### Low-Cost Micro-Irrigation I

### An Initiative to set up a Global Network to Disseminate a Promising Technology

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Low cost micro-irrigation has the potential to help many smallholders to earn much needed cash income. The challenge is to allow more people to exploit the opportunities offered by this technology. Earlier this year a group of representatives from NGOs and public development agencies met to explore the establishment of a global network for the dissemination of low cost microirrigation technology on a large scale. A major point of discussion were the different perceptions on what functions a network would need to assume in order to achieve its objectives.<sup>2</sup>



#### The potential of low cost micro-irrigation

Access to irrigation water is a limiting factor to the productivity and profitability of many small farms in developing countries, in particular in the many areas where water is becoming increasingly scarce. Most water saving irrigation systems are not affordable for poor smallholders, because the equipment is capitalintensive. Common drip irrigation systems are designed to serve larger areas, and cannot be broken down to fit the small plots which the large majority of poor farmers cultivate. Thus, low cost small-scale microirrigation systems have a huge potential to contribute to improving the livelihood of poor farming families by enabling them to earn additional cash income or to grow more food for themselves.

A drawing from promotional material for micro-irrigation kits from Nepal.

In recent years, various low-cost micro-irrigation systems have been adapted to the conditions of poor farmers and for household kitchen-gardens. Drip irrigation kits of varying capacity for plot sizes from 40 m<sup>2</sup> up to 2 ha have been developed, tested, and are now used by over 20'000 families in India, Nepal and some other countries. These kits reduce the cost to irrigate an acre of land to 250 US\$ on average compared to 1000 US\$ in conventional drip irrigation systems. They require only little initial investment (with a bucket kit of 8 US\$ a plot of 40 m<sup>2</sup> area can be irrigated), and they can be easily increased in reach later on. With a 200 litre drum kit for 25 US\$, a poor family can irrigate 500 plants and may earn 100 US\$ and more additional cash income in a year, a substantial improvement of their livelihood. On the ecological side the technology leads to significant savings in water (up to 60%) compared to flood irrigation.

There are other micro-irrigation technologies with similar poverty reduction potential like various models of treadle pumps, rope pumps and low-cost sprinkler systems.

<sup>&</sup>lt;sup>1</sup> The article contains parts of a concept paper for a micro-irrigation network written by Urs Heierli and Paul Polak. Other parts of the article have been written by Elisabeth Katz.

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#### The market creation approach

The many development organisations and programmes which are working in rural areas could easily distribute low-cost micro-irrigation kits free of cost to poor farming families and train them in how to use these. However, such a strategy is neither sustainable, nor does it ensure large-scale access of rural people to the equipment, because development organisations have limited reach and duration of their programmes.

Therefore, to ensure widespread and sustainable availability of low-cost micro-irrigation systems a market creation approach is more promising. This means to establish an independent, economically viable and profitable supply chain in the private sector, which covers all the steps from raw materials over manufacturing and assembly to distributors and spare part dealers who sell the equipment to the users in rural areas.

To be able to utilise the potential of the micro-irrigation systems well, farmers need access to other services like agricultural inputs (good quality seed, possibly fertiliser and pest and disease control measures), credit, markets, and advisory services. Where the access to such integrated services is not ensured, interventions to build it must complement the interventions for developing the supply chain.

In practice market creation for low-cost micro-irrigation equipment requires activities like

- assessing the feasibility of the technology in an area
- adapting the technology to the local circumstances
- social marketing of the technology (raising awareness, showing how it works, demonstrating the economic benefits etc.)
- analysing the requirements for the supply chain and building a locally adapted supply chain.
- analysing the requirements for agricultural support and establishing the required links or building the necessary structures.

Market creation approaches have been successfully employed for the dissemination of e.g. treadle pumps in Bangladesh, India and in a number of African countries, metal sheet grain storage bins in Central America, and nursery plants for farm forestry in Bangladesh.

