



FRAMEWORK FOR IMPLEMENTATION OF WATER NEUTRALITY MODEL IN LARGE BUSINESS ORGANIZATIONS

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Abstract:

Business can only thrive in healthy economies where social and environmental needs are satisfied as well as economic ones. It needs reliable water supplies to manufacture products and deliver services to its customers. It also needs safe sanitation systems to protect the health of its employees and to treat and recycle used water. It needs healthy and vibrant communities and attractive environments in which it can do business. These cannot exist if water management is neglected. Water should be high on the business agenda because all businesses depend on water. The continuity and future success of any business are impacted by the availability, cost, and quality of water at many points along the value chain, including upstream, midstream, and downstream. Like people and governments, businesses tend to ignore water until it becomes scarce, polluted, too expensive, or in some way is mismanaged. But in the near future, as a result of changes in both human and natural systems that affect water availability, access, affordability, and quality, the water management challenges facing humanity will become more complex. In any case, it is time for businesses of all sectors and sizes to add water to their strategic thinking. There has been little attention to the fact that, in the end, total water consumption and pollution relate to what and how much community consumes and to the structure of the global economy that supplies the various consumer goods and services. The aim of the present paper is to critically discuss the various strategies which help the company becoming water neutral.

Key Words: Business, Footprints, Strategy & Water Neutrality.

Introduction:

The idea of looking at whole production and supply chains in order to assess the total environmental impact that can be associated with a final product and to identify ways to reduce the impact is not new. This is precisely what is done in the field of life cycle assessment. During the past few years the water footprint has started to receive recognition as a useful indicator of water use, within both governments and non-governmental organizations as well as within businesses and media. The increased interest in the water-footprint concept has prompted the question about what consumers and businesses can do to reduce their water footprint. Several instruments have been proposed, including a water label for water-intensive products, an international water-pricing protocol, an international business agreement on water-footprint accounting, and a Kyoto-protocol-like agreement on tradable water-footprint permits. Another concept that has been proposed is that of water neutrality. The idea behind the concept is to see whether humans can somehow neutralize or offset their water footprint. The question is very general and interesting from the point of view of both individual consumers and larger communities, but also from the perspective of governments and companies.

In the present paper, the author first discusses the water-footprint concept, because water neutrality is all about reducing and offsetting the impacts of water

footprints. After a generic discussion of the concept, it is discussed what water neutrality means for a product, an individual consumer or a business. The objective is to understand the actions reasonably possible to reduce the existing operational water footprint and reconcile the residual water footprint by making a reasonable investment in establishing or supporting projects that focus on the sustainable and equitable use of water. Various human activities consume or pollute a lot of water. At a global scale, most of the water use occurs in agricultural production, but there are also substantial water volumes consumed and polluted in the industrial and domestic sectors. Everyone understands that water is essential to life. With population growth and economic development driving accelerating demand for everything, the full value of water is becoming increasingly apparent to all.

The Water Footprint Concept:

The water footprint is an indicator of water use that looks at both direct and indirect water use. The water footprint of a product, good or service is the total volume of fresh water used to produce the product, summed over the various steps of the production chain. The water footprint of an individual or community is the total volume of fresh water used by the individual or community in direct or indirect way. The indirect water use refers to the water that is used to produce the goods and services consumed by the individual or community. The water footprint of a business consists of its direct water use in its own operations plus its indirect water use, i.e. the water use in the business's supply chain. Water use is measured in terms of water volumes consumed or polluted.

A water footprint can be calculated for any product or activity as well as for any well-defined group of consumers e.g. an individual or family, or the inhabitants of a village, city, province, state or nation or producers e.g. a public organization, private enterprise or a whole economic sector. A water footprint is more than a figure for the total volume of water used; it refers specifically to the type of water use and where and when the water was used. The concept of the water footprint shows similarity to the concepts of the ecological footprint and the carbon footprint. The roots and intended purposes of the three concepts differ. The water footprint of an individual, community or business is expressed in terms of a volume of fresh water used per year. The water footprint of a product is expressed as the volume of fresh water used per unit of product. Water use means here that the water is either evaporated or polluted, so that it is no longer available in its original state and cannot be readily reused. The focus on fresh water is important because fresh water is scarce, not water in general. The volume of fresh water on earth is only 2.5% of the total amount of water on earth.

A water footprint consists of three components: the blue, green and grey water footprint. The blue water footprint refers to the volume of blue water that has been evaporated as a result of its appropriation for human purposes. It excludes the part of the water withdrawn from the ground or surface water system that returns to that system directly after use or through leakage before it was used. The green water footprint refers to the volume of green water that has been evaporated as a result of its appropriation for human purposes. The grey water footprint is the volume of polluted water that associates with the production of goods and services. It is calculated as the volume of water that is required to dilute pollutants to such an extent that the quality of the water remains above agreed water quality standards.

