Modern management instruments – control of a water resources management association by means of an agreement on targets (balanced scorecard)

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Abstract Since the matter of water supply and sewage disposal is safeguarded in Germany, public concern would no longer appear to be directed at questions of disposal reliability, but almost exclusively to economic efficiency. The requirements with respect to sewage disposal are dominated not only by growing environmental regulations and technical challenges, but also to a major extent by a discussion on the costs arising. In order to ensure a viable and at the same time economic water supply and sewage disposal despite this, it is necessary to have a holistic corporate control system. As a counterpart to the river basin management approach adopted at the Wupperverband there is, on the business management side, the agreement on targets (balanced scorecard) as a management and controlling approach. This incorporates purely financial variables as well as non-financial variables in the economic valuation of corporate success. The starting point is the formulation of strategic goals, while including customer-oriented, in-company and forward-looking perspectives, taking into account at the same time the interactions between them. A major perspective of such balanced scorecards is customer satisfaction. By means of an intensive dialogue with members, licensing and supervisory authorities of the Wupperverband within the framework of a holistic corporate control, it has been possible not only to improve corporate success, but also, and more importantly, to achieve an appreciable increase in confidence.

Keywords Balanced scorecard; controlling; river basin management; sewage treatment

Introduction

The Wupperverband (WV) (Wupper Association) is responsible for the natural catchment area of the Wupper with an area of 813 km^2 (Figure 1). Its members include towns and municipalities, districts, water utilities, as well as small and large industrial concerns.

As an environmental body the Wupperverband is committed to sustainable and integrated environmental protection. The prime concern is a holistic study of the Wupper river region.

The statutory tasks of the Wupperverband, namely

- sewage treatment and waste disposal
- operation of dams to control the water flow in the Wupper
- maintenance and restoration of surface waters plus
- provision of drinking water,

are examined in the context of their interaction with the water system and adjusted to one another in such a way that optimum benefit for people and the environment is obtained at reasonable cost.

Growing requirements in sewage disposal

The requirements for sewage disposal are at present dominated to a major extent in Germany by the discussion of costs and the prices to be paid by customers. Since the matter of water supply and sewage disposal is safeguarded in Germany, public concern would no longer appear to be directed at questions of disposal reliability, but almost exclusively to economic efficiency. Irrespective of this the environmental policy and technical requirements continue to be on a high level.

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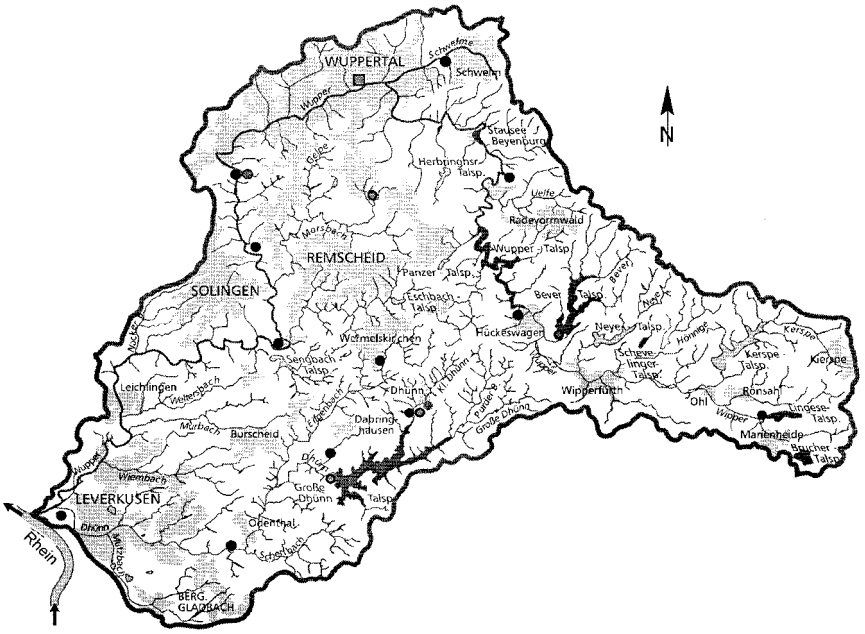

Figure 1 Natural catchment area of the Wupper

Water is a vital public good. Conveying it and transforming it from a polluted state to a cleaner state is seen as a social service, and it is almost always a natural monopoly. In many instances, water services are undertaken in the public sector and where they are in the private sector they have a profit motive and are subject to strong political control. Having no profit motive to focus upon, many public organisations are subject to the demands of a variety of other goals (Holmes, 1999).

