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## Land and Environmental Management in Denmark

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## **Introduction**

Denmark places the environment high on the national political agenda as well as in international relations. Danish environmental policy aims at comprising all aspects of environmental problems, i.e.: pollution control; protection of the variety and quality of the scenery; protection and management of nature and the built environment and heritage; and planning and control of land use.

Denmark created a Ministry of the Environment in 1971. The Ministry is responsible for protection of the environment at national level and thus draws up overall political and managerial guidelines. The Parliament strongly emphasise a more targeted, long term and holistic approach in which solutions to environmental problems are integrated into all activities in society. The principle of preventing environmental problems instead of curing them is being increasingly emphasized. Each Ministry is accounting for integrating environmental considerations into the sector for which it is responsible.

The trust of the Danish environmental policies over the last two decades has been in combating pollution from ongoing activities, protecting natural resources and heritage from degradation, and implementing comprehensive and sustainable land-use planning at regional and local level of government.

Overall land-use planning as well as the protection and management of nature has been building on a long tradition for comprehensive action. However, as far as pollution is concerned, the development of a holistic environmental policy can be characterized as an issue-to-issue approach. As a result, following the creation of an overall legislative framework in the 1970s, a series of action programmes have been issued during the last two decades to address air pollution, pollution of the aquatic environment, waste treatment, recycling, and the promotion of use of cleaner technology.

The integration of environmental factors into the planning process is a special feature of the Danish system of spatial planning and land use control. The Planning Act, the Nature Protection Act and the Environmental Protection Act (in total known as the "Environmental Reform, 1992") have the same common objective of "... protecting the Country's nature and environment so that sustainable development of society with respect for peoples living conditions and for the conservation of wild life and vegetation is secured".

The clear delimitation between town and country in Denmark is a crucial aspect of planning, and these provisions of the Planning Act are the cornerstones in protecting the countryside. The European Union Directive on Environmental Impact Assessment is implemented in the regional planning process. Special types of projects such as large transport facilities require an EIA with special consideration, due to their effects on nature and environment.

## **Comprehensive Planning Control**

Comprehensive plans prepared at regional and local level to ensure integration of environmental considerations in all aspects of decisions having spatial effect. Statutory powers for planning and for protection of nature and the environment are extensively decentralized, with the various regional and local authorities being responsible for executive, administrative and supervisory functions in most fields. A detailed presentation of the system of planning control is given in The Danish Way Publication No 2,1999.

The county councils are responsible for administering and monitoring the overall environmental conditions in the countryside. Most counties have special administrative departments dealing with environmental issues and control functions, and the county authorities maintain sectoral programmes on natural resources.

Through the guidelines for land use, established in the comprehensive regional plans, great consideration is taken to environmental interests, e.g. by guidelines for location of polluting enterprises that require special siting. The guidelines for location are based on the crucial environmental aspects such as noise, protection of groundwater, water supply, air pollution, waste disposal, traffic access, etc. Such polluting enterprises must normally also obtain a specific permit from the county council pursuant to the Environmental Protection Act.

Furthermore, the county council is responsible for carrying out the procedure of Environmental Impact Assessment required for special enterprises and facilities. This procedure is carried out by providing a supplement to the regional level plan and it is thus ensured that public participation is included as an integrated part of the process.