The water footprint is another indicator of water use than water withdrawal, the classic water-use indicator generally found in statistics. It differs from the classic indicator in three respects. First, the water footprint refers to consumptive water use,

while the indicator of water withdrawal includes no consumptive water use return flows as well. Second, the water footprint measures not only blue water use, but also green water use and the production of polluted grey water. Third, the water footprint measures total water appropriation of goods and services by integrating water consumption and pollution over the complete production and supply chain. In other words, the water footprint includes direct and indirect water use, while the indicator of water withdrawal refers to direct water use only. By adopting the supply-chain perspective, the water footprint maps the link between locally consumed or produced products and global appropriation of water resources, something that the classic indicator cannot do.

Water Footprint of Overall Business & Impact Assessment:

One can also assess the water footprint of producers, be it a single producer, a company or a whole economic sector. The water footprint of a business is defined here as the total volume of fresh water that is used directly or indirectly to run and support a business. This water footprint can be assessed by looking at both the direct water use, i.e. the producer's water use for manufacturing or for supporting activities, and the indirect water use, i.e. the water use in the producer's supply chain. The water footprint of a business thus includes two components; the operational and the supply-chain water footprint. Both components potentially break down again into a green, blue and grey water footprint. Many businesses in the industrial or service sector will typically have a supply-chain water footprint that is larger than its operational water footprint. Particularly when a company does not have agricultural activity itself but is partly based on the intake of agricultural products, the supply-chain water footprint will generally be much larger than the operational water footprint. In the supply-chain water footprint green water will often be dominant, while in the operational water footprint it will be blue or grey water. Also in the bio-industry a business water footprint will be dominated by its supply chain component, because the water volume used for making the feed is much larger than the water volumes used for operating a bio-industry. For crop farms, however, the operational water footprint will be much larger than the supply-chain water footprint. If we roughly describe the economic system as a chain that goes from agricultural production and mining through manufacturing and retailing to consumption, we see that direct water use intensities gradually decline. By definition, the water footprint of a business is equal to the sum of the water footprints of the business output products. The supply-chain water footprint of a business is equal to the sum of the water footprints of the business input products. Obviously, the water footprint of one business can overlap with the water footprint of another business. The supply-chain water footprint of a retailer for example will partly overlap with the water footprints of its suppliers. This is important to recognize, because if businesses decide to take up the challenge to reduce their water footprints, they we will have shared responsibilities.

The impact of a water footprint at a certain location at a certain point in time will depend on a variety of factors, including the availability of water resources at the location considered, the level of local competition between various water users, the local environmental flow requirements and the assimilation capacity of the local water system. A moderate level of freshwater consumption in a region with low water availability can have a higher impact on the environment than a higher level of water consumption in a water abundant region. Finally, local water systems differ in what they can assimilate, because degradation rates for specific chemicals vary depending on various conditions, so that the effect of chemicals disposed into ground or surface water

systems will not be similar everywhere. The impacts of a water footprint can be economic, social or environmental. The water footprint associated with a certain product can have a negative economic impact when the marginal cost of the water is not fully charged to the user. In practice, users seldom pay the full marginal cost of water, which reflects the sum of investment costs, operation and maintenance costs, a scarcity rent and economic externalities. As a result, existing water use patterns are often not efficient from an economic point of view. Environmental impacts of water consumption and pollution include damage to local ecosystems and biodiversity. Social impacts of water consumption and pollution include impacts on public health and social equity issues that arise when some users apply a lot of water while other people do not have access to a minimum.

The Water Neutral Concept:

The idea of the water-neutral concept is to stimulate individuals and corporations that undertake water consuming or polluting activities to make their activity water neutral by reducing water consumption and pollution and by compensating for the negative impacts of remaining water consumption and pollution through investing in project that promote the sustainable and equitable use of water within the environment and community that is affected. Water consumption and pollution can be reduced for example by investing in water saving technology, water conservation measures and wastewater treatment. Compensation for negative impacts can be done for example by investing in improved watershed management or by supporting poor communities that do not have access to clean water to set up and maintain their own water supply system. The water-neutral concept shows similarity to the carbon-neutral or carbon-offset concept as has been developed in response to the challenge of taking climate change counter-measures. The principle of the concept is that a person reduces his/her water footprint as much as possible and pays a justified amount of money for the residual water footprint that he/she presses on the global water resources. It can be an instrument to raise awareness, stimulate measures that reduce water footprints and generate funds for the sustainable and fair use of freshwater resources. A certain water footprint in a water-scarce area or period is worse and thus requires a larger offset effort than the same size water footprint in a water-abundant region or period. Water depletion or pollution in one river basin cannot be neutralized by water saving or pollution control in another basin. Offsetting is to be done within the hydrological unit where the impacts take place.