The examples for this include guaranteeing a uniform reliability of disposal, ensuring a sustainable development of bodies of water by means of holistic river basin management, predictability in the political domain, balancing the interests of public water resources management, ensuring an appropriate development of prices and fees and the conduct of informative and educational work on the subject of water.

Fulfilment of these requirements and/or balancing them assumes the active management of objectives and risks. If the management approach of "shareholder value" is applied here, i.e. the pursuit of shareholder interests, the term "stakeholder" can be coined, someone whose interests are to be managed.

Sewage disposal parameters influencing costs

Central to the interests currently under discussion are, as already mentioned, costs. To influence these there is first a need for an analysis of the factors which determine them (Firk, Mertsch and Pinnekamp, 1998).

The costs of sewage disposal are initially influenced to a major extent by the statutory parameters and official conditions applied in each case. With respect to the Wupperverband, mention should be made of the German State Water Act ("Landeswassergesetz") and the regulations under water, waste, pollution control and construction law. These lay down that an investment project must be preceded by the conduct of environmental impact studies, noise and odour assessments, wind measurements and water-related calculations, the drafting of a landscape conservation support plan and an explanatory report, and the

production of extensive general, piping, route, process and construction object plans. The ongoing amendment of statutory provisions may result in the replacement of some installations which have only been in operation for a few years and the need for applying extraordinary write-downs, i.e. additional costs.

As the actual construction work is being performed, the standardising regulations influence the costs in the form of the qualities demanded for the construction equipment, machinery, electrical facilities and the instrumentation and control systems.

The performance of construction work involves intervention in the landscape and nature. This normally leads to a need for countermeasures, such as re-afforestation or the costly acquisition of replacement areas. In a comparable way to the countermeasures, cost-effective accompanying measures are to be taken in addition to the actual investment. Possible odour and noise concentrations, for example, are to be countered beforehand by means of encapsulation, exhaust air treatment and noise control measures. Increasingly rigorous accident prevention stipulations must be observed. On the other hand, more extensive requirements, such as ensuring for reasons of pure tourism that plant and building silhouettes are not optically conspicuous, will probably be rare.

In addition to the investment, the statutory parameters and official stipulations also influence the operation of facilities. The major factors are not only the tighter sewage treatment plant discharge values, but also the conditions under which they are checked (in Germany this is done on a spot check basis and not with the use of a mixed sample as is possible under European law). Compliance with the discharge values is underpinned by criminal penalties. So as not to run the risk of a confrontation with the law, cost-effective investment and operational reserves are provided for.

Investment and operating costs are characterised by statutory and official stipulations, as well as, to a major extent, by the development of prices and conditions on the market. With investments the currently favourable construction prices from the investor's point of view in Germany, combined with historically low interest rates, lead to considerable savings, if these benefits are actively utilised. The operational expenses are substantially dominated by the personnel expenses subject to collective agreements, high residue disposal expenses and the use of equipment and energy. Only when electrical energy is used are any notable savings possible owing to the liberalisation of the German power market. They are partly cancelled out by the electricity (ecological tax) act in force since 01.04.1999.

Other cost-influencing factors are customer expectations and employee motivation, as well as circumstances specific to location and body of water. The latter in particular show the reciprocal relationship with the body of water quality situation and hence the need for a comprehensive study.

The control of costs must cover not only the cost-influencing factors mentioned here, but also all factors which influence the quality of the body of water positively or negatively. To achieve the optimum allocation of funds with limited availability while enjoying further success in water protection, it is therefore necessary to have a holistic study related to the catchment area. The approach adopted by the Wupperverband is river basin management. (Londong and Renner, 1999; Amtsblatt der Europäischen Gemeinschaften, 1997).

