Business Process for Shared Watercourse Institutions in SADC

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Business Process for Shared Watercourse Institutions in SADC

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1. Introduction

Organisations have focussed on achieving their objectives through structured business processes for more than 200 years (Smith, 1776). Many of the principles and best practice approaches found in the business world are also applicable to other areas, such as government, NGOs, non-profit organisations, societies and sports teams. This paper introduces a generic business process with examples of particular tools, and discusses its application in Shared Watercourse Institutions (SWIs).

The generic business process (Figure 1) is an iterative cycle that starts with a vision, which is supported by a strategy. The strategy is pursued through an operational plan, which directs decisions and actions. The efficacy of these actions in relation to the vision and strategy is then assessed through a monitoring and review process. This is in line with the cycle of interpretive water management, which includes a science of understanding; a science of establishing goals; a science of developing a management response to those goals; and a science of generating activities that lead to and drive these three steps (Lankford and Cour, 2006).

Figure 1: Generic business process

A visioning is an expression of a desired future state. A vision is the cornerstone of the strategy since it provides the overarching strategic intent (Pollard and du Toit, 2008). The vision is based on an understanding of the current situation and potential future directions and must address the interrelated objectives of sustainability and equity. Scenarios are often used in this context. Scenarios typically address the question “what could happen to us?”, whereas visions typically address the question “what do we want to make happen?” (Pinkham, 1999).

The root of the problem for many businesses is the failure to distinguish between operational effectiveness and strategy (Porter, 1996). Operational tools such as total quality management, benchmarking, outsourcing, partnering, business process re-engineering, and change management can result in operational improvements. These benefits are however not always translated into sustainable benefits. Operational

effectiveness and strategy are both essential to superior performance, but that they work in very different ways (Porter, 1996). Strategy is about doing the right things, whereas the operational plan is about doing things right. The operational plan should be specific about who should do what, by when.

Impact is achieved through action, which is triggered by a decision to take action. Decisions are often very complex, due to the multiple factors that should be considered and incomplete information about these factors. An undue delay in a decision can often be more costly than a suboptimal decision. Many tools and approaches are available support decisions, such as multi-criteria decision analysis, decision trees, risk analysis, expert systems, models, cost-benefit analysis, etc. While these tools provide useful information on key drivers and/or consequences of decisions, insight and experience remains a key determinant of good decisions.

Many successful organisations attribute their success not just to the effective operations, but the ability to continuously assess the consequence of actions (in an ever-changing world) and to respond accordingly. Examples include: *"Business at the speed of thought"* (Gates, 1999); *Adaptive Enterprise* (Haekel, 1999); *"Adaptive Resource Management"* (Waters, 1986; McCarthy and Possingham, 2007). The monitoring and review process can lead to improvements in operations or in revisiting the vision and strategy if operational efficiencies still achieve the intended impacts.

Further reading

GWP and INBO (2009) published a handbook for basin managers, government officials and all their partners involved in water resources management. It provides practical guidance for improving the governance of freshwater resources, in particular through effective application of the integrated water resources management (IWRM) approach in lake and river basins, and aquifers. The handbook complements IWRM efforts already underway or planned at national and international levels.

This handbook respond to some of the questions most frequently asked about integrated water resources management at the basin level:

- What political and legal factors do basin managers need to understand and take into account?
- What are the functions and what are the different kinds of institutional and legal arrangements for basin organisations?
- What are the different ways in which basin organisations and basin management can be financed?
- What type, level, structure and frequency of stakeholder involvement should basin managers seek to establish?
- How should basin managers go about strategic planning?
- What do basin managers need to consider in developing and implementing basin action plans, and how can they get feedback on how plans are progressing?
- What data and information management systems do basin managers need for integrated water resources management?
- What are the key communication issues basin managers need to consider?

The handbook suggests that policy making, planning and management might be considered as a series of sequential steps in basin management. The 'learning-by-doing management cycle' allows for adaptive management of water to changing circumstances, for example political changes, natural catastrophes and changes in demography.

2. Visioning

A vision is a statement of a desired future state. The process of establishing a vision is as important as the product of the visioning process. It can allow for broad consultation to ensure that the aspirations of all people that have an interest in a common future are taken into account. Deliberative visioning is the processes of inclusive, multi-stakeholder deliberation over a desirable future (Kallis et al, 2009). The vision describes a future where these aspirations can be realised, but does not describe how the future is to be achieved. An idealist view of the future (utopian thinking) can however be disappointing if it is not met or unsatisfactory if it is met, particularly if new desires emerge along the way (Stevenson, 2009). The modalities of getting from the "here" to the "there" are contained in a strategy. The outcome of the strategic planning process should be a clear statement of the 'vision' of a basin organisation or basin initiative, but also set out unambiguous goals and explaining how, when and where the goals will be achieved (GWP & INBO, 2009) A vision can be self-fulfilling. When people agree on a common, desired future, they typically choose options that are biased towards that specific future.

