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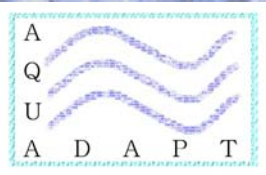
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Strategies for managing coupled, dynamic processes in the field of IWRM:

The AQUADAPT project

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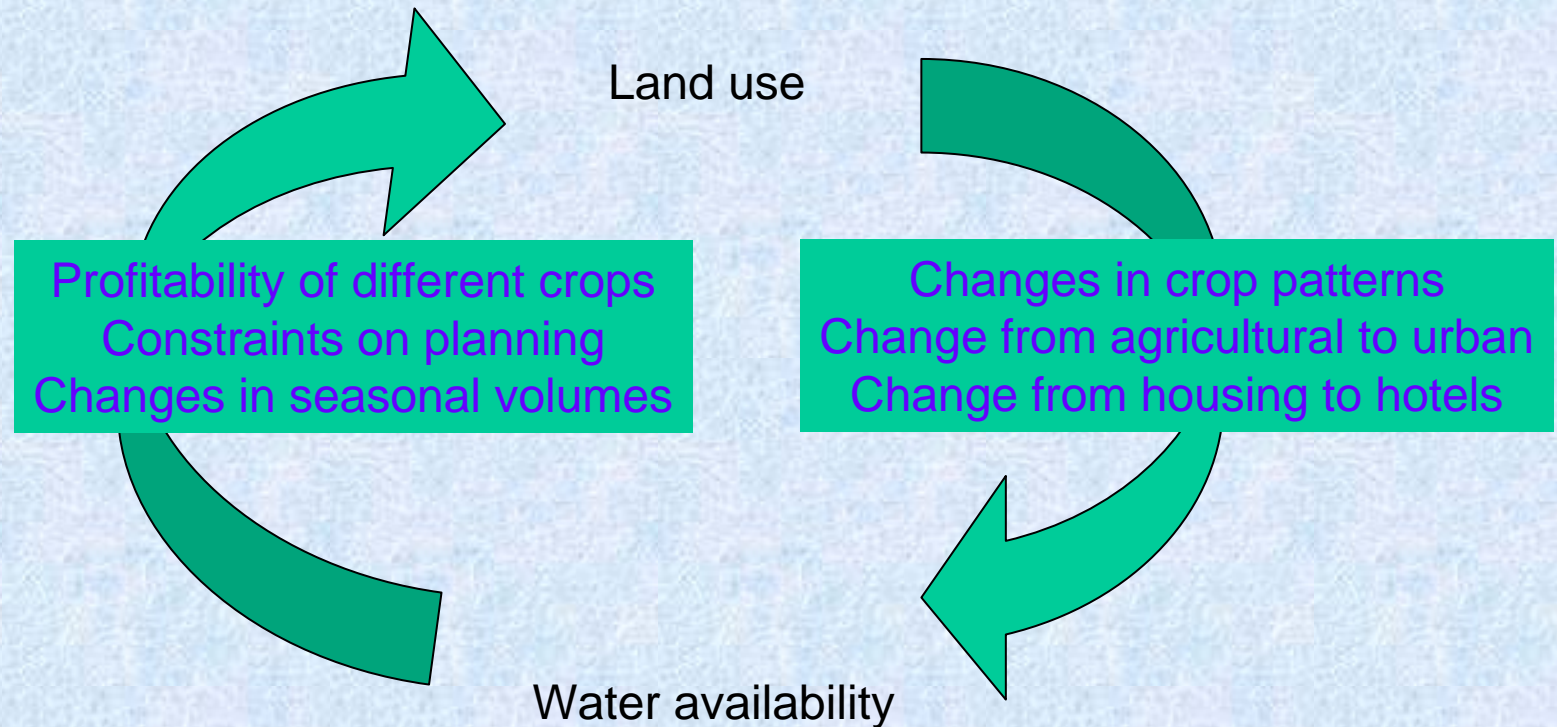


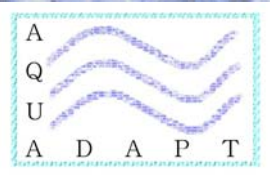
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What is a coupled, co-dynamic process ?





