GlobWetland Project

Review of wetland inventory approaches; considerations for GlobWetland and future wetland monitoring work

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GLOBWETLAND

Rationale for monitoring and inventory

Contracting Parties to the Ramsar Convention on Wetlands decided that national wetland policies should be based on a nationwide inventory of wetlands and of their resources:

- Recommendation 1.5 (COP1, Cagliari, 1980),
- Annex to Recommendation 2.3 (COP2, Groningen, 1984),
- Recommendation 4.6 (COP4, Montreux, 1990),
- Resolution 5.3 (COP5, Kushiro, 1993), and
- Resolution VI.12 (COP6, Brisbane, 1996).

Definitions: Ramsar (and CBD)

- *Wetland inventory*: The collection and/or collation of core information for wetland management, including creation of an information base.

- *Wetland assessment:* The identification of the status of, and threats to, wetlands as a basis for the collection of more specific information through monitoring activities.
- *Wetland monitoring:* Collection of specific information for management purposes in response to hypotheses derived from assessment activities, and the use of these monitoring results for implementing management.

Development of methods

- The Convention's Scientific and Technical Review Panel (STRP) prepared *A Framework for Wetland Inventory* for COP8, which was adopted as the Annex to Resolution VIII.6
- Handbook 10: *Inventaire des zones humides - Cadre Ramsar pour l'inventaire des zones humides* – collects together all the adopted guidance, which informs the GlobWetland project.

