

ICID STRATEGY THEME SYSTEMS
IEC Sacramento, 05 October 2007
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TRIPLE¹

TRIPLE refers to three areas ICID should focus on when considering the improvement of water management systems. TRIPLE refers to three key aspects in each of the three areas of focus of ICID. The theme TRIPLE will recur throughout the presentation. The objective of the presentation is to:

1. Lead
2. Inspire, and
3. Stimulate the various Work Bodies of the ICID and in particular those under the Theme Systems.

To achieve sustainable water management systems there are three concepts in our work that we need to be very clear about. They are:

1. Integrated Water Resources Management (**IWRM**) what does it mean?
2. Triple Bottom Line (**TBL**), what does it mean?
3. **Modernisation**, what does it mean?

ICID's mission is Managing Water for Sustainable Agriculture – Water for Food and Rural Development.

What do IWRM, TBL and Modernisation mean to us and why do you need to know this? You are movers and shakers, the change agents of your respective countries. You are leaders and representatives who can make a difference. You are the networkers and you care about our future. The meaning of each of these three concepts will be described, and for each, three key indicators that can be used to measure our endeavours with respect to achieving sustainability of our water management systems are presented. Work Bodies (Working Groups, Task Forces and Permanent Committees) are requested to take-on these concepts in their mandates and work towards applying them in their work using SMART² indicators.

IWRM

Integrated Water Resources Management (IWRM) is represented in Figure 1 and shows the various components of the hydrologic water cycle. When considering water management systems it is important to place the system in the context of the water cycle; quantitatively and qualitatively. To test whether you are actually applying IWRM three indicators are suggested. These are:

1. whole of catchment assessment
2. actual measurements year round
3. appropriate use of average values.

Whole of catchment approach

Traditionally the organisation of irrigation systems is according command areas. Such an organisational set-up ignores drainage and groundwater or treats them separately. This is not an integrated approach. True IWRM should consider all irrigation, drainage, river and groundwater systems as one interacting system at catchment scale (Figure 1) and report as one unit. Where groundwater systems underlie more than one catchment appropriate proportional surface water – groundwater interaction should be considered. Where more than one water

¹ Presentation at the 58th IEC, Sacramento, USA. October 5, 2007

² Specific, Measurable, Achievable, Repeatable, Timeable

management organisation exists in the catchment, they should only act as executing agencies, with catchment scale IWRM decision making by a coordinating body.

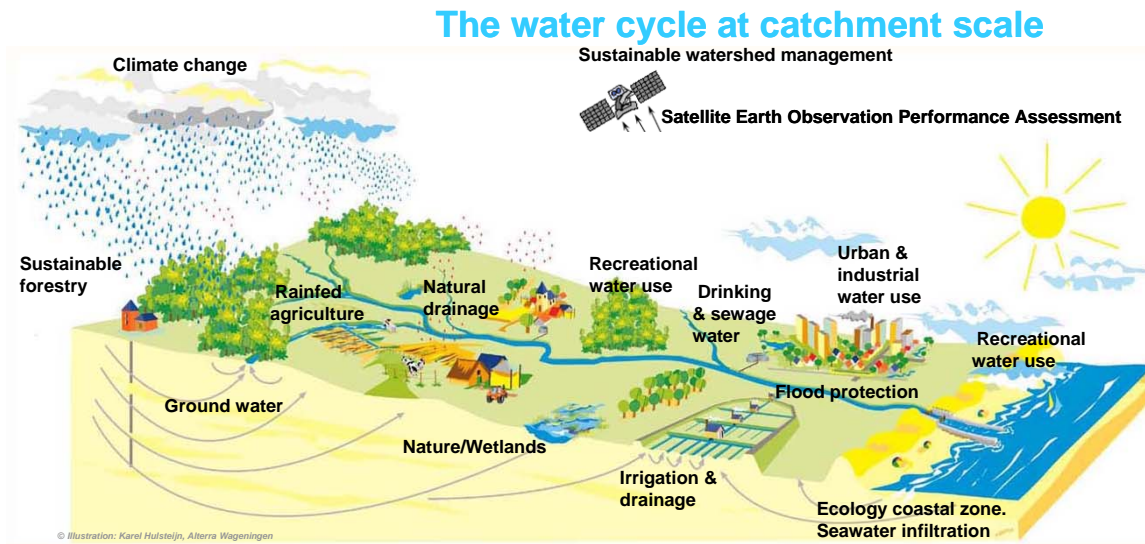


Figure 1. Integrated water resources management (IWRM) at river basin scale; the water cycle (after Vlotman et al., 2002)

Measure year round

In this day and age with automatic datalogging and remote sensing observations being readily available there is neither justification nor excuse for not measuring year round. Many irrigation authorities limit measurements only to the time period of irrigation, usually not year round. Many public funds are wasted on paying consultants to generate complete year-round data sets of stream flows, irrigation flows (e.g. if part of the conveyance is through natural carriers) such that long-term simulations can be performed. These “infilled” data are generally of marginal quality. Yet in order to get a complete whole of catchment water quantity and quality balance it is paramount that the key parameters are observed year-round. We should draw conclusions that are based on actual year-round data.

