

# RAISING RURAL INCOMES

## WITH LOW-COST WATER TECHNOLOGIES

Poverty and abject poverty along the Pacific Coast of Nicaragua amounts to respectively 65% and 28%, and occurs most frequently on farms of up to 7 ha. The presence of a well on farms in this range can double income, whilst the use of a 60US\$ Ropepump raises family income by an average of 220US\$. A major part of the income is derived from the so called patio and given the right conditions (incl. access to a market), a well with a hand pump and a low pressure irrigation system can be a lasting solution to poverty.

The Nicaraguan NGO, CESADE\*, is active in the “dry” tropics of Central America and aims at poverty alleviation under ecosustainable conditions. Its approach includes the use of low-cost technology such as hand-drilled wells, Ropepumps and low-pressure drip irrigation. Activities of organizations like Cesaede led to the fact that there now are some 50,000 hand Ropepumps and several thousands of wind-, animal, and motor driven Ropepump models in this region.

Together with a local University, CESADE investigated environmental and socio economic trends in rural areas in Nicaragua with the purpose to adjust future policies to local reality. Information was gathered from 5025 families among others indicating the relationship between poverty and the presence of water and a pump on the farm. Based on farm income alone, poverty (less than U\$425.- per capita) amounts to 77% and absolute poverty (less than \$210.-) to 54%. Based on total income, poverty and absolute poverty amount to respectively 65% and 28%. The difference comes from off-farm employment. The regions surveyed more or less give an indication of the poverty in the rest of the dry tropics of Nicaragua.

TABLE 1: FARM INCOME ACCORDING TO PROPERTY SIZE WITH AND WITHOUT A WELL (US\$)

Property in Manzanas (Mz)*	North of Chinandega			La Paz Centro and Nagarote		
	Well	No well	% incr.	Well	No well	% incr.
0 – 1				649	521	25
1 – 2	750	550	36	855	723	18
2 – 4	1242	965	29	2069	1075	93
4 – 6	1594	1206	32	1386	881	57
6 – 10	1777	1404	24	1787	1628	10
10 – 20	1541	1772	-11	2423	1597	52
20 – 30	2636	2048	29	2567	1192	115

\* 1 manzana = 0.7028 ha

## Impact of a well and a water pump on farm income

The impact of water in terms of farm income can clearly be seen in Table 1. In the Province of León, poverty still prevails on properties larger than 21 ha. In the North of Chinandega poverty disappears from 14 ha upwards when there is a well, whilst in La Paz Centro and Nagarote this already occurs at 7 ha.

Of the farm owners with less than 7 ha only 10% have a well, whilst for farms between 7-14 ha this is 55%. Though these figures do not take into account the differences between terrain, lithology, and depth of the groundwater table, it is clear that the smallest land owners can ill afford the cost of a conventional well, which lies between U\$200.- and U\$1000.- Therefore the introduction of low-cost well drilling with the Stonehammer, that can reduce cost 20-60%, is self evident.

This also applies to the hand Ropepump, which at a cost of US\$ 60.- raises average income by U\$220.- as compared to farms without a pump, even if this pump is mainly used for domestic purposes.

## Water and gender

Up to 40% of the income obtained from small properties comes from the so called "patio". (A "garden" around the farm house of 900-1800 m<sup>2</sup>, with fruit trees, firewood species, and shrubs. Within the area one finds a dozen or so of chickens, pigs, herbs like basilicum and mint, the washing area, the social area, and perhaps a well and a latrine. ) The patio in general is the domain of women, and income derived from it is exclusively theirs to spend. Contrary to men, spending priorities of women often are food, health, and children's education. It is further worth noting that 40% of the properties in the range of 0.5-1.5 ha belong to single mothers. For them access to water can mean an increase of income of 100% or more, not to mention the time saved on obtaining water elsewhere for washing, cooking, and cleaning.

## Role of low-cost technologies for poverty reduction

In many situations in Latin America there are conditions similar to Nicaragua with good soils, enough ground water and ready markets for products.

The before mentioned investigation shows that a patio of 1800m<sup>2</sup> with a well a pump and a low pressure irrigation system can easily produce an annual gross income of U\$3500 at an investment cost of U\$837, and a recurring annual cost of U\$760. \*\* The 3 hours daily labor that are needed are not included.

A net annual income of U\$2740 puts a family of 6 above the poverty line of U\$2550. This indicates that besides other aspects, the introduction of low-cost water technologies can play an important role in the reduction of rural poverty.

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\*\* Considering a groundwater table of 10m. At 20 m water quantities are 50%

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More info on Low-cost technology on [www.Practicafoundation.nl](http://www.Practicafoundation.nl)