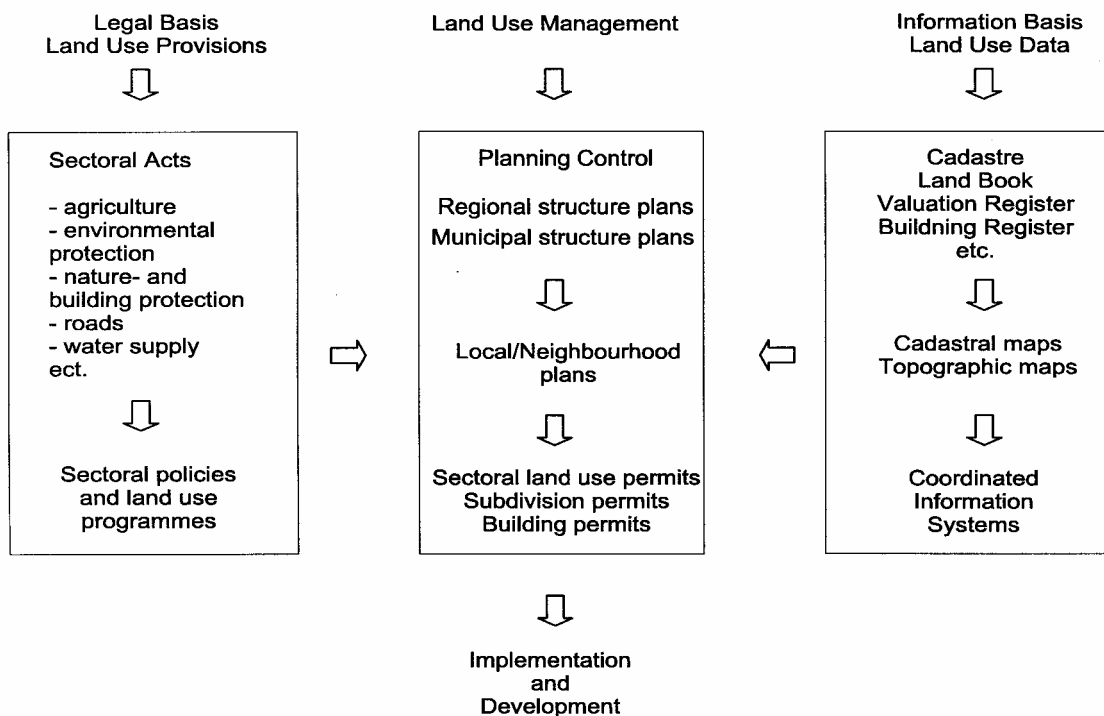
The municipal councils are responsible for monitoring and administering the local environment, especially in urban areas. The municipalities produce comprehensive municipal plans with policies and land use regulations for the total municipal area. A lot of interest groups are involved in this process e.g. The Danish Society for the Conservation of Nature. Many municipalities have produced special environmental action plans and local agenda 21 plans as an integrated part of municipal planning, focusing on solving the

environmental problems in the municipality. The local Agenda 21 plans shall include a broad definition of the environment, the cyclic flow of resources and materials, cleaner technology, building preservation, green spaces, biotopes, etc.

## An Integrated Land Management System

The Danish policy on national resources includes a number of issues such as agriculture land, forestry land, natural areas, raw materials and groundwater. Policies on land and environmental protection and utilization of natural resources are expressed in the sectoral land use acts and sectoral programmes, and the policies are implemented through comprehensive countryside planning and administration at regional level. The policies, however, have changed over recent decades responding to changing agriculture policies within the European Union as well as responding to national policies on environmental improvement.

Furthermore, the system of Planning Control is based on appropriate and updated Land Use Data Systems, such as the Cadastral Register, the Land Title Register, the Property Valuation Register, the Building and Dwelling Register, etc. These registers are organized to form a network of integrated subsystems connected to the cadastral and topographic maps. The total concept for Land Management is presented below.



*The Danish concept for integrated Land Management*

## **Countryside Management**

The county councils are responsible for formulating and monitoring the overall policy on land and natural resources in the countryside.

A system of sectoral planning for the countryside was introduced in the 1970s comprising area resources such as soil quality, landscape qualities, raw materials and water accessibility. The interests were given priority towards each other implying zoning of areas reserved for agriculture, for raw materials extraction or for special natural areas. It was intended that this planning system should be integrated in the regional level plan to form the basis for rural land use administration.

In the 1990s, by adopting a comprehensive environmental reform, this system of statutory sectoral planning was considered too demanding on administrative resources and not actually necessary. However, the basic mapping of the natural resources (including ground water) is maintained as a source of information for balancing the interest in the regional level plans and providing a framework for administration of the sectoral land use acts.