Control of costs and services

To actively control costs and services, knowledge of the influencing factors for a body's own costs is to be used to determine the variables which can actually be influenced.

It cannot be assumed that statutory parameters will be amenable to influence. Official stipulations, standards, the need for countermeasures or the performance of accompanying measures can basically not be changed. When interpreting these specifications, there is, however, a considerable potential for influence by negotiation and by an intensive and open

professional and personal dialogue with licensing authorities. Success achieved in this way is difficult to quantify financially in advance. The following approach initially assumes control of a body's own investment, operational and financial circumstances.

Within the framework of a plan of action designed to run for 12 years and agreed with members, licensing authorities and supervisory bodies, the Wupperverband is responsible for implementing extensive investments to ensure sustainable water protection in the Wupper's catchment area. It has provided for investments in sewage disposal amounting to about DM 460 million up to the year 2010. A major improvement in the water quality situation in the Wupper was already possible in the past by this means.

In order to ensure sustainable water resources management at reasonable costs and reasonable fees an extensive technical and business optimisation process is necessary. Examples for this are the development and implementation of a comprehensive energy management concept, including renewable energies, the development of new, in part publicly funded process technologies such as split-flow treatment with a lamellar separator or plant and process simulation to achieve optimum plant dimensions, in order to avoid safety reserves in the extension. For the extension of the Buchenhofen sewage treatment plant with 700,000 million PE and an investment of approximately DM 200 million it was thus possible by process simulation to reduce the investment costs by about DM 60 million as against the traditional dimensions (Londong, 1996).

The technical optimisation measures receive extensive business management support. This is based on financial and fixed assets accounting and cost accounting using SAP R/3, a consistent project management, an active interest and credit management and operative and strategic controlling.

The plant and process developments and the resulting operational, financial and liquidity-related developments are incorporated in a multi-year cash-flow study within the framework of the strategic controlling. The cash-flow determines the performance-influencing cash surplus made in a period, normally a financial year, and it therefore yields information on the company's internal financing capacity, i.e. the ability, for example, to implement investments or effect repayments. The Wupperverband bases its observations on the so-called "net operating cash-flow".

The expenses given in the annual statements of account and expected in future from active control provide, in a multi-year cash-flow study, a picture of the necessary future contributions and other income. This is a major basis for an agreement on targets to be

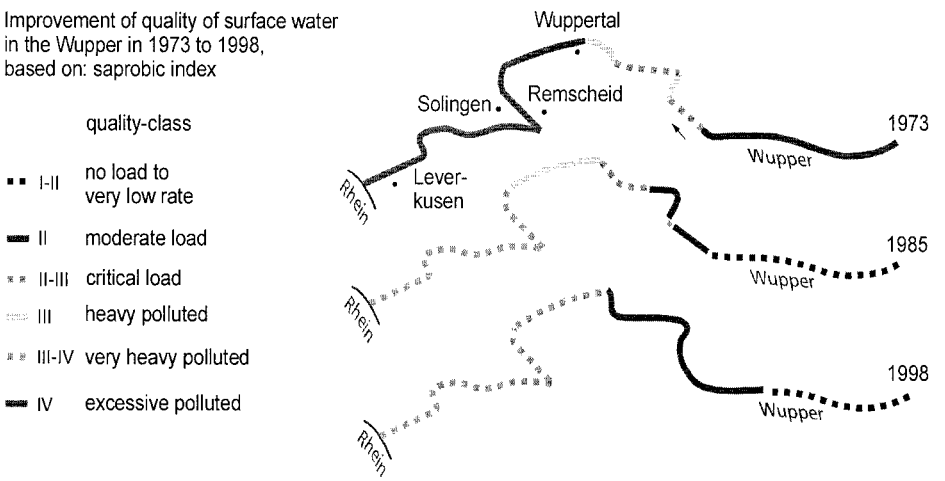

Figure 2 Development of quality of surface water in the Wupper at a glance

	Contributions by members
+	Capitalized services
+	Other operating revenue
=	**Revenue in total**
–	Material and equipment costs
–	Other operating costs
–	Depreciation
–	Personnel costs
+/–	Interest
–	Taxes
=	**Annual result**
+/–	Liability reserve (dissolved/established)
+	Depreciation
+/–	Special item with accrual character (dissolved/established)
+/–	Operating reserve for wastewater levy (dissolved/established)
=	**Cash-flow (net operating)**

Figure 3 Applied cash-flow structure

agreed with a customer or stakeholder. The agreement on targets is at present characterised externally by primarily monetary criteria, i.e. the development of contributions within an agreed time-frame, and internally it is backed up by corresponding agreements.

