

## Socially equitable mechanisation in Nepal

The Nepalese government's policies concerning mechanisation of agriculture generally warn that it could lead to large rural unemployment and therefore only labour intensive technologies should be promoted. This policy has led to only a few mechanization projects in the public sector while the fairly active private sector moves forward introducing whatever technologies they felt were marketable. This has resulted, writes Scott Justice and Stephen Biggs, in Nepal following a "western" pattern of mechanisation that looks more like that of the Punjab rather than the "AT" pattern of Bangladesh.

The Punjab pattern of mechanisation, occurring mostly in the Terai (plains) areas of Nepal, is distinguished by the importing of 25 - 45 HP 4-wheel tractors over the last 25 years, and more recently, combine harvesters in the central and western Terai (the eastern Terai differs slightly in that instead of combines there are stationary wheat/rice threshers). Imports into Nepal of four-wheel tractors are averaging 1,500 per year.

In the mid-seventies and early eighties there were two Japanese International Co-operation Agency projects that promoted Japanese two-wheel tractors. In the decade that followed the private sector imported approximately 2,000 Japanese, Korean and Chinese two-wheel tractors. These two-wheel tractors went mainly to the Kathmandu and Pokhara valleys. In 1993 the city governments of Kathmandu and Pokhara banned further imports into the valleys, as the city administration perceived that the tractors were being used primarily in the construction industry for haulage purposes. As the importers felt that the only markets for two-wheel tractors were these two valleys the imports ceased. Though they are older and neglected mechanisations systems, with 20 year old two wheel tractors still plying the fields and roads, they are in fact part of very viable and sustainable mechanisation innovation systems, which are rapidly expanding. Recent analysis has shown that the two wheel tractors in the Kathmandu Valley are owned by rural entrepreneurs who provide in the market a wide range of agricultural and haulage services. Some stakeholders in the "new" power tiller programmes on the terai are now recognising that they have a lot to learn from this dynamic in-country capability.



*Photo 1: Women and girls labourers, sickles in hand, watching a combine harvester in Kalpilvastu District of Nepal*

Bangladesh

An alternative to the “Punjab” pattern of mechanisation is a process that has been occurring over the last 15 years in Bangladesh. This rural mechanisation process (also private sector directed) has been led by the import of 300,000 or more Chinese two-wheel tractors and perhaps 4-5 times as many small HP light weight water pump sets. Currently, imports of four-wheel tractors are only about 400 per year, and are mostly used for hauling. This has led to a unique situation in south Asia where Chinese two-wheel tractors are responsible for more than 70 percent of cultivations (as compared to India’s 30-40% and Nepal’s less than 20%). Additionally, many people consider the Bangladesh mechanisation process to be pro-poor as the two-wheel tractors are much more affordable, can service much smaller and more fragmented holdings, and have had favourable effects on pro poor agricultural and rural development (Mandal, 2002).

The basic power source is the Chinese 12 - 15 HP Chinese two-wheel tractor (made by up to 10 or more factories in China), which rural entrepreneurs and small farmers in south Asia find much more affordable as compared to the Korean, Japanese or Indian products. In addition, their attachments such as trailers, rotovators, reduced till-drills (Photo 2), strip till-drills, zero till-drills, and bed planters can be made in local workshops and factories in south Asia.



**Photo 2:** *Belwa Agricultural Mechanisation Committee posing with their new Chinese two-wheel tractor and reduced till-drill.*

Since 1990, the International Maize and Wheat Improvement Centre (CIMMYT), its partners in the National Agricultural Research Systems and other local and international actors have been collaborating in a range of projects to promote conservation in tillage, crop establishment and harvesting machinery. In many respects they have tried to replicate the Bangladesh pro-poor mechanization process. This coalition of projects and partners is helping to bring about a change in the way Nepalese farmers prepare their land, sow their seeds, transport their goods, thresh their crops, pump their irrigation water, cut their rice, etc.

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In 1989, the first CIMMYT two-wheel tractor project in Nepal began. At first the technology was transferred by the farming systems approach, but failure to get farmers to adopt later, led the project to changed to the participatory technology development (PTD) approach with more focus on poverty reduction and gender equality. The current “project” has become a “coalition project”, with many links to other projects and government programmes. The goals of the current rural mechanisation project in is to strengthen equality of access, and poverty reduction while introducing appropriate technology resource conservation machinery. Besides funds coming from the government, mainly through the Nepal Agricultural Research Council, funds are also coming from such donors as New Zealand AID, the Asian Development Bank, and DFID. These projects came in response to a renewed interest in pro poor rural mechanisation processes, which for decades had received little attention in international development.

The coalition project takes an interactive approach to R&D and is concerned mainly with strengthening local pro-poor rural mechanisation and innovation systems. All members of the coalition continuously search for potential new partners who have similar interests in poverty reduction and social inclusion and want to join the coalition.

The coalition is also developing new ways for managing multiple partners in this new type of coalition project. A number of actor oriented tools are being used such as, Actor Linkage Map, Actor Linkage Matrix (ALM), Actor Innovation Time Lines, Actor Learning and Action Tables, to plan, manage and monitor changes in social relationships and activities as the coalition project proceeds. The way these tools are being used in the project are described in a project document (Biggs, Justice, Gurung, Tripathi and Sah, 2003).

At the moment the Nepal project is promoting smallholder mechanisation, via the two-wheel tractor, and assessing its efforts to expand the accessibility through small group ownership of the tractors and their attachments, and improved and more equitable market access to the services of mechanical equipment. It is assessing changes in gender roles and relations that are arising as a result of mechanisation, and monitoring the impacts from the use of attachments (both “old” such as trailers and “new”, such as minimum tillage seed drills, and ground water pumps) and of “new” agronomy methods, such as reduced tillage, zero till, bed planting, and surface seeding. The project is providing credit facilities for targeted resource poor farmers, landless groups, women’s groups and rural entrepreneurs. Rural mechanisation in neighbouring areas/countries is being monitored in search of lessons, institutions and technologies that may be relevant in Nepal. A rural mechanisation information network is being established and rural mechanisation is being publicised via papers and workshops.

One of the outcomes of the project in Nepal has been its contribution to an increase in two-wheel tractor sales, which have restarted after being at a very low level for a number of years. Four years ago there were no two-wheel tractors being sold in Nepal. Estimates for 2003 are that up to 1,000 pieces will be sold. Many of these sales are in the old well established power tiller innovation systems in the Kathmandu and Pokhara valleys where rapid agricultural, linked sector and construction sector growth is taking place.

In the Terai where past coalition projects have been concentrated, the project has found that many buyers are in the medium to small farmer category (less than two ha). The project has found that many rural entrepreneurs have become service providers to their surrounding villages, and are selling a range of tillage, haulage and other services. As these entrepreneurs sell their services to neighbors and acquaintances, they are also extending credit for their services, something the four-wheel tractors normally do not provide. It is reported locally that this has led to more equitable access to services for poorer agricultural and other rural households.

The actual poverty and equality outcomes are being monitored as the project progresses. The results of a recent formal assessment are expected in early 2004. Additionally, the Ministry of Agriculture and Co-operatives is now going through a mechanisation policy review to develop a strategy to promote pro-poor mechanisation in Nepal.

## **Appropriate Technology – Vol 31, No. 1 March 2004**

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