HOW TO...

use Strategic Adaptive Management (SAM) and the Adaptive Planning Process (APP) to build a shared catchment future

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Unilever

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WHO ARE THESE HANDBOOKS FOR?

The user-friendly series of “How to….” handbooks are aimed at staff and stakeholders in catchment management forums (CMFs), catchment management agencies (CMAs) and municipalities. The handbooks are not all written at exactly the same level of “user-friendliness”, it depends on the topic, and target users.

The list below shows which groups are likely to find the handbooks most useful:

TITLE	#	CMF	CMA	MUNICIPALITIES
How to think and act in ways that make Adaptive IWRM practically possible	**1**		√	√
How to think about water for people and people for water: Some, for all, forever	**2**	√	√	√
How to establish and run a Catchment Management Forum	**3**	√	√	
How to manage Water Quality and Water Quantity together	**4**		√	√
How to engage with the challenges facing Water and Sanitation Services (WSS) in small municipalities	**5**			√
How to run a Green Drop campaign in a Catchment Management Forum	**6**	√	√	√
How to engage with coal mines through a Catchment Management Forum	**7**	√	√	√
How to use Strategic Adaptive Management (SAM) and the Adaptive Planning Process (APP) to build a shared catchment future	**8**	√	√	√
How to understand Environmental Water Quality in Water Resources Management	**9**	√	√	√

NOTE: Words marked with an * in these handbooks appear in the glossary at the end of each handbook.

Definition: **Adaptive IWRM**:

Using adaptive, systemic, processes and an understanding of complex social-ecological systems **to coordinate conservation, manage and develop water, land and related resources across sectors within a given river basin, in order to maximise the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems.**

A definition based on the Global Water Partnership 2000 definition of IWRM (Agarwal et al., 2000), with specific Adaptive IWRM additions (italics).

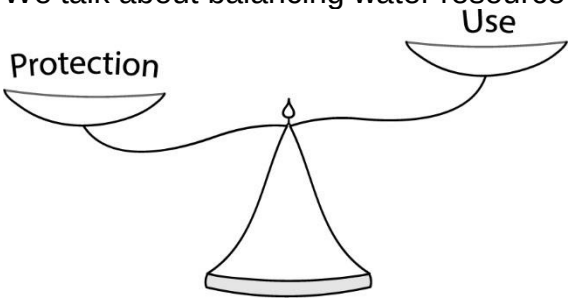
Integrated Water Resources Management (IWRM) is a way of managing water resources in ways that can make sure that there are social and economic benefits for people and sustainability for the environment. The 1998 government slogan supporting IWRM is:

Some, for all, for ever

and supports fair water sharing among all people, now, and into the future.

Water resources include all the water on a landscape – water from rain that flows in rivers and streams, feeds wetlands, seeps into groundwater, is caught in dams and finally reaches the sea through an estuary. Rivers, streams wetlands, lakes and aquifers (groundwater) are aquatic* ecosystems. The area of land that 'catches' the water is called the catchment.

We talk about balancing water resource **protection** with water resource **use**.



The South African National Water Act (NWA) states that IWRM must

- aim at protecting aquatic ecosystems so that water can be used sustainably for the benefit of all people, and that
- the management of water must be **decentralised and participatory**, that is, all stakeholders must be involved in decisions about managing their water resources in a bottom-up (as well as a top-down) approach.

Water resource use and protection must be:

- **Sustainable** – healthy water means healthy people. Ecological and socio-economic sustainability depend on each other. Unhealthy rivers and wetlands lead to unhealthy people and an unhealthy economy.
- **Equitable** – the costs and benefits of using water resources must take account of water resource protection, and be distributed fairly across South African society.
- **Efficient** – South Africa is a dry country, prone to both floods and droughts, and the water we have needs to be allocated and used efficiently to ensure a diverse, healthy environment; a robust, sustainable economy, and people who have fair access to water.

For these reasons, the National Water Act specifies that Catchment Management Forums (CMFs) must be established to communicate the knowledge and needs of local users to Catchment Management Agencies (CMAs) and to collaborate in developing and implementing* strategic plans for the catchment. (See: *How to establish and run a Catchment Management Forum*)

CONTEXT is a word we will be using often in this handbook, with a very specific meaning.

Context refers to your own place, with all its history, and the differences that make is the special, unique place it is now. It includes all living creatures and every factor that affects them, like rainfall, pollution, water use, etc.

It is helpful to think about the social, technical, environmental, economic and political characteristics of our context, and to consider what are the values that we share. We use this acronym* to help us remember these aspects: V-STEEP.

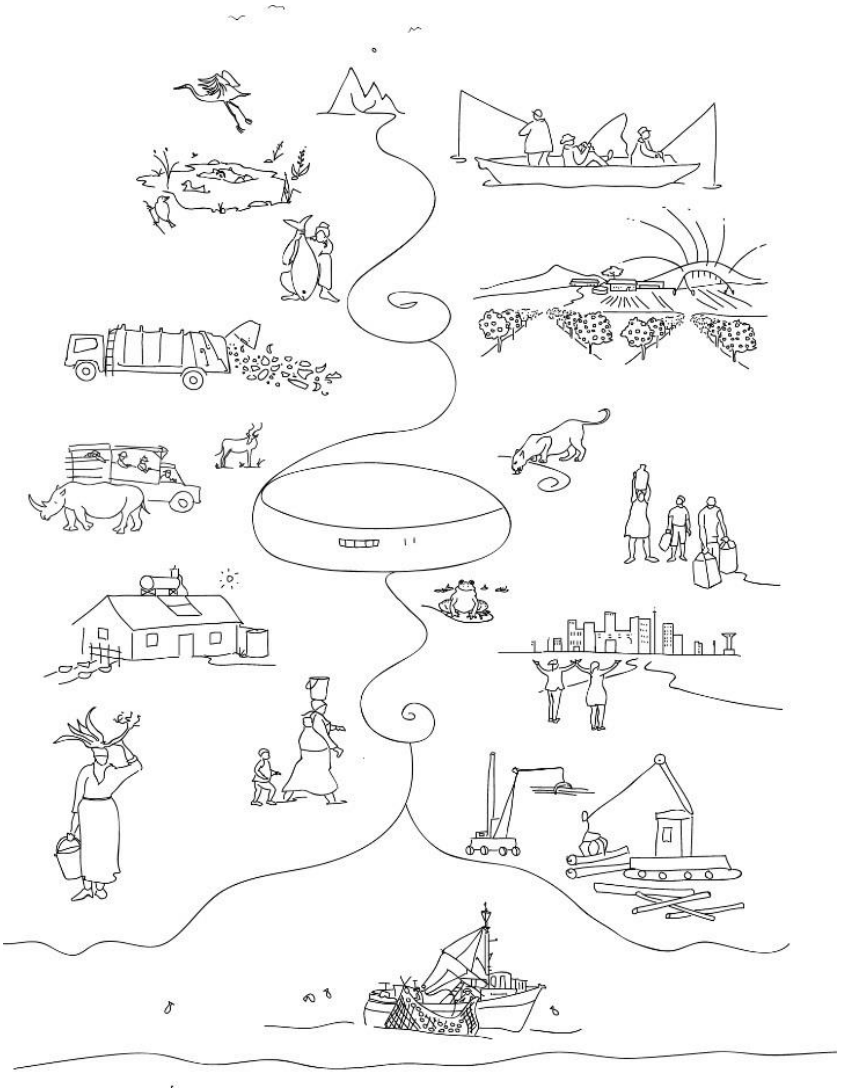
WHO IS THIS HANDBOOK FOR?

For members of Catchment Management Forums (CMFs) and Catchment Management Agencies (CMAs).

CMFs are made up of people who represent all the stakeholders in a catchment. They are the people who know the catchment best, and therefore are in the best position to alert CMAs to local issues and to help develop the strategic plans for their local catchment.

However, catchments are dynamic*, complex* systems that need a special planning approach – and that is what this handbook is about. If one part of a catchment is neglected and damaged, it affects the whole system and everyone living in it.

We use and recommend a flexible, adaptive approach in which everyone involved in the planning is both a teacher and a learner, and where everyone contributes their special wisdom to developing a sustainable plan for the catchment.



There are nine Water Management Areas (WMAs) in South Africa, and each will have a Catchment Management Agency (CMA). Local representation to CMAs is through Catchment Management Forums (CMFs).

Each CMA must develop a Catchment Management Strategy* (CMS). Forums (CMFs) can contribute local Catchment Management Strategy (CMS) recommendations to a CMA, to form part of the WMA CMS.

A CMS should help a group of responsible people to act collaboratively and move from a real, muddled present state towards an agreed and shared future.

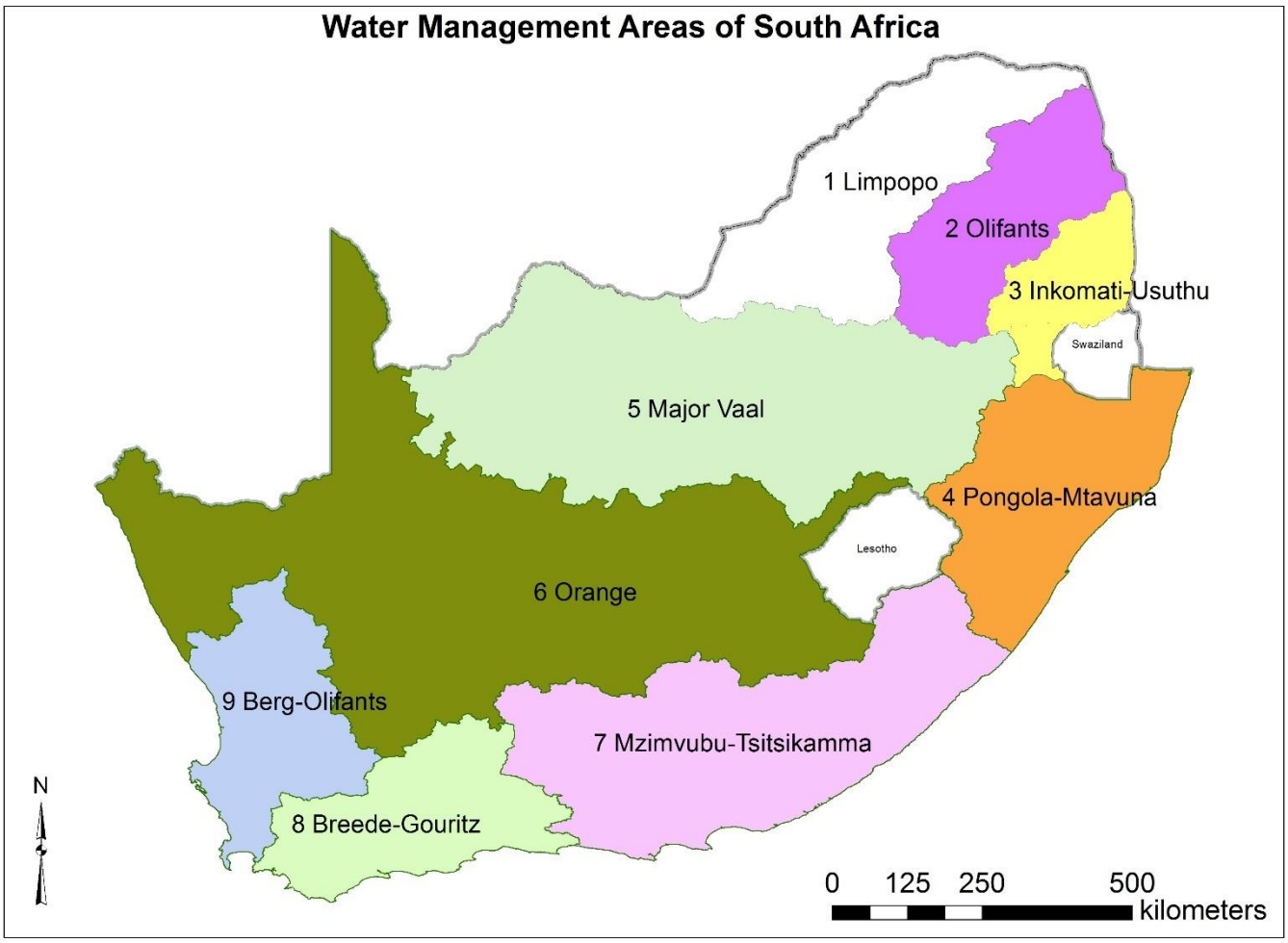


Figure 1: Nine water management areas of South Africa (modified from Bailey and Pitman, 2016)