### **Rural zone development**

A basic element of the planning system is the division of the country into three zones, urban, recreational and rural. In the urban and recreational zones, development is allowed in accordance with the current planning regulations. In rural zones, covering about 90 per cent of the country, developments or any changes of land use are prohibited, or subject to a special permission according to planning and zoning regulations.

An important exception is that construction necessary for commercial agriculture, forestry and fishery operations requires no permit. Also, existing agricultural buildings no longer necessary for agricultural operations may be used for craft and industrial enterprises and for storage and office purposes without applying for a rural zone permit.

The provisions on rural zone development as stated in the Planning Act are intended to prevent uncontrolled land development and installations in the countryside and to preserve valuable landscapes. Urban development can then only occur where land is transferred from a rural zone to an urban zone, by providing a local plan, followed by a land use tax, to be paid by the landowner.

The rural zoning is established in the regional plans. The permits are managed by the Municipality Councils. Applications for rural zone development permits are assessed on the basis of the guidelines of the regional and municipal plans. These guidelines weight countryside protection and commercial interests in a broad sense.

### **Coastal zone management**

Coastal areas are of national interest. One-third of the coastal area is built-up or planned for new development. However, there is still pressure on the coasts for increasing urban development, tourism, summerhouses and technical facilities. Open coastal areas, then, are scarce, and need to be managed carefully by planning and land-use administration. The

coastal protection therefore was strengthened in 1994 through amendments to the Planning Act and Nature Protection Act.

From the 1930s the Danish coasts have been protected through a 100 m protection zone. This is enlarged to 300 m in open coastal areas, 100 m in summer cottage areas; and in urban areas the protection zone, ranging from 0-300 m, has to be designated by a special Coastal Protection Committee. A special 3 km planning zone along the coast is determined in the Planning Act. The planning zone ensures that special planning or functional reasons must be justified prior to locating buildings and construction works within the coastal areas. These provisions in the Planning Act are intended to ensure that new urban development or holiday and leisure facilities must only be located if they are based on comprehensive considerations of tourism policy, and only in connection with existing urban communities or larger holiday and leisure settlements.

### **Nature protection**

The Nature Protection Act gives protection to certain areas and elements in nature and landscape. There are fixed protection zones of 300 metres along the coasts in rural areas, 100 metres around ancient monuments (e.g. viking burial mounds), 150 metres around lakes and streams and 300 metres around woods and churches.

Existing natural features are also directly protected against any changes to the existing state of watercourses, lakes, bogs, marshes, heaths, dunes, boundary banks and ancient monuments. Finally, the Act provides for establishing conservation regulations that make it possible to schedule areas as nature reserves and to determine how such areas shall be used. The act is administered by the county council.

Aesthetic control is carried out to ensure that advertisements in the countryside do not disfigure the landscape. Therefore, placing of outdoor advertisements in the countryside is prohibited unless they are placed in direct connection with the enterprise, and provided that they do not dominate the landscape and not visible over a long distance. Furthermore, public structures in the countryside must be located and designed in such way that the greatest possible consideration is given to scenic values and environmental interests. Location and design of major roads and electric wires therefore must be approved by the Ministry of the Environment, whereas minor roads and wires must be approved by the county council.

### **Nature Conservation**

Conservation has been an important instrument for nature protection since the original Nature Conservation Act in 1917. Conservation is mainly used to preserve areas of outstanding beauty or cultural value or to protect areas with valuable flora or fauna of specific national interest. About four percent of the Danish land is under protection through conservation orders.

Conservation orders are adopted by the Conservancy Boards, which are established for each county. The Boards comprise three persons: a chairperson (judge) appointed by the Ministry for the Environment and one member appointed by respectively the county and the municipality in which the area concerned is located. The means of conservation is only

to be used when it is not possible to preserve the areas by other means, e.g. by planning regulations. Full compensation is awarded to the landowners for losses suffered as a result of the implementation of the conservation. The Minister for the Environment, the county councils, the municipal councils and the Danish Society for the Conservation of Nature may initiate the process of conservation. Appeals against the decisions of the Conservancy Boards may be made to the Nature Protection Board of Appeal.