Do not use long-term average values

Average values are often used for public relations purpose to get the message across. They can be very misleading if the actual value deviates considerably from this average. For instance, take a data series comprising of 1, 1, and 10. The average is 4, but how representative is that when it can be 1 or 10? The Standard Deviation is: 5.2 and the Coefficient of Variation is $CV = SD / AVG = 130\%$. It is recommended that the CV of a data series always be checked and that the guideline for use of an average value be applied as shown in Table 1.

Table 1 Guidelines for use of average values as representative of a data series.

CV < 30%	The average is representative
CV < 50%	Average can still be used but start getting worried
CV is between 50% – 100%	CAUTION the actual value may deviate 100% from the average: how good is that?
CV > 100%	You can not use the average as a representative or meaningful value!

Triple Bottom Line

IWRM needs to be sustainable. World-wide emphasis on sustainable development is defined as development that needs to meet the needs of current generations without compromising the ability of future generations to meet their needs and aspirations. This can be conceptualised by three overlapping dimensions (Figure 2):

1. environment
2. economics
3. social/cultural.

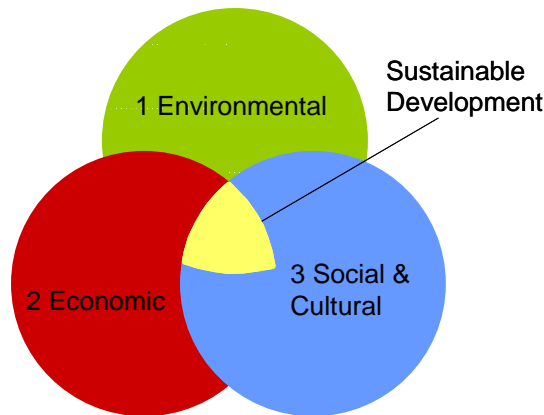


Figure 2. Overlapping dimension of Triple Bottom Line (Vlotman et al. 2007)

These are referred to as the Triple Bottom Line (TBL). Only when a negotiated balance of the three dimensions is achieved can we talk about sustainable development. It is important to report on key indicators each of these three dimensions.

Environment

When TBL is used as a guiding principle for water management systems then the environmental dimension should include the following three main aspects in its considerations:

1. Water quantity (includes all our traditional engineering aspects with respect to efficiencies, etc and includes environmental-flows, referred to as e-flows)
2. Water quality (salinity, pesticides, herbicides, insecticides and other chemicals, temperature, COD, etc.)
3. Ecology, comprising river health (e-flows, flora and fauna) and biodiversity.

Economics

The environmental aspects of the project, organisation, or business need to be supported by sound economical and financial aspects. Three aspects need specifically attention:

1. Economically viable, incl. environmental costs and benefit, the value of ecology needs to be considered appropriately,
2. Financially sound which includes true cost recovery, value engineering and asset management, and
3. Profits shared equitably in the food business chain.

The first two points may be rather obvious and are to a large extent self-explanatory but the third needs some further examination. To get food on the table an elaborate business chain is in place starting from the farmer to the shelf in the supermarket. The business chain comprises the farmer, transport companies, manufactures, distribution centres and supermarkets. Each of these is considered a cost-centre in the business chain. Analysis of business chains showed great disparity of the relative share in the profit made on the final product at each of these cost

centres. For instance, the share of profit by the farmer may be 1% while the supermarket in the chain achieved 30%. Therefore better management of the chain can lead to a more equal share in profit for all cost centres, while cutting out some of the middlemen may achieve substantial savings. Rather than reducing the price of the final product the savings and more balanced profit sharing can be used for investments in improved water distribution. Hence, rather than only the government investing in improved water management, private industry could make significant contributions too.

Social and Cultural

There are three aspects that should be considered as a matter of priority to achieve long-term sustainability. They are:

1. *Stakeholder involvement.* One should consider what is important for each stakeholder; food and clean water access; shelter, adequate living conditions; living comfortably and healthy; good sanitation (refer to Maslow's hierarchy of needs). Not being poor: poverty alleviation through **multiple use of the water system** is one of the options that should be considered; the water provided can serve other purposes than just providing agricultural or drinking water, i.e. it can be used for small scale pottery and other small home based industries. The canal banks can serve as roads, etc. These multiple uses may be equally important to the community involved and can be a deciding factor in making the system sustainable.
2. *Safety.* Safety is an important issue ranging from safe drinking water to prevention of drowning. This is often referred to as EHS: Environment, Health and Safety.
3. *Culturally acceptable.* Customs, religion, heritage, and family values are to be considered and accommodated where possible to sustain the technical solutions of water management.