The basis for successful agreements on targets should basically be as follows:

1. definition in terms of the content, extent and time-frame of clear specifications
2. the combination of technology, organisation and culture
3. sustainability as an honest, practised principle
4. the endeavour to achieve a balancing of interests

The success of agreements on targets can be measured in terms of the confidence achieved vis-à-vis customers, rising effectiveness and the maintenance of the ability to adapt to changing market conditions.

For the Wupperverband itself success can be seen, on the one hand, in an appreciable growth in confidence on the part of its members and, on the other, in the degree of cost optimisation achieved. From this there developed the possibility of limiting the original contribution expectations of between DM 117 million and, in the medium term, DM 145 million to DM 135 million, according to present knowledge. Also evident is the willingness of members to reward the signs of cost optimisation, combined with river basin management, initially in the form of additional funds for monitoring, and for basic and tool developments.

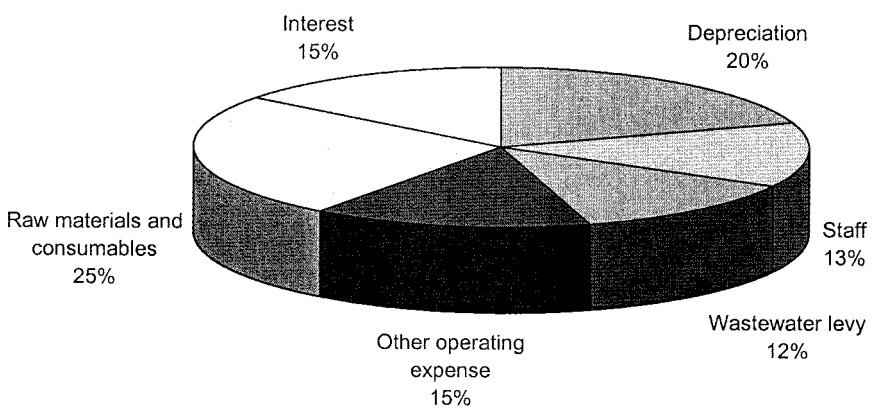

Figure 4 Comparative costs of sewage treatment (WV 1998)

Balanced scorecard

If one extends the observation of cash-flow and monetary criteria to include additional perspectives, such as stakeholder management, one obtains the instrument of the balanced scorecard (Figure 5). This assumes the approach of holistic corporate control with the help of a mixture of goals and consequently data and figures of different perspectives (Kaplan and Norton, 1997).

If one attempts to systematise these perspectives, it is possible to distinguish financial, in-company, customer-related and forward-looking perspectives. From the respective perspective, items of information are incorporated in strategic company objectives or corresponding agreement on targets. The aim here is to achieve a balance between these items of information, which are mutually independent, but which exercise a joint influence on corporate control.

The reciprocal links can be described in simplified form as follows. The achievement of financial objectives is top of the list of priorities. Financial objectives can only be achieved, however, if the customer orientation and customer satisfaction are right. Satisfaction with services rendered can only be achieved if the service process is competitive. The competitiveness in turn depends on an a forward-looking orientation, i.e. the ability to make ongoing improvements and apply sustainable solutions. This assumes the presence of qualified and motivated employees.

With the transparent formulation of goals it becomes clear what influences corporate success and how the individual can contribute to the overall success of the company. From the corporate objectives it is possible to obtain sub-objectives for business units, departments or employees, and to implement them on this level. With the linking of the objectives there is to be an ongoing feedback process.

The balanced scorecard includes, among other things, the perspective of "customer satisfaction" in a cluster of objectives to be considered. For the work of the association this demands that the claims of the association's customers and stakeholders be analysed in terms of their substance, as should the possibilities of conveying the services and the costs of the association's own actions.