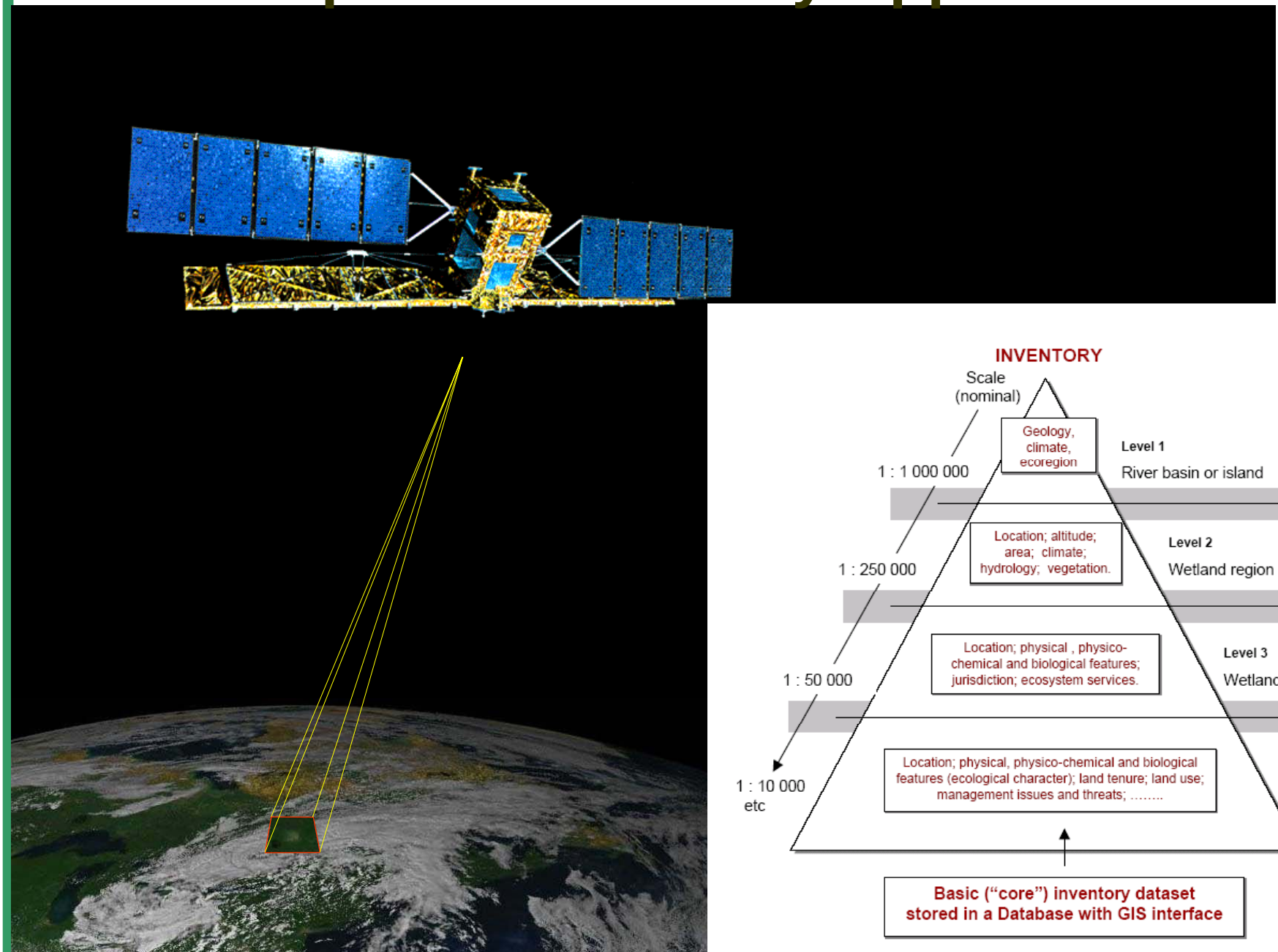
Advances in techniques

- Earth observation since ca.1990 useful for wetland delineation, but many wetland types remain difficult to separate (e.g. peatlands/ wet grasslands, or wetland surfaces below tree canopy).
- Desktop GIS available 1995 onwards
- Web-GIS 2001 onwards

Limitations of existing global data

- Ramsar Information Sheets developed to record baseline data, application of criteria and wetland types present, but;
- No spatial delineation information is held about the wetland within a Site boundary – no spatial change analysis is possible within Ramsar Sites Database
- GIS-based national data on Sites often inaccessible