A vision should also be reviewed from time to time, in particular because changes to the context (environmental, social, economic and political), technological innovations, aspirations, improved knowledge may open up new opportunities, or people's altered current reality may change their view of a desired future. A vision can therefore be particularly powerful in shaping and achieving a desired future, both through overt strategic planning and management decisions as well as through influencing seemingly small actions at the individual level. These "small" actions can however add up to significant impacts through the fractal effect. Leunig (2001) portrayed visioning as a self-fulfilling prophecy with the character walking on an imaginative path (Figure 2).

Examples

Historically, transboundary basins have encouraged regional cooperation but, as resources dwindle and demands grow, the potential for conflict over shared waters also grows. To offset this, some basins are using a shared vision approach.

The World Water Vision process was launched by the World Water Council in 1998 and lasted until March 2000. It has become one of the largest participatory visioning exercises in the water sector, with an estimated 15,000 people directly involved (van der Helm, 2003). The vision states that *"Our Vision is a world in which all people have access to safe and sufficient water resources to meet their needs, including food, in ways that maintain the integrity of freshwater ecosystems."*

Malaysia provides an example of a county-level water vision - "*In support of Vision 2020 (towards achieving developed nation status), Malaysia will conserve and manage its water resources to ensure adequate and safe water for all (including the environment)*" (Le Huu and Falcon, 2001).

The UK vision for the marine environment (*clean, healthy, safe, productive and biologically diverse oceans and seas*) is supported by a hierarchical framework that starts with this vision under the central principle of sustainable development, which is followed by supporting principles. High level delivery on the vision is ensured through objectives, goals, targets and indicators, while there are also objectives and indicators for operational delivery. (Rogers et al, 2007)

The Rhine Salt Treaty, the Rhine Chemicals Treaty, and the Rhine Action Program expressed strategic visions, goals and instruments, which offered a framework for change. The case of the river Rhine illuminates the importance of an appealing strategic vision to promote international river catchment management ("*sustainable development of the Rhine, its alluvial areas and the good state of all waters in the watershed*"). The visions stimulated the self-regulation of the private sector and contributed to the increase of the public involvement in the issue of the quality of the Rhine. This became especially obvious when a recognizable goal was selected in the form of the return of the salmon. (Dieperink, 2000)

In 2003, the nine member states of the Niger Basin Authority (NBA), Benin, Burkina Faso, Cameroon, Chad, Ivory Coast, Guinea, Mali, Niger and Nigeria, formulated a "clear and shared Vision" for the Niger Basin. The vision is to "create an enabling environment for co-operation based on a Sustainable Development Action Plan". (GWP and INBO, 2009)

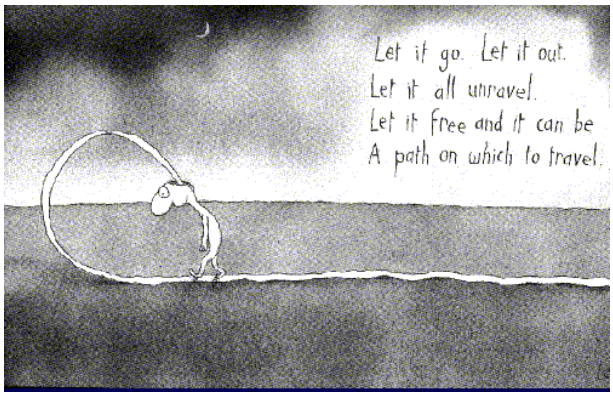


Figure 2: Visioning as a self-fulfilling prophesy.

In reflecting on individual and collective mediation of the past and the future, Edwards (2007) argues that vision of the future is not merely a product of personal imagination, but a multi-layered function of social meditation through shared revelation and co-creation (Figure 3). Visioning adds foresight to an active-learning process in which participants share critical reflection, decision and change (Stevenson, 2006). Hooper (2003) suggests that water visioning is not just ownership of the "commons" problem but also covenants of mutual responsibility and self responsibility. There are seven different contexts, or visions types. On the one hand we distinguish religious, political and humanistic visions and on the other hand we can distinguish business or organisational visions, community visions, policy visions and personal visions, all defined by their respective field of use (van der Helm, 2009).

