Gendered Adaptation to Water-Climate Challenges in Home Gardens and Small Orchards in San Ignacio, Sonora, Mexico

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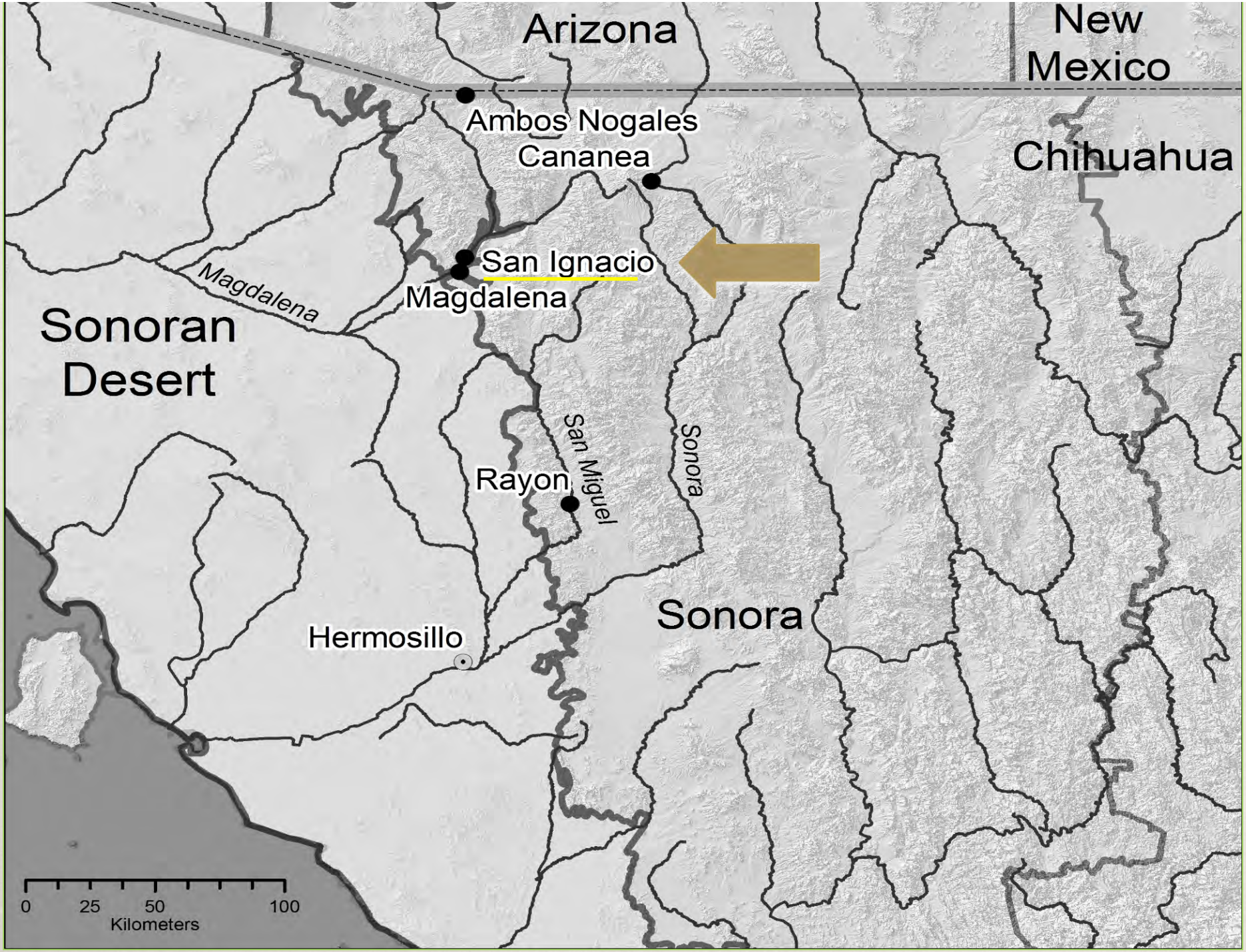
Arizona
New Mexico
Ambos Nogales
Cananea
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San Ignacio
Magdalena
Magdalena
Sonoran Desert
San Miguel
Sonora
Rayon
Sonora
Hermosillo
0 25 50 100
Kilometers

Farming and Rainfall in Sonora

* Both rainfed and irrigated agriculture depend on rainfall.