If we want to protect **ONE PART** of a catchment, we need to protect it **ALL**

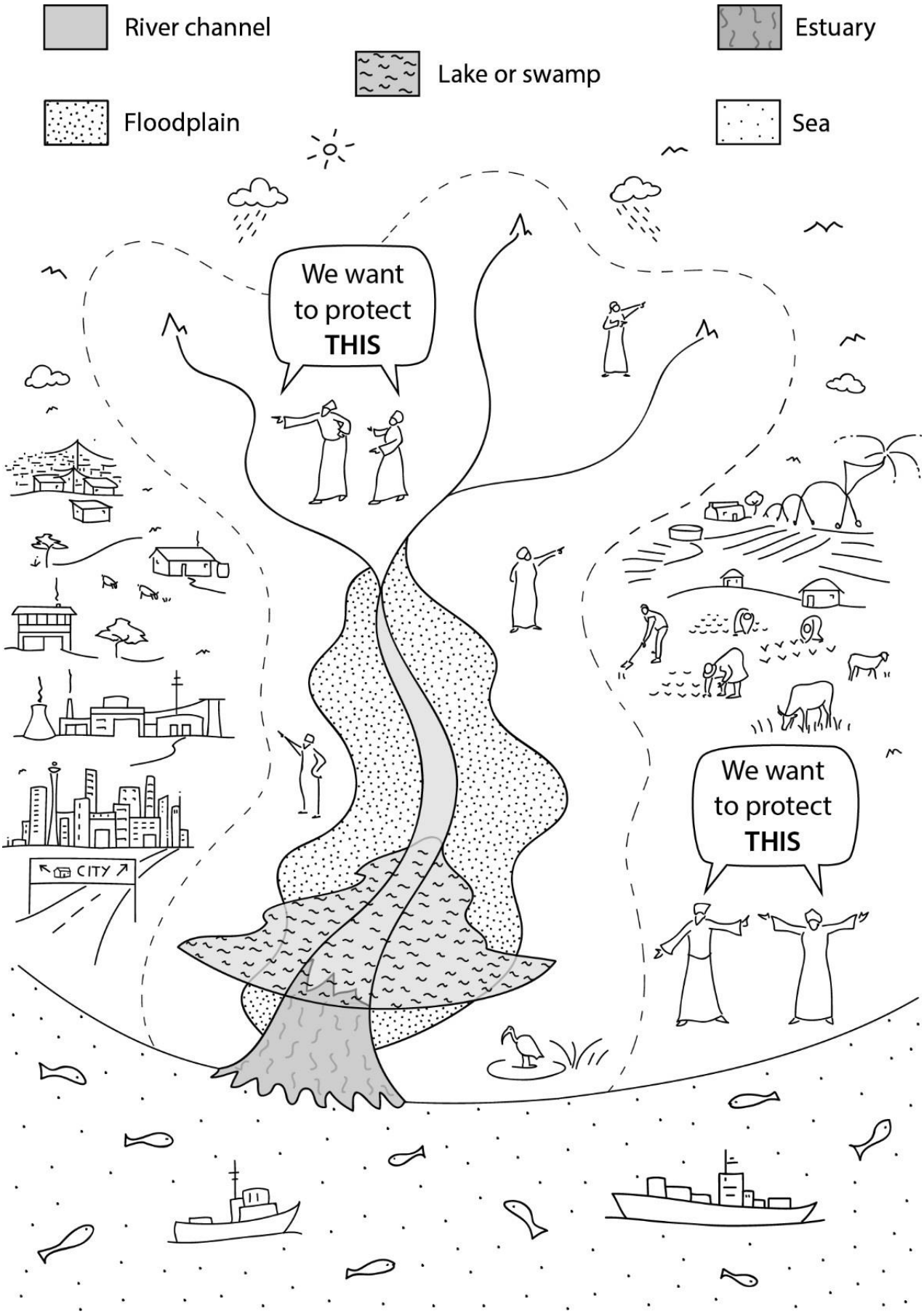


Figure 2: A catchment (Adapted from: Kingsford and Biggs, 2011)

WHAT IS STRATEGIC ADAPTIVE MANGEMENT (SAM)?

SAM starts with a shared understanding of how things work (see *How to think and act in ways that make Adaptive IWRM practically possible*). It is based on stakeholder views, participation and understanding. It focuses on 'building the future together', and has been used successfully to get consensus* and cooperation between very different stakeholder groups in a variety of different situations.

SAM is an approach that involves stakeholders in the management of complex issues such as catchments, water distribution, and wastewater treatment.

Like most planning approaches, SAM consists of four stages:

1. Planning
2. Implementing
3. Monitoring
4. Reviewing and learning.

Three things are essential to understanding how SAM works:

1. We are all moving towards a future that is changing.
2. We need to take careful account and notice of context – that is, the specific situation we are in and for which we are making plans. Every context is different and unique.
3. Pathways to our goal are never direct, as the diagram below shows.

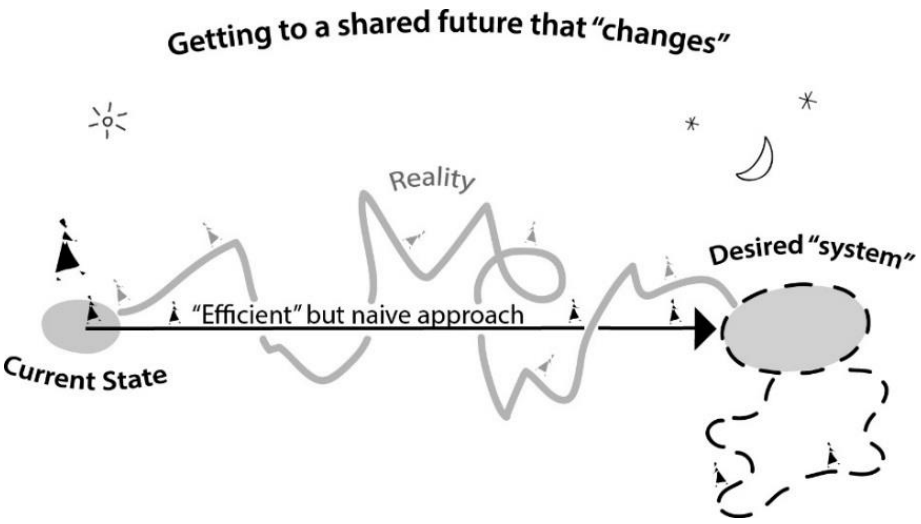


Figure 3: Getting to a desired future

The old pattern of 'do as you are told' doesn't work very well, and we have to find new ways of dealing with problems. SAM is a guide to find a pathway into a shared future.

What makes SAM different is the WAY it is carried out using the Adaptive Planning Process (APP)

ANSWERING QUESTIONS ABOUT SAM

The rather complex diagram below answers the following questions about Strategic Adaptive Management:

- Why use SAM?
- What is SAM?
- How do we use the APP to achieve SAM?
- When should we start?

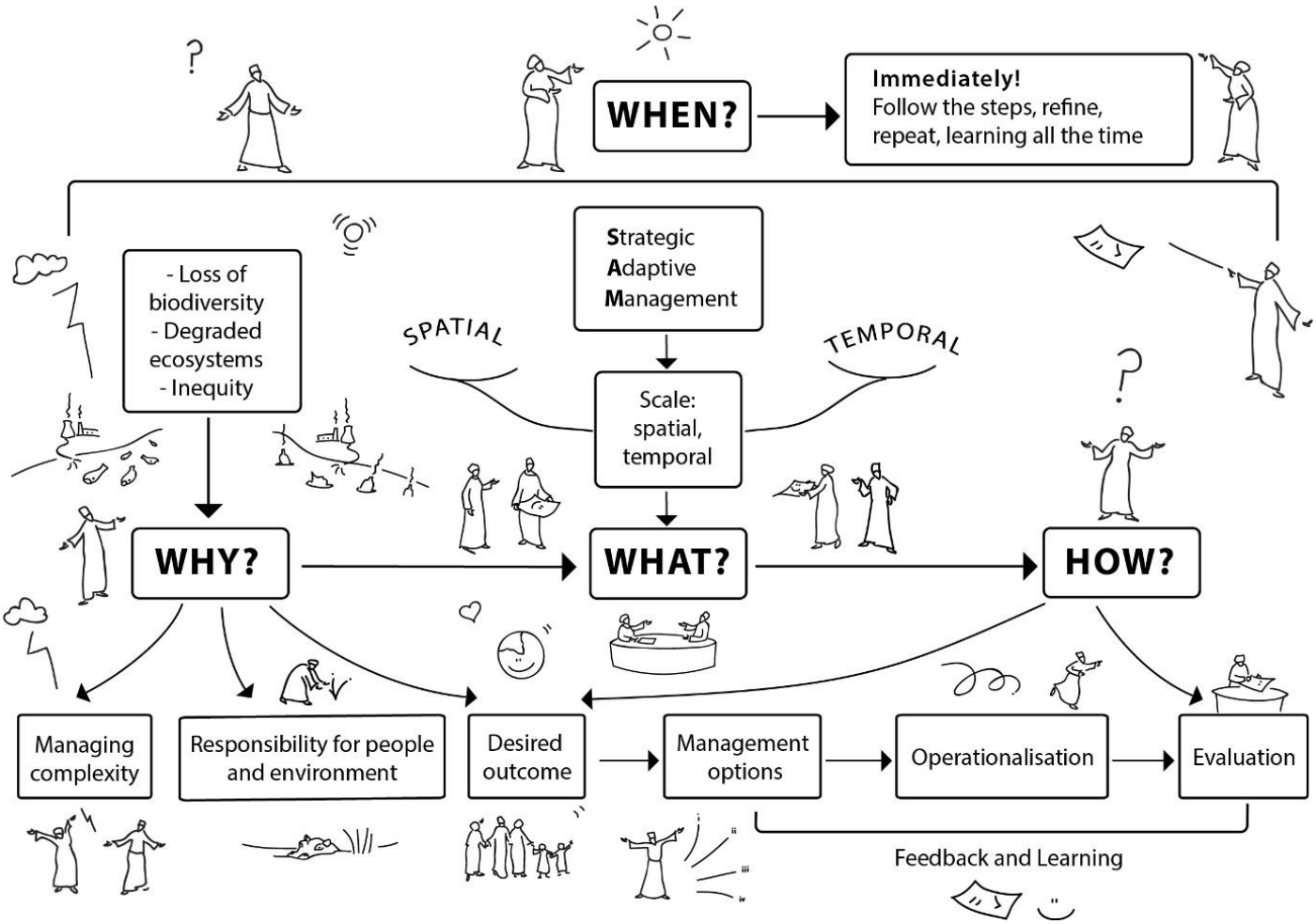


Figure 4: Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

Let us take one part of the diagram at a time, and explain each section:

WHY use SAM?