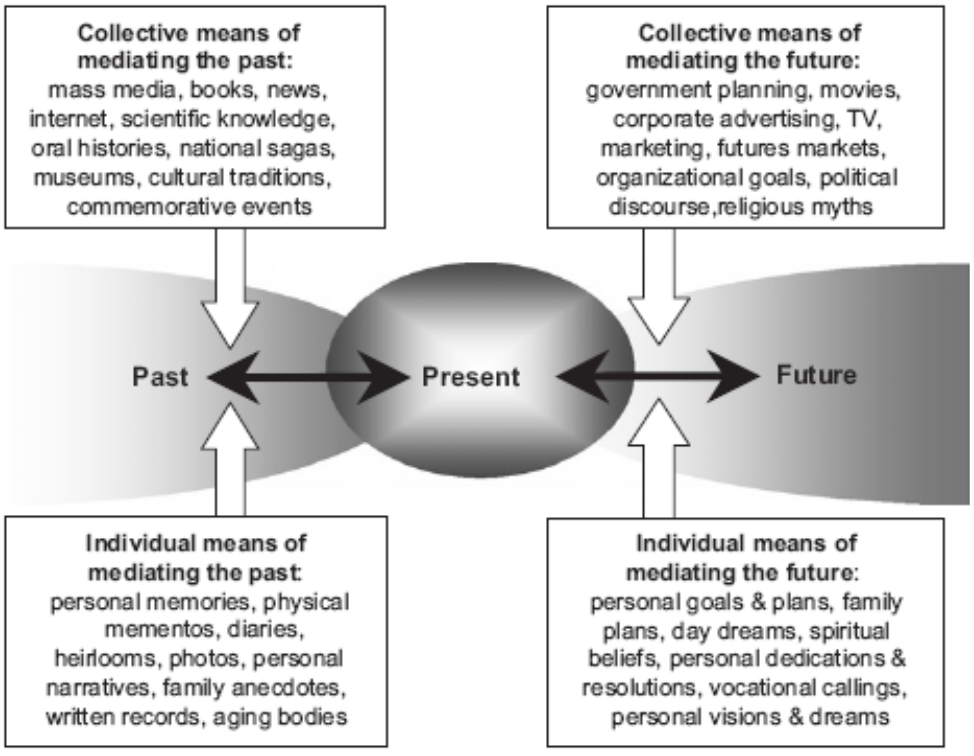


Figure 3: The mediation of pasts and futures (Edwards, 2007).

Any vision theory should go beyond the creation of a preferred future, beyond the (rational) construction of a future that we would like to obtain. We should gain an understanding what turns an expression or a claim about 'a future that could be' into the idealised future of a vision, how those claims are created, how they obtain their authority, and how they move from an ideational to an action-based level (van der Helm, 2009). The vision resulting from a participatory scenario-building process helps to connect to participants' imagination stimulate systematic thought about complex issues with respect to the impact of globalization and regional transformation. The richness and originality of the visions produced in Rabat/Casablanca suggests that the scenario-building approach can be useful for mapping cognitive as well as behavioural attitudes of participating agents of change. (Barbanente et al, 2007)

Examples

The Nile Basin Initiative shared vision ("to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources") seeks to share the benefits derived from good water resources development and management between the riparian countries rather than focus specifically on sharing the water itself. The Shared Vision Program supports this vision through building stakeholder capacity to participate in managing natural resources across boundaries, share benefits and improve water efficiency in agriculture for example. (NBI, 200)

In the development of the Andhra Pradesh Water Vision in India, stakeholder 'water messages' were collected from over 600 people in village meetings. A local non-government organisation that specialises in collecting 'local voices' gathered the opinions of people who normally have very little, if any, access to government decision makers. This made sure that the voices of groups in remote locations were heard. The material gathered in this way was a key input to the Andhra Pradesh Water Vision. (GWP & INBO, 2009)

In 2003, the nine member states of the Niger Basin Authority (NBA), Benin, Burkina Faso, Cameroon, Chad, Ivory Coast, Guinea, Mali, Niger and Nigeria, formulated a "clear and shared Vision" for the Niger Basin. The vision is to create an enabling environment for co-operation based on a Sustainable Development Action Plan (GWP & INBO, 2009)

The Mekong River Commission published the Vision for the Mekong River as *"An economically properous, socially just and environmentally sound Mekong River Basin"*, whereas the Vision for the Commission is *"A world class, financially secure, International River Basin Organisation serving the Mekong countries to achieve the basin Vision"* (MRC, 2009)

GWP & INBO (2009) referred to various applications of scenarios, including:

- Scenarios to be discussed with stakeholders towards building a successful basin management strategy
- Decision support systems to look at different scenarios and show what happens when parameters are changed
- Develop water footprints under different climate change scenarios.
- Use risk assessment to evaluate water resources management options under different climate change scenarios.
- Water-related development scenarios, assessments of future water demand, risk assessments.

Developing a vision requires understanding what is important to the people involved from a values perspective - e.g. asking the questions: What do we need? What do we want? What do we care about? (Hooper, 2003).

DWAF (2006) suggested a process for developing a catchment-level vision. The visioning process (Figure 4) includes a process to disaggregate the vision to objectives to promote accountability in both management and the public who participate in the process. The approach accommodates public participation processes that range from non-existent to robust and vibrant across the basin and therefore allows the drafting of a catchment vision and management objectives regardless of the state of maturity of public engagement processes. The focus is on the social process of sourcing shared

values towards the development of a shared vision for the future. This dynamic social process can generate voluntary co-operation and support for the vision as well as the management objectives that flow from it. The visioning process begins with the generation of a vision statement and ends with the identification of focus areas that allow for the setting of management objectives. A vision statement must be converted into, and explicitly linked with, objectives that are useful at the operational level. Promoting these objectives will move society towards the attainment of the vision.