For many companies, fresh water is a basic ingredient for their operations, while effluents may lead to pollution of the local water system. Initially, public pressure has been the most important reason for sustainability initiatives in businesses. Today, however, many companies recognize that failure to manage the issue of fresh water raises different sorts of business risk, including damage to the corporate image, threat of increased regulatory control, financial risks caused by pollution, and insufficient freshwater availability for operations. A number of multinationals recognize now that proactive management can avoid risks and contribute to their profitability and competitiveness. Business water footprint accounting is increasingly regarded as an essential part of sustainable corporate performance accounting. An increasing number of businesses recognize that not only their operations, but also their supplies depend and impact on natural water systems. The concept of water neutrality is a possible means for a business to reduce and offset the negative impacts of its water footprint. A business can take full responsibility for reducing its operational water; it can strive towards using the best available technology. Besides, a business has influencing power

over its suppliers, which it can use to get them to reduce their operational footprint. A business can also switch to another supplier that has a smaller water footprint. Additionally, a business can control or influence the process of designing products such that they inherently use or pollute less water over their complete life cycle. Businesses that aim to be water-neutral should take responsibility for improving the water-use characteristics of their products when technology allows. After maximum efforts have been made to reduce the two components of the business footprint, then offsets are needed to balance the residual water footprint. Because the water footprints of the businesses in one supply chain partially overlap, businesses in one production and supply chain can best cooperate in offsetting the impacts along the supply-chain. The biggest players in the chain, often large food industries or retailers can take the lead in this. The ability of businesses to reduce and offset their supply-chain water footprint is limited in the sense that they have to influence others, while they have full control over their operational water footprint.

Strategy Development for Water Neutrality:

Certain businesses develop landscaped gardens and lawns which are maintained to provide a pleasant aesthetic environment and which promote a good corporate image. These tend to be well watered, on top of which, many of the gardens contain exotic plants which are thought to have substantially higher water requirements than indigenous plants. One of the major uses of water in the sector is that related to the actual manufacturing processes and the end product. Water use may be consumptive and non-consumptive. Although water use for cleaning can be related to a process, it is also used for non-process related cleaning purposes. Again, cooling is often processes relate, however, there are a number of non-process related cooling requirements which utilize water. The levels of service for the others uses may therefore be excessive leading to excessive use. Certain business treats their own water to achieve the standards necessary for their process requirements. Furthermore, some businesses also have to treat their effluent to a standard to meet receiving water quality objectives or the requirements to discharge into local sewer systems. Often these treatment facilities are inefficient which may lead to significant quantities of water being wasted. It is envisaged that the process of developing the strategy will follow a conventional strategic planning approach, whereby policies are developed at the outset of the initiative; strategies are then developed to support these policies; and finally, action plans, programs and budgets are put together to support the strategies. This process seems to be one directional as it becomes more focused moving from the conceptual policy planning phases through to the more definitive action planning phases. However, there is an on-going need to refer back to either the strategies or the policies and to review whether these are still relevant. This review is required as action plans are implemented and the focus of the strategies may change from that of execution to that of monitoring. It is therefore envisaged that this document will have a limited shelf life and will have to be updated on a regular basis.

Proper planning of water management should be done to reduce the wastage of water and for sustainable use of water as a resource. Should the assumption of specific adaptive strategies be valid, then one will have to consider the classification of the businesses. This is supported by the fact that the implications of water conservation will vary tremendously according to the type of business, the applicable processes and their water requirements. Furthermore, the extent to which a business, or group of businesses, is regulated, and the extent to which it will be expected to become actively involved in water resources management, will depend on the scale of its water

utilization and wastewater discharge. A system will be developed to classify businesses in the industry, mining and power generation User sector based on individual water utilization and wastewater discharge requirements. The primary purpose of the classification will be to identify those businesses that have the greatest impacts on the water resources in terms of water utilized, wastewater discharged and the efficiency and effectiveness thereof. If one is serious about water conservation, as is the case here, then targets should be set and performance monitored. However, before targets can be set, the objective of a business should be to understand its use of water and waste water discharge requirements. Much in the same way that expenditure is analyzed and budgeted, so too should the water related elements. They are, after all, items of expenditure. Furthermore, another objective of understanding the water use and wastewater discharge requirements is to determine the impact on the overall water environment, and to ensure that this is mitigated.