Triple Bottom Line Reporting

TBL is not a new term and has been around since the Johannesburg World Summit on Sustainable Development. To assess whether a development meets TBL aspects sustainability reporting guidelines have been developed and have been well received by both business and government. They have recently been updated (GRI 2006) by the Global Reporting Initiative (GRI). GRI's vision is that reporting on economic, environmental, and social performance becomes as routine and comparable as financial reporting. An international network of thousands from business, civil society, labour, and professional institutions create the content of the reporting framework in a consensus-seeking process. They are being developed and refined continuously and you can still have your say in developing the key indicators; so ICID get involved!

TBL and ICID

Figure 3 is my personal interpretation of how well the four ICID Themes are doing when considering the three TBL dimensions. This figure is meant as a preliminary benchmark for the ICID Themes and if the concept is accepted in ICID, it may be given more flesh and bone.

The Work Bodies in the Theme Systems are biased towards environmental dimension aspects such as water quantity and quality primarily, with some aspects of the social dimensions covered. Little work is done on the economics but this may be partially covered by Work Bodies in the other themes. However, very few activities of the various mandates cover all three TBL dimensions in a balanced way. It is recommended to set goals to achieve a greater degree of balance by 2010. The recommendation can be made for the all themes except the Theme Knowledge, which due to its coverage of all activities of ICID has, by default, relatively equal coverage of all three dimensions of TBL and therefore one can say that ICIDs work leads to sustainable solutions.

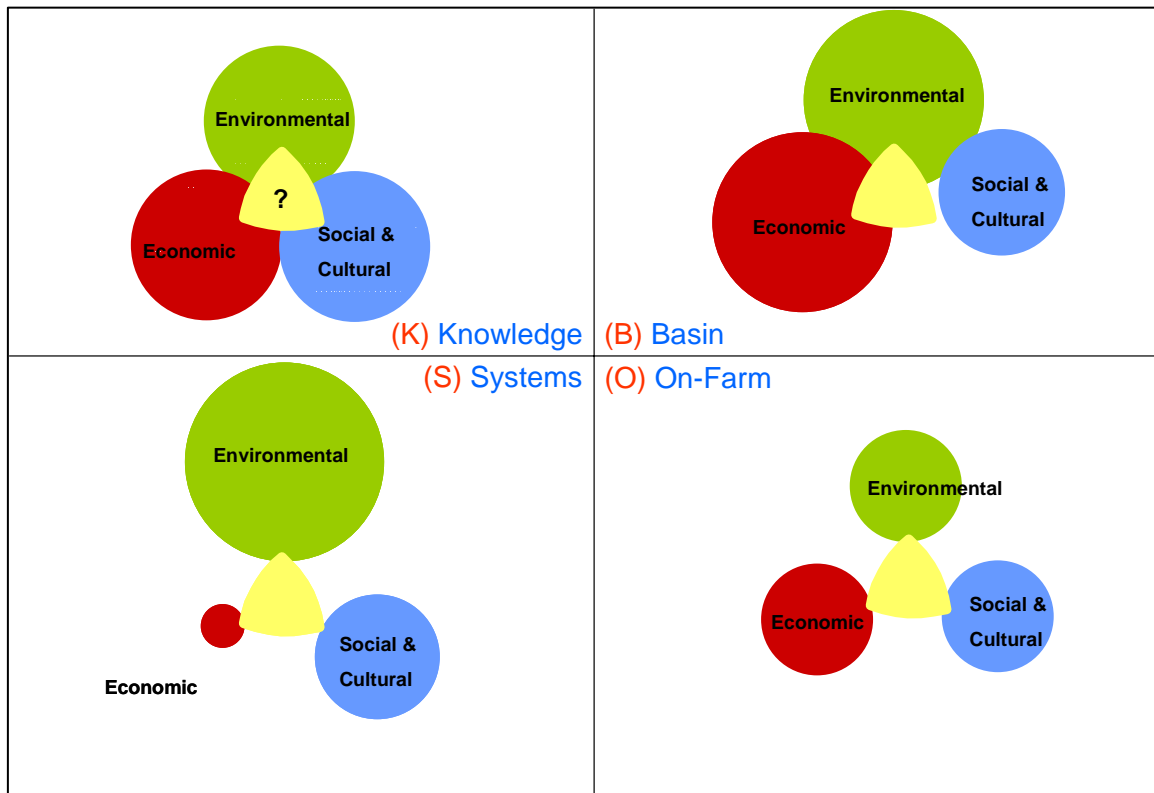


Figure 3. ICID Work Bodies in the TBL frame for each of the four Themes

Modernisation

The final area of focus for ICID Work Bodies concerns Modernisation. Apart from describing what modernisation of water management systems should include, there are three guiding principles we should adhere to:

1. Modernise within budget,
2. Do it on time, but most of all,
3. Take your time to do it right!

Modernisation involves rehabilitation of the physical infrastructure, improvements in management, and incorporation of the TBL dimensions to achieve sustainable development. Recently, two procedures to assist us with doing it right were published. They are DRAINFRAME (Slootweg et al. 2007) and MASSCOTE (FAO 2007).