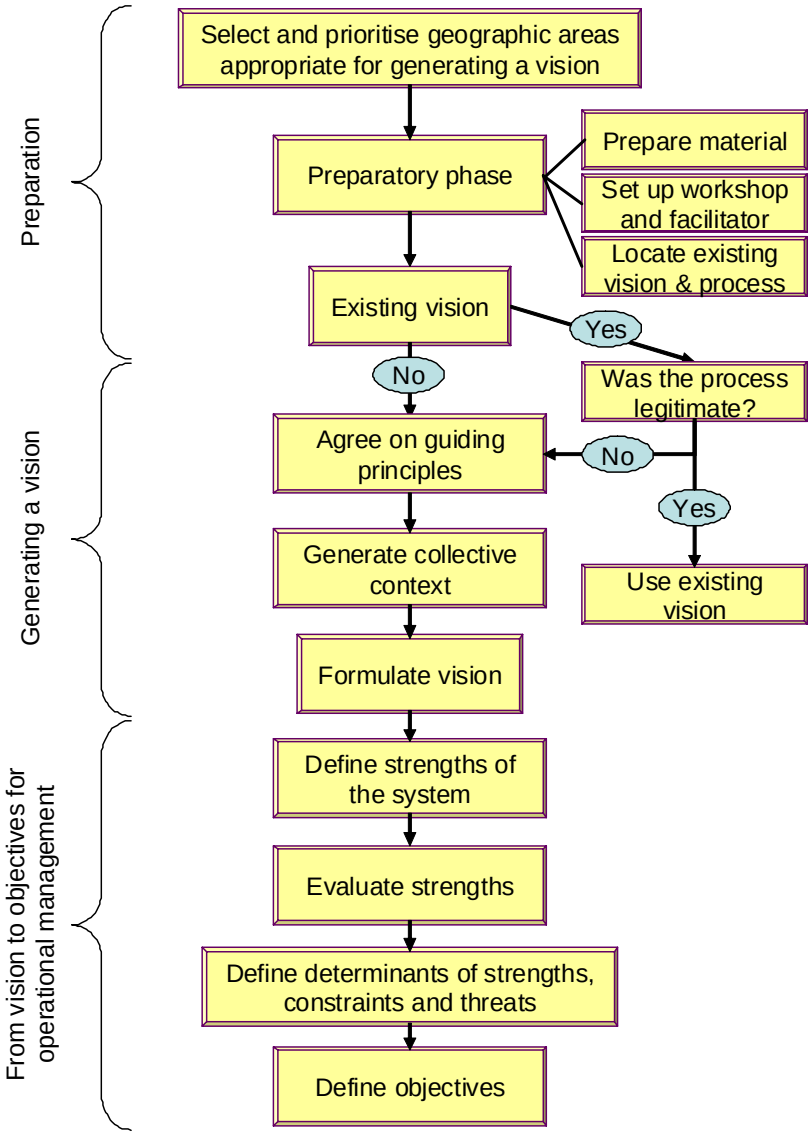


Figure 4: Steps in generating a vision and breaking it down into component objectives (redrawn from DWAF, 2004).

Use of Scenarios

Scenarios can be a particularly useful approach to inform the development of a vision. Scenarios represent different future possibilities, which are constructed through prioritising key drivers in terms of their uncertainty and impact. Knowledge about these drivers and uncertainties provides information to discriminate alternative futures and select desirable outcomes towards a vision. It is important to note that these drivers (or our understanding thereof) may change over time. Scenarios should thus be revisited from time to time to ensure that it still represents the landscape of plausible outcomes. Scenarios can thus provide managers and policy makers with different pathways that the future may bring. In a review of evidence, politics and power in public policy, Juntti et al (2009) reinforced the need to bridge the gap between lay and expert understandings of environmental issues, and to respond to the challenge that this poses for the validity and legitimacy of evidence generated specifically for policy decision-making. Visions and goals are necessary in order to make sense of these many forces that will drive or enable changes in the water sector (Pinkham, 1999).

Example: Learning from Mont Fleur scenarios

The "Mont Fleur" scenario exercise, undertaken in South Africa during 1991–92, was innovative and important because, in the midst of a deep conflict, it brought people together from across organizations to think creatively about the future of their country (GBN, 2009, originally The Weekly Mail & The Guardian Weekly, July 1992.).

The scenario team met three times in a series of three-day workshops at the Mont Fleur conference center outside Cape Town. After considering many possible stories, the participants agreed on four scenarios that they believed to be plausible and relevant:

- ***Ostrich***, in which a negotiated settlement to the crisis in South Africa is not achieved, and the country's government continues to be non-representative
- ***Lame Duck***, in which a settlement is achieved but the transition to a new dispensation is slow and indecisive
- ***Icarus***, in which transition is rapid but the new government unwisely pursues unsustainable, populist economic policies
- ***Flight of the Flamingos***, in which the government's policies are sustainable and the country takes a path of inclusive growth and democracy

The Mont Fleur project produced several different types of results: substantive messages, informal networks and understandings, and changed ways of thinking.

The Mont Fleur exercise demonstrated the informal, indirect scenario approach to be an innovative and productive method for a society in conflict to approach the future. This approach is different from and complementary to negotiation. As this project demonstrates, it is a promising tool for future attempts to reach public consensus.