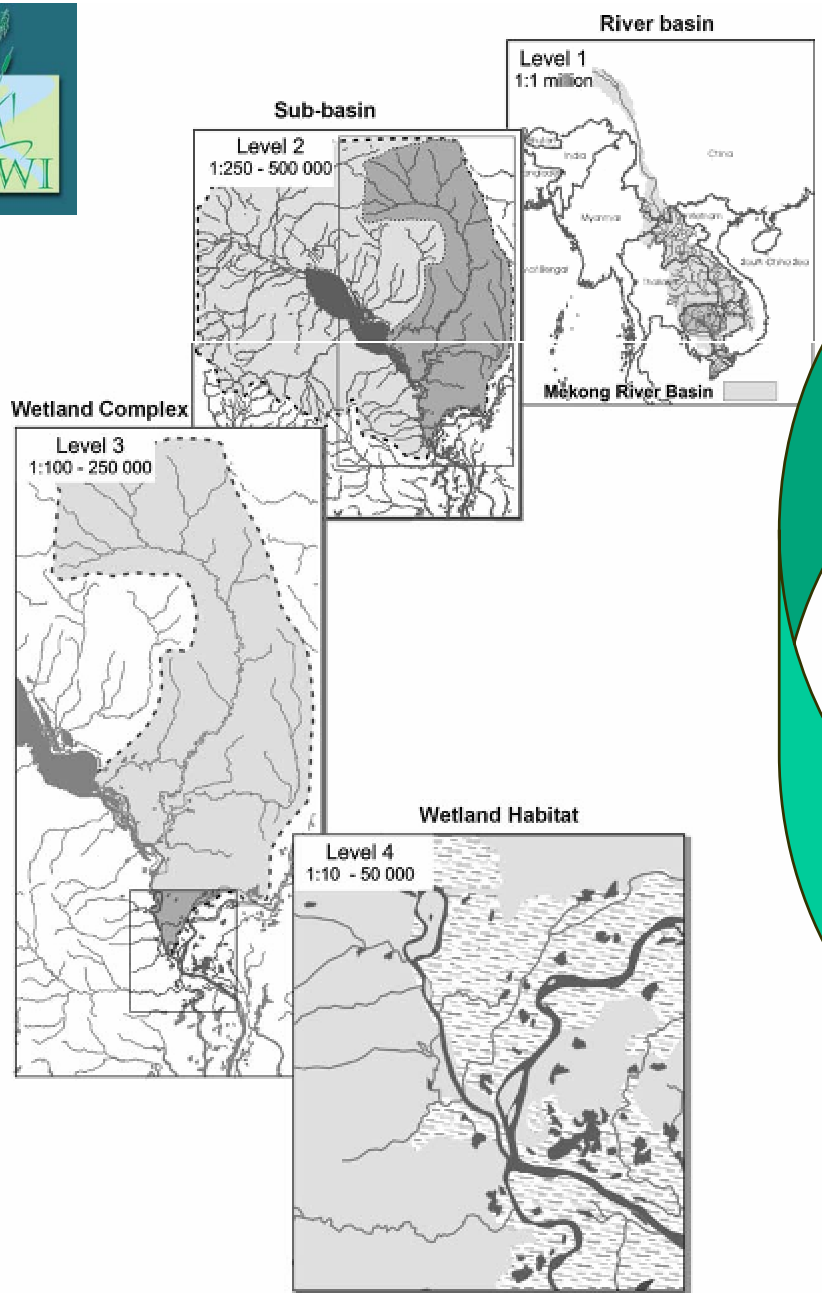
Improved Inventory Approaches



Development of multi-scalar inventory

- Accurate spatial estimate of wetlands
- Methods work at any scale from Site to National level (e.g. Levels 1 to 4)
- Enable area and location of wetland types to be mapped
- Enables change detection (ecological change)
- Suitable for Earth Observation

e.g. Asian Wetland Inventory



Broad scale:

low-cost,
low resolution

Targeted:

high cost,
high resolution

www.wetlands.org/AWI

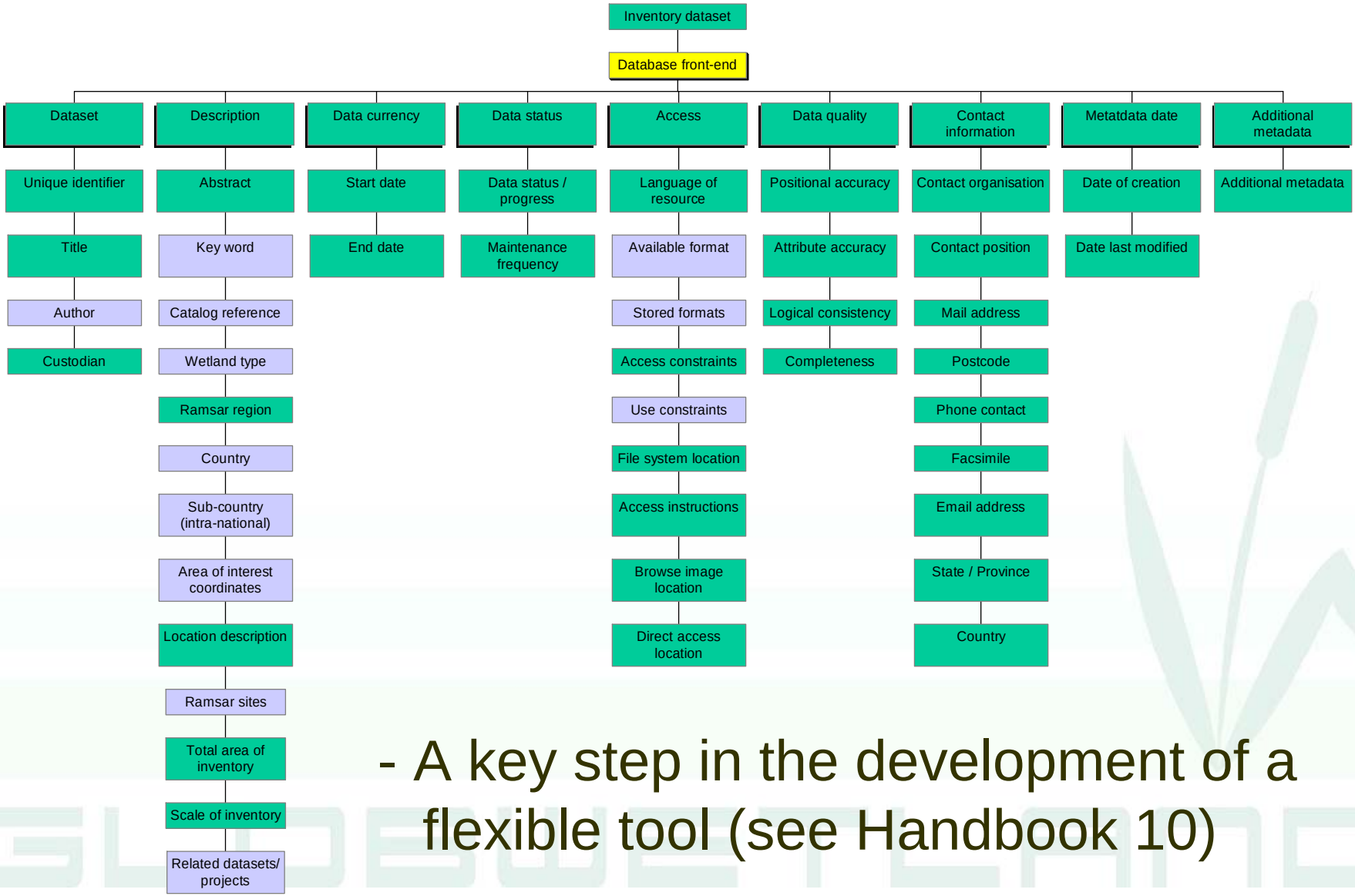
Issues under consideration

- How to delineate (recognise) wetlands consistently?
- What classification system to use for all GW Sites, and the level of trade-off with User requirements?
- Guidance on “recognition unit” and scale of mapping
- Consistency on (wetland) ground data collection

The need for global standards

- Contracting Parties have adopted a global standard for indexing and sharing inventory data: a metadata base adopted as the base for the GlobWetland Information System

Metadatabase adopted at COP8



- A key step in the development of a flexible tool (see Handbook 10)

The need for a Global standard

- For EO based wetland classification, no common standard has been agreed.
- Most wetland classifications rely on ground-based assignments.
- Main systems reviewed in Handbook 10, but there remains a need to link Ramsar wetland types to EO hierarchical (scalar) approach

The “CRamsar” scheme

Aim and need to:

- Develop a multilevel classification that enables EO use at any resolution
- Avoid possible top level misclassification of wetland features
- Integrate Ramsar classes (insertion at L3 according to Ramsar groupings – inland, marine, or man-made)
- Be consistent with L1 CORINE (and below if possible)