The association's customers are, on the one hand, association members such as local authorities, industrial concerns and water utilities who have to pay contributions for

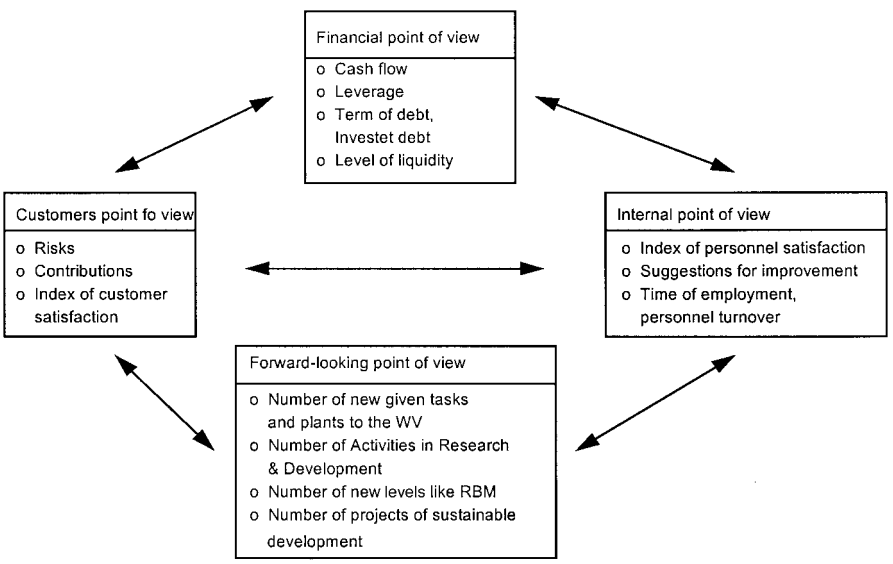

Figure 5 Balanced scorecard

services rendered by the Wupperverband and, on the other, official administrative bodies and the supervisory authority, the Environment Ministry of the State of North Rhine-Westphalia.

The requirements of such a heterogeneous "group of people" are highly varied and frequently not directly product-related. Rather it is indirect claims that predominate, such as unhindered urban development not impaired by deficiencies in sewage disposal, or politically unobjectionable sewage charges.

It is also striking that problems which were formerly of high priority, such as flood protection and the reliable supply of industrial water, today no longer have such a high status in the eyes of the public, now that the problems have in some cases not arisen for a number of decades. The costs for the objectively still necessary expenses, such as the operation and financing of dams, are still incurred regardless of this.

The problem-solving approach adopted by the Wupperverband consists of agreements on targets of services and costs geared to the medium term. With these balanced scorecards the aim is to create a consensus with all customers, in other words not only with members, but also with the authorities. For this purpose it is necessary to include the stakeholders in the work of the association.

The balanced scorecards form the basis for medium-term and long-term planning, the ongoing endeavour of course being to improve services and optimise costs. The services are geared to the water protection objectives based on river basin management as agreed with the licensing authorities, and the costs are geared to their political feasibility.

Such balanced scorecards have been agreed for sewage treatment and waste disposal, and also for the operation of industrial water dams and reservoirs. The matter is still under discussion for the domain of maintaining bodies of water.

Changing focuses in water protection, the demand for the internalisation of costs, integral thinking and Europeanisation require a new cost distribution scheme in the medium to long term for the Wupperverband's expenses. Proposals are being drawn up and are to be discussed on a broad basis.

Conclusions

Increasingly complex corporate decisions have been taken into account at the Wupperverband by the introduction of a river basin management and the management and controlling approach of balanced scorecards. Improvements achieved in this way both in the quality of bodies of water and in the development of costs, combined with a growth in customer confidence in the work to be performed, would appear to confirm the correct nature of the approach adopted.

Customer requirements, political expectations, technical developments and stipulations imposed by the administrative authorities are subject to ongoing change, however. The success achieved to date cannot therefore be sustained as such. To continue to be successful in the future, further efforts are therefore needed. The improvement of the balanced scorecard instrument and a more detailed analysis of the interactions between the perspectives it links provide support in this.

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