### **Nature management**

The Nature Protection Act provides funds for acquisition of property with the object of implementing state afforestation or major nature restoration projects. The Act also provides loans or subsidies to the counties and municipalities, as well as to organisations and private landowners, who wish to tend and restore nature areas and improve the opportunities for recreational activities. The Minister for Environment may use pre-emption in order to ensure future land acquisition for nature management purposes. During the last ten years about 800 million DKK (about one million USD) have been granted for nature management projects, distributed as 40 per cent for nature, 40 per cent for afforestation and 20 per cent for recreational activities. Nature management is based on the principle of voluntary cooperation and therefore, local support is a central element of the prioritisation of funds under the Act.

### **Agricultural policies**

The Agricultural Holdings Act requires that all agricultural properties be operated in accordance with agricultural and environmental considerations. This duty applies to two thirds of Denmark's land. The Act governs ownership, use and size of the properties, and the provisions are changed rather often reflecting current agricultural policy. The Act is administered by regional agricultural commissions supported by a secretariat located at the county administration. The general protection of agricultural land can be abolished if the land, in the light of local planning, is to be used for other than agricultural purposes, especially when rural land is transferred to an urban zone for development purposes.

In the 1970s the official policy was to reserve the agricultural land resources for intensive farming carried out by educated, full-time farmers. The objective was to protect good farmland against urbanisation and extensification and to ensure optimum investments and growing security. The impact of this policy has been an increase of the average size of holdings from 16 hectares in 1960 to about 48 hectares in 2000. During the same period the number of holdings decreased from about 200,000 to 55,000.

In the 1990s agricultural policy has changed from just supporting effective and rational use of the holdings, to supporting various forms of less intensive farming which contribute to the reduction of the total agricultural area. The new policy also supports environmentally friendly land use in agriculture. This includes support for afforestation (permitted for the total area of the holding), introduction of ecological working methods, environmentally friendly growing methods (without fertilizers and sprays) as well as permanent fallowing of agricultural land (minimum 5 hectares and for a minimum of 20 years).

To create a less intensive agricultural production it is now possible for people without agricultural education and without having farming as main occupation to buy holdings when the area is smaller than 30 hectares. These liberal rules for acquisition apply to about 75 per cent of the holdings in Denmark. The rules also aim at having a more differentiated settlement in the rural districts.

### **Land consolidation**

Local agricultural development may be promoted by means of land consolidation pursuant to the Land Consolidation Act, in order to adjust the structure of the agricultural holdings within a certain area for the purpose of optimising the basic conditions for agricultural production. In recent years, environmental considerations are also integrated into the process of land consolidation.

A land consolidation project then may be undertaken both on the request of the owners of local holdings or in order to alleviate any negative effects of implementing public works, such as major roads. Under the Act the Directorate of Agricultural Development is in charge of carrying out the land consolidation plans. In practice the planning is normally assigned to a local licensed surveyor. The process of land consolidation is based on negotiations and the principle of voluntarism. The final plan is approved by the regional Agricultural Commission.

When the parcelling-out and transfer of plots comprised by the plan are carried out and all legal and economic issues are resolved, the plan is submitted to the same Agricultural Commission for approval by a final discussion. Participation in a land consolidation project is totally funded by the state.

### **Forestry policies**

Forestland, which comprises 12 per cent of Denmark's land, applies to the duty of being used and operated as forests. The national forest policy implies that the Danish forestland is to be doubled within the next 80-100 years, which means that 5000 hectares shall be afforested per year. The efforts in connection with afforestation are aimed at wood production and recreational purposes, as well as the establishment of living places for wild flora and fauna.

One third of Denmark's forests are state-owned and managed by the National Forest and Nature Agency using multiple-use forestry: modern forestry production combined with protection of the environment and taking recreational activities into account. The Agency also supervises private forestry and implements environmentally sound forestry. Furthermore, the Agency is responsible for managing the state-owned natural areas in Denmark.