Changes in Precipitation

⋆North American monsoon provides up to 70 percent of NW Mexico and neighboring U.S. SW's annual rainfall.

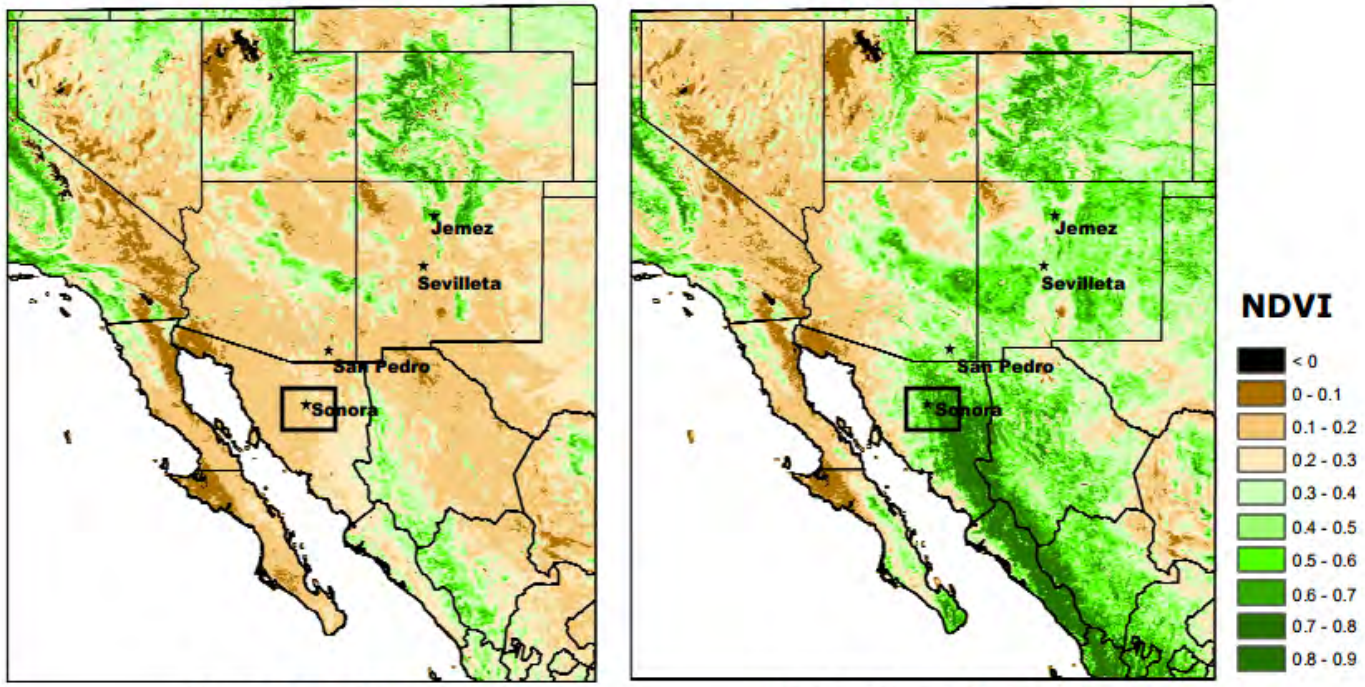
- ⋆ Monsoon rains waters crops and rangelands for approx. 20 million people (Vivoni et al. 2007).

⋆A study by Cook and Seager (2013) predicts that future monsoons will arrive later in summer and rising temperatures will lead to greater evaporation harming agricultural productivity.

