

# **Sustainable (?) agriculture and water in California**

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# What does sustainable mean?

**It depends who you ask**

**To many, including me,  
it means the ability to persist  
for a long time**

**Sustainability includes**

**Ecological**

*(environmental)*

**and**

**Cultural considerations**

*(economics, politics, religion, community)*

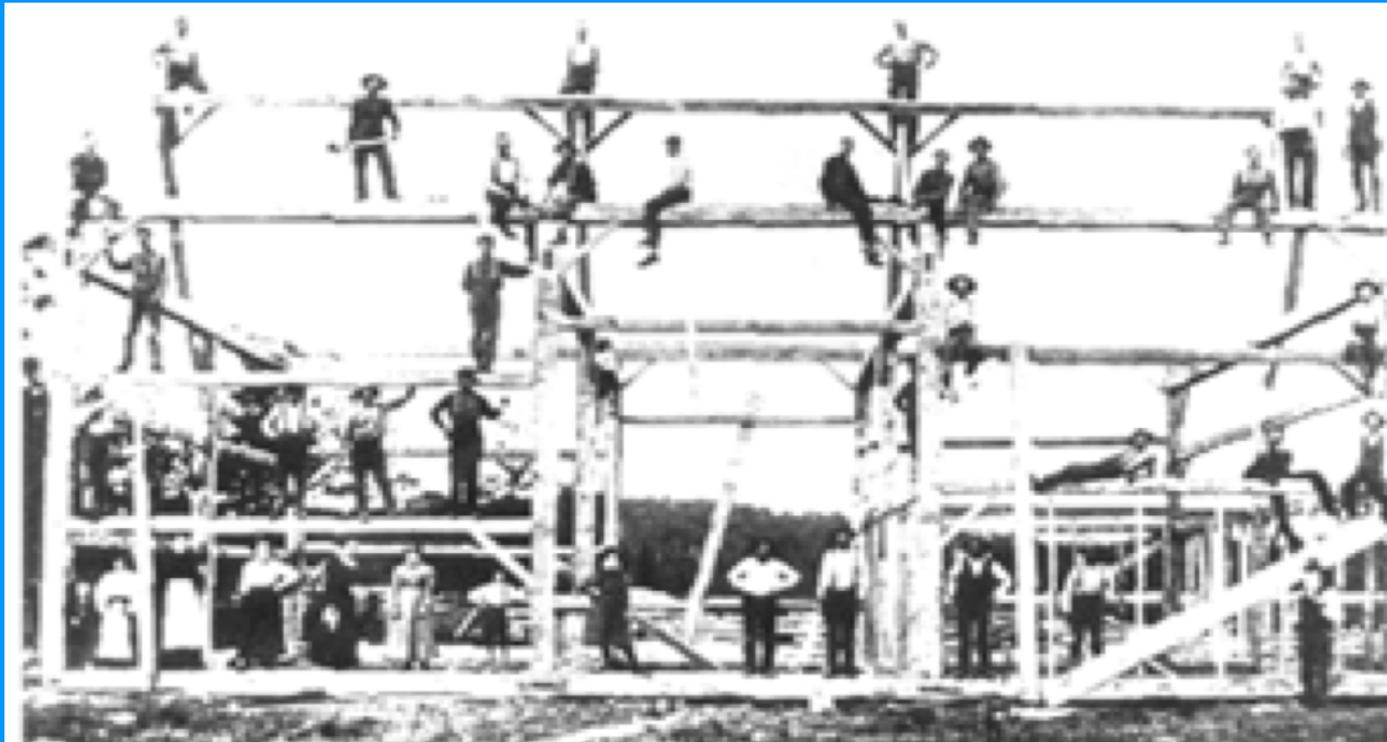
# Several thousand years old



**California's Bristlecone Pines and the creosote bushes of the Mojave desert are examples of ecological sustainability - with young seedlings beneath the patriarchs**

