River Sustainability: The SERIDAS Definition and Action Agenda

Second SERIDAS Webinar convened by IWRA, June 17, 2021

Based on:

- Multi-year work by SERIDAS team on ten engineered rivers in arid lands: challenge and response

- Work of Club of Rome/Murray-Darling river authority

Club of Rome Assessment 1

Meadows, *Limits to Growth*, 1972

- Access to arable land for food production has been critically important during all of history.
- Within 30 years there may be a serious shortage: arable land is removed for urban-industrial use.

Action needed: Stop population growth.

Club of Rome Assessment 2

Meadows, *Beyond the Limits,* 1992

Globally water is in excess. But because of the ways we operate and pollute water, world will reach limits of irrigated agriculture within thirty years.

Action needed: Control pollution, improve operating procedures.

Club of Rome Assessment 3

Meadows, *Limits to Growth: The 30 Year Update,* 2004

“Sooner or later (reservoirs) silt up and become ineffective, so they are not a source of sustainable flow”.

Action needed: Shift to drip irrigation. Combat climate change. No mention of removal of sediment.

Club of Rome Assessment 4

Weizsäcker and Wijkman, *Come On!* 2018

“Currently dominant global agriculture is in no way sustainable.”

Action needed: Replace it by “agro-ecology (that) preserves soils and water supplies, regenerates soil fertility and encourages biodiversity. Sequester carbon rather than live on it”.

Club of Rome 50-year summary

- Key challenges identified
- Change farming practices
- Little on river governance

Brian Richter, 2014 (Island Press)

- Build shared vision for your watershed
- Set limits on consumptive water use
- Allocate specific volume to each user, then monitor
- Practice water conservation
- Enable trading of water entitlements
- Subsidize reductions in consumption

These principles are built on the Murray-Darling approach

SERIDAS

- We endorse the Murray-Darling principles—one of ten SERIDAS rivers
- Operationalize by measuring/and repeatedly updating *dependable yield*
- Use dependable yield as yardstick for river management

SERIDAS

A reservoir-dominated river is sustainable when four conditions are met:

1. Dependable yield

Nature’s water supply, averaged over the period of the most severe drought experienced, delivers yield sufficient to meet human and ecological needs.

2. More efficient water use

Water managers and river stakeholders, proactively and jointly, search for ways to use water more efficiently.

3. Adjust

Whenever human or natural changes modify river flow, managers and stakeholders jointly adjust rules for water allocation and use to match the new level of dependable yield.

4. Environment

Define, maintain, or restore prudent level of instream flow.

Tough road ahead!!!

- Needs deep changes of existing management organization and practice
- For example:
  - better conjunctive management of ground and surface water
  - Avoidance/resolution of water conflicts

And most fundamentally:

River management organization:

- Incorporates scientific team competent to determine dependable yield
- Receives authority to balance water allocations between agriculture, cities and environment

On way to achieve these goals: Basin Sustainability Plan

- **Coalition of governing body and water stakeholders drafts and, in ten year-intervals, updates sustainability plan for the river basin.**
- **The plan uses dependable yield as the central yardstick for both technical assessment and recommended actions.**
- **The plan is approved by Congress/Parliament**