Scenario builders can use narrative descriptions of these alternative futures to capture the complexity of many factors and drivers and provide contextual richness and meaning to potential developments (Pinkham, 1999). Strategies and decisions can be played out in different futures to secure the most beneficial outcome through the most robust approaches with the least risk. A better understanding of key drivers and potential trajectories of changes will not only clarify the impact of decisions, but will allow active countering of undesirable trajectories of change. Envisioning and creating a future world may demand more logical, empirical rigor, scepticism and critical capacity through critical realism (serious efforts to falsify) so as to minimize the chances of accepting and spreading false beliefs (Bell, 2005). This does not discourage creativity, innovation, or the construction of positive visions. The identification, description and ranking of key drivers and uncertainties can be translated to potential implications, both for social and economic development. The consequent selection and development of indicators can serve as navigation instruments to assess trajectories of change and support adaptive management towards desirable outcomes.

The importance of visioning and the development of options through scenarios offer important management tools that are well-recognised in complexity theory for accommodating change, as well as establishing a hierarchy of actions that can address the overarching principles and that can accommodate change. Motivating effective adaptation to socio-institutional and environmental change requires participation across a broad spectrum of stakeholders and citizens. Self-organisation, identity and embeddedness are all essential characteristics of building social resilience in a catchment system (Pollard & du Toit, 2008). Scenarios that are developed in a context relevant to stakeholders are not assertions of desired states by technical or political elites, but represent the context and perspectives of stakeholders, in particular their culture, values and priorities (Mahmoud et al, 2009). Although scenario exercises are often initiated by a small group of experts and stakeholders and developed further with larger groups, a more participatory interaction is beneficial (Warwick et al, 2003). In complex systems, the users must be part of deriving management solutions since this is where and how they learn. In recent years, the use of scenarios for creative visioning of potential futures for planning and strategy testing has become increasingly popular. A variety of scenario approaches have been undertaken for diverse purposes, particularly in the water resources management field (Warwick et al, 2003).

Scenario types can be distinguished on the basis of the process followed (Mahmoud et al, 2009). Exploratory scenarios describe the future according to known processes of change and extrapolations from the past. These future trend-based scenarios, which are exploratory in nature and are based on extrapolation of trends, projections, and patterns, include projective and prospective scenarios. Projective scenarios project forward in time using trends experienced over some past period, whereas prospective scenarios anticipate upcoming change that significantly varies from the past. Anticipatory scenarios are based on different desired or feared visions of the future that may be achievable or avoidable if certain events or actions take place. These policy-responsive scenarios are based on expert judgement or stakeholder inputs. Expert judgment-driven scenarios model future conditions by means of scientific knowledge derived from decisions, rules, objectives and criteria established by science investigators and field experts. Stakeholder-defined scenarios involve stakeholders in defining the assumptions about the future that are to be incorporated into scenarios. Such scenarios can be used as a tool for delineating possible futures, which differ in crucial ways from the present. Rather than taking a predictive approach, scenarios are used to picture the future in an exploratory way, with the aim of identifying factors that will need to be taken into account in planning (Warwick et al, 2003). Plural futures allow a choice of future destinations in order to come back from that chosen vision (backcasting) and to develop an action plan and pathway for realising it (Stevenson, 2006).

Scenarios can be classified into three categories based on their purpose: Scenarios for learning by those involved in the scenario building process; Scenarios for building of a common vision to influence public attitudes outside of the business environment; and Scenarios for strategy evaluation or development. (Ringland, 1998, quoted in Warwick et al, 2003).

An iterative scenario development framework can be used in environmental studies, consisting of scenario definition, scenario construction, scenario analysis, scenario

assessment, and risk management (Mahmoud et al, 2009). Scenario definition and assessment generally require extensive interactions and cooperation between scientists and stakeholders; scenario construction and analysis are primarily scientific efforts of researchers; and risk management is mainly the responsibility of stakeholders. The iterative design provides for feedback among all phases of scenario development.

From the above, it is clear that there is a range of dimensions, approaches and outcomes of scenarios. Some of the variables that characterise scenarios are temporal scale, spatial scale, level of multi-disciplinarity, level of engagement and level of quantification. Furthermore, a Delphi approach iterates towards consensus of key issues and scenarios, whereas scenarios in the public interest deploys a diversity of inputs to characterise divergent (though plausible) futures. In this case, it is more about exposing different possibilities than to agree on specific future realities. The suggested approach for the development of scenarios in a river basin is based on the framework suggested by Shell (2003) and draws on international best practice and experience of the project team. The five broad phases and particular questions and actions are:

1. Preparation
   - What impending decision keeps you awake at night?
   - What key factors will determine the success or failure of the critical issue?
   - What are some of the driving forces creating change in the wider world?
   - The driving forces are ranked by importance and uncertainty.

2. Pioneering
   - The scenario logics are selected and the scenario matrix is created.
   - Suggest plausible events that might create that state (referring to the key factors).

3. Map-making
   - How does the decision look in each scenario?

4. Navigation
   - Find indicators or signposts that are heading toward one or another of these scenarios.

5. Reconnaissance
   - Interpret signals, share perspectives and recognize differences.

3. Strategy

The root of the problem for many businesses is the failure to distinguish between operational effectiveness and strategy (Porter, 1996). Management (operational) tools such as total quality management, benchmarking, time-based competition, outsourcing, partnering, business process re-engineering, and change management often result in operational improvements, but are not always translated into sustainable profitability. Operational effectiveness and strategy are both essential to superior performance but they work in very different ways (Porter, 1996). Strategy is about doing the right things, whereas the subsequent steps in the business process (contained in the operational plan) is about doing things right.