Vegetation in Sonora before/after Monsoon Rains

Source: Vivoni et al 2007

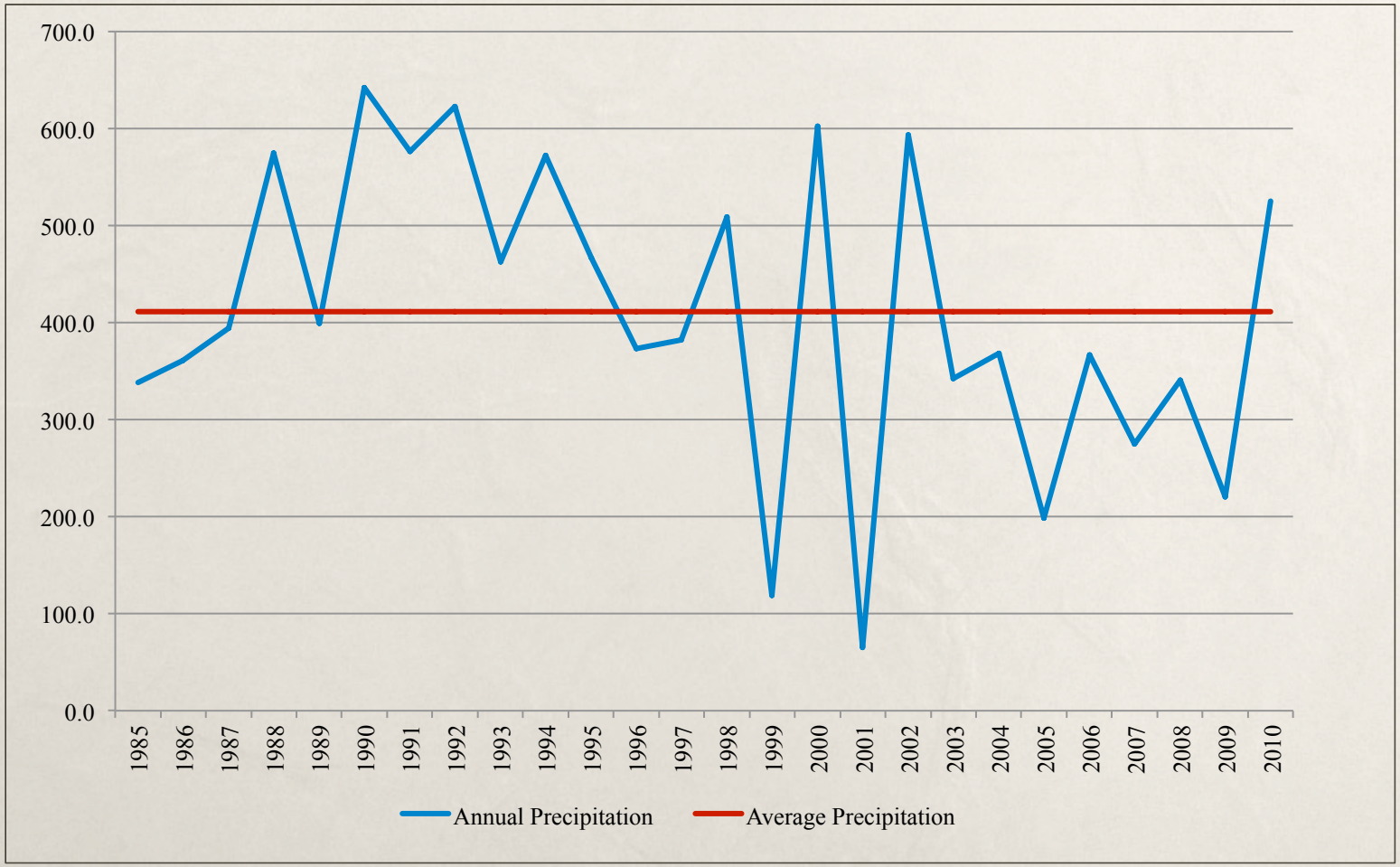
Precipitation during the NAMS leads to a strong vegetation response consisting of leaf-on of subtropical deciduous species over the complex topography in western Mexico.