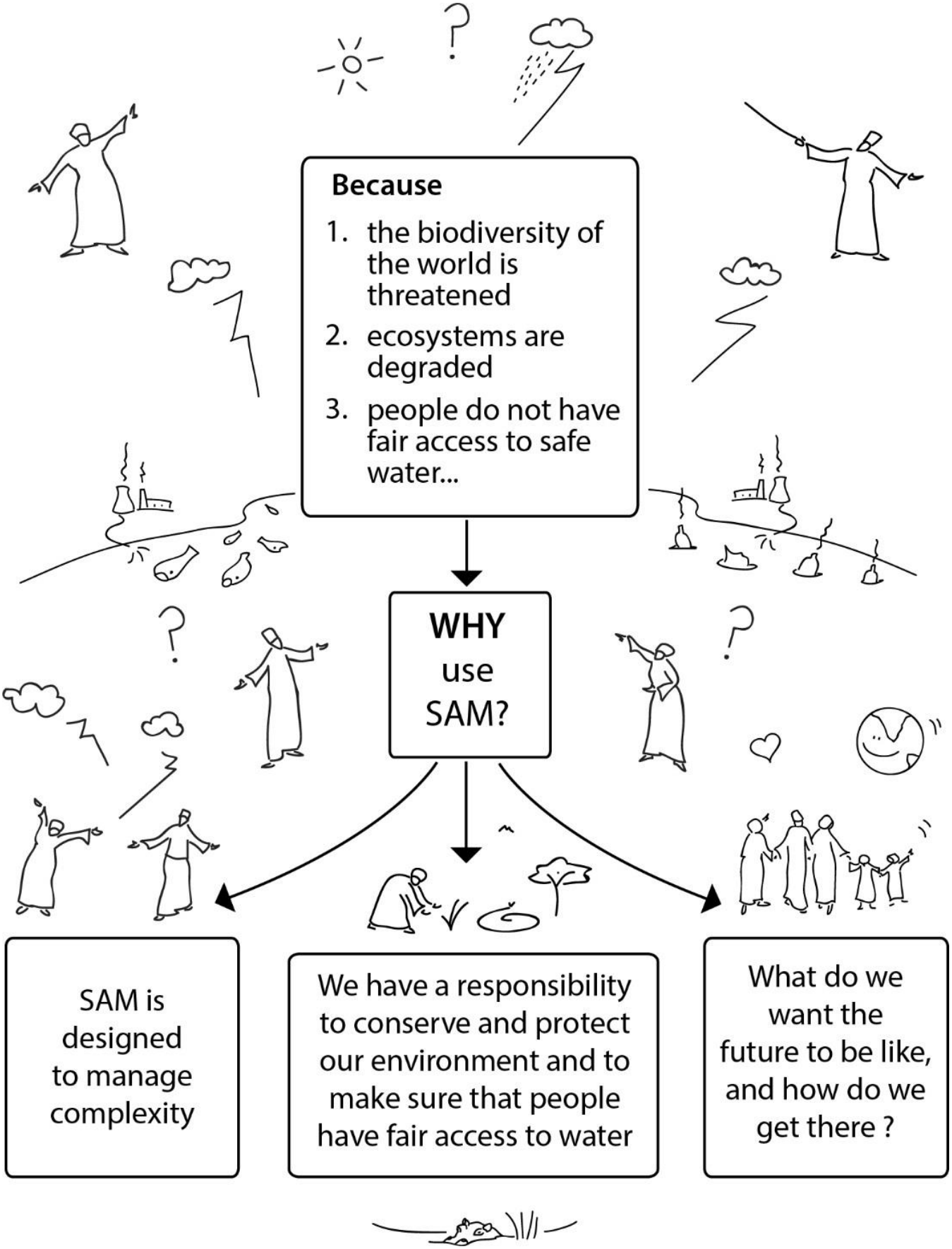


Figure 5: Why use Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

WHY should we use SAM to manage catchments?

1. Existing management procedures are not protecting the biodiversity and function of aquatic ecosystems or ensuring fair household water supply.
2. Climate change is affecting ecosystems and society must be able to adapt to these changes.
3. We have a responsibility to protect our environment – it supports all life: human, animal, and plant.
4. Balancing the protection and use of freshwater ecosystems is difficult because all users need a reliable supply of water of a particular quantity and quality. They also usually want more than is available, and sharing is hard and difficult.
5. Freshwater ecosystems need a holistic* management approach because all the elements of the system (people, other species, and the structure of the system) are connected. Every action has multiple effects – some of them unexpected – and whatever happens upstream always affects what happens downstream.
6. The adaptive planning process (APP) of SAM provides a set of objectives for action. Management actions to achieve the objectives can be tested and adapted in the full SAM process.
7. APP embraces uncertainty and uses it as a learning opportunity. Managers using Adaptive Planning recognise that they are constantly ‘learning by doing’.
8. APP recognises that demands on an ecosystem such as a river often compete with each other. Fair sharing can emerge from consensus. Taking account of social-ecological connections increases adaptive possibilities.

WHAT should we do?

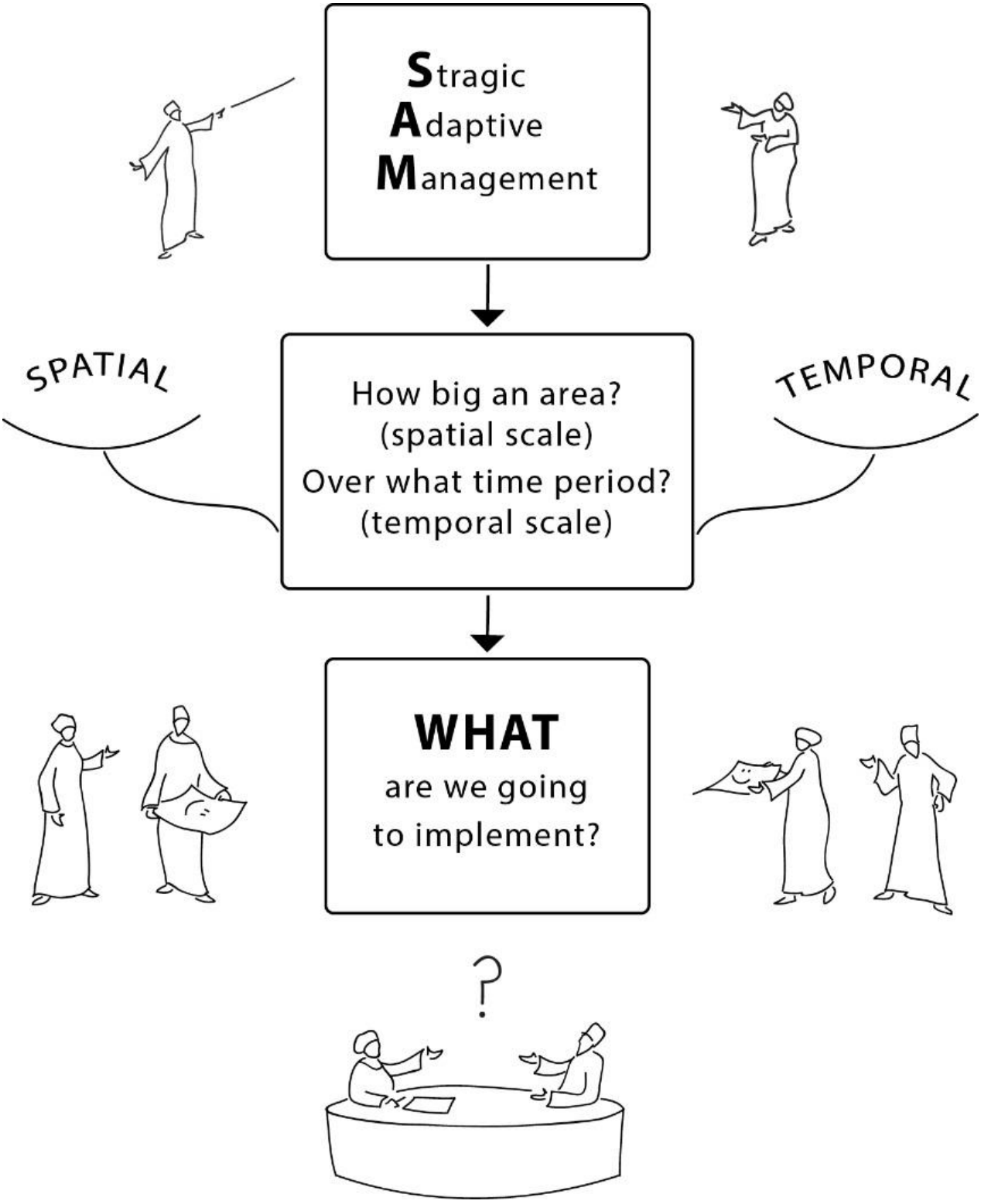


Figure 6: What to implement in Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

1. As a stakeholder group, gather all the immediate concerns. (More about this when we discuss the APP in detail.)
2. Realise that if we focus on solving these, we stay stuck in the present and continue fire-fighting to solve the growing pile of problems. Put these aside to use as a checklist later.
3. 'Jump' into the future and collect the characteristics of the future that the stakeholders want.

4. Collect the words that describe the values (V) that stakeholders want to describe the functioning of their catchment.
5. Describe the catchment – taking care to describe Social, Technical, Ecological, Economic and Political characteristics.
6. When you describe the STEEP characteristics of the catchment, consider the scale at which you need to operate, both temporal* (time-based; short, medium, and long term) and spatial* (size of the area), so you have a better understanding of who needs to be involved in the decision-making process and in the implementation of the plans that the stakeholders create.

These steps describe the beginning of the APP process, as you will see a little later on.