The strategy development process starts with the vision, which broadly defines a destination. The destination may be characterised by environmental conditions (through scenario development) and a future desired state. An organisation has to assess its current position in relation to the desired state to plot a path "from here to there". The strategy would therefore have a long term strategic perspective. A strategic analysis typically includes a "SWOT" analysis, which defines the strengths, weaknesses, opportunities and threats of the institution. The Theory of Constraints (ToC) approach can also be used to support the development of the strategy. ToC identifies obstacles to achieving the goal and then identifies intermediate objectives to overcome the obstacles (Goldratt and Cox, 1984).

Examples

The ***EU Sustainable Development Strategy*** (EU, 2006) defines key objectives under the headings of Environmental Protection, Social Equity and Cohesion, Economic Prosperity, and Meeting our International Responsibilities. It expands on the guiding principles of Promotion and Protection of Fundamental Rights, Solidarity within and between Generations, Open and Democratic Society, Involvement of Citizens, Involvement of Businesses and Social Partners, Policy Coherence and Governance, Policy Integration, Use Best Available Knowledge, Precautionary Principle, and Make Polluters Pay.

The strategy highlights the alignment with the Lisbon Strategy for Growth and Jobs and sets out objectives for better policy-making. It identifies seven key challenges with an overall objective for each. It then defines operational objectives, targets and actions under each of these headings. This is done at a high level, since the details would be contained in operational plans. The seven areas are Climate change and clean energy, Sustainable transport, Sustainable consumption and production, Conservation and management of natural resources, Public health, Social inclusion, demography and migration, and Global poverty and sustainable development challenges

Financing and economic instruments are identified through which the strategy will be resourced. Key enabling mechanisms of the strategy include communication, mobilising actors, multiplying success, implementation, monitoring and follow-up.

The ***Oxfam International Strategic Plan*** sets out their overarching objective (*"Demanding justice"*), confirms their central commitment (*"We will …"*), describes the business environment (*"The world around us"*) and sets goals (*"Our change goals"*). The strategy also acknowledges the role of other actors (*"Part of a global movement for change"*) and defines particular enabling measures (*"Making it work"*). (Oxfam International, 2007)

Understanding the external environment, define the core business, set out values and principles, prioritise issues, set direction, identify partnerships, supply chains and clients.

4. Operational plans

Operations plans describe how an institution would go about to achieve its strategy. In particular, the operational plan defines who does what by when. The plan would generally define objectives in the areas of human resources (recruit, retain and develop staff), core business functions (decisions and actions), resourcing the plan (financial plan) and measures to ensure impact in line with the vision.

The Logical Framework is used by many institutions to develop an understanding of the connections between the Activities, Outputs, Purpose and Goals (NORAD, 1999). Each of these elements is described through a Narrative, Objectively verifiable indicators, Means of verification, and Assumptions.

Operational plans identify actions that should be taken to achieve the intermediate objectives, specify who is responsible for the actions and set target dates. The plans also specify monitoring and evaluation measures, typically linked to a quality management system. The plans should then define staffing and resource requirements to ensure effective implementation.

The implementation of a plan depends first and foremost on sufficient, able, motivated and empowered people. The plan should cover the pipeline of staff from entry-level through to tertiary education and include a strategy to compete for skills in the international arena. Furthermore, the development of current staff should be directed towards the organisational objectives.

Having appropriate and sufficient capacity to implement the plan is necessary, but not sufficient to achieve the desired impact. Adequate attention should be given to technology transfer, adoption capacity, a culture that embraces new approaches, and an effective communication strategy. It is also important to measure success through the development of monitoring and evaluation system. It is important to know who can contribute to the objectives of the institution. The role of potential contributors must be understood and interactions between them facilitated.

Examples

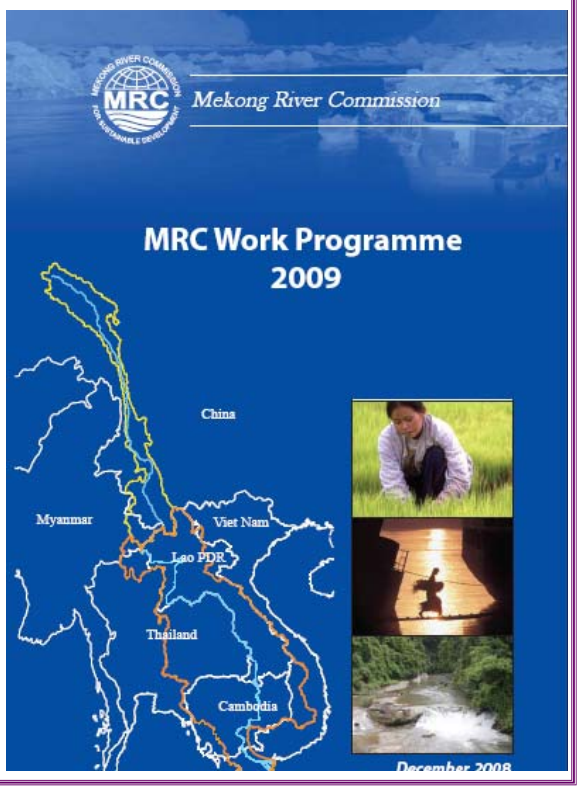
The Mekong River Commission (2009) establishes annual work programmes in support of the Vision. The work programme for 2009 provides an overview of the Commission, with a description of the overall goal (""*More Effective Use of the Mekong's Water and Related Resources to Alleviate Poverty While Protecting the Environment*"). This is supported by the following four specific goals, with five to seven objectives under each goal.