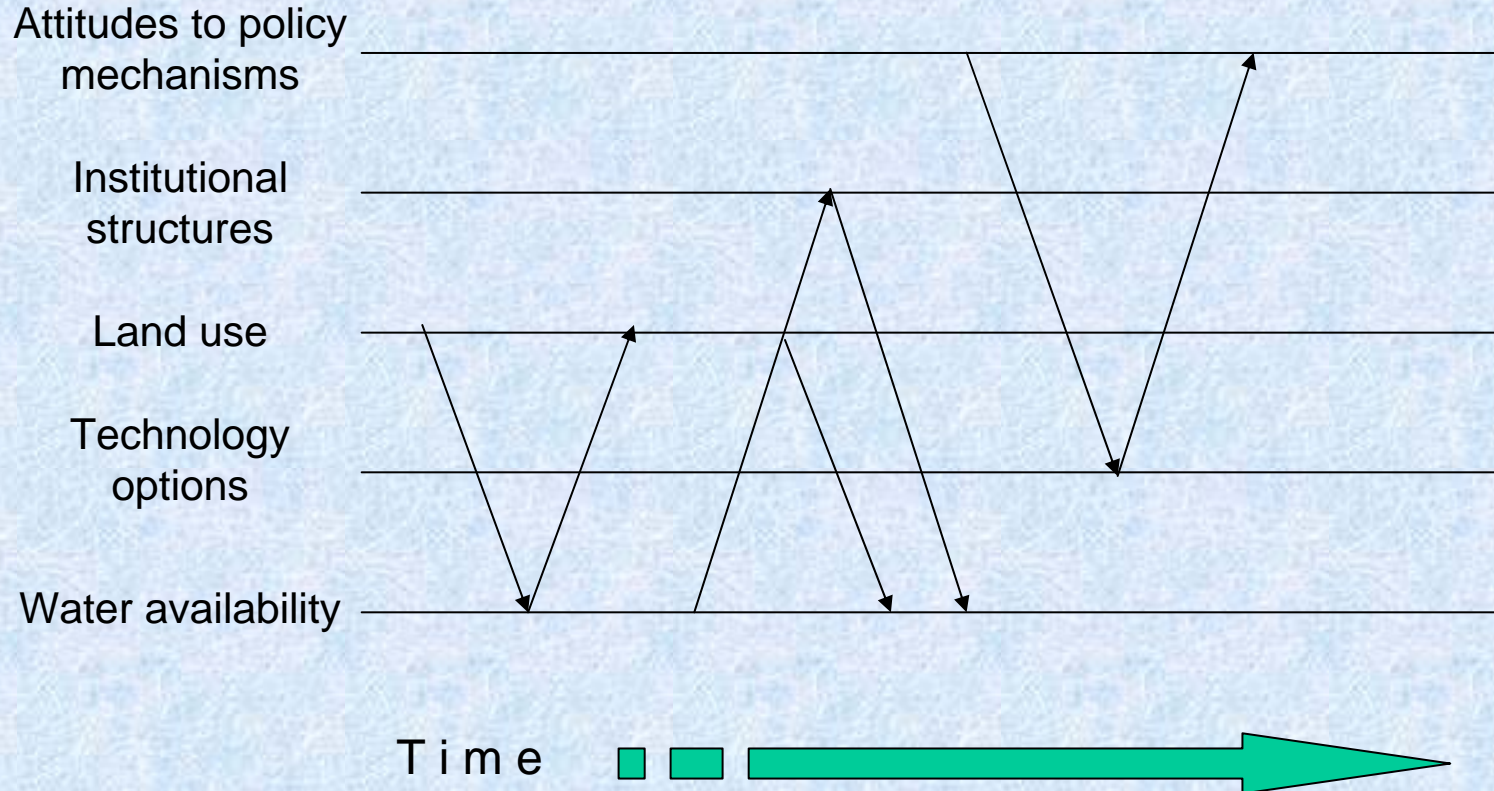
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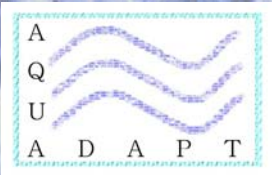
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But there are multiple, coupled processes !