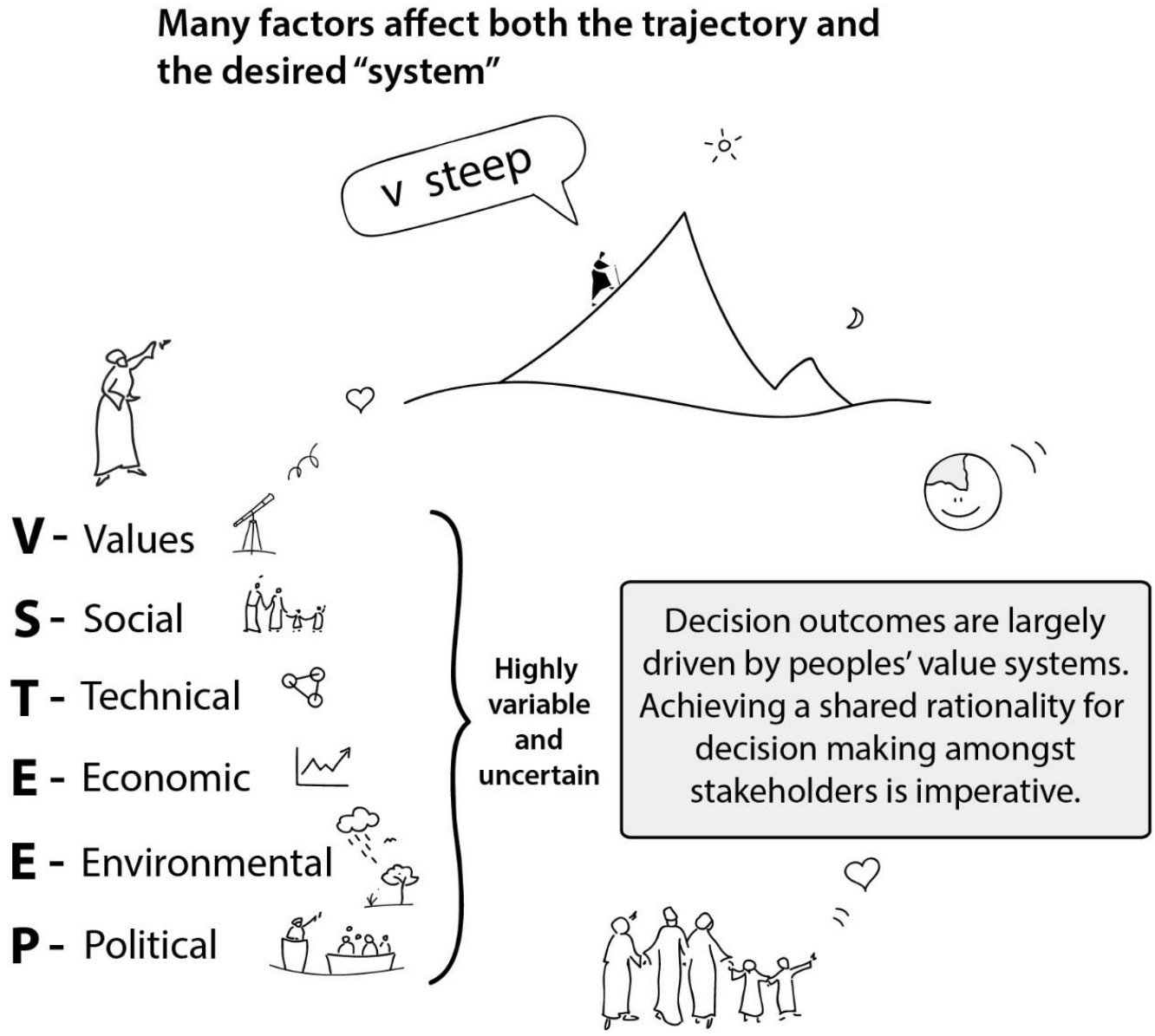


Figure 7: Factors affecting the Strategic Adaptive Management process

HOW do we implement a SAM?

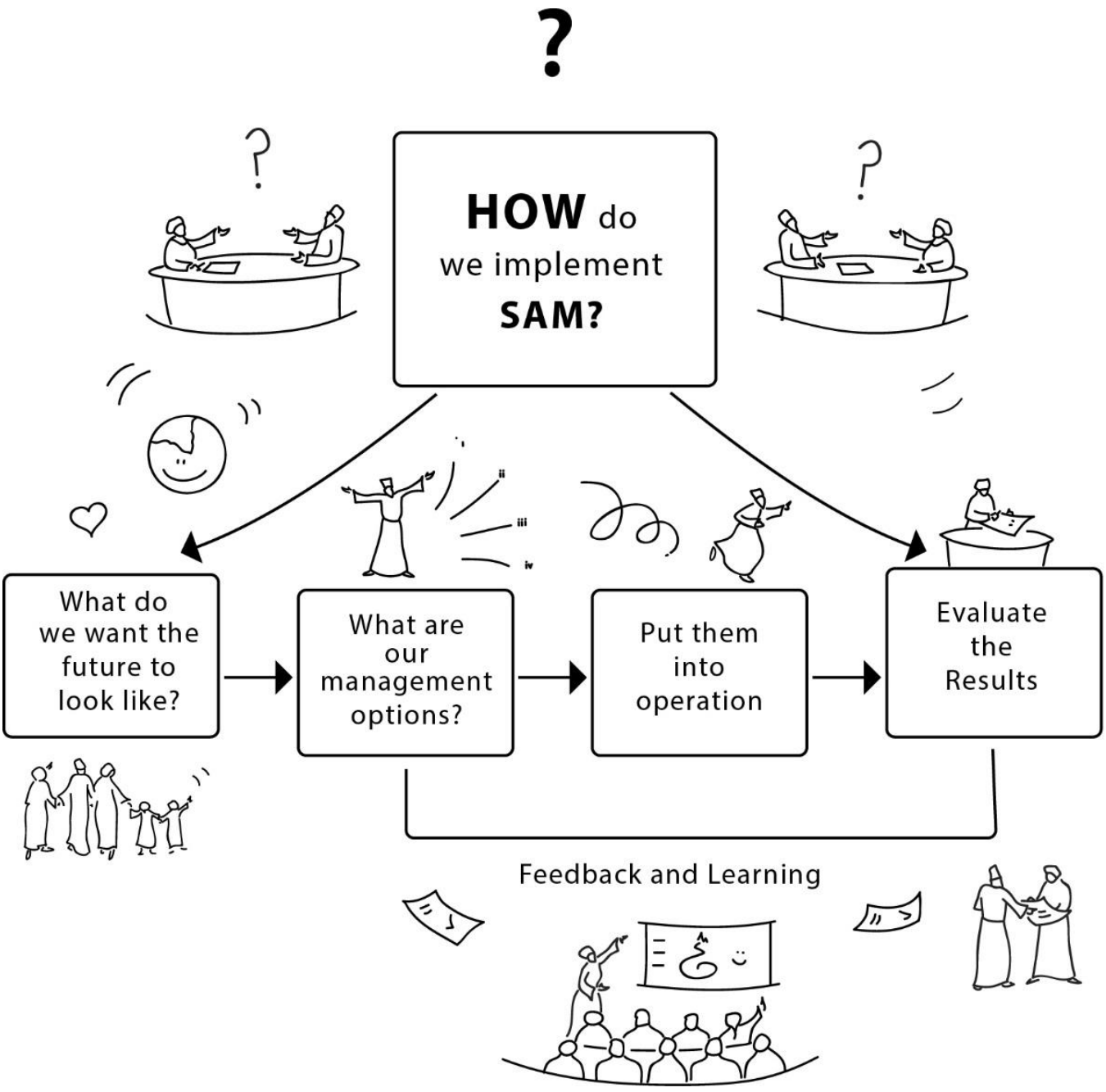


Figure 8: How to implement Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

HOW do we use SAM to manage the catchment?

Start with the vision for the catchment that all the stakeholders have developed. Then:

- work out the objectives, and the options you have for managing the catchment;
- next, implement the options,
- then, evaluate the effect, and
- learn from what you have done, make changes and …
- keep going!

WHEN should we start?

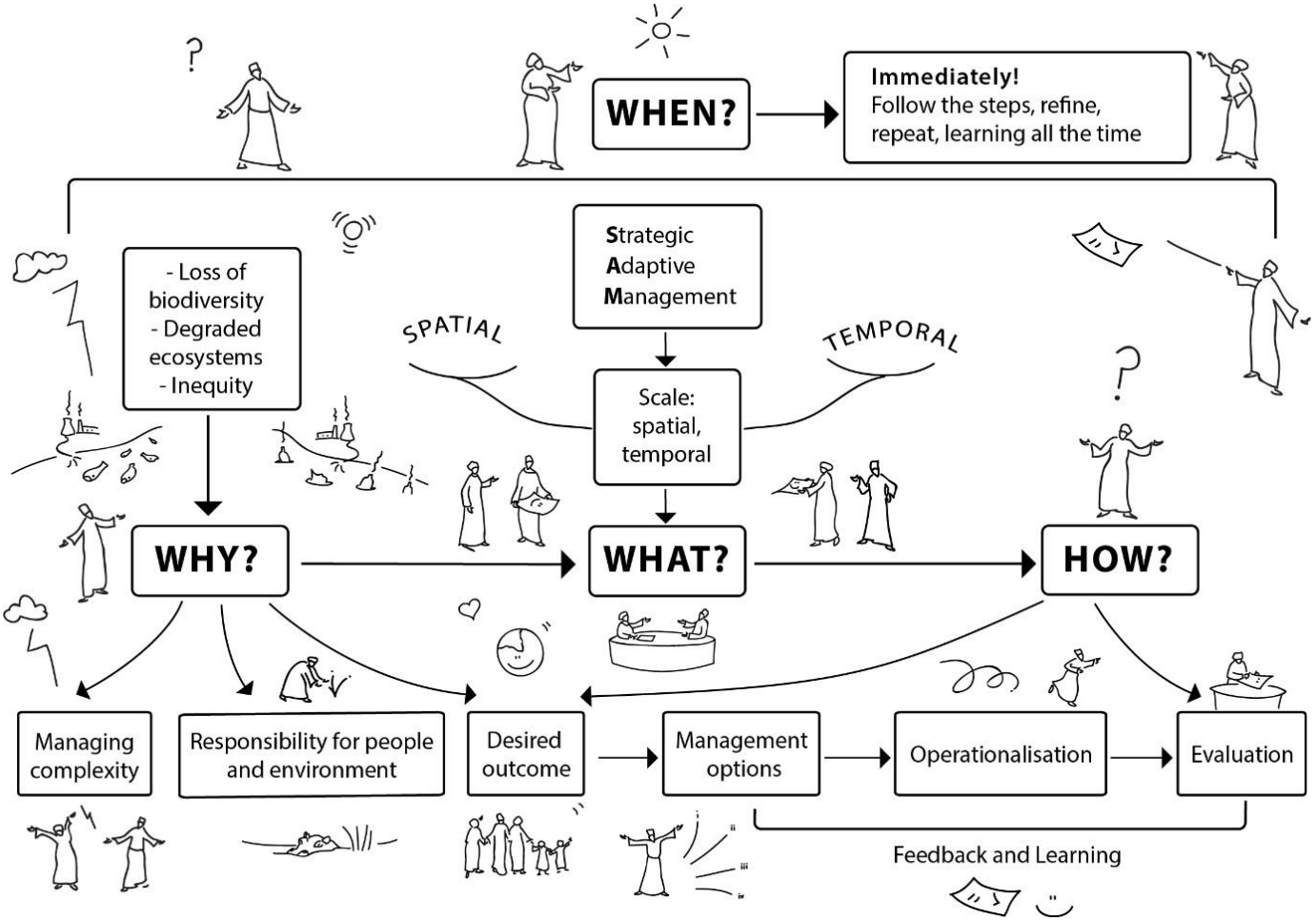


Figure 9: When to start Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

WHEN should we start?

Start immediately!

Begin with what you CAN fix right away, but keep the long-term vision in mind. You develop the objectives using APP (see below). Once you have developed them, look at your objectives and act on the ones that are most possible. These might be cleaning the rubbish out of the river; providing places for nappies to be collected for landfill waste disposal; preventing soil erosion; not wasting water … Learn from the steps you're taking and refine and improve them all the time.

The objectives remind you of what else needs to be done so they can be used to build a set of actions, with deadlines, as you go along.

