

Table 7. The Pre-conditions for Implementation of ICARM in a River basin (1st Order Outcomes)

Focus	Marker	Songkhla Lake (TH)		Bang Pakong (TH)		Chilika Lagoon (IN)		Krishna (IN)		Oder (DE/PL)	
		'05	'10	'05	'10	'05	'10	'05	'10	'05	'10
A. Problem definition and development of policy, strategy and management plans.	1. Have the main environmental concerns arising from river basin, coastal and marine activities been identified?	No		No		Yes		Yes		Yes	
	2. Have these concerns been analysed?	No		No		Yes		No		No	
	3. Is there a policy that will allow ICARM to be effectively introduced?	No		Yes		No		Yes		No	
	4. Is there a strategy to effectively solve the concerns being encountered?	No		No		Yes		Yes		No	
	5. Have realistic interim and end goals been set within the strategy?	No		No		Yes		No		No	
	6. Have management plans been drafted?	No		Yes		Yes		Yes		No	
	7. Have management plans been adopted?	No		No		No		No		No	
B. Political, legislative and institutional support.	1. Is there an executive mandate?	No		No		Yes		No		No	
	2. Is there support within the political structure at all relevant levels?	No		No		Yes		Yes		No	
	3. Is there relevant, general legislation in place to allow an ICARM programme to be implemented?	DK		Yes		Yes		Yes		No	
	4. Is there specific legislation in place that enables the target goals to be reached?	No		Yes		Yes		Yes		No	
	5. Is there recognition that a 10-15 year commitment is required?	No		No		No		Yes		No	
	6. Is there a sufficient budgetary allocation committed for an ongoing programme?	No		No		No		Yes		No	
	7. Are there relevant institutions in place that will be specifically responsible for the programme?	-		-		-		-		-	
C. Stakeholder and Public involvement	1. Do the public and stakeholders agree with the government policy?	No		No		Yes		No		No	

and support.	2. Is there stakeholder awareness?	-	-	-	-	-
	3. Is there stakeholder support?	No	No	Yes	Yes	No
	4. Is there public awareness?	No	No	Yes	No	No
	5. Is there public support?	No	No	Yes	Yes	No
	6. Are there mechanisms for stakeholder and public participation in decision-making?	Yes	Yes	No	No	No
D. Capacity for implementation.	1. Are there sufficient human resources?	No	Yes	No	Yes	No
	2. Do those human resources have sufficient, relevant capacity?	No	No	No	No	No
	3. Is there sufficient information exchange between the responsible institutions?	No	No	Yes	No	No
	4. Are the roles and responsibilities of the collaborating institutions clear?	No	No	Yes	No	No
	5. Is there an effective vertical (i.e. national/ regional/local government) information flow mechanism in place?	No	No	Yes	Yes	No
	6. Is there an effective horizontal (i.e. between the stakeholders and public) mechanism in place?	DK	No	Yes	Yes	No
	7. Is there a conflict resolution mechanism in place?	No	No	No	No	No
	8. Have public-private partnerships been set up?	No	No	No	No	No
E. The content of the management plans.	1. Have the relevant stakeholders been identified?	No	No	Yes	No	No
	2. Have marginalised groups been given adequate empowerment?	No	Yes	Yes	No	No
	3. Has economic backwardness been targeted?	No	Yes	Yes	Yes	No
	4. Has an education programme been included?	No	No	Yes	No	No
	5. Has a communication programme been included?	No	No	Yes	No	No
	6. Do the management plans include traditional knowledge and community-based practices?	-	-	-	-	-
	7. Have appropriate management examples been included?	No	No	Yes	Yes	No
	8. Have EIA's/SEA's been included?	Yes	Yes	Yes	No	No

	9. Have protected areas been included?	No	No	Yes	No	No
	10. Is ecosystem costing included?	No	No	No	No	No
	11. Has a permitting system been included?	No	Yes	No	No	No
	12. Are enforcement measures included?	Yes	No	No	No	No
	13. Is there a penalty system included?	Yes	No	No	No	No
	14. Are non-regulatory incentives included?	No	No	No	No	No
	15. Have the management plans been based upon existing and emerging scientific knowledge?	No	No	Yes	Yes	No
	16. Has a comprehensive set of indicators been agreed to assess progress towards sustainability?	No	No	No	Yes	No
	17. Is there a monitoring programme of these indicators in place?	No	Yes	Yes	Yes	No
18. Will the programme be evaluated?	No	No	No	Yes	No	