**Zoroastrianism** 2700 years young  
is a sustainable religious group

**The American Amish** offer an example  
of a sustainable cultural/religious group (300 years).  
With the highest retention ever today (~90%)



**With that as background  
let us consider water and  
agriculture in California**

# **The ecological question:** **Is agriculture as currently practiced** **sustainable in California?**

**In many areas it is not**

**Water use exceeds reliable supply, there are drainage problems, salinity buildup, and pollution from overuse of biocides are common**

**The existing water supply system has severely damaged California's native ecosystems, degraded virtually every stream and river, destroyed the once massive salmon runs, and threatens many more**

# The cultural question:

**Is agriculture economically sustainable in California?**

**Many farms survive thanks to enormous subsidies for water and power (often at 10% of true cost), subsidized drainage, Federal subsidies, minimal pollution control, largely uncontrolled damage to ecosystem and species biodiversity, and destruction of valuable services once provided by Nature (flood control, pollution cleanup, oxygen, etc.)**

# An example: rice production in California

Several hundred thousand acres of rice are grown, using up to 3 acre feet of water per acre

*Photo: Tom and Sally Myers*



**California grew rice worth \$485 million (1999-2000) with support of \$480 million in Federal farm payments**

**More than a million acre feet of water with an open market value between \$200 and \$2000 per AF was used**

**California rice consumed between \$200 million and 2 billion dollars worth of water to make \$5 million**



# Can politics save the farmers?

**The farm lobby is powerful, well-organized and has often been successful in defending illogical, expensive and environmentally damaging policies and programs**

**They will resist and slow the change - but the pressure is too great**

**Hundreds of thousands of acres will have to be taken out of production to balance water supply with use**

# **Agriculture in much of California is ephemeral- not sustainable**

**It has always been so - the once profitable farms of Vermont and New Hampshire have vanished into history. The states governments are considering subsidies to keep a few fields open and mowed for scenic values to attract tourists**

**A study of the European Union showed that 1/2 the farmland would fall out of production if some of the subsidies and supports were removed**

**If subsidies and support payments were removed  
much farmland would fall out of production**

**Political pressure and special interest lobbying will slow  
down the process, but farmland abandonment will  
recreate the environmental and cultural problems of the  
Owens Valley and Antelope Valley on a massive scale in  
the Sacramento, San Joaquin and Imperial Valleys**

**It will also create opportunities for environmental  
restoration and recreation of valuable native habitats -  
including the almost vanished California grasslands and  
wetlands**

# The challenges ahead!

- 1. Create fair, visible and free markets for water  
(overcoming water rights problems, political shenanigans, and special interests)**

*We do not really have a water supply problem:  
we have a water allocation problem*

**Making water cost visible should include water meters in the living room or kitchen of every home built from now on**

**2. Develop true cost accounting for water (it is often considered a free good - with charges only for delivery). San Diego has among the highest costs \$700 AF, but prices in Germany (where it rains!) are \$1600 AF**