### **Natural resource management**

Raw materials, such as gravel, clay and chalk, are finite resources. About 500 hectares of land, often farmland, are dug up annually. Such materials are extracted, and then the land is restored. The national policy, therefore, aims to limit the consumption through a deliberate policy of management that ensures a long term supply of raw materials.

Environmental considerations must be integrated with the commercial activity. Permission for extraction is given according to the Raw Materials Act administered by the county council. The extraction is based on a raw materials plan, integrated in the regional level plan, which takes account of environmental and other interests.

The aim of the Raw Materials Act is to ensure that raw materials are considered as a limited resource. The need for stone, gravel, sand etc. for construction works then is balanced against considerations of landscape degradation, groundwater pollution etc. Industrial exploitation requires a license from the county council, which may be granted on the basis of the considerations mentioned. Licences are only issued for ten years and may contain special terms and conditions especially with regard to the subsequent treatment of the areas in order to avoid lasting disfiguration of the landscape. Furthermore, large-scale extraction of raw materials is subject to Environmental Impact Assessment

### **Environmental protection and pollution control**

The general policy in Denmark emphasises that economic growth can be achieved simultaneously with improvements to the environment. The environment is considered as one of the most important parameters. But, to compete, industry must be able to absorb - constructively and economically- environmental considerations into its development.

The Environmental Protection Act is based on the "polluter pays principle" which is internationally recognized. Furthermore, the Act contains (i) the "localization principle" saying that an enterprise shall be located at a site causing least possible pollution, and (ii) the "pollution restriction principle" saying that any enterprise shall plan its operations and adopt the measures necessary to prevent pollution to the greatest possible extent.

The Environmental Protection Act includes provisions to prevent and control pollution of air, earth and water, as well as provisions for noise and waste treatment. The Act also lays down requirements for use of the least pollution technology. These requirements are made operational through a statutory system of prior approval/authorization applying for the establishment of all kinds of, plants or activities considered as potential sources of pollution and therefore are listed in an annex to the Act. The annex includes the majority of the Danish industries. This approval ensures that all enterprises meet a number of environmental and technological standards and so pollute soil, air and water as little as possible. Companies are required to use the least environmentally demanding and economically viable solution with regard to the use of raw materials and production processes, taking into consideration the whole life cycle of the products.

The responsibility of administering the Act is divided between the county and municipal councils. The terms of the approval - which provide the environmental conditions for operational activity - are issued and enforced by the county and municipal councils. The approval safeguards the enterprises against authority requirements for a period of eight years.

The Environmental Regulations issued under the Act include special demands for e.g. the location of agricultural buildings, as well as demands for the environmental use of properties in general. The procedure for Environmental Impact Assessment of special

projects, likely to have significant impact on the environment, is incorporated in the process of regional planning.

The Environmental Protection Act also includes provisions for wastewater treatment to be managed through the guidelines in the regional plans for safeguarding the quality of watercourses. Finally, environmental legislation includes provisions for discharge of toxic substance, spreading of animal manure, use of plant fertilizers, and general provisions for animal households etc., in order to safeguard the quality of groundwater as well as the general hygienic standard of the community.

Groundwater is becoming an increasingly important policy area and is now one of the major political subjects on the agenda in 1990s. A national strategy on groundwater has been adopted in 1994 and it is recognized that the assaults on groundwater contamination needs to be prioritised. This should be based on the selection in each region of the groundwater resources on which the future water supply is to be based. The aim being to ensure sufficient uncontaminated water resources to cover expected future requirements.

The groundwater strategy uses spatial planning as a necessary strategic instrument. The strategy is based on the following principles: (i) focused and differentiated approach in contrary to a firm nationwide regulation; (ii) high priority to remedy for contaminated sites in the areas of special interests for water supply; and (iii) regulating the future land use in the areas of special interest e.g. the size and number of farms, and attention to existing land use in the areas especially with regard to reducing the washing out of nitrate.

