented methods developed in Rotterdam and analyse what factors influence the effect of the use of these methods for environmental policy integration in urban spatial planning.

2 The Dutch perspective on environmental policy integration

After the Second World War the Netherlands has experienced a rapid economic expansion, interspersed with a few periods of recession in the period 1970-1990. However, the economic growth as well as the growing population still keeps the country in a permanent state of reconstruction and alteration. Spatial planning tries to meet the continuing demand for land for residential, business, industrial and transportation functions and services, as well as a range of other interests, such as recreation, nature conservation, and agriculture (VROM [4]).

The spatial development of the Netherlands is reflected in the National Policy Document for Spatial Planning (NPDSP). The Dutch have produced such spatial planning documents since the 1960. As result a number of spatially organizing concepts have been developed and had an important leverage on national, provincial and local developments. (Faludi and van der Valk [5]; Hajer and Zonneveld [6]). Generally, the spatial planning policy documents provide a framework for the provincial and municipal authorities on their specific spatial plans. Strong emphasis in the Dutch planning is put on the land allocation plans ("Bestemmingsplan"), which regulate local spatial developments of an urban area (Van der Valk [7]). These land allocation plans are developed in compliance to provincial Regional Spatial Plans ("Streekplan") and Spatial Structure Plans ("Structuurplan"), which in their turn have to reflect the priorities of national policy plan. Hence a hierarchical system has been developed, in which a shift from large scale spatial policies (national level) to more specific land use allocations (local level) currently takes place (Table 1).

More comprehensive planning concepts related to sustainable urban planning were introduced in the fourth NPDSP (Vierde Nota Ruimtelijke Ordening, 1990;



VROM, [8]). Its follower the Nota Ruimte”, published in 2004 (VROM [9]) differs from the previous planning policy documents in providing general policy for specific areas, which gives this policy document a more area-oriented character. Furthermore, it offers more detailed descriptions of the manner in which the different spatial concepts and policy instruments are to be used as well as the distribution and share of responsibilities (VROM [9]).

Due to the small and densely populated territory of the Netherlands environmental policy have also played a crucial role in maintaining the quality of life in the urban areas. The Dutch environmental policy is embedded in a National Environmental Policy Plan (NEPP). The first NEPP was mainly focused on corrective measures in order to counteract emerged environmental problems, while the more recent NEPPs have put more emphasis on preventive measures (Carley and Christie [10]). A special feature of the Dutch NEPP is that it has introduced ways for more decentralized planning through negotiated agreements between number of actors at local and provincial level (VROM [11]).

Table 1: Current policy framework for spatial planning and environment in the Netherlands.

Horizontal levels	Spatial planning policy	Environmental policy
Vertical levels		
The Netherlands		
National Policy	Spatial Planning Document	National Environmental Policy Plan
Regional	Provincial Development Plan Structural Plan	Provincial Environmental Plan
Municipal	Land Allocation Plan	Municipal Environmental Plan

Despite the well-developed national policy framework as in many other countries as well as in the Netherlands it is still not an easy task to manage balancing interests between the sectoral developments of national importance and quality of the environment of the densely populated urban areas. There is an ongoing debate in the Netherlands on institutionalization of more effective mechanisms for integration and cooperation between both different policy sectors within one governmental level (horizontally) and between different governmental levels (vertically) (RIVM [12]).

2.1 Some approaches promoting EPI in spatial planning the Netherlands

The idea of environmental policy integration in the Netherlands was firstly introduced in 1983 within the Environmental Policy Integration Plan (PIM) followed in 1989 by the first National Environmental Policy Plan (NEPP) (VROM [11, 13]). These plans had to increase the awareness of the politicians and professionals on the existing interdependency of the environmental policy to other sectoral policies. As a result, a number of more specific approaches have been developed that help enforcing more integrated environmental policy at



regional and local levels. These approaches illustrate a changing tendency towards policy tools in the Dutch urban planning that can provide solutions to the dilemmas of the compact city urban form and intensification of urban activities (De Roo and Visser [3]; Schreuders and Tiemersma [14]). Compact city planning in the past has been used to prevent the exodus of citizens from the city centres in the larger cities of the country and reduce uncontrolled urban sprawl into the countryside. It also aimed to offer a structure for multifunctional use of urban space in order to preserve both the spatial and environmental qualities (De Roo [15]). However, the claims about the sustainability of the compact city have not yet been proved completely (Burton et al. [16]). One of the reasons for this is the lack of tools with which urban managers can assess, measure and predict the effects of the compact city development in concentration, while at the same time increasing the environmental quality (Schreuders and Tiemersma [14]; De Roo [15]; Burton et al. [16]).