CRamsar

CRAMSAR	Corine	LEVEL I	CRAMSAR	Corine	LEVEL II	CRAMSAR	Corine	LEVEL III	8 bit code	R-G-B code
1000	1	Artificial Surfaces	1100	11	Urban Fabric	1110	111	Continuous Urban Fabric	1	230-000-077
						1120	112	Discontinuous Urban Fabric	2	255-000-000
			1200	12	Industrial, commercial and transport units	1210	121	Industrial or commercial units	3	204-077-242
						1220	122	Road and rail networks and associated land	4	204-000-000
						1230	123	Port areas	5	230-204-204
						1240	124	Airports	6	230-204-230
			1300	13	Mine, dump and construction sites	1310	131	Mineral extraction sites [7]	7	166-000-204
						1320	132	Dump sites	8	166-077-000
						1330	133	Construction sites	9	255-077-255
			1400	14	Artificial non-agricultural vegetated areas	1410	141	Green urban areas	10	255-166-255
						1420	142	Sport and leisure facilities	11	255-230-255
2000	2	Agricultural Areas	2100	21	Arable Land	2110	211	Non-irrigated arable land	12	255-255-128
						2120	212/213	Irrigated land inc. Rice fields [3]	13	230-230-000
			2200	22	Permanent crops	2210	221	Vineyards	14	230-128-000
						2220	222	Fruit trees and berry plantations	15	242-166-077
						2230	223	Olive groves	16	230-166-000
			2300	23	Pastures	2310	231	Pastures [4]	17	230-230-077
						2320		Dry pastures???	18	???
			2400	24	Heterogeneous agricultural areas	2410	241	Annual crops associated with permanent crops	19	255-230-166
						2420	242	Complex cultivation patterns	20	255-230-077
						2430	243	Land principally occupied by agriculture	21	230-204-077
						2440	244	Agro-forestry areas	22	242-204-166
3000	3	Forested areas (natural and semi-natural)	3100	31	Forests	3110	311	Broad-leaved forest	23	128-255-000
						3120	312	Coniferous forest	24	000-166-000
						3130	313	Mixed forest	25	077-255-000
						3140		Forested peatlands (Xp)	26	051-204-051
						3150		Intertidal Forested (swamps) [I]	27	051-153-102
						3160		Freshwater, tree dominated wetlands (Xf)	28	000-128-128
			3200	32	Shrubs	3210	323	Sclerophyllous Vegetation	29	166-230-077
						3220	324	Transitional	30	166-242-000
						3230	322	Moors and Heathlands	31	166-255-128
						3240		Shrub dominated wetlands [W]	32	204-255-051
4000	n/a	Un-forested areas (natural and semi-natural)	4100		Herbaceous vegetation associations	4110	321	Natural grasslands	33	204-242-077
						4120	411	Marshes [Sp,Ss,Tp,Ts]	34	166-255-166
						4130	421	Salt Marshes [H]	35	204-204-255
						4140		Alpine Grassland [Va]	36	255-255-153
						4150	412	Peatbogs [U]	37	077-077-255
						4160		Geothermal [Zg]	38	255-204-000
			4200	33	Open spaces	4210	334	Burnt Areas	39	000-000-000
						4220	335	Glaciers and Perpetual Snow	40	166-230-204
						4230	331	Beaches, Dunes, Sands [E]	41	230-230-230
						4240	332	Bare Rock [D]	42	204-204-204
						4250	333	Sparse Vegetation [Vt]	43	204-255-204
						4260	423	Intertidal mud, sand or salt flats [G]	44	102-000-051
5000	5	Water Bodies	5100	52	Marine waters	5110	523	Sea and Ocean	45	230-242-255
						5120	522	Estuaries [F]	46	166-255-230
						5130	521	Coastal lagoons [J,K]	47	000-255-166
						5140		Coral Reefs [C]	48	000-255-204
						5150		Subtidal Aquatic Beds [B]	49	000-204-153
						5160		Permanent Shallow Waters [A]	50	000-153-153
						5170	422	Salines [5]	51	000-236-255
			5200	51	Inland waters	5210	511	Water Courses [M,N,9]	52	000-204-242
						5220		Deltas [L]	53	051-102-153
						5230	512	Water Bodies [O,P,Q,R,Y,1,2,6,8]	54	128-242-230