- Goal 1: To promote and support coordinated, sustainable, and pro-poor development
- Goal 2: To enhance effective regional cooperation
- Goal 3: To strengthen basin-wide environmental monitoring and impact assessment
- Goal 4: To strengthen the Integrated Water Resources Management capacity and knowledge base of the MRC bodies, NMCs, Line Agencies, and other stakeholders

The Plan sets out *"Criteria for Prioritising MRC Activities"* and measures for *"Implementation of the Strategic Plan"* and *"Integration and Coordination of Programmes"* and provides details of *"Programme Costs and Funding"*.

The plan for each of the 14 focussed programmes is discussed under the following headings:

- Programme overview (purpose, approach, strategy, structure, implementation, and outputs)
- Progress in 2008
- Workplan for 2009 (including detailed budget and GANTT chart)



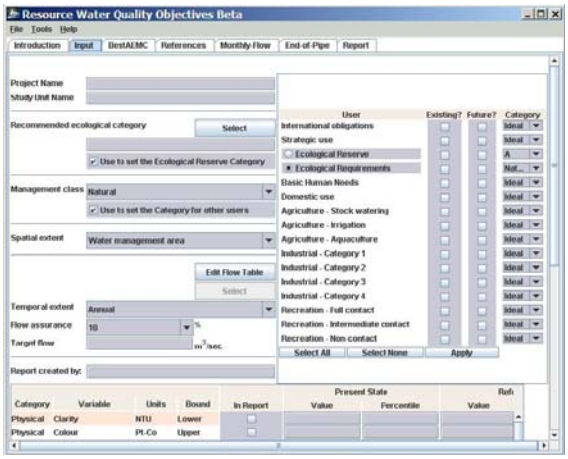
5. Decisions

A decision is required where more than one option for a particular action is available. These options include a 'no action" option. Decisions are typically made in a changing and uncertain environment with incomplete knowledge of all the drivers and potential consequence. The challenge is to make timely decisions that would most likely lead to the desired outcome, given the best available information. This desired outcome should a step in the direction of the vision.

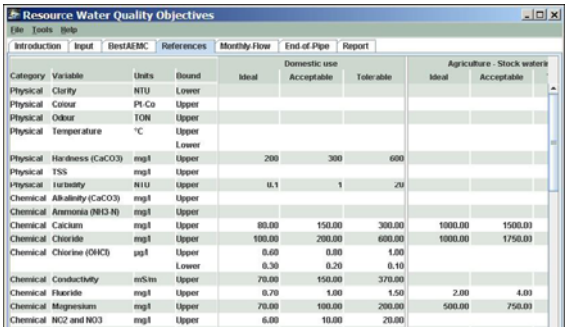
The criteria for a particular decision should be derived from the strategy. In particular, a decision should be guided by values and principles and represent the best option in the context of the stated priorities and objectives. Decisions can be based on the experience and knowledge of a decision-maker, while considering available information and opinions. Some argue that such decisions can often be very good, since it can implicitly process very complex sets of criteria (Gladwell, 2005). A critique of such decisions is that it is not transparent, difficult to audit and/or justify. More explicit decision analysis may be necessary where the cause-effect relationship between drivers and consequences should be determined. Such decisions are often based on cost-benefit analyses. Multi-criteria decision analysis can be deployed where the costs and benefits of multiple issues should be considered. When there is uncertainty around inputs to decisions and when such uncertainty can have an impact on the outcome, such uncertainty should be dealt with explicitly. A common solution to this to express uncertain inputs as ranges (the input is probably *x*, but can range from *y* to *z*), or to base the decision on particular assumptions (e.g. "This would be the best course of action if the agreement is ratified"). Scenarios can also be used to develop, discuss and communicate alternative futures.

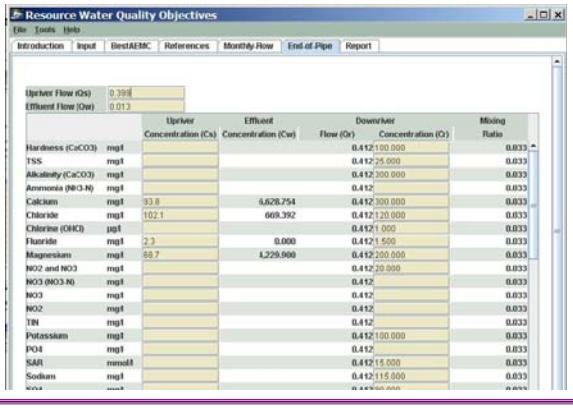
Examples

The CSIR develop decision support systems for the Department of Water Affairs and Forestry (DWAF) in 2006. One of these is the RWQOs Model (vs 4.0), which provides users with a standard approach to consistently setting Resource Water Quality Objectives (RWQOs) for surface water resources in South Africa. By selecting the water resource and user requirements, the Model generates RWQOs that are based on a database of provided and entered water quality parameters.



