

Rural incomes increase with low-cost water technologies¹

Summary: A socio-economic survey in Nicaragua shows that, under the right conditions such as market access, a well, a pump and a low cost irrigation system can be a lasting solution to poverty. 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 additional 220 US\$. A major part of the income is derived from the so-called patio.

Introduction

The Centro de Estudios y Acción para el Desarrollo (CESADE, cesade@ibw.com.ni) is a Nicaraguan NGO that is active in the dry tropics of Central America and aims at sustainable poverty alleviation. It promotes the use of low-cost technologies such as manual well drilling, rope pumps and low-pressure drip irrigation. In Nicaragua there now are around 50,000 rope pumps, produced commercially and installed on both communal and domestic wells. The choice for hand ropepumps instead of traditional piston pumps increased rural water supply in Nicaragua from some 28 to over 50% in a few years, (3 times faster than other Latin American countries). CESADE developed the combination of rope pumps with a windmill, animal traction, electric and gasoline motors. With the UPOLI University, CESADE carried out a socio-economic survey among 5025 families living in the dry tropics. It was found that 65% of the respondents were poor (less than 425 U\$/person) while 28% suffered absolute poverty (less than 210 U\$/person). The study area is representative of the rest of the dry tropics of Nicaragua. The survey indicates the relationship between poverty and the presence of water a farm.

Table 1: Farm income according to property size with and without a well (u\$)

Property in Manzanas (1 mnz = 0.7028 ha)	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 This paper is based on the article "The impact of farm water supply on smallholders income along the Coast of Nicaragua" by J. v. d. Zee, A Fajardo, H. Holtslag., which was presented at the SIMI workshop (Global initiative for small-scale irrigation) in Switzerland, May 2002.

Impact of wells and water pumps on farm income

Table 1 shows that 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%. The study also showed that **farms with a US\$ 60 hand rope pump for domestic use, have an average of US\$ 220 more yearly income than farms without a pump.** However some 90% of the small farmers do not have a well and can ill afford the cost of a conventional hand-dug well, which lies between U\$ 200 and U\$ 1000. To improve this situation CESADE, supported by the Dutch organizations ICCO and PRACTICA, are introducing the “Rotation sludge” and “Stonehammer” methods of manual well drilling. These technologies that originate from Asia and were improved in Nicaragua, can reduce cost of wells 30 to 70%.

Water and gender

Up to 40% of the income obtained from small farms comes from the so-called “patio”. This is a home garden of 900-1800 m², with fruit trees, firewood species, a dozen or so chickens, pigs, kitchen herbs like basilicum and mint. It also accommodates the washing area, the social area, and sometimes a well and a latrine. Generally, the patio 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 in income of 100% or more, not to mention the time saved by the availability water for washing, cooking, and cleaning on the patio.**

Role of low-cost technologies in poverty reduction

Several regions in Latin America have conditions similar to Nicaragua with good soils, ample ground water and ready markets for products. The study demonstrates that a patio of 1800 m² with a well, a pump and a 700-1400 U\$ low-pressure irrigation system, can produce an annual gross income of U\$ 3500 at an investment cost of U\$837 and an annual recurring cost of U\$760 (considering a groundwater table of 10m. At 20 m water quantities are 50%. The 3 hours daily labor are not included in this analysis). A net annual income of U\$ 2740 puts a family of 6 above the poverty line of U\$ 2550.

This indicates that **the introduction of low-cost water technologies can play an important role in the reduction of rural poverty.**