STRATEGIC ADAPTIVE MANAGEMENTS (SAM): STEP-BY-STEP

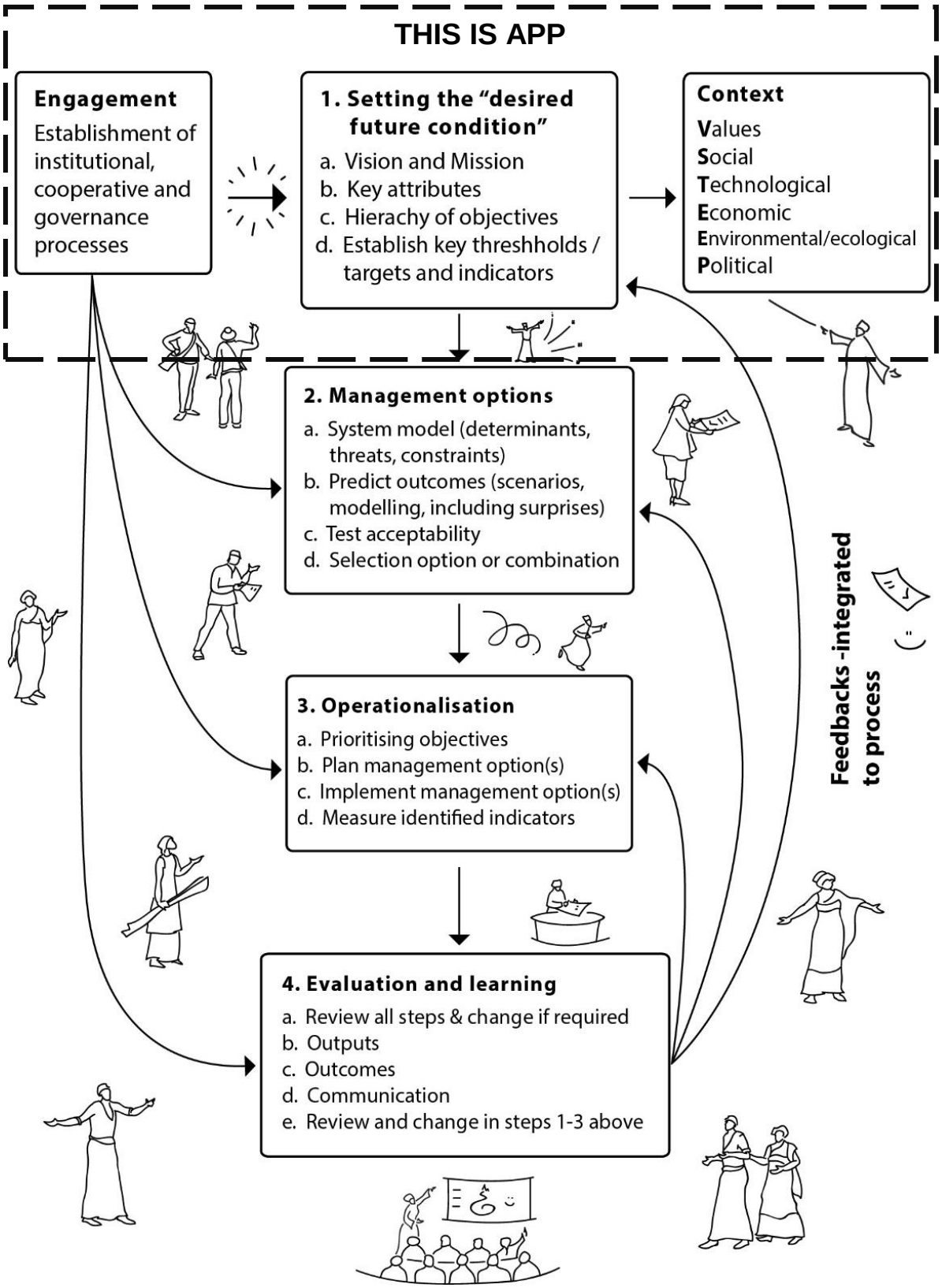


Figure 10: Steps in Strategic Adaptive Management (Adapted from: Kingsford and Biggs, 2011)

The diagram above shows all the steps involved in SAM. Although this handbook does cover them all, the emphasis is on the important Adaptive Planning Process (APP) – it is the foundation on which SAM depends. The APP is described in the three boxes at the top of the diagram, and will be explained in detail.

HOW IS SAM DIFFERENT FROM OTHER KINDS OF PLANNING AND MANAGEMENT?

Table 1: Differences between SAM and other management approaches

SAM	**The usual management approach**
All stakeholders are involved in developing a vision for the future of the environment that they share.	Top management decides on the vision for the organisation. Other levels in the organisation are not usually consulted.
Stakeholders collaborate to develop objectives, prioritise them, and participate in implementing them in order to achieve their shared vision.	Top management designs and prioritises objectives in order to fulfil the vision, and allocates resources, people, equipment, time, money. Lower levels of management are expected to carry out the plans. People at the bottom are expected to accept the results.
Knowledge is shared; everyone learns from everyone else. Everyone's knowledge is important: indigenous, scientific, general.	The knowledge and expertise is provided by experts in the organisation.
People recognise that the environment is a complex system; it changes constantly and can never be fully understood. Therefore, acknowledging uncertainty is part of the planning. They are able to adapt the plan as they go along – still aiming at the shared future they want.	People expect the plan to work, and are unhappy and even angry when it does not.
Because the whole system is uncertain and cannot be fully understood, planners need to be flexible and ready to adapt plans when they do not work the way they expected.	Planners are expected to reduce the risk of things going wrong.
If the implemented plan does not have the expected result, it is seen as an opportunity to learn and adapt; it is not just a failure.	If the implemented plan does not have the expected result, it is seen as a failure and people may lose their jobs.
Decision making is iterative* – results are evaluated and actions adjusted based on what has been learned. Stakeholders are involved implementing the plan.	Decision-making is in the hands of top management who might not be directly involved in implementing the plan and might not understand the problems.
Management is a tool for learning about a system as well as changing it.	Management is a tool for implementing the plans to achieve the objectives of the organisation.
APP is about finding the correct balance between gaining knowledge to improve management for the future, and achieving the best short-term result based on what we know **NOW**.	Management aims to achieve its objectives rather than improve the store of organisational knowledge.

(Developed by H. Holleman, drawing on Rogers and Luton (2011); Kingsford and Biggs (2011))

Using SAM for Integrated Water Resources Management (IWRM)

The diagrams (Figures 9 and 10) introduce some of the basic concepts and processes of SAM.

Getting to a shared future that 'changes' – As this diagram (Figure 11) shows, the 'usual' management approach is like a straight line. We plan as carefully as we can; we try to be efficient in the way we use time, money and effort … and then things don't work out the way we thought they would, and we feel that the plan has failed.

Reality is not like a straight line – things change all the time, and our path to the future looks more like the squiggly line – it's much longer, sometimes we have to go backwards, and we don't always end up exactly where we planned, but close enough to have achieved something that we planned to do.

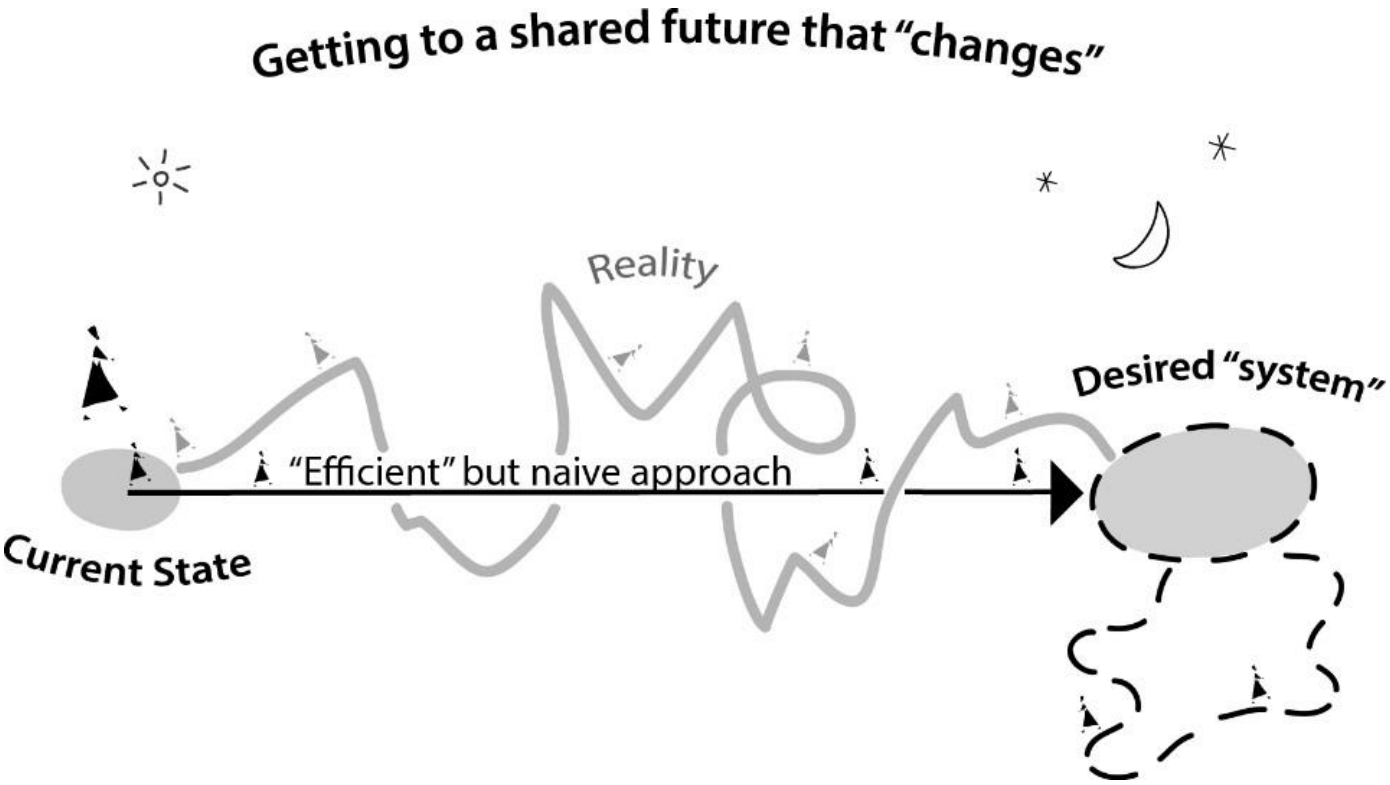


Figure 11: Getting to a desired future (Adapted from: Rogers and Luton, 2011)

Factors that affect (1) the direction, and (2) the desired, shared future

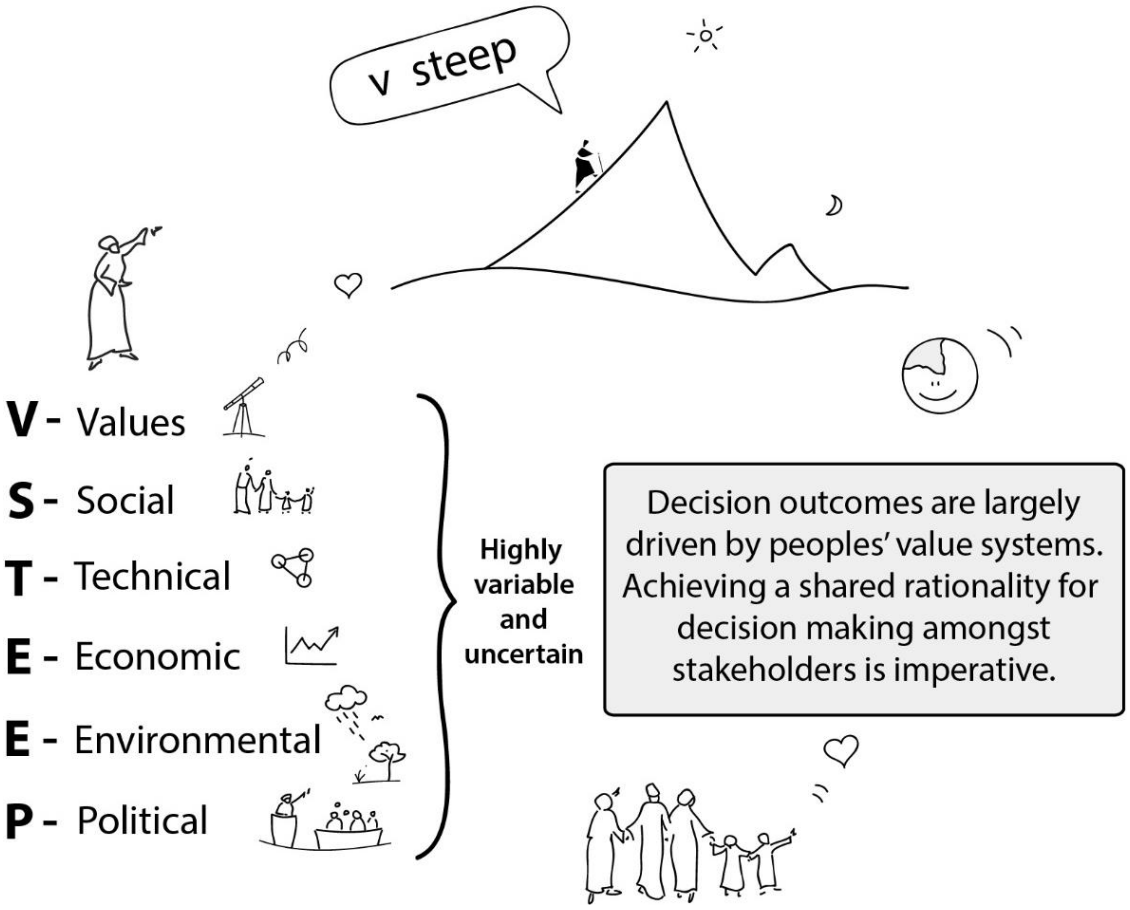


Figure 12: Factors affecting the Strategic Adaptive Management process (Adapted from: Rogers and Luton, 2011)

The V-STEEP way of thinking about the catchment:

Catchments are complex social-ecological systems with many different characteristics and it is helpful to think about them in terms of Social, Technological, Economic, Environmental and Political (STEEP) characteristics.

