



Issues in Coastal & Continental Water Quality in Chile

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Issues

- Policy set by Chili on quality of coastal waters?
- Do standards set on waters rejected by wine industry yield
 - Environmental improvements
 - a significant water supply suitable for other sector/users?



General considerations...

- Chile has a peculiar geography...relevant to understanding water issues in the country
 - 4000 kms long, only 200 kms wide
 - Latitude 18 to 56 south!! (Senegal to Scandinavia)
 - Steep country, due to Andes Mountains (6000 mts)
 - Significant stock of ice in Andes mountains
 - Variety of climates & rainfall (tropical, desertic, mediterranean, temperate/cold rainforest, tundra-like in Patagonia).
 - 18% of surface is protected, which includes many rivers, lakes and coastal areas.



Implications of Geography

- 1. Diversity of types and severity of water issues:
 - Short supply and low quality in the dry north
 - Fairly abundant water in Center/Southern regions,
 - Some quality problems in central regions (wine industry), and some coastal areas (urban residues)
 - Good quality of surface waters in south, but localised quality problems in coastal areas in the south (Salmon industries)



Implications (cont...)

- Long distances, steep & rugged landscape makes hard/expensive to move water around.
- Perhaps not justifiable in center/southern regions due to fairly large water supplies



Water Quality Regulation in Chile

- Primary (human health) vs. Secondary (environmental, biodiversity, wildlife) water quality regulation.
- Primary water quality regulation regulates only quality of water for human consumption & irrigation.
- Secondary water quality NOT regulated directly, only indirectly through regulation of *emissions* to coastal & continental waters
- Yet, water quality is *monitored*...
- Emission standards are not site-specific, but the same everywhere!
- Hence, variety of river flows & density of emission sources yield diversity of resulting surface water quality,.
- ...and yield localised (not generalised) water quality problems...



Why no secondary water quality regulation?

- In contrast with air quality regulation in Chile, the latter has been defended as a “public health problem”.
- But, most Chilean population has access to potable water (99%) & sewage (95%), (with subsidies to the poor & programmes for rural areas), and treatment of used waters (80%).
- Hence, advance in setting standards for water quality beyond human consumption (secondary use) has been slow, as it is not seen as an urgent matter of public health.
- However, currently there is some advance towards development of secondary water quality standards, site-specific.
- Joint with Integrated Water Management by Basins & Regions



Policy for quality of coastal waters

- As mentioned, no direct policy for coastal water quality...
- However,
 - Decree 90 regulates emissions on ground and coastal waters
 - Environmental Impact Assessment for new projects since 1994 Environmental Law
 - “Clean Production Agreements” by Salmon producers since 2002 (involving growing & processing). About 80 % of industry.
 - 18 % of national surface is protected, which includes many coastal areas.
 - 4 new Marine & Coastal reserves (2005 National Biodiversity Strategy)
 - Zoning & identification of vulnerable coastal areas (Biodiversity Strategy).
 - Special regulation for Salmon Producers
 - Treatment of waters rejected to the sea by mining companies in the north
 - Partial treatment of urban waters in main coastal urban areas & redirection deep into the sea (Valparaiso, Vina)
- In this manner, some advances in quality of coastal waters have been possible...



But...

- Doubts about enforcement, compliance and effectiveness of regulations
 - No real follow-up of implementation & impact of recommendations of EIAs
 - Nearly 50% of non-compliance with Decree 90 (emissions regulations) and Clean Production Agreements
- No real national strategy against spills of oil (& other substances)



Wine Industries

- Again, no direct secondary regulation of water quality, but of emissions to rivers, lakes & seacoast.
- Some localised water quality problems in some wine growing regions...
- Environmental Impact Assessments
- Clean Production Agreement, since Sept. 2003.
 - Efficient water use
 - Treatment of liquid residues
- Again, issues of enforcement and compliance...nearly half aren't complying with legal emissions standards...



Can water rejected be reused elsewhere?

- The regulations of emissions require treating used waters in wine industry to meet standards.
- Quality of Water for irrigation is also regulated
- But standard for waters released to rivers are higher than standards for irrigation, as in the latter case the “treatment” is completed by soil & plants.
- Accordingly, treatment is cheaper for water reused in irrigation, which create an incentive to recycle water rejected by wine industry.
- Wine firms often have neighbouring fields with vines, where treated waters can be reused.



How significant is recycling of water?

	Emissions of Liquid Industrial Residues	Emissions of Treated Liquid Industrial Residues
	(% of firms)	(% of firms)
Sewage	80	48
Surface Waters	18.4	34
Irrigation	2	13
Underground Waters	1.7	6

- Consider that 50% of wine industry does not comply with emissions regulations!



Relative size of liquid residues

Wine-producing Region	Water Consumption in Agriculture	Liquid Industrial Residues Flow
	m ³ /s	m ³ /s
IV (Center North)	39	0.3
V (Center)	40	1.3
VI (Center South)	148	2.1
VII (Center South)	176	1



In conclusion...

- Water treatment and recycling in wine industry is still low
- Amount of recycled water is marginal relative to actual water use in agriculture.
- Benefits of recycling waters are mostly associated with avoiding water pollution, not much with creating a water supply for other uses.
- In most of central-southern wine-producing regions the issue of water availability is not a central issue.
- Moreover, water markets in general Chile show few transactions, and mostly happen among neighbouring estates. This reflects;
 - Relative large supply of water in most parts of the country (except the North)
 - Difficulties of transporting waters due to geographical factors (long distances, slopes, rugged terrain).
- Yet, recycling waters may yield both environmental & water supply benefits in some parts of the drier northern wine-producing regions.
- As enforcement of emission regulations increases, incentives for recycling waters for irrigation should increase (non-compliance is often profitable today)