Nowadays, the Dutch environmental policy can be characterized as moving from a centrally governed sectoral policy, based on quantitative standards toward an area-oriented environmental policy which provides more responsibility to the local authorities to meet developmental needs considering specific local factors. This tendency has significantly induced the development of a number of more specific area-oriented methods, currently used by some Dutch municipalities to assess environmental qualities and impacts of spatial developments. The major contrast with the earlier applied approaches is that these methods are focusing on assessment of an urban area or part of it as an integrated structure of functions, networks and actors (De Roo and Visser [3]).

This way an area-oriented approach allows an assessment of well-defined geographical areas within the cities or regions in which environmental pressure (e.g. air pollution and disturbance due to industrial activity, traffic etc.), is expected and which are assessed for the whole area at once. By this approach the environmental pressure is measured by set of criteria confronted with desired standards. If standards are exceeded re-allocation of functions and land use is considered. Such approaches have gained prominence during the last decade, largely because it creates a framework for concerted action to counteract conflicts between sectoral objectives. The spatial perspective of the approach enables the development of a platform upon which cross-sectoral efforts can be coordinated. Moreover some visible effects within relatively short time, have made it popular among politicians, as it enables to demonstrate results of their work. Finally, the area-oriented approach is aimed to produce considerable synergy in the planning process, as it implies direct involvement and cooperation with the local community as well as with various public authorities, businesses and other local organizations and actors.

3 Environmental policy integration approach in Rotterdam

Rotterdam is the second largest city in the Netherlands and part of the country's western conurbation, the so-called Randstad. The city forms the main node in the southern wing of the Randstad, and is important to both the regional and national



economy due to the presence of the nation's main seaport. As a result of the port and industrial activities Rotterdam and its region Reijnmond represent one of the areas in the Netherlands under continuous environmental pressures (Salet and Kreukers [18]). The city is constantly in move. Its reconstruction after the second World War have been followed by the renovation of old city districts, new expansions, and the transformation of former harbours into attractive places to live, work and relax (dS+V [18]).

To ensure better coordination between all urban activities local authorities focus on three ambitions (dS+V [19]). The first is that Rotterdam must be varied and attractive city to reside, work and live. The second ambition is that the city is to be the centre of south wing of the Rndstad and the third ambition sees it as a European city with international harbour. To achieve these ambitions the city is seen in five integrated structural images: the residential city, the enterprising city, the mobile city, the water city, the recreational city (dS+V, [19]). However, to be able to coordinate plans and projects with each other it is not sufficient to simply put all these ambitions together but integrate these in specific planning measures and approaches.

Current local policy framework with regard to spatial development and environment consists of two plans, which play key role for the sustainable urban development of the city: (1) the Rotterdam Spatial Plan 2010 (dS+V, [19]), and (2) the Rotterdam Environmental Perspective 2007 (Gemeentewerken [20]). In the attempt to balance between the sectoral objectives of these plans within many development projects local authorities have applied an area-oriented planning methods (Gemeentewrken [20]).

3.1 The area-oriented method of Rotterdam

The initiative of the biggest Dutch port city to develop its own area-oriented methods has been broadly acknowledged as a new standpoint in the planning practice. First, in 1997 the methodology *The right place for the environment* (Milieu op z'n plek (MOZP) was developed in Rotterdam by a team of local experts (Gemeentewerken Rotterdam [21]). This method allows one to translate the Rotterdam environmental policy into the land use planning. Two main questions are addressed: (1) What environmental quality should be aimed for which place? (2) What is the best way to implement environmental issues in the spatial planning process? (Schreuders and Tiemersma [14]).