June 1, 2006 **September 1, 2006**

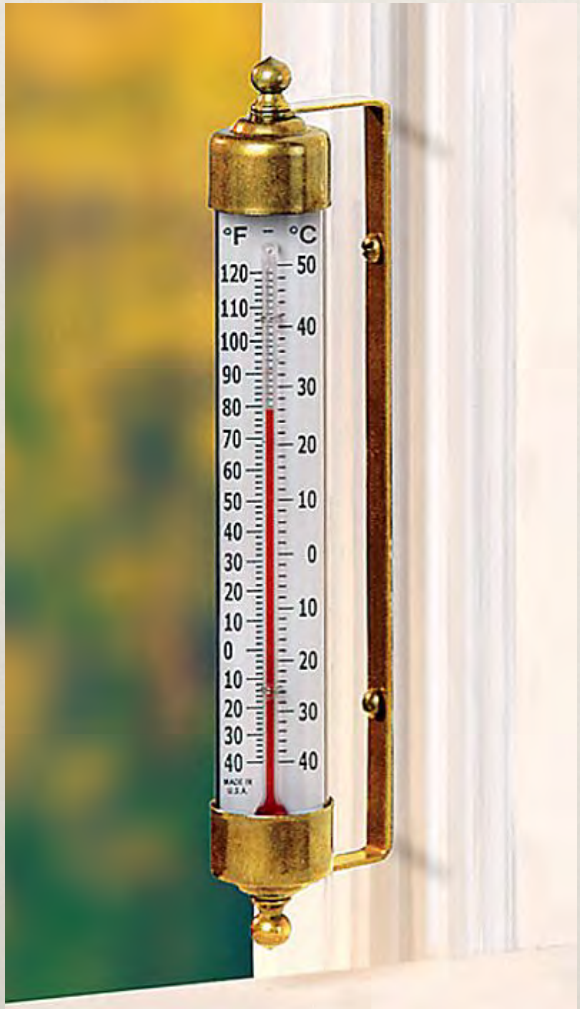
SPOT VEGETATION 2 Product, 1-km resolution
10-day composite, Normalized Difference Vegetation Index

Annual Average Precipitation Nogales, Sonora 1985-2010 showing multi-year drought



Source: CONAGUA 2011

Rising Temperatures, Declining Rainfall



The Intergovernmental Panel on Climate Change predicts temperature increases of 3.5 to 7° F by 2050.

More days of 100 F and above.

Possible decline of 5 to 8 percent in rainfall for the Northwest Mexico-U.S. western border region where monsoon exists.

Fruit production in Sonora

- Rising percentage of government assistance in Sonora is for non-food crops
  - Most SAGARPA for fodder crops like alfalfa, which is highly water-intensive.
  - Thus many more hectares of land planted with animal feed crops than fruits and vegetables.
  - Extension services in general and SAGARPA's budget experienced deep cuts over several decades with only slight recuperation in 2015.

San Ignacio, Sonora

~Springs (linked to river; lower H_2O levels)

~ Wells (linked to river; groundwater table decline)

~ Intermittent river

Fruit and Vegetable Production and Processing in San Ignacio

* Agricultural production is gendered
  * women's locus: within home compound
  * men's locus: larger parcels of land away from homes.