Thinking about catchments in these terms reveals how different aspects of the catchment are inter-linked and depend on each other. There are many different views, beliefs and values that influence our behaviour and decisions about catchments and management of water. It is important that these are understood by everyone who participates in decisions about water.

V-STEEP

Using V-STEEP helps you to understand and describe the CONTEXT (see Box on page 3) – that is, your own place, with all its history, and the differences that make is the special, unique place it is now. It includes all living creatures and every factor that affects them, like rainfall, pollution, water use, etc.

We use V-STEEP (described below) as a way of remembering the factors/characteristics* that we need to think about as we analyse the present situation and build a vision of the future.

The characteristics are:

- Values (also called 'principles') which are the beliefs that are important to us and that we use when we make choices and decisions. Examples of values are such things as equity,

transparency, ubuntu, simunye. Values are held by individuals, by groups of people, by organisations, and even by society as a whole.

- Social characteristics, e.g. important relationships between people, organisations and the environment; age and gender distribution of the population; educational, recreational and health facilities, cultural sites …
- Technical factors, e.g. pipes, pumps, dams, databases, phones, computers, irrigation canals, water treatment plants, wastewater treatment plants, infrastructure and maintenance …
- Economic characteristics, e.g. size and distribution of income, size and distribution of the population; municipal finance management; ring-fencing of funds; procurement policies and implementation; the land-use patterns (farming, mining, recreation, industry, etc.); the number and prosperity of towns, cities, rural development areas; levels of employment; levels of industry …
- Environmental/Ecological characteristics, e.g. rainfall patterns and frequency; groundwater; water availability and allocation; water quality, quantity and threats; people, birds, fish, insects, algae; all living creatures that affect pollution; protected areas, location of wetlands, springs, the protection of the Ecological Reserve* …
- Political factors, e.g. municipalities, district areas, international agreements, irrigation boards, CMAs, WMAs …

V-STEEP characteristics are variable. We are all different, with different experiences and knowledge. The environment changes all the time – and so do we! We all know different things, so when we share our knowledge, we all become better informed! V-STEEP factors help us keep track of these changes.

Because we make decisions based on our values, and we often have different values, it is important to share that wisdom, too, so that we take account of each other's values when we make group decisions.

Going back to values to check objectives and actions focuses us on our shared future.

USING THE ADAPTIVE PLANNING PROCESS

What does 'the Adaptive Planning Process' mean?

Every parent knows …
… that getting your child to school involves planning:

- is his/her uniform clean and ready?
- have I packed a sandwich for him/her?
- what time must I wake him/her up to be ready?
- how long does it take to get to school?
- will s/he have to walk, or take a taxi?
- is there money for a taxi?

There are a lot of things to plan, and sometimes things don't work out the way you thought they would …

- there's no bread for a sandwich – what can you do?
- the alarm didn't ring, and it looks like s/he might be late for school – what will you do?
- there's no money for the taxi – how will you solve the problem?

As you find solutions to these new problems, you are using Adaptive Planning!

Making the meaning of some important words clear:
Adaptive – all ecological systems change all the time and the objectives for managing the system may have to change, too. Plans for changing systems cannot be rigid but have to adapt as the circumstances change. As a result, people must be willing to accept – even embrace – uncertainty and learn from it.

Planning – deciding what needs to be cared for and controlled in the catchment; finding and allocating resources (people, time, knowledge, skills, money, etc.) to implement the plan.

Process – the actions and steps taken to achieve a particular purpose. APP recognises that the **process** is as important as the result, and that the process is something that is iterative*; that is, it is repeated over and over again.

The Adaptive Planning Process recognises

- that we can never **know** everything about a situation – but that if we **share** our knowledge we know a lot more.
- that there is a lot of **uncertainty** in any plan, but when things don't work out the way we expected, it is not a failure, but an opportunity to **learn**, and a chance to correct the plan.
- that we've got a better chance of getting where we want to be if we **share** our vision of where that place is.

The key to sharing is:

ENGAGEMENT – Working together

Successful 'bottom-up' planning requires everyone who has a stake or an interest in a catchment to be involved in planning, deciding and carrying out the plan. Look at Figure 10 and notice the arrows from the 'Engagement' box to the other boxes.

Before the workshop

- Create a database of all interested stakeholders in the catchment area: civic organisations, municipal representatives, business people, farmers, factory workers, NGOs, chiefs, headmen, community leaders, school principals, teachers, hospital representatives, departmental representatives (DWS, WSS), historically disadvantaged individuals (HDIs) … in short, anyone who has an interest in using our water resources carefully, taking account of fairness to people now, to future generations, and to the environment that supports us. Keep the database up to date.
- A month to six weeks before the workshop, send out individual invitations by email, fax, or hand delivery. Follow up a week later with phone calls or personal visits.
- The following week distribute the stakeholder orientation document by email, fax, or hand delivery. This is the information stakeholders will need to know in order to participate fully in the workshop.
- Follow up a week later with phone calls or personal visits.
- Stakeholders must be identified, contacted, reminded and inspired to attend workshops and to report on them, and come to follow-up workshops. They must have the skills and willingness to work with local, regional and national governance bodies.

Figure 13: Pre-workshop planning (Developed by N. Mtati, M. Ntshudu)

Facilitating the workshops

A **skilled facilitator** creates the situation in which those attending can express their views confidently and honestly, and feel that they are making a valuable contribution to the process of planning. The facilitator must ensure that everyone present understands what the purpose of the workshop is, that they understand the terms that are being used, that a **translator** is present (if necessary). Everyone needs to understand the complex nature of catchments and catchment management as they work towards developing a Catchment Management Strategy (CMS).

At the workshop

It can be helpful for the facilitator to establish some 'rules of engagement' along these the lines:

- Everyone will be able to, and needs to, give their own view on any issue. We (the other participants) will accept it as their (the speaker's) perspective.
- We can all ask questions of each other and ask for explanations at any time.
- **The best way to achieve what you need is to help others get what they need.**
- First try to understand, THEN to make yourself understood. Listen first and speak later.

The APP facilitator's approach is fundamentally different from the usual 'top-down' managerial approach which is more like a lecture with lots of PowerPoint slides, one person doing all the talking, and very little time for questions. In APP, everyone contributes their wisdom to the collective process. At the end, everyone owns the objectives that will need action to achieve them.

Engagement that encourages respectful listening and open sharing is necessary at every step of the process. It is needed to establish the institutional, cooperative and governance processes that are essential to the success of the plan.

Because of the open approach of APP, the process often reveals 'champions' in local stakeholder groups – people who are enthusiastic and capable, and able to inspire others in the area to act with them. Are you a 'champion'?

CONTEXT, VISION, AND PLANNING

Suggestions for facilitators appear in boxes.

Step 1: Context – Where are we now?

Establish what **values** are important to participants. This is vital to make it clear what values we share. What we share we can build on.

'Values' are the things we believe are important to the way we live and work. They help us decide what is important to us, and what is not. The idea of 'values' can be a difficult idea to grasp, and the facilitator may have to use examples to illustrate what is meant, e.g. Think of someone you like working with, and someone you don't like working with. What is it about the relationships that makes one successful and the other not? You may receive answers like: trust, reliability, courage, fairness, cooperation. Those are values.

Give each participant a piece of paper and ask them to list three values that are important to them. Provide translation, if necessary, and a scribe for those who have difficulty writing. Ask each participant to share the value at the top of their list of three. Make sure that everyone has a chance to contribute. If an item is repeated, ask the person making the contribution to give you the next item on their list.

The facilitator explains the importance of accepting what is shared and contributed, asking questions for clarity, but not debating. There are no 'wrong' answers.

Write each response up, either on a flip chart, or typed on a digital projector. Recording responses encourages interaction.

This method works especially well at the beginning of a workshop when people may not know each other. Writing things down also creates space for thinking and limiting the list to three items restricts the time

Step 2: Moving from values to STEEP

Every catchment situation is unique and specific. The more we know about it, the better we can understand it; the better we understand it, the more chance we have of changing it into the place we would like it to be. Local people have first-hand knowledge about the conditions of the area they live in – the seasonal patterns, land-use and abuse, local political relationships – which make the analysis of local problems more grounded in reality than they otherwise are when analysed by outsiders, regardless of their education and training.

At this stage, it is possible to start listing the 'worries' under the STEEP headings. Involve participants with questions like: Do you think that should go under 'Social' or 'Ecological'? These clarifying questions help participants understand the STEEP references, too.

V-STEEP is helpful in eliciting aspects that participants may have overlooked. Ask participants to use the same piece of paper and this time write down three things about the existing situation that worry them. Different stakeholder groups will have different worries: 'Not enough grazing', 'The wastewater from the factory pollutes the river', 'Soil erosion is making the water dirty.' Again, write them up as participants report back. When an item is repeated, ask the participant to give the next one on their list.

The 'mud puddle'

When we have gathered all the concerns, the facilitator askes participants if they think **all** of these concerns can be addressed in the one or two-day APP workshop. It is clear they can't. So the facilitator ask for agreement that the list is put up on a wall in the room, and later checked to see if the outcome of the workshop – the objectives to get to a share future – were to become real, if we would have addressed most of the concerns.

Participants are asked to stand up and imagine they have walked into a deep cold mud puddle. The facilitator demonstrates this wriggling and squishing in the mud. The movement embodies "stuckness' and people laugh. They are asked to describe the experience: "cold" "stuck" "uncomfortable" "frightened" "dirty" "frustrated" …. Everybody shares their experience. This shared experience is then related to the list of concerns.

Participants are then asked to escape the mud puddle and stand next to it. This is a metaphor for posting the concerns on the wall. Then, they are asked, physically, to take a huge (or as huge as possible) jump away from the mud puddle. The facilitator jumps – this elicits laughter – and then they jump. Again, there is a shared experience of effort and movement. This is the leap into the future. Now they are ready to contribute to a vision of this shared future and to work towards a plan to travel there.

This activity has proved to be a catalytic moment in the process and the group participation is generally warmer and more active in the next steps.

So, the mud puddle is a metaphor for where each person is now, in their catchment. But no one feels happy there – because of the many concerns. They have two choices – just as the participants at the workshop do: they can

- stay there, or
- JUMP out of it!

Step 3: Vision – Where do we want to be?

Having listed the concerns, and achieved a picture of how people see the catchment at the moment, the facilitator moves on to establishing a **vision** for the future of the catchment. Again, stakeholders have a chance to describe what they would like the future to be, and to work towards a shared vision. It is important that the vision is truly shared – if it is not, there is a real possibility that the plan and its implementation will not be sustainable.