The essence of the method is in defining different types of land functions and assessing environmental qualities for each of these by which both the desired function and environmental quality of that specific urban area is defined. This is done in three major steps: (1) reviewing of the spatial structures in the planning area concerned, based on the municipal spatial plan and define the main aspects of the future development of the area, (2) distinguishing the type of area on the basis of environmental aspects which have a structural function with a long life cycle (e.g. ecological network, human transportation network) (3) assessing the environmental qualities which can be applied in using the potential of the area and set specific environmental standards (Schreuders and Hoeflaak [23]). By the use of the method it is attempted to reduce the environmental pressure on certain



areas, optimize the functioning of public transport, increase possibilities for industries and businesses, and improve the quality of living spaces. Eight types of areas are distinguished such as: rail junction, public transport zone, car area, business/infrastructure, agriculture/greenery, urban recreational nature, outside area, natural area (Schreuders [24]). The environmental themes are related to each type of the area while specific references for environmental qualities are defined (table 2).

The MOZP has been popularized as a new philosophy and as a new instrument in the planning process of Rotterdam. At the same time it has also become a part of a much broader consultation process among local experts and politicians. There are a number of factors, however, that influence the effectiveness of the method. In 2001 the first evaluation concerning the effectiveness of the method was conducted by a team of local experts. Thanks to this evaluation such key factors for success and failure were assessed. They have been related to the content of the method, the communication strategy for the method and the way the environment is brought within the planning process.

A number of positive developments due to the introduction of the method in the local policy and as well as some difficulties related to the performance of MOZP in the spatial plans implementation became evident. Most significant factors for the effectiveness of the method were considered as the popularity and the understanding of the method by the local experts, its broad acceptance locally, the performance of the measures into the spatial plans, the integration of sectoral objectives and ensuring an equal initiative of the planners and environmentalists to apply the method in their practice (DCMR [25]).

The method had an important role for Rotterdam authorities in trying to communicate departments responsible for both environment and spatial planning. For example, during defining of a complex spatial project the method is applied to discuss the different interests of the intended area development. This allows for multidisciplinary project teams to be formed including representatives from different municipal divisions. Often agreements are made between the responsible municipal actors on their contribution to the development of the spatial plan including the contribution of the environmental department in relation to the MOZP operation. A major issue in this however is that the method should be applied at the initiation phase of the spatial planning process. This way a method such as MOZP suggests that integration of the environmental goals with the spatial planning can be achieved firstly by substantive assessment and secondly by interdisciplinary co-operation of the municipal departments and services. Because of this the method can be used both as an assessment tool and as a process-supportive tool (De Roo and Visser [3]).

The disadvantages of the method are that first of all it is too broad and it does not necessarily include a clear implementation plan. Secondly, it did not succeed yet to achieve sufficient internal communication between the environmental experts and planners. Thirdly it does not foresee external communication such as public involvement (De Roo and Visser [3]).

In contrast to the initial form of MOZP method its follower the Local area types and environmental quality method named LOGO (DCMR [25]) appears to



provide better elaborated and more operational framework to guide the local authorities' in Rotterdam in their decisions about the area quality. The LOGO method was more recently developed and is based on the same principles as MOZP including, however the lessons learned from the previous experience of the local authorities with MOZP.

The difference of LOGO compared with MOZP is in its ability to identify more clear indicators for quality differentiation of the area (Table 2). It also appears to provide a more systematic way to apply these indicators in the developing of the spatial plans and to formulate specific measures for achieving desirable quality of the area (DCMR and Provincie Zuid-Holland [25]).

Table 2: Example of environmental parameters defined per type of area according to the LOGO methodology (DCMR and Provincie Zuid-Holland [25]).

Environmental factor	Parameter	City centre margin	City district	Green district	Suburban resident district	Buildings	Apartments district	Villa area
Waste	construction	90%	90%	80%	70%	70%	80%	70%
	households	45%	45%	55%	60%	60%	45%	60%
Energy	per house/y	40 Gj	50 Gj	50 Gj	60 Gj	50Gj	40Gj	60Gj
Green	% open green	5	10	15	20	25	15	25
Noise	(Db(A))	55	55	50	50	50	50	50
Air	NO ₂ µg/m ³	30	30	30	30	30	30	30

Next to this LOGO method ensures that a monitoring and appraisal of the effects of these measures is made at later stage of the planning process.