### **Infrastructure development**

The tasks relating to roads are divided between the national, regional and local level. The State, through the Ministry of Transport, is responsible for overall transport planning and for the implementation of motorways, main bridges and trunk roads (in total 4,500 km). Counties are responsible for the construction and maintenance of secondary roads (approx 7,000 km) and, in addition, the counties carry out the maintenance of motorways and trunk roads on behalf of the Ministry. Municipalities are responsible for the construction and maintenance of local public roads (approx 60,000 km) and, in addition, they administer private roads established and maintained by the landowners themselves.

The Ministry of Transport carries out comprehensive transport planning with a perspective of 10 - 15 years, based on estimated investment needs as well as considerations for resource consumption and the environmental impact. The construction of new motorways must conform to a special procedure. The Parliament must adopt an Act for the specific project specifying its location. According to the State Expropriation Act, an independent expropriation commission then has to examine the project on location and the Ministry of Transport must ensure that necessary consultation is made in order to solve any environmental or agricultural conflicts, using land consolidation as the main means.

New secondary roads are designated in the regional plan, and implemented according to the procedure stated in the Public Road Act. In locating a new secondary road, the environmental impact must be taken into account. The procedure of implementation follows the normal process of expropriation that includes inspection and negotiations on the location, to be followed by an expropriation decision. The process of implementation often includes

land consolidation in order to alleviate any negative effects on the structure of agricultural holdings involved. New local roads are designated in the municipal plan and implemented by the municipal council following the same procedure of expropriation mentioned above.

The Danish State Railways (DSB) is a part of the Ministry of Transport, responsible for planning, implementation and maintenance of the railway network as well as a number of car-ferry and coach services. The costs are funded partly by state investments and partly by user payment. Construction works follow the same procedure described above for motorways.

## **Urban Management**

### **Urban planning control**

The urban environment is controlled by the municipality councils through means of comprehensive municipal planning and provision of binding local/neighbourhood plans. Management of local affairs should be seen in a total context. Municipal planning gives the municipal council a procedural instrument well suited to link sectors and co-ordinate the total political and economical activities of the municipality.

Urban development in Denmark, as in many other countries, accelerated between 1945 and the mid 1980s. This occurred at a time of increasing affluence and increasing mobility through the use of private cars. Light, fresh air and green surroundings were given high priority when creating new urban areas of detached houses, blocks of flats and low rise housing. The result was a huge urban sprawl around the cities and towns. These new urban districts now encompass 75 per cent of the developed urban land and half of the population. Today the urban areas in Denmark have virtually stopped growing, and the demographic trends show that the need for new dwellings is more or less nonexistent.

However, Denmark's cities need to be restructured to adapt to changing demands due to changes in family patterns and the labour market as well as changes within priorities of the commercial and retail sector. Furthermore, older industrial areas - especially in larger cities - have been abandoned; and harbour areas and defence installations are made available for other purposes.

Increasing environmental awareness and the need to protect the global environment will also place increasing demands on the restructuring of Denmark's cities. The historic city centres have received increased attention. They are unique in Europe because they have been spared from skyscrapers and motorways. But interests in preservation often conflict with the financial interests of developers and specific property owners.

To summarise, the process of restructuring cities seems to represent a much greater challenge of integrated management than planning just for urban sprawl or new towns

### **Urban regeneration**

In the 1960s and 1970s the main focus of urban development in Denmark was on developing new settlement areas for residential purposes. In the 1980s and 1990s,

however, the focus has been on urban renewal and restructuring, including the conservation and protection of valuable urban and building features. This process of urban regeneration also includes traffic and environmental considerations for the purpose of generating new life in the old (historic) city centres. The process of urban regeneration is managed by the municipal council by means of spatial planning and intensive public participation. Projects are implemented partly by public investments in infrastructure, partly by urban renewal companies and partly by private investment works.

Urban regeneration is mainly based on the Urban Renewal Act, passed in 1982, covering three types of interventions: renewal of obsolete urban areas; improvement of obsolete residential housing; and elimination of health and fire hazards in buildings in general. The Act shifted the focus from slum clearance, by demolition and replacement, to the renewal of city areas by preservation and improvement of housing standards and the local city environment. The policies of urban regeneration were, therefore, linked to the process of spatial planning; and the owners and residents became involved in all phases of the urban renewal process. The Urban Renewal Act provides general public subsidies to the regeneration of blighted urban areas, while the Act on Private Urban Renewal, passed in 1992, is an experimental approach aimed at the promotion of urban regeneration through partnerships between owner and tenants in private rental, housing without any public support.

