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TECHNICAL BRIEF

RAINWATER HARVESTING

Training and capacity formed crucial elements of this project to disseminate knowledge and ensure the sustainability of rainwater harvesting initiatives in rural communities.

In-Field Rainwater Harvesting (IRWH) Adoption on Small Farm Plots

IRWH – a proven technology

Water harvesting is the process of concentrating rainwater runoff from a larger area, for its productive use on a smaller area.

The in-field rainwater harvesting (IRWH) technology was initially developed by the Agricultural Research Council's Institute for Soil, Climate and Water (ARC-ISCW) through Water Research Commission funding. It has the proven potential to contain all runoff within field plots and reduce evaporation from the soil surface considerably, resulting in increased plant-available water and hence increased crop yields.

Intensive field experiments on clay and duplex soils in the Free State, conducted over six seasons, showed that IRWH increases maize and sunflower yields by as much as 50% compared to conventional production techniques. Further research has proven IRWH technology to be sustainable, not only in terms of increased agronomic productivity, but also in terms of containment of risk, conservation of the natural resources base, social acceptability and economic feasibility.

The initial drive to transfer IRWH technology

The initial plan for completing the research cycle was to transfer the IRWH technology to six rural communities around the towns of Thaba Nchu and Botshabelo in the Free State over two years. This entailed, firstly, the effective dissemination of knowledge of the technology to persons owning small areas of land or having access to communal land, as well as to officials of the Department of Agriculture and, secondly, provision of active assistance and support for farmers and extension officers in applying the IRWH technology.

IRWH application gathers momentum

The scope of technology transfer and adoption expanded rapidly beyond what was originally envisaged, with many more households and communities than initially anticipated requesting to become involved in implementing IRWH. Arising from this, an additional challenge to completing the technology transfer phase of the research cycle was to devise and implement an appropriate exit strategy that would allow for sustainability, i.e. continuing adoption and effective implementation of IRWH by new communities and households after withdrawal of research support.

Therefore, the drive to disseminate knowledge of IRWH and provide support for its implementation, had to be expanded and supplemented in line with this exit strategy, through introducing other measures such as the development and provision of IRWH training guidelines.

Communication methods and channels

Communication methods used to disseminate knowledge of the IRWH technology made use of a combination of individual, group and mass approaches. Mass approaches included the use of local radio and television stations, videos, brochures, pamphlets, leaflets, newsletters, songs and posters.

Group approaches included on-station and on-farm demonstration plots, on-farm trials, focus group discussions, seminars, workshops, short courses, farmers' days, training sessions, computer programs, 3D models, focus group discussions and festivals. The individual approach included visits (to office or farm), letters, telephone calls and informal, personal contact.

By using various communication methods and channels, at least one of them, in most cases, conveyed the correct message to an individual or group. Different communication channels were used at different stages of the technology exchange process.

During the initiation phase, videos, pictures and posters played an important role in introducing the IRWH technique for the first time. Thereafter, the 3D model served well in explaining IRWH principles and demonstrating differences between IRWH and conventional production techniques.

Demonstration plots (28 of which were set up) presented the opportunity to involve farmers in activities throughout the growing season and fallow period. In addition to those activities directly related to IRWH, others such as planting of various crops, fertilisation, weeding, insect and pest control and harvesting, could also be demonstrated.

Active participation rather than passive observation was encouraged, both to assist farmers in taking ownership of the IRWH technology and mastering the various related activities.

Focus group discussions and support from the ARC-ISCW technical assistants played a very important role in mobilising individual farmers and communities, addressing problems as they arose, and in motivating and encouraging farmers. Festivals were another means of stimulating, motivating and encouraging farmers and provided opportunities for giving farmers recognition for achievements, hard work and dedication. These, in fact, contributed substantially to the explosive growth in the use of the IRWH technology.

Capacity-building initiatives

Capacity-building initiatives in the form of training courses and workshops were aimed at extension officers, youth workers and farmers. Training was first provided to extension officers, who thereafter collaborated with researchers in providing the same training to farmers.

Training sessions did not focus solely on IRWH, but included topics such as soil types, crop nutrition, weed control, insect control, management practices, natural resources utilisation, record