Table 8. The Implementation of ICARM in a River basin (2nd Order Outcomes)

Focus	Marker	Songkhla Lake (TH)		Bang Pakong (TH)		Chilika Lagoon (IN)		Krishna (IN)		Oder (DE/PL)	
		'05	'10	'05	'10	'05	'10	'05	'10	'05	'10
A. Have the priorities changed during implementation?.	1. Are the issues and their priority still the same as when the programme began?	No		No		Yes		No		No	
	2. Has the programme been adapted because of changes deemed necessary?	No		No		Yes		No		No	
	3. Are programme policies being enforced?	No		No		Yes		No		No	
	4. Has the strategy been modified?										
	5. Have the goals been modified?	No		No		Yes		No		No	
	6. Have such adaptations strengthened the potential of the programme to achieve its interim and final goals?	No		No		Yes		No		No	
	7. Are the management plans being carried out according to schedule and agreed processes?	No		No		Yes		No		No	

	6. Has there been an improvement in the information flow between the stakeholders and public during the programme?										
	7. Are conflicts among user groups being reduced?	No		No		No		No		No	
	8. Are private-public partnerships functional and generating desired results?	No		No		No		No		No	
E. What are the effects of implementing the programme?	1. Have the stakeholders changed during implementation?										
	2. Have marginalized groups entered the mainstream as a result of the programme?										
	3. Is the quality of life changing of those anticipated to benefit from the programme?	No		Yes		Yes		Yes		No	
	4. Are more people, including children, learning about environmental/sociological aspects of the programme and the proposed solutions?										
	5. Is information about the programme reaching an ever widening audience?										
	6. Have the management plans built upon traditional knowledge and community-based practices?										
	7. Have appropriate management examples called for by the programme been adopted?	No		No		Yes		No		No	
	8. Have the solutions called for by the programme taken into account the results of the EIA's/SEA's?										
	9. Has the inclusion of protected areas led to increased conservation status of identified landscapes, habitats and species?										
	10. Is ecosystem costing affecting decision making?	No		No		DK		No		No	
	11. Is the permitting system changing the perception of ecosystem resources?	No		No		No		No		No	
	12. Is enforcement reducing illegal forms of resource use?	No		No		Yes		No		No	
	13. Is the penalty system an effective deterrent to the behaviour of those contravening the legislation of the programme?	No		No		No		No		No	
	14. Are incentives for desired behaviours proving effective?	No		No		Yes		No		No	
	15. Is existing and emerging scientific knowledge being incorporated into the implementation process?	No		No		Yes		Yes		No	

	16. Is a comprehensive set of indicators documenting progress towards programme goals?	No		No		Yes		Yes		No	
	17. Is environmental monitoring of the chosen indicators being done regularly enough to reveal the impacts of programme actions?	No		No		Yes		Yes		No	
	18. Have mechanisms for reviewing and evaluating progress in the implementation of the programme been embedded in governance?										

The responses should feed-back into the programme as a whole which should be adapted if necessary. This means that the assessments need to be periodically repeated.

Table 4. An example of ecological indicators

Goal	Indicator	Parameters
Maintaining ecosystem health	Diversity	- Diversity of communities
		- Diversity of populations
		- Diversity of Species
	Abundance	- Biomass
		- Number of individuals
		- Density
	Production & reproduction	- Spawning survival rates
	Mortality	- Fishing mortality
	Water quality	- Sedimentation
		- Pollutants and contaminants
- Eutrophication		
Habitat quality	- Alteration	

Similarly, socio-economic indicators should represent the state of the human component essential in the development of inter-linked management. ICARM should not only improve the environment *per se* but do so in a manner which will improve the quality of life in river and coastal communities to mutual effect (Table 5).

Table 5 Socio-economic indicators

Goal	Indicator
Maximise sustainable wealth & reduce poverty	- Total economic value
	- Total employment
Minimise environmental degradation	- Sustainably managed exploitation and use
	- Pollutants and introductions
	- Habitat alteration
Protect human life, property, protect human life, property & establish equitable population dynamics	- Disease and illness
	- Weather and disaster
	- Population dynamics