Field-irrigation training in the Peruvian Andes

by Willem H.M. van Immerzeel

'The Unu Kamachiq Raymi is the first experience that I know of where communal socioeconomic structures are connected with processes of extension in rural development.' *Anthropologist*

IRRIGATION IS AN ancient practice in the highlands of the Peruvian Andes, and is used almost exclusively to supplement rainfall. During the last few decades, a considerable amount of money has been invested in improving the existing traditional schemes or expanding irrigation to new areas, almost always focusing on improving the main irrigation infrastructure, such as the intake structures, canals, etc. The improvement of the main infrastructure means that water losses are reduced and the irrigated area can often be doubled. Some programmes also follow up the construction phase with agricultural extension and credit programmes to improve production. Most extension programmes include the introduction of a second crop, which must grow during the dry season and is therefore more dependent on irrigation.

Field practices

Improving the efficiency of irrigation systems allows the expansion of irrigation to new areas, something usually accomplished only by extending the main infrastructure. Experience in the highlands of Cuzco has shown that much can be done to improve field-irrigation practices, as the techniques used today by most peasants in the Peruvian highlands are extremely inefficient and cause erosion on the often steep slopes. Improving field irrigation techniques contributes as much or more as improving infrastructure to the reduction of water losses and consequently expansion to new areas.

The main crop is irrigated during field preparation only, and most crops do not receive any water until the first rains. Almost no supplementary irrigation is applied during the rainy season. Although very rare traditionally, the introduction of a second crop is certainly possible. This second crop, however, will have to be irrigated frequently during all of its stages to prosper during the dry period. Improving field-irrigation techniques is therefore important not only for water use efficiency, but also for the introduction of a second crop, which is not an easy task. Because of the hydrologic and topographical conditions, most projects are small (less than 1000ha). The land has been parcelled into plots with an average of 2.2 landowners per hectare in the area studied, which means that a training programme aimed at improving irrigation efficiencies has to be massive to be effective. It is estimated that the training pro-

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Some irrigation programmes follow up the construction phase with agricultural extension work.

gramme will have to reach directly 30 per cent of the peasants in every irrigation project. Moreover, as irrigation is an ancient practice, it is embedded in the traditions of the peasant population, traditions which have to be respected if programmes introducing changes are to be effective.

Extension programmes

This field-irrigation training programme not only respects traditions, but also allows a massive introduction of the new techniques. The techniques to be introduced are brought from Arequipa, where highly efficient field-irrigation methods have evolved because of the desert climate. The farmers, especially the Kamayoc people from Arequipa, have the specific know-how.

When four Kamayocs first came to Cuzco, they immediately started training peasants on their own fields. An evaluation of this first encounter demonstrated only a limited effect, as the training programme had not been properly introduced into the peasant communities. These considerations led to the organization of an irrigation competition called 'Unu Kamachiq Raymi' in 1988.

The competition allowed for a greater impact than the simple training programme, intensifying and motivating training in irrigation in preparation for the competition. In 1988 four of these competitions were organized, involving the training of a total of 400 peasants in teams of five farmers, about eight per cent of the irrigators.

The most important aspect of this extension programme is that the training is carried out on the fields of the participants themselves. Every participant also received memory aids which had to be studied at home, because part of the competition is based on questions asked by the jury.

During the week of the irrigation competition itself, each group of five farmers, representing different communities, prepare a field for irrigating different crops, such as maize, potatoes, and onions, and for pastures. During the last two days of the week the jury judged the 20 different parcels prepared by the communities.

Prizes are in money and kind, and there are trophies both for the best irrigators and for the cultural activities held during the same week, like dancing competitions etc. Each participant received a set of simple agricultural tools and a diploma.

The groups of women participating in the competition received in addition a package of vegetable seed.

Stimulating the participation of women has been effective. Out of four competitions, two were won by female teams.

Motivation

The peasants declared that at first they participated for the prizes, but later learning more new techniques was their motivation to continue training on their own fields.

A clear indication that this training programme has been fully accepted by the peasant communities, is that during the festivities the communities decided to organize an irrigation competition every year. The festival will be continued by the communities.

During 1989 the winning teams of 1988 were trained to be teachers. They, in turn, trained all the teams