Once a business understands its water utilization and wastewater discharge requirements, it will be in a position to monitor its performance in this regard. The setting of performance targets is always a sensitive issue since the implications of water conservation are not easily quantified. The first step is to determine what the performance indicators should be and then to determine the current levels of performance of these indicators. The focus here should be on the specific industry processes. Thereafter, achievable targets can be set and the performance monitored and reported. The objective of this exercise is to achieve the optimal balance between effective and efficient water utilization and wastewater discharge. Water utilization and wastewater discharge performance indices for all appropriate business processes will be determined and published. It should be noted that certain infrastructure might have to be installed by businesses to enable them to monitor these indices. The performance status of the businesses will then be entered into the database. Although self-regulation is being promoted, audits of those businesses listed on the databases will be undertaken on a regular basis. Businesses are often unaware that they are performing above or below the norm in areas relating to water conservation. It is essential that some sort of feedback on performance be established. Ideally this feedback should be confidential, but it is important for businesses to get an indication of their relative performance for specific industry processes against established norms. This creates a competitive environment and provides a positive result of all of their efforts in setting targets and monitoring performance.

Water Conservation Programmes:

When implementing water conservation measures, there are several important issues that must be taken into account. It is clear that reducing wastage in order to promote greater profit margins should be a fundamental issue that requires little additional motivation. The measures required to reduce waste are often of a capital nature, whilst the savings will be reflected on an operating budget. Although such actions generally pay for themselves over a relatively short period, it is often difficult for businesses to motivate for, and to secure the required capital budgets. Furthermore, the cost of water is often a rather small item on a business's operating budget. The costs of implementing water conservation interventions and the benefits of the reduced water utilization will be determined and assessed by means of a cost-benefit analysis. Furthermore, businesses that generate wastewater will benefit in that the reduction in use will have a corresponding reduction in wastewater and therefore reduction in the treatment and disposal thereof.

More often than not, businesses that discharge wastewater incur greater expenses in this regard than they do in the purchase and/or purification of water. As a result, there is always the danger that the wastewater is diluted so that it meets receiving water quality objectives. Although not necessarily a consumptive use, this practice can influence water resources allocations. Furthermore, wastewater discharges either to sewer systems, or into an open river system, are notorious in terms of their water quality problems and pollution. The objective is therefore to promote the practice of businesses containing all their wastewater on site and recycling it as much as possible. The principle of waste minimization and clean technology should be the principal objective here. An important aspect required for successful water conservation is the ability to network and share information, tactics and experience with colleagues. Workshops or forums will provide an opportunity for managers and planners to discuss any problems and/or successes they have had in their quest to reduce wastage and pollution. Although many of the strategies described above comprise tasks that include pilot projects and investigations, these are better stated in a separate strategy. The increase in water prices in future and the ongoing need to review water resources allocations to ensure the most beneficial use of the resource both necessitate a need for increased knowledge and technology regarding water conservation. Some of the larger businesses have established research and development sections that can also concentrate some of their efforts on water conservation.

The various water acts, regulations and other related documentation in circulation at present in India contain a plethora of terms and definitions related to water resources management, many of which differ and conflict each other. The success of implementing any water conservation strategy will depend to a large extent on communication, and the first step in this regard will be a common understanding of the relative terms and definitions. The objective therefore is to provide definitions of all terminology relating to water resources management used both in the industry and in the User Sector. Some companies acknowledge that reducing water wastage in order to reduce costs and therefore promote greater profit margins is common sense; however, certain businesses continue to overlook this aspect. Furthermore, many businesses lack the technical insight on how to undertake water conservation and need guidance in this regard. Focused education and training programme will go a long way to helping businesses in this regard. One of the biggest problems will be to provide the public with an easily accessible repository of information related to water conservation. On top of this, it is often difficult, if not impossible, for the public to report water conservation problems to the appropriate authorities.

Conclusion:

The aim of the study is to provide some helpful strategies which help the company achieving the water neutral status as well as monitor the current status of the organization. In this report methodologies are being provided, which through proper planning can be implemented. These strategies and methods are useful in conservation and proper management of source water as well as treated waste water. The main focus is being put on offsetting the water footprints and make proper use of water. Hence the findings of the report should be corrected and all the suggestion should be implemented properly with strategic planning and management. The study can be further extended to identification of the various sources of waste water and implementation of various water saving strategies and waste water management technologies. The economic perspectives of management of waste water are yet to be explored. The recycling and

recovery potential of waste water can be analyzed and incorporated in the management plan.

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