Both MOZP and LOGO methods can serve as an area assessment and as a communicative tool. In the assessment part LOGO, method however is accompanied by provision of visualisation materials, which helps finding common language between the environmentalist and planners. Although the methods have had already some positive effects with regard to improvement of the communication process it still needs to be enhanced and a more clear strategies for inter-departmental cooperation need to be developed.

One way or another these methods allow for more integrated and streamlined spatial planning to take place while preventing occurrence of hindrances at later stages of the decision making and discrepancy between developments and environmental qualities in the urban area.

4 The lessons learned from Rotterdam

In table 3 we assess the presence of the success and failure factors that have influenced the effectiveness of the area-oriented methods in Rotterdam (Gemeetewereken [21]).

The progress of Rotterdam with EPI process in general and with the area-oriented policy in particular is a result of a number of reforms within the national policy and based on local initiative. One of the reasons for the undergoing shift towards area-oriented policies is that the top-down legislative framework proved



not to bring desired effect for sustainable urban development. To move towards locally designed policies a higher degree of decentralisation of the national policies was introduced. Next to this we have noted above that the acceptance of EPI as a principle has been achieved in Rotterdam because of the awareness and acknowledgement of the politicians and experts on the need for EPI in urban spatial planning as a new principle and philosophy. Hence, we assert here that the presence of a number of specific preconditions is necessary in order to apply more effectively the area-oriented methods. These preconditions include: 1) awareness of the interdependencies between the sectoral policies among local actors; 2) willingness for communication and consultation internally/externally within the municipal administrations and other local organisations; 3) decentralised decision making for environmental and spatial planning policies; 4) systematic evaluation of policy measures.

Table 3: Assessing the methods of Rotterdam.

Factors for success and failure	Presence
Is there an awareness and acceptance of the need for integrated approaches to urban development?	Yes
Is there any strategy for an internal/external communication?	To be enhanced
Is there a transparency of the policy?	Yes
Are there any arrangements for the implementation of plans?	To be enhanced
Is there any involvement of interests at the beginning of the planning process	Yes
Is there a monitoring and evaluation process?	Yes

The methods of Rotterdam have brought significant popularity and broad acceptance of the area-oriented policy as a new understanding in the urban planning (Gemeetewereken [21]). However, the performance of the method in practice needs still to be enhanced. To deal with this the main concerns of the local experts are that the environmental measures have to be formulated at the initial phase of each spatial plan and be considered by the decision makers (Gemeetewereken [21]).

Besides bridging the substantive differences in the method significant change is also needed in the communication strategy. This means that the attention on the use of the method should be shifted from its perfection as an instrument itself towards formulating commonly understandable professional languages, which can be used by all target groups such as the planners and environmental experts.

5 Conclusions

This study shows that the process of environmental policy integration (EPI) in urban spatial planning is a challenging process at national as well as at local level of governance in the Netherlands. The Dutch planning tradition and the efforts to address EPI in urban planning practice brought some innovative policy



approaches such as the area-oriented approaches. Rotterdam is among those Dutch municipalities who have developed specific methods for EPI in their planning practice. Such area-oriented methods allow more systematic changes in the spatial layout of an area focusing on a common understanding for quality of life rather than on sectoral objectives and norms.

The methods of Rotterdam provide a number of criteria for defining quality of the area and balancing interests between different development activities and environment. This becomes possible by applying both substantive and process-supportive elements of planning. Our research suggests that a combination of these two elements is necessary to achieve more effective performance of the area-oriented methods during the different phases of preparation of the spatial plans.

Our study also indicates that the main constraints in the use of the area-oriented methods in Rotterdam concern the process-supportive element. Communication and equal share of responsibilities between planners and environmental experts in the municipal departments is essential for this.

The experience of Rotterdam shows that in order to introduce the concept of an area-oriented policy much effort has to be put at first place on reaching greater awareness and understanding of the local professionals and politicians for environmental policy integration in the spatial planning as part of the general and the specific spatial plans and projects. However we can conclude that so far there are no best 'recipes' nor 'the best solutions' but the assessment of experiences based on exchange of knowledge are especially appropriate in learning more about EPI related processes in urban context. The Dutch authorities are seeking for ways to achieve such integration by re-evaluating their initial ambitions and experiences.

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