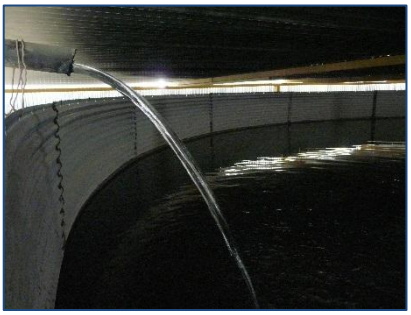
COUNTRY:
CHILE



SOLAR POWERED IRRIGATION SYSTEMS – COUNTRY CASE STUDY LA TIRANA

Geographical Location:

- La Tirana, Pampa Tamarugal
- Latitude: 20°18'16" S
- Longitude: 69°37'50" W
- Altitude: 1,000 m

Specific Site Conditions:

- Climatic condition: arid
- Farm is located in remote area, not connected to public grid
- Farmer is used to working with diesel generator sets (used 150kW generator before)
- Irrigation water is provided by two deep-wells from which a covered 200 m³ reservoir (made of corrugated iron sheet) is filled
- Farm is one of the first having a solar tracking system

Salient Features of Solar-powered Irrigation System:

- 1,0 kW_p PV generator on one-axis tracker
- Daily mean water output: 28 m³/day
- Pumping Head: 33 m
- PV pump already provided 30,000 m³ of water within 5 years
- Drip irrigation system with manually perforated tubes (1/2"), very high water discharge due to large boring approx. 20 – 25 gph
- Water supply by gravity with satisfactory uniformity of water distribution, but risk of over-irrigation/water losses

System Costs / Financing:

- PV system: 7,470 EUR
- Irrigation system: approx. 1,500 EUR
- Water storage tank: approx. 3,500 EUR
- PV system financed by: Compañía National de Energía (CONADE) and Ministry of Energy (MoE) based on 90% subsidy and with 10% own equity of farmer

Farming System / Cropping Patterns:

- Horticultural farming
- Main product: Pomegranate (5 different varieties) with pilot production of liquor
- Farm size: 50 ha, currently only 1.2 ha under irrigation, planning to extent grenadine cultivation to 18 ha
- Good water quality but sandy soil with high salt content
- Crop rotation: Perennial tree crop, rotation 7 – 10 years
- Low maintenance tree crop management, no fertigation (fertilising by manure application 1 – 2 times a year

Experiences / Lessons Learnt:

- Further processing and refinement of Pomegranate fruits is promising
- Building a tank from corrugated iron sheets is an easy and appropriate solution for Chilean farms
- Irrigation by gravity at a pressure of 0.3 bar is possible and reliable
- Irrigation management and low quality rip equipment causes risks with regard to soil salinisation
- Difficulty to find farm workers in remote areas (high salary expectations around 20 EUR per day)

Promoting and Planning Bodies:

- System financed and promoted by CONADE and MoE
- Supported by Universidad de Chile
- System integrator: Arica Solar, Chile