The Model provides a quick approach to setting RWQOs based on the guidelines for determining Resource Water Quality Objectives (RWQOs), Allocatable Water Quality and the Stress of the Water Resource (DWAF, 2006). The system considers water quality needs of different users (screen shot hereunder). One of the outputs is the calculation of discharge quantities and qualities, depicted in the next image.





6. Actions

Effective action depends on timing, an enabling environment, the availability of appropriate resources, human capacity and skills, and partnerships.

Timing

There should be a clear understanding of which other actions should be undertaken before a particular action can be successful as well as other downstream actions that depend on the completion of the particular action. A process plan should be developed to make such dependencies explicit. The expectations about when a particular action will be completed and when the impacts of such actions are expected should be tempered with realistic plans.

Enabling environment

The degree to which laws, policies and regulation support a particular action is a key determinant of the implementation success. This alignment should be assessed before an action is undertaken. Where this could present a barrier, the action should either be changed to be aligned, or, where necessary, actions should be instituted to revise policies, strategies and regulations.

Resources

Effective action may depend on the availability of appropriate infrastructure, information, raw materials, finance, methods and approaches, and support from stakeholders. The availability of such resources should be secured in preparation for a particular action.

Human capacity

While the appropriate skills are needed for effective action, the availability and/or quantity of such capacity may also constrain effective action. Plans should therefore be put in place to secure and develop capacity which is aligned with the required actions.

Partnerships

The effective completion of a particular action often depends on partnership, particularly when some of the required resources are held or controlled by other parties. Political support for a particular action is often required to ensure effective action.

7. Monitoring

The balanced scorecard approach has been used by many organisations to give top managers a fast but comprehensive view of the business (García-Valderrama et al, 2009; Vila et al, 2009; Thompson and Mathys, 2008; Jazayeri and Scapens, 2008). The approach uses financial measures to reflect the results of past actions and three sets of operational measures that focus on customer satisfaction, internal processes, and the organization's ability to learn and improve. The balanced scorecard can be created by translating their company's strategy and mission statements into specific goals and measures (Kaplan and Norton, 1992). In particular, the organization establishes objectives, measures, and targets for each of the four areas focusing on the following four questions (Thompson and Mathys, 2008):

- To succeed financially, how should we appear to our shareholders?
- To achieve our vision, how should we appear to our customers?
- To satisfy our shareholders and customers, at what processes must we excel?
- To achieve our vision, how will we sustain our ability to change and improve?

A stronger focus on sustainable development in the 1990's, led to the development of the Triple Bottom Line approach. This approach focuses on how business can proper financially, while protecting and renewing the social, environmental and economic resources they need (Ravitz and Webber, 2006).

Examples: World Bank (2004)

Monitoring and evaluation (M&E) of development activities provides government officials, development managers, and civil society with better means for learning from past experience, improving service delivery, planning and allocating resources, and demonstrating results as part of accountability to key stakeholders. The Bank includes several data collection methods, analytical frameworks, and types of evaluation and review, with the following being relevant to the Transboundary context:

◗ Performance indicators
Performance indicators in particular are measures of inputs, processes, outputs, outcomes, and impacts for development projects, programs, or strategies. When supported with sound data collection analysis and reporting, indicators enable managers to track progress, demonstrate results, and take corrective action to improve service delivery.

◗ The logical framework approach (LogFrame)
The LogFrame helps to clarify objectives of any project, program, or policy by following results chain: inputs, processes, outputs, outcomes, and impact. Theory-based evaluation is similar to the LogFrame approach but allows a much more in-depth understanding of the workings of a program or activity.

◗ Formal surveys
Formal surveys can be used to collect standardized information from a carefully selected sample of people or households.

◗ Rapid appraisal methods
Rapid appraisal methods are quick, low-cost ways to gather the views and feedback of beneficiaries and other stakeholders, in order to respond to decision-makers' needs for information.

◗ Participatory methods
Participatory methods provide active involvement in decision-making for those with a stake in a project, program, or strategy and generate a sense of ownership in the M&E results and recommendations.

◗ Cost-benefit and cost-effectiveness analysis
Cost-benefit and cost-effectiveness analysis are tools for assessing whether or not the costs of an activity can be justified by the outcomes and impacts.

◗ Impact evaluation
Impact evaluation is the systematic identification of the effects on individual households, institutions, and the environment caused by a given development activity such as a program or project, which helps us better understand the extent to which activities reach the poor and the magnitude of their effects on people's welfare.

8. Review

The review phase is the last component in the iterative cycle, where the results from monitoring are used to asses whether expectations are met. Firstly, the vision should be assessed as to whether it is realistic and achievable or if it needs to be revised based on new knowledge. The strategy and operational plan is then assessed to ensure that the best options has been selected and executed to achieve the vision. The monitoring programme should also be reviewed to ensure that it provides sufficient information for the review.

9. References

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