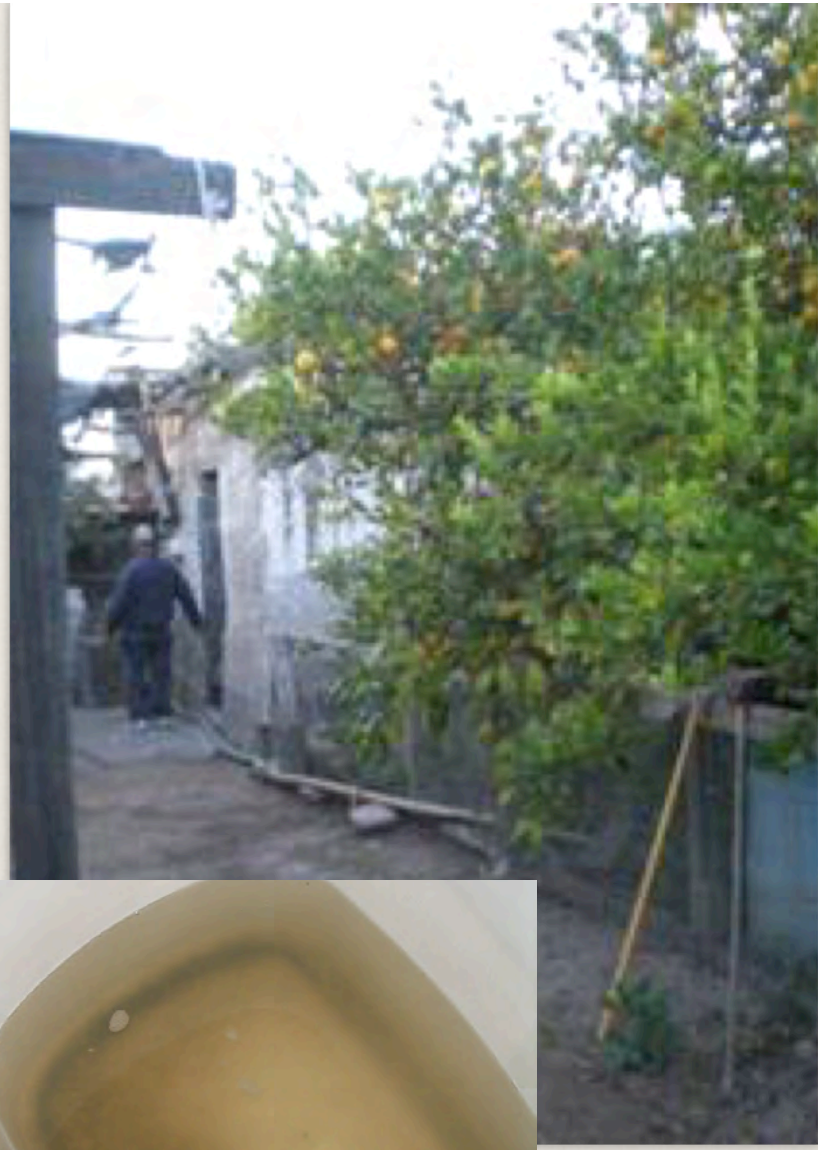
* Home production of jams and canned, candied fruits, pickled vegetables and olive products- women's spheres of agricultural processing

Gendered Agricultural Production
Women farm fruit orchards adjoining homes

Irrigation of Home Gardens

Women use, e.g.:

* Greywater from kitchen
* Greywater from washing machine
* Water from own or neighbor's drinking water well (sometimes stored in rooftop tank)
* Municipal water



Women's agricultural production is invisible to policymakers

Gendered Agricultural Processing
Canned fruit, jam; pickled vegetables

Olives-in brine

Figs-jam

Peaches-canned

Lemons-candied

Nopales-pickled

Fruit product marketing

Sold from: homes, small stores

Sold to: vendors on roadside stands; municipal markets in Hermosillo and Nogales; supermarkets regionally

Canned and Candied Goods Foster Cultural Connections, Continuity

Canned, Candied Goods Foster Cultural Connections and Continuity

Environmental Challenges and Responses

Women's Adaptation Strategies in San Ignacio

* Reintroducing tree species such as plums in home compounds as an experiment.
* Purchasing inputs like olives and quince from other communities in region.
* Altering water sources and water storage methods.
* Diversifying crops and other income sources.

Policy Implications

- Decline in water resources and variable temperatures harms crop production and processing.

- Production and processing within home compounds has been an invisible space policywise.
  - Women: major actors in food production and processing; crucial for household, community and regional food security

- Critical to learn from women's knowledge and provide support to help them build on their grassroots adaptation strategies that confront water-climate challenges.

Publications on San Ignacio, Sonora

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Routledge

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