Participants imagine and describe the place, catchment, sub-catchment or system as you would like it to be. Different stakeholder groups will have different visions: the community wants good, safe drinking water; the paper-mill needs water for the pulping process; farmers need water for irrigation. Take into consideration* local, regional, national and international scales, and the STEEP factors.

As in Step 2, get participants to help you 'sort' the parts of their vision into STEEP categories. The facilitator may also like to point out how some of the STEEP factors represent values, e.g. 'clean drinking water', is a social factor, and 'transparent communication' could be a political factor.

It takes time to work towards the shared vision, and a skilful facilitator will not rush the process. A **vision statement** pulls together everything that has been discussed and agreed on, and may look something like this:

OUR VISION FOR OUR CATCHMENT:
The XXX River catchment will be sustainably and adaptively managed to improve the health of the veld and the rivers. As result, there will be better livestock production, less erosion, and healthy people.

Good political leadership will ensure transparent communication to all the people.

Natural resources (land, water and all living things) and financial resources will be used honestly to benefit all the people.

Empowered, knowledgeable people will live in a safe, low-conflict, well-serviced catchment.

Step 4: What makes our catchment special?

Having developed the vision, the group then focuses on the key attributes* or characteristics of the catchment, area or system under discussion.

The key characteristics are those things that are special about the area, that 'make it the unique place it is', for example:

- good farming land
- the town is an educational centre
- good rainfall
- the area is a popular tourist destination

Attributes can be sifted, and grouped together, and between five and ten key attributes should be agreed on. **Avoid making the list too long** – a long list means that the plan loses focus, resources will be stretched, and the plan is likely to be unsuccessful. The final list should incorporate the features that are **essential** characteristics of the catchment.

Identifying the strengths (key attributes) of a catchment is the start of focusing on objectives. It identifies the fundamental purposes(s) of managing a specific resource.

This activity is best done in small groups. Ask the groups to list what they see as the key characteristics on pieces of paper – one characteristic per piece of paper. At the end of the activity, the facilitator invites one group at a time to put their pieces of paper on the floor (make sure you have enough space!). As groups contribute their pieces of paper, the facilitator helps them group attributes, using the STEEP headings, e.g. 'good farming land' may be connected with 'high rainfall' and both could be grouped under 'Economic'. Participants may argue that 'high rainfall' is an Ecological characteristic, which is a useful opening into exploring the inter-connectedness of the system, and finding ways to deal with it.

This step may also expose hidden agendas, which requires careful facilitation and tact. Encourage participants to be open. Develop a provisional list of attributes without debating their merits, then reduce the list be eliminating those that are incompatible with each other, or with the vision.

Step 5: What threatens and constrains the special features?

To explain what these words mean, imagine that one of the key attributes of our catchment is 'a spring of clean, safe drinking water that is freely available to everyone'.

Special features – a factor which affects the nature or result of something, e.g. the geology of the area which creates the conditions for the quality of the water.

Threat – something that is likely to cause damage or destruction, e.g. animals trampling the area and making the water undrinkable. Act on what you can change.

Constraint – a limit or restriction that you have no control over, e.g. the flow of water is slow. Adapt to what you cannot change.

Expert opinion may be necessary to expand these aspects, but do not let that stop the process – call on the local knowledge available in the workshop to fill in as much information as possible.

Use small groups again, giving them time to construct a table of the attributes, special features, threats and constraints. Allow plenty of time for this, and then ask groups to pin up their tables on the wall. Allow questions for clarity, not for debate.

V-STEEP characteristics are:

- Values (also called 'principles') which are the beliefs that are important to us and that we use when we make choices and decisions. Examples of values are such things as equity, transparency, ubuntu, simunye. Values are held by individuals, by groups of people, by organisations, and even by society as a whole.
- Social characteristics, e.g. important relationships between people, organisations and the environment; age and gender distribution of the population; educational, recreational and health facilities, cultural sites …
- Technical factors, e.g. pipes, pumps, dams, databases, phones, computers, irrigation canals, water treatment plants, wastewater treatment plants, infrastructure and maintenance …
- Economic characteristics, e.g. size and distribution of income, size and distribution of the population; municipal finance management; ring-fencing of funds; procurement policies and implementation; the land-use patterns (farming, mining, recreation, industry, etc.); the number and prosperity of towns, cities, rural development areas; levels of employment; levels of industry …
- Environmental/Ecological characteristics, e.g. rainfall patterns and frequency; groundwater; water availability and allocation; water quality, quantity and threats; people, birds, fish, insects, algae; all living creatures that affect pollution; protected areas, location of wetlands, springs, the protection of the Ecological Reserve* …
- Political factors, e.g. municipalities, district areas, international agreements, irrigation boards, CMAs, WMAs …

How do we identify threats and constraints?

1. Stakeholders work together in small groups identifying all the threats and constraints they can think of, using V-STEEP for a complete picture. (See Box on previous page)
2. Assess how serious the threats and constraints are, and whether they are making the situation worse, or not really affecting it.
3. Evaluate each of the threats/constraints throughout the catchment: up-stream, down-stream, in-stream, in dams, wetlands, lakes, springs, in the vegetation, the soil. Try to think of every aspect that is affected.

4. Focus on the constraints and ask yourselves: “By thinking ‘out-of-the-box’ and using our imaginations, is there a way any of these constraints (which we can’t manage) can be changed into an opportunity?”

The threats and constraints are events or situations that may make it difficult or impossible to implement the plan. We need to think about them because knowing what the possible problems are to implementing the plan means you are better equipped to deal with them – they should not take you by surprise and find you unprepared!

Some threats can be influenced and changed, but others cannot (these are called constraints), and it is important to distinguish between them.

Adapt to what you CAN’T change;

Influence and act on what you CAN change

When we manage a system or catchment, we want to keep the attributes and to do that we need to know what makes them like that. The table below gives an example:

Table 2: Examples of threats and constraints

Attribute	Special features	Threat	Constraint
Spring of good water.	Geology of the area.	Cattle trampling the area.	Flow of water is slow.
Good grazing land.	Regular rainfall, no overgrazing, no alien vegetation, no over-stocking.	Fencing has been stolen, gradual spread of alien wattle trees.	An important cultural site is located within it.

All the special features, threats and constraints can be organised on a table like this.

Another constraint is people’s attitudes. You often hear people say things like:

Do not give up! Making APP work takes perseverance* patience and resilience*.

Nothing succeeds like success! When you are successful, people want to join you and work with you. Start small with what you CAN do, and grow to bigger things! Keep learning from what you're doing.

Attitudes change once people see that your CMF or CMA is making a difference.

Step 6: What do we do first?

Now that the group has a clearer idea of the challenges and opportunities presented by each attribute, establishing objectives is the next step. Going back to the vision at this point is helpful.

The vision is the long-term objective; it is a broad statement which includes many social, ecological, and economic goals and must be broken down into more detailed objectives. It is almost impossible to manage everything that the various stakeholders want at once, so they must agree on what has to be done first and establish a **hierarchy* of objectives**. This simply means that the group has to decide what they are able to focus on first, and what goal depends on meeting other goals first.

The facilitator must be ready to take on the role of negotiator at this point; there will be many perceptions about what is important.
These points can help the process:
1. Start with a wish list.
2. Ask: 'either/or' OR 'both/and'?
3. Ask groups to explain reasons for concern.
4. Identify consequences of current objectives.
5. Ask WHY? Why is A preferred to B? and relate the answer to the vision, values and key attributes.

Do NOT allow the group to vote on this as it often reduced the decision to 'gut-feel' or personal agendas.

The hierarchy of objectives is like an upside-down tree, with a few branches at the top of the diagram, and many branches as you move down the levels. We show only one 'branch' in the following diagram, which is helpful in understanding the planning process.

The Vision includes five **objectives** (or 'branches'). Each of the objectives has a number of aspects* that need to be dealt with. But let us imagine that the stakeholders have decided to focus first on the **ecosystem objectives**.

- At the next level, the ecological objectives are broken down into more detail: clean, safe water; biodiversity; alien species; soil erosion.
- Because it may not be possible to deal with all of these at once, the group has decided to focus on soil erosion, and that is broken down into more detail.

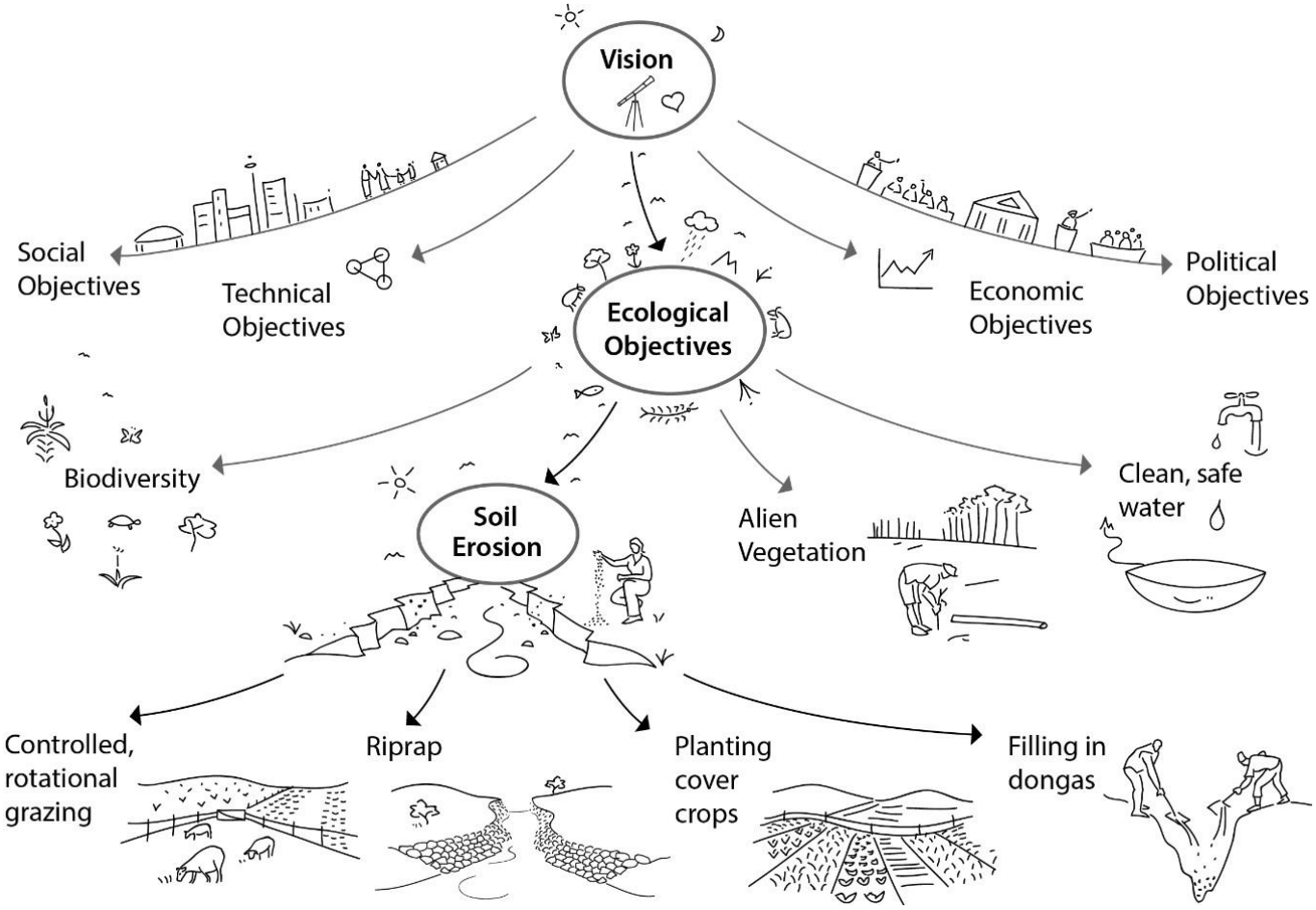


Figure 14: Examples of the objectives of the vision

Even though the group may have decided to concentrate on soil erosion, they must be alert to the possibility of links to other objectives. For example, controlling soil erosion will help achieve clean, safe water; getting rid of alien vegetation will help with biodiversity. Achieving these objectives will help with some of the objectives at the level above, too: for example, clean, safe water will fulfil a social objective.