## Making low cost micro-irrigation technology widely available

Low-cost micro-irrigation has proven a substantial potential for poverty reduction in many rural areas around the world – in semi-arid and arid areas as well as in regions with rainfalls distributed unevenly over the year. Farmers make good profits out of micro-irrigation systems even in water abundant countries like for instance Vietnam and Bangladesh.

However, the capacities to disseminate the low-cost micro-irrigation are limited. There are a number of organisations with relevant experience, on the technological side as well as with the market creation approach, in a number of countries all over the world. But the technology has potential in many more places.

World-wide dissemination of low cost micro-irrigation by market creation requires a strategy which involves organisations which are working in the many areas where micro-irrigation has potential.

Organisations which want to disseminate low cost micro-irrigation need to be capable to facilitate the building up of independent supply chains for the equipment, if necessary complemented by other services, as explained above. This requires skills and knowledge which may not be available with many of the interested organisations. To develop the capacity and to ensure certain quality standards, they will need access to technical and methodological know-how and support.

The challenge thus is to establish a structure which allows organisations such as NGOs, development programmes, farmer organisations, private dealer networks of agro-input companies, and other organisations which are interested in micro-irrigation, to link up with those people and organisations who have the relevant know-how and experience.

# An initiative to create a global network for low-cost micro-irrigation

In May this year a group of persons and organisations interested in low-cost micro-irrigation met for a workshop in Switzerland to initiate the establishment of a global network for the dissemination of this promising technology. Public development agencies from a number of European countries, international agencies like the World Bank, FAO and IWMI (International Water Management Institute), NGOs implementing micro-irrigation programmes or interested in doing this, private sector companies (drip equipment manufacture) and an applied research institution were represented in the workshop.

The purpose of the workshop was on the one hand to provide an opportunity to share experiences with low cost micro-irrigation, market creation approaches and different forms of networking, and on the other hand to muster support for the network initiative, and discuss options for the functions that such a network should take on, and the shape it could take. This article focuses on the latter of the two purposes.

#### Emerging visions of a micro-irrigation network

### Views on objectives – at the network and at the end user level

Immediate goals of the network:

- The network helps actors to implement low-cost micro-irrigation activities effectively and build sustainable supply chains.
- The network helps donors to make the microirrigation activities they fund more effective.

Key objectives at the end user level:

- Enabling smallholders to generate income.
- Promoting more efficient water use.

#### Views on network functions – knowledge and information management as well as skills development

The interest of the workshop participants in such a network turned out to be high; however, the views on its functions and shape varied widely. Regarding the basic functions there were two poles of opinion:

- a) A network whose chief task is knowledge and information management (i.e. establishment of an information collection, storage and retrieval system)
- b) A network which offers support services for agencies implementing micro-irrigation programmes (e.g. training, technical consulting, process coaching)

In the course of the workshop views tended to converge towards a combination of both these poles, based on the insight that for large-scale dissemination of a technology skills development and knowledge/information management are equally important.

#### Ideas on network financing

A key question for any such initiative is how to finance it. The view emerged that a combination of core funding on the supply side<sup>3</sup> (for the knowledge management part, and possibly for coordination functions) and demand-based funding (for the skill development part) is the most realistic funding pattern. Task-based contributions by the involved organisations in cash and in the form of staff working time need to complement the funding base.

#### How will the initiative move on?

The present group of players has informally mandated a task force comprising the most motivated and interested persons to work out a more detailed network proposal, possibly with different options to choose from. This proposal will be discussed among a wider range of possible stakeholders. Until mid 2002 the global micro-irrigation network should then be ready to be launched. If you are interested in being kept informed on the network establishment process, or want to contribute in one or the other way, please contact any of the authors.

<sup>&</sup>lt;sup>3</sup> Supply side funding means that the funder directly gives finance to the network or its institutions for defined tasks. Demand-based funding means that the organisation which requires services from the network pays for these services. If a funding agency wants to fund network services it must give the finance to the organisation which demands the services which then pays the network. This has the consequence that the network gets funds only for services which prove their usefulness by being demanded.