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Traditional hand-drilling tools of Orissa

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Indian Decade Programme is by and large, a continuation of the similar programme by the Public Health Engineering Department and its equivalent that began with the Bihar Drought of 1967. These programmes, particularly in the southern peninsular states (area south of entire Ganga valley) began as drought-relief measures to provide drinking water in the rural areas. The borewell and handpump device chosen for the Indian villages are although quite simple technological tools - the handling of this technology has rather proved that the programme of past two decades have created a cleavage between the locally existing technology of slow drilling devices of various types and the alien technology of fast rigs that more or less invaded the scene during the past 20 years.

The technology of drilling tubewells existed all over India in the form of hand boring - particularly for the soft formations. Only few of them, are known to the outside world, e.g. the 'Bamboo scaffolding (hydraulic percussion) methods used in Bengal delta (Ref) and 'Bamboo tubewells' of Bihar driven by the hand boring methods. Less known are the hand percussion tools of various designs that work both in the Gangetic valley as well as in the crystalline rocks. CALYX drill, a semi mechanised form of rotary drilling are extremely effective and versatile even today. The hand boring techniques of Orissa are labour oriented and simple. They are effective in many respects. The local groups have the basic knowledge and confidence to carry out the job. The technology is easily acceptable by the rural community as they understand & grasp it. The tools can reach even the most un-accessable areas and a number of these units can be mobilised to

participate in the large drinking water programmes. Apart from its being slow - all other inherent weaknesses of this drilling technique can be overcome by inducing a few new scientific and technological supports. The marriage of modern scientific/technological ideas with the traditional technology is highlighted in the present paper. The programme has been supported by the Danish International Development Agency (DANIDA).

The support scientific and technological package chosen to upgrade the technology of hand borings consist of (i) identification of fresh & saline layers by conducting electrical logging of the bore (ii) reaming to ascertain proper fixing of well assembly (iii) use of developed drilling gels in the most collapsing formations and wherever else necessary (iv) sealing to protect fresh water layers from the salinity and (v) back washing and surging of the borewell properly to develop it into a drinking water well.

The use of traditional technology may not be cheap at least as far as the financial schemes of the implementing agencies are concerned. All these additional support measure obviously add cost to the total job which works out to be only marginally less than the prevailing cost of the job by the fast drilling machines. Yet using this traditional technology has its advantages. Some of these advantages are realistic only in the Orissa context but some of them undoubtedly are universal for example :

- (i) It brings a wider group of local community to participate in the programme in form of skilled and unskilled labours.
- (ii) The users/beneficiaries of the installations (tubewells and handpumps) find this

approach favourable for their easy adaptation.

- (iii) More local people get employment.
- (iv) It promotes self help measures which in turn may help effective maintenance of the installations.
- (v) It also promotes less utilization of petroleum based consumables.

The methods, techniques and technical data has been presented in the main text of the paper