### **Urban conservation**

Urban conservation is, to a large extent, taken care of by means of planning e.g. by providing legally binding local plans for the protection and maintenance of historical urban quarters or city centres. In addition, urban renewal schemes may contribute to urban conservation. According to the Building Act, a permit is needed for demolition or alteration of existing buildings. The municipal council then may consider imposing a ban in order provide a local plan for the protection of historical or architectural values.

The National Forest and Nature Agency carries out the mapping and registration of buildings and groups of buildings that should be preserved. The mapping is preformed according to a specifically developed system called the Survey of Architectural Values in the Environment (SAVE), and the results are published in a municipal atlas that summarizes the special characteristics and features worthy of preservation. This work is not an official listing, but it is an important prerequisite for the municipalities to integrate preservation considerations in their spatial planning and administration.

The Preservation of Buildings Act includes provisions empowering the National Forest and National Agency to preserve architecturally or historically valuable buildings. A total of 9000 buildings have been listed since the Act was passed in 1918, and about 100 are added annually. As a rule, buildings for preservation should be more than 100 years old, but younger buildings can be listed if they possess unique value or other special circumstances. Listed buildings may represent city-houses for residence, schools, churches (apart from those churches belonging to the Danish Lutheran Church), monasteries, merchants houses, farms, manor houses, castles, wind- and water mills, factories as well as lighthouses, lifesaving stations, railway stations, bridges and monuments etc.

### **Waste management**

Denmark's policy on waste management reflects a worldwide problem. The amount of waste products is increasing, and it is more difficult to dispose of it, partly because of the increased volume and partly because waste disposal causes environmental problems.

The Danish national policy on waste management aims to encourage recycling so that waste is thought of as a resource to be recovered instead of disposed of, thus reducing the total amount of waste. The overall policy has three elements: (i) to avoid generating waste (using low-waste technology); (ii) to increase recycling; and (iii) to reduce the amount of untreated waste dumped at landfills. The last priority means that waste that cannot be recycled should be incinerated (with heat recovery), composted, or treated by another controlled method.

The planning for waste management is organized at three levels. The state authority, the Ministry of the Environment, provides an overall framework. Each of the 14 county councils makes a survey of the quantity and types of waste produced in each municipality under its jurisdiction and prepares a regional waste management plan. Each municipal council then prepares a comprehensive waste disposal plan for the municipality.

The local level plans describe the current waste disposal system, including the local system of waste collection and waste disposal facilities and any facilities operated jointly with other municipalities. The local targets for the proportion of waste to be recycled, incinerated or dumped are determined using the targets set by the counties and adapted to local conditions, taking into account overall regional and national priorities.

## **A Global Land Management Approach**

The various sectoral policy areas, as described above, should be linked together to form a global approach. The means to achieve this are not precisely identified in the legislative framework. Some areas, such as pollution control, agriculture, and nature and heritage protection, are mainly organized through vertical connections, by setting standards and regulations at national level to be administered at regional or local level. Other areas, such as transport and environmental protection, provide a firm framework at national level to be further detailed through sectoral and comprehensive planning at regional and local level. Finally areas such as housing, the environment, nature and resource management, tourism, and economic development, are organised by fulfilling national policies through efforts of comprehensive planning based on regional and local considerations and needs.

In general, one may describe the system of public administration in Denmark as a mix of vertical connections, implementing each sectoral policy by a top-down approach, and horizontal connections, linking the different sectoral policies on the same level through comprehensive spatial planning.

A global management approach then is mainly achieved through the principle of framework control within the spatial planning system, meaning that plans must not contradict decisions at higher levels. The principle of framework control ensures that planning decisions at regional and local level - in principle - will be in conformity with overall national policies.

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