**The value of Nature' Services must be considered**

**True cost accounting will drive efficiency improvement -- often dramatically**

**When reporting about water and agriculture - follow the money**

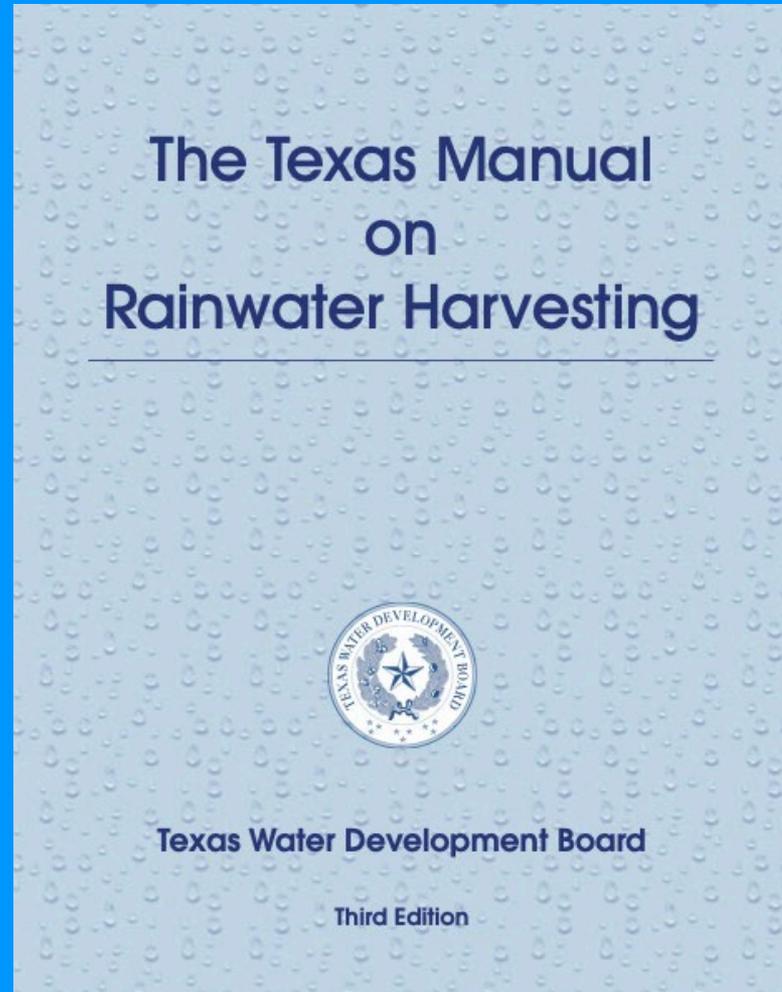
**3. Pay for the Colorado River water we have taken from Mexico, typically 10 -12 million acre feet a year with a value of between 1 and 2 billion dollars**

**Payments could be earmarked for pollution control, water conservation, water harvesting, improved farm water use efficiency and building recycling and desalinization plants**

**4. Optimize water use on farms. Explore new high value crops, halophytes (salt tolerant plants), improved irrigation efficiency and use of reclaimed water**

**My current research is on super-efficient irrigation for restoration. Our current trial is growing trees with 1 liter of water a month using deep pipe, wick, and porous tubes.**

## 5. Promote water harvesting and stormwater capture for urban area agriculture and landscaping



**6. Higher prices will encourage dramatic efficiency improvements (up to 90%) and will encourage more environmentally appropriate landscaping**

**If the Native Americans had conquered England would they graze buffalo on the lawns of Buckingham Palace?  
Raise saguaro cactus?**

# Our use of lawns in San Diego is equally inappropriate



- 7. Develop reclamation plans and programs before land is abandoned and irrigation systems are dismantled.  
Fallowed land in arid areas does not recover quickly - it may take a thousand years without intervention  
Bare soil can lead to big dust storms and respiratory illnesses, including coccidioidomycosis.**
  
- 8. Develop retraining and relocation programs to assist both farmers and farm workers adjust to new realities**

**9. Provide effective and continued support for water allocations to Nature to protect biodiversity, support ecological services and to protect future generation's options and opportunities**

**10. Protect taxpayers and water users from more outrageous water payment schemes - where water is sold to the farmer and then resold to cities at cost multiples (or tie water profits to land restoration)**

**11. Provide meaningful and accurate information on water supply, use, cost and efficiency improvement in schools and colleges with demonstrations regionally or in every community.**

***The Casa del Agua in Tucson is an excellent example.***



**What will Global Change bring?**

**Hotter and drier is not a  
comforting trend!**

**What else?**

- **Increased fungal pests!**
- **Increased pressure from alien pest species**
  - **Increased migration pressure**
- **Severe storms, flooding, wind damage**

## A Turkish proverb

- *Millions of men have lived without love - none have lived without water*



Prospector remains Thermal Canyon