Everything is linked to everything else in a catchment!
Use the following page to create a diagram of your own ‘objectives tree’.

Step 7: What will happen if …?

Predicting the outcomes, developing scenarios*. The group is now ready to develop and test the options they have decided are the most important ones. (We will use the example of soil erosion from the figure above to show how this works) When they are choosing options, the group needs to consider:

- Will the plan help us achieve our 'desired future state'?
- Will the plan work in different scenarios (see Step 6 below), that is, is the plan resilient*?
- Have we considered the 'scale of management', for example: it is pointless to build many structures to stop soil erosion, but only check one or two of them; or, if we remove alien fish from our part of the river, but the people above us do not, the problem will continue.

Participants work together in small groups to predict whether the plan they have will work in the short-term, the medium-term and the long-term, explaining why they think so. They should also consider events that do not happen very often, e.g. floods or fires. What will happen to the plan then? What effect do we think climate change will have on the catchment? What happens if the law changes in some way?

Scenarios are fairly easy to develop if you are working in a group because different ideas help us think about situations differently. Predicting scenarios helps us decide how to cope with uncertainty and surprises, and guide our thinking about the resilience* of the plans.

Step 8: Action!

Take time to make the scenario as accurate as possible because it is the basis for what you do next: **allocate tasks and resources**.

In other words, the group finds answers to these questions:

- Who does what by when?
- What do they need (i.e. resources: information, data, skills, transport, equipment, etc.) in order to do the task?
- Who must they report back to, by when?

During this process, the group may find that they have to **adapt** the options to fit the capacity they have.

If the answer to some or any of the questions in the box on the right is 'No', then the group can identify and start on what is do-able immediately. For example, suppose the group has decided that they will deal with soil erosion in (Figure 14 above):

Controlled rotational grazing may require fencing in order to fence of grazing camps. This costs money that the group has not yet raised. Someone suggests getting some of the young boys in the village to watch the cattle and herd them into the appropriate grazing camps until the money for fencing has been raised.

Planting cover crops. The group identifies suitable cover crops, sources the seeds, and makes plans to plant at the appropriate season. They identify the areas that need attention most urgently.

The participants may need more help with the detail of answering those three questions, e.g.
Do we have the people who can do it?
Do they have the necessary skills?
Do we have the money to do it?
Do we have the time to do it?
Do we have the appropriate equipment to do it?
How will we know that we've been successful?
Do we have the capacity to keep records and collect data?

Filling in dongas. The group identifies the dongas closest to homesteads as the ones to be filled in first using appropriate materials close at hand: trunks of alien vegetation, rocks, etc.

Find partners to help you implement land restoration projects: Department of Environmental Affairs: Natural Resource Management (DEA: NRM).

[Some useful sites with practical advice on dealing with sheet erosion and dongas are:
http://www.agis.agric.za/agric_engineering/pdf/Barricades&smallstructuresforthepreventionofsoilerosion.pdf
http://www.farmersweekly.co.za/farm-basics/how-to-crop/protect-the-soil-by-controlling-erosion/
http://www.ostrichsa.co.za/downloads/bio_diversity/soil_erosion.pdf]

How to develop a scenario:
Keep asking the questions: What will happen if …… ?
And if that happens, then what?
Who will be affected?
How?

For example, let us go back to Figure14. We can imagine that the group asked these questions at every level – in choosing to focus on the Ecological Objectives, and then on prioritising soil erosion as the most important objective.

In developing a scenario about soil erosion, they will ask questions like:
Who will be affected if we implement rotational grazing? if we plant cover crops, use riprap, fill in the dongas?
What will happen in three years/ five years/ ten years if we do nothing?
What will happen if there is a fire? If there is a flood?
What will happen if the fences are stolen?

Try to imagine every possibility and its consequences**. How will we adapt?**

EVALUATION AND LEARNING

Review all steps and change whatever needs to be changed.

Although 'Evaluation and learning' is listed at the end of the process, if you refer back to Figure 10, it is clear that every step requires the stakeholders to evaluate their decisions and learn from the results of those decisions and actions.

If this step is omitted, the entire process is a waste of time because nothing has been learned, and no new ways of dealing with old problems have been found.

Ask questions like:

- Do stakeholders trust each other enough to work together?
- Are we actually achieving the vision of our shared future?
- Did we achieve our objectives or do we need to adapt them, or adapt our methods?
- Did we monitor the activities adequately?
- Were the outcomes we predicted correct? If not, what do we need to change?
- Were the options we chose appropriate?

Taking time to answer the questions outlined above, is NOT a waste of time, although the process may seem slow. What we learn from the process that makes our efforts sustainable.

Communication. All the planning, all the hard work needs to be shared with stakeholders and with government officials. Everyone involved needs to understand who did what, for what reasons. This is an important part of accountability and transparency, as well as a valuable tool for learning and sharing.

All the steps outlined in Figure 10 (engagement, context, the desired future state, management options, implementation and the evaluation and learning).

Review and change. Adapt and succeed!

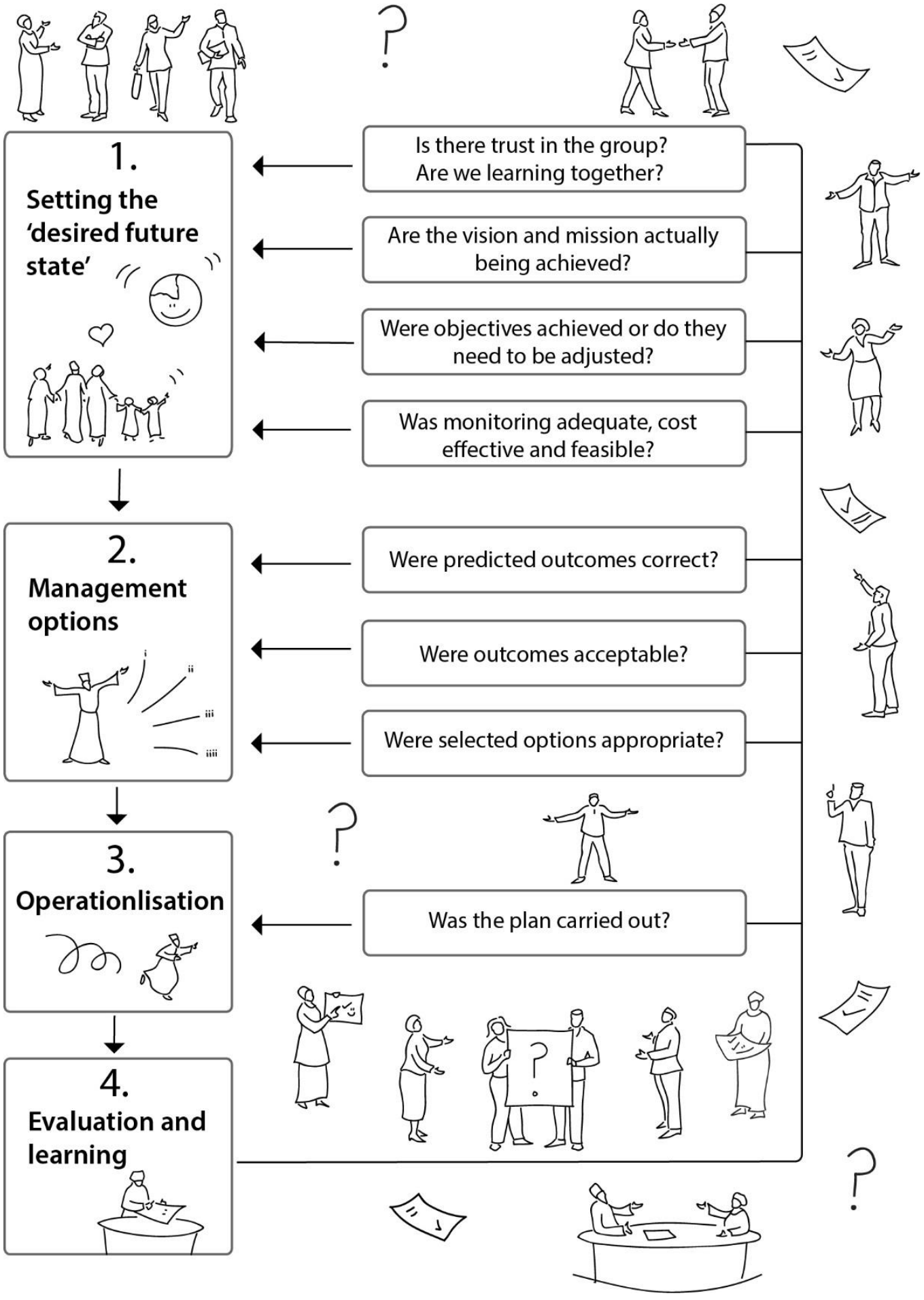


Figure 15: Evaluation and learning. (Adapted from: Rogers and Luton, 2011)

GLOSSARY

acronym – an abbreviation formed from the first letters of other words and pronounced as a word.

attributes – features, qualities or characteristics of someone or something, e.g. Transparency should be an attribute of all government actions.

aspects – a particular part of something.

characteristics – a feature that is typical of someone or something, e.g. Drought is characteristic of the Karoo.

complex – a group or system of different things that are linked in a close or complicated way; a network.

consensus – general agreement.

constraints – threats to a plan that cannot be influenced or changed.

dynamic – describes a process or system that is constantly changing, active, or progressing.

hierarchy – a system in which things are listed in order of their importance.

holistic – based on the belief that the parts of something are intimately interconnected and can only be understood by understanding the whole.

implement – put a plan into action.

iterative – repeated.

perseverance – to continue doing something even though it is difficult or you are not successful immediately.

Reserve – South Africa was one of the first countries to pass a law that allocates water specifically for use by the environment. This aims to ensure that our water systems have enough water to sustain them, which, in turn contributes to the sustainability of the living resources on which we depend. This water is called the Ecological Reserve.

resilience – the capacity to recover quickly from difficulties; toughness.

scenario(s) – a possible sequence or development of events.

spatial scale – relating to the size of the space.

special features – a factor which decisively affects the nature or outcome of something.

strategy – a plan of action designed to achieve a long-term or overall aim (‘strategic’ – describing such a plan.

take into consideration – take into account, consider, think about.

temporal scale – relating to time.

topography – the arrangement of the natural and artificial physical features of an area, e.g. hills and valleys, cities, towns, open areas.

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Upper Kowie Water Sanitation and Catchment Management Forum (UKWSCMF) (2017). Upper Kowie Integrated Catchment Management Strategy Stakeholder Information Pack.

GUIDELINES FOR FACILITATORS

1. Elicit, elicit, elicit (talk less, listen more).
2. Involve – make sure everyone has a chance to give their views.
3. Allow small-group discussion before feeding back to a larger group.
4. Use small groups (3-5 people per group) for group tasks. This encourages people to give their opinions more easily, especially if they can use their own language.
5. Encourage people to write before speaking. This is especially helpful for people who do not speak English as their mother tongue.
6. Provide someone who can write down the ideas of those who cannot write.
7. Try to have a translator available to make sure everyone has a voice, everyone understands.


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