Artificial surfaces

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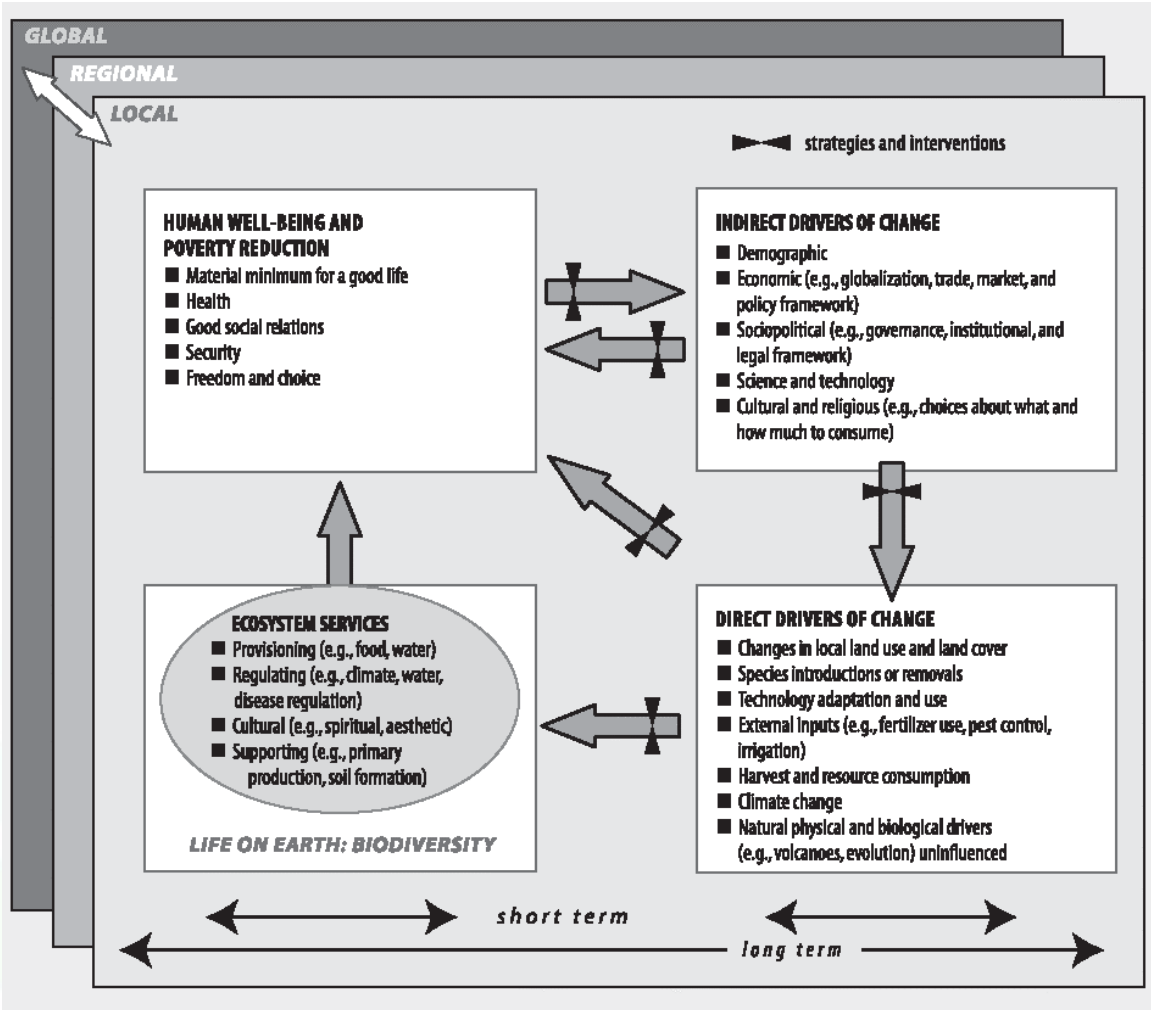
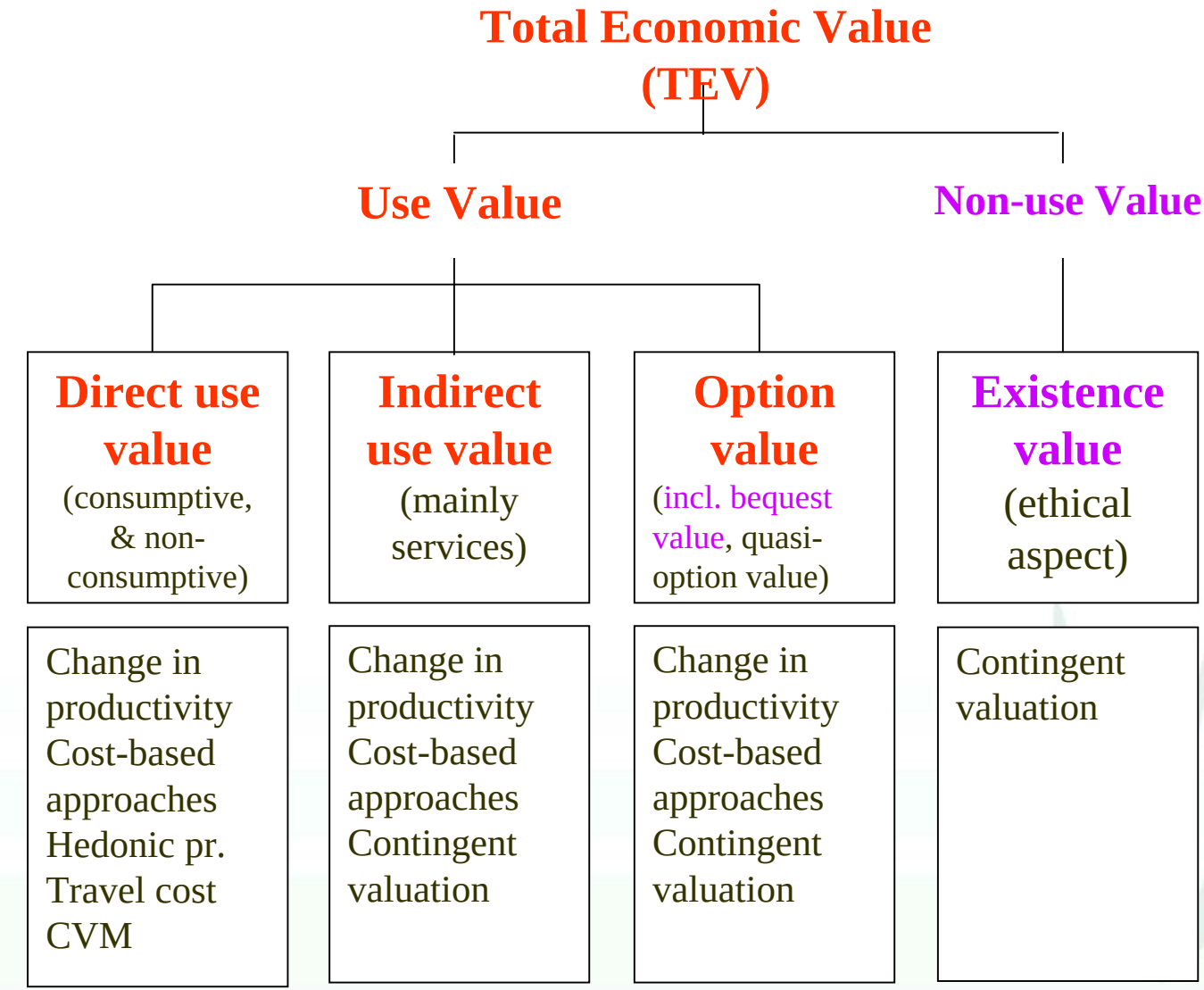
Current / future status of CRamsar scheme

- Through the Prototype Products we are evaluating and refining the CRamsar classification
- May add further levels of detail (L4 on)

MA model for state-pressure etc.



(3) Total Economic Value and Valuation Methods (from MA, 2003)



Economic assessment?

- Key issues are landscape accounting gaps and need to relate CLC to valuation (fuzzy valuation?)
- Stakeholder based valuation