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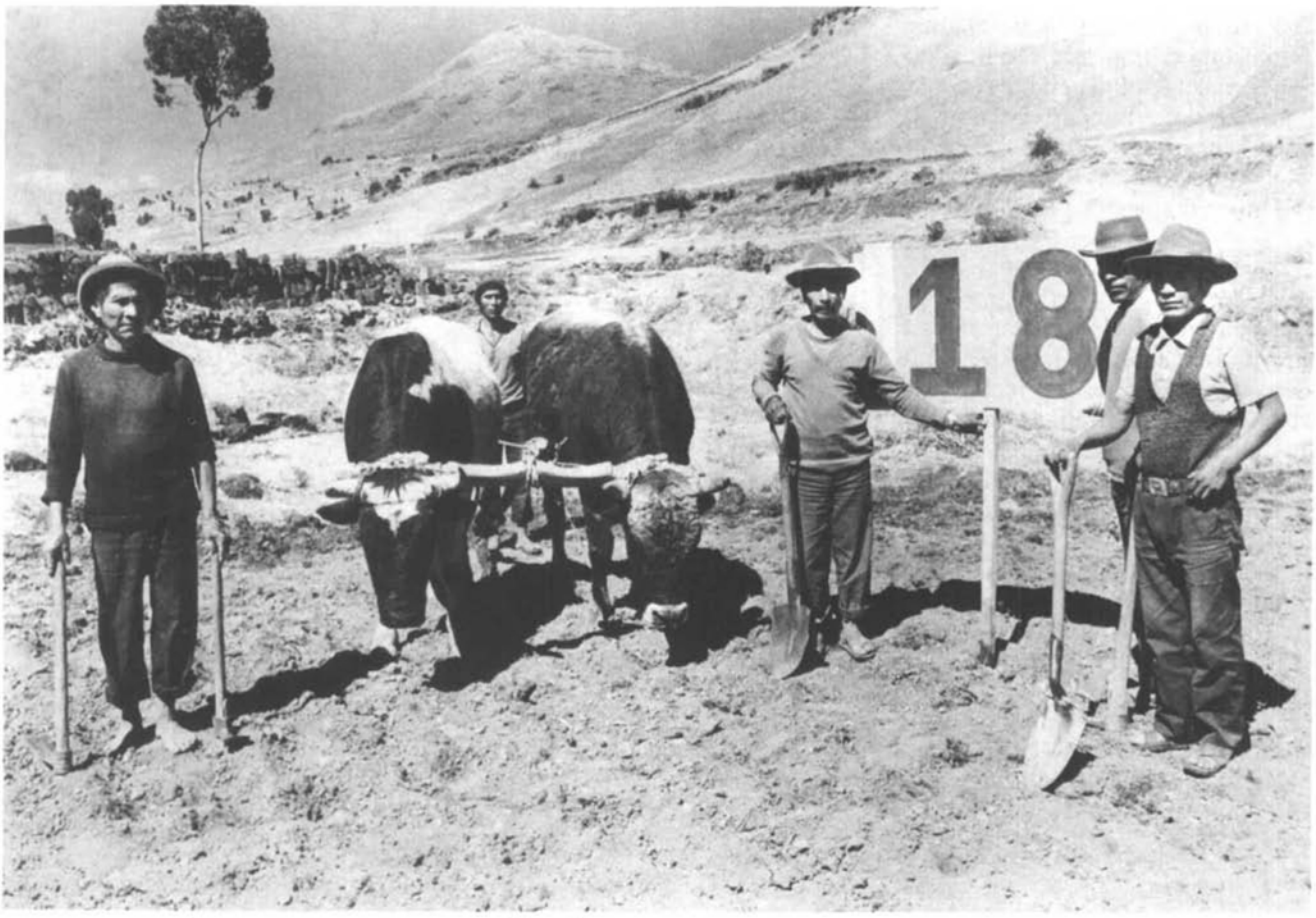
The jury judged each of the parcels of land prepared by the communities.



Each parcel of land is prepared by a team of five farmers.

that will enter the competition in the second 'Unu Kamachiq Raymi'. The Kamayocs from Arequipa undertook technical assistance for the trainers only. During this training the techniques learned from the peasants of Arequipa were adapted slightly to the situation of the highlands. This process needed some investigation, which was carried out by the peasants themselves.

During teaching the peasants are encouraged to take notes. This is possible even for illiterate people who observe closely the work on the field and copy the field layout onto paper. This process is the theory behind the practical work, and it reinforces the learning process.

The winning teams of 1988 were all involved in teaching for the 1989 competition, and they will continue teaching afterwards to individuals interested in horticulture. This programme allows the training of over 1000 peasants in horticulture alone. This is about 20 per cent of the irrigators in the projects.

The participants of the 1989 competition will be involved in a programme meant to stimulate the application of new techniques in their own fields, and at the same time will pass their knowledge to other peasants. This programme is called 'competition of teachers'. The 1989 competitors will act as teachers with a group of 'pupils'. At certain intervals a jury will assess their fields and at harvest time the winning teachers and pupils will be awarded prizes.

The total programme allows for the training of 30 per cent of the irrigators in three years. It is thought that repetition with another year will be necessary to guarantee the formation of a proper and locally adapted technique.

Important aspects of the training programme are:

- Teaching and learning is done in a practical situation and is followed by discussion of the theory behind it.
- Memory aids are given to all participants.
- The training is peasant-to-peasant.
- The training allows for modification of the methods used in Arequipa, making its adoption in other regions possible.
- The investigations necessary for these modifications are conducted by the peasants themselves.
- Participation is stimulated by awarding prizes to the best participants.
- The participation of women is stimulated in addition by a gift of vegetable seeds.
- The best students will be incorporated into the teaching programme.
- The programme is self-sustainable and replicable in very different regions.
- The programme has low recurrent costs.

Conclusion

The total cost of this kind of training programme is less than 15 per cent of the investment in infrastructure. The effect on irrigation efficiencies, however, is as much or more. In many circumstances, improving irri - gation in the Peruvian highlands could be limited to a training programme. Such a programme could eventually be followed by investment in infrastructure.

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