The approach called DRAINFRAME is a framework for analysis, communication, discussion, and decision-making by all stakeholders. It looks at the overall social, economic, and environmental productivity of the entire water management system, of which drainage is an integral part. It allows comprehensive analysis and assessment of catchment-wide social and economic impacts of drainage following a participatory planning approach. The DRAINFRAME approach has been applied in planning of some new World Bank-supported projects in Egypt and Pakistan (Abdel-Dayem 2006; Slootweg et al., 2007).

MASSCOTE is a process for analysis of irrigation systems which aims to convert complexity into simple and straight forward elements. These can then be explored, mapped and assessed in a process that will lead progressively towards new management, improvements of canal operation and improved service delivery (FAO I&D Paper no 63, 2007). Because MASSCOTE concentrates on irrigation canal operation and service delivery IWRM and TBL aspects as described before need more emphasis. MASSCOTE stands for Mapping System and Services for Canal Operation Techniques.

Application of MASSCOTE and the various TRIPLE elements in conjunction with DRAINFRAME will go a long way in achieving sustainable water management of large modernised irrigation canal systems.

Modernise within budget

One of the main items of concern in modernisation projects is to execute the improvements within the budget allocated. This can be done by making sure that the project is also executed on time.

Do it on time

Executing the project in accordance within the original time frame is very important to keep interest in the development going. Delays will cause unnecessary frustrations and should be avoided. Delays tend to translate into abandoning critical elements in the planning, training and stakeholder involvement aspects of sustainable modernisation. Moreover political and physical conditions may change, which make it difficult to maintain the same level of support as was once received. Physical changes may be caused by climate change, amongst other things, and hence modernisation should really be achieved within a planning and execution period of 10 - 30 years. Unfortunately modernisation projects are now planned for periods of 5 years and when delays occur the project objectives are still to be achieved in the last 2 – 3 years of the original project life. Such projects will never be sustainable and are merely a waste of tax payers' money! Hence the final and third guiding principle of modernisation: TAKE YOUR TIME TO DO IT RIGHT!

Take your time to do it right

Modernise rapidly if need be, but do not compromise on the level of inputs of components critical to achieve a sustainable development. Sustainability requires multi-disciplinary inputs, all of which are important. When delays occur:

1. do not squeeze project execution into unrealistic time frames,
2. do not delete critical sustainability components, and
3. keep the TBL balance.

Typically modernisation of systems in developed countries takes 20 -30 years to complete. In developing countries the same is attempted in 5 – 6 years, sponsored by various donor agencies. When these modernisation projects become delayed, critical stakeholder involvement activities are shortened or left out all together. Emphasis is on spending the project budget. This practice should be stopped immediately. It goes against everything we have been advocating and ignores lessons learned from similar approaches in the early 60's and 70's. We should not repeat the mistakes of the past. Unfortunately there is a large new class of policy makers, planners and, yes also, scientists who do not seem to be aware of past experiences. ICID can play a major role through its network of country representatives and Work Bodies to make sure these new arrivals in the field of IWRM are made aware of our experiences and lessons learned of the past. As mentioned at the beginning of this presentation you are the leaders, movers and shakers in your country and you should not sit by passively!

Conclusions and Recommendations

- You apply IWRM correctly when you can confirm positively on the following three indicators:
 - That all indicators are considered at catchment scale even if the catchment is beyond your boundaries of responsibility,
 - That you measure year round; i.e. collect complete data series because proper scenario planning and risk assessment require complete data series, and
 - That you do not use averages in decision making unless the Coefficient of Variation (CV) is less than 30%.
 - Sustainable development is achieved only through application of Triple Bottom Line (TBL) dimensions in a negotiated balanced way. That is a balance of:
 - Environmental aspects
 - Economic aspects, and
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- Social and Cultural aspects.
- Modernisation according IWRM principles and TBL dimensions should also be guided by:
 - Execution of projects within the budget, and
 - On-time, but most of all
 - Take your time to do it right!

NOW YOU KNOW WHAT **TRIPLE** IS MEANT TO CONVEY.

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