..... which operate across different spatial and temporal scales, at different rates of change, and many of which involve more than two elements





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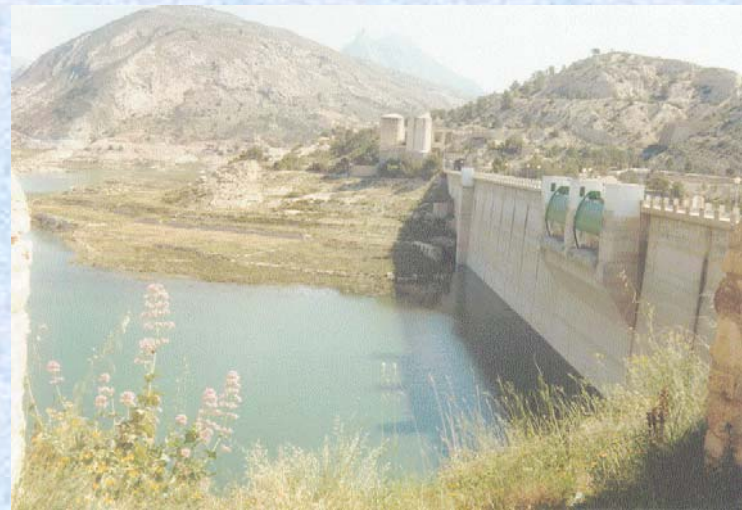
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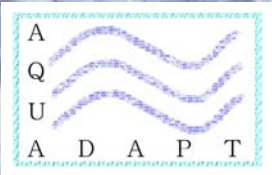


But our problem set is not just complicated

Complicated – many elements interacting in many ways at different spatial and temporal scales

Complex – as above but with the added dimension that the rules or laws by which interaction takes place are also changing ... so any specification of the relationship between phenomena 'A' and phenomena 'B' will change through time.





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If we accept that our problem set is both complicated and complex, are there any ways of understanding the process that can help us make sense of it ??

Aquadapt has looked at

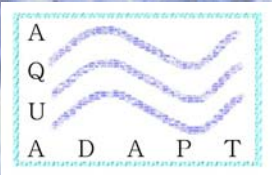
- Systems science
- System dynamics
- Co-dynamics
- Evolutionary theory
- Co-evolutionary theory



And found some utility in all of them which leaves us with a problem



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The model we use to describe something will influence how we seek to influence its future

A cow ?

A milk provider ?

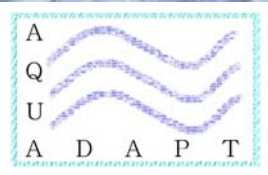
A burger on legs ?

A productive unit ?

A reproductive unit ?



- The trouble comes when it fails to behave in accordance with our descriptive or aspirational model
- We perhaps understand it as a milk provider (and try to manage it as such), yet it may start behaving like a sheep
- ... and if we suddenly want to manage it as a burger on legs, do we need a different understanding of it ?

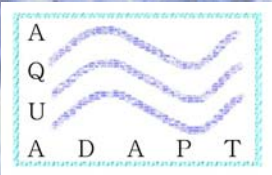


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- Understanding and managing water resources is no different
 - Each potential use, perspective or way of understanding will have its adherents (disciplines, professions, stakeholders etc)
 - Theories of change such as systems dynamics or coevolution promise generic or integrated understanding
 - But they still lock us in to a way of managing the resource which is dependent on how we understand it to work
 - Prescription and intervention is a function of diagnosis or understanding. Economists run something called the economy, engineers do engineering.
 - A co-dynamic or co-evolutionary insight can't give us anything better than policy guidance based on creating a more efficient or effective co-dynamic or co-evolutionary system
- and we know that systems with these characteristics are often unpredictable, unstable, unjust, and unmanageable



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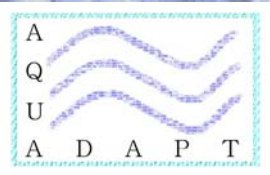
Which brings me on to the subject of 'adaptive management' !

An adaptive management strategy based on an understanding of the types of change which might happen can be of two types;

- a) If we believe we have control of the levers which determine system behaviour then it is little more than contingency planning ... if X happens, then we do Y
- b) If we believe that we don't have sufficient control of the system behaviour levers, then we can instil or promote system properties which **might** provide some potential for adaptation

But such adaptation may not have the intended or even the anticipated effect





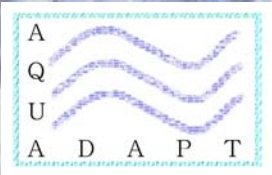
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Project level questions

1. Can the pace and scale of changes in the relationships between water and its use / management be characterised ?
2. What are the temporal and spatial scales of suitable adaptation processes ?
3. Where is the adaptive capacity in governance, social and economic systems ?
4. How easy / difficult is this adaptive capacity to manage ?
5. What indicators might be used to identify or track transitions towards unsustainable water utilisation regimes ?
6. How useful are coevolutionary analogies in the field of natural resource management ?



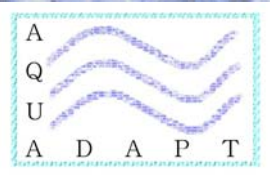
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Aquadapt project outputs

- A computer based water resources planning tool (SCAPT)
- Comparative analysis of consumer attitudes to water policy mechanisms – a European profile ?
- Comparative assessment of approaches to adaptive water resources management
- Understanding of the role of water in socio-natural dynamics in Marina Baixa
- Picture of the role played by water availability in human activity on the Karst plateau, Slovenia
- Considerable impact on the debate regarding the application of coevolutionary theory to socio-natural systems



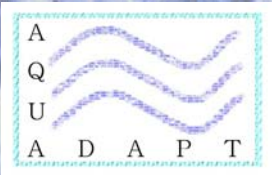
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What type of debate can we inform ?

- 1. The gaps between policy fields** – we understand little of the modifying impact of policy mechanisms in one area of governance on other areas – need for ‘joined up governance’
 - Collaboration needed with governance & regulatory bodies
 - Tensions between ‘sustainable X’
- 2. Sustainable water livelihoods at catchment scale** – evaluation of the water carrying capacity of a catchment based on renewable water availability – envisioning and trade-off analysis to identify specific industry – agriculture – environment – society water use configurations.
 - South – North knowledge transfer ... scenario building
 - Focus on inter-community resource management
- 3. Policy mechanism change (i)** –the effectiveness of different policy mechanisms (e.g. pricing, education, regulation) is significantly influenced by social and cultural contexts. The ways in which issues of legitimacy, trust, and social capacity (the ability of communities to respond to policy mechanisms) impact on policy mechanism change are poorly understood.
 - More involvement from social sciences
 - Lessons from NIS region



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4. **Policy mechanism change (ii)**

The relative effectiveness of specific policy mechanisms to address water stress will depend on an understanding of the temporal profile of mechanism impact.

- More work needed on ‘time to deployment and impact’.

4. **Lock-in** – Adaptive management practices require deeper understanding of how and why communities become locked in to ‘ways of managing water’ and more importantly, under what conditions this is beneficial and when is it not + how can they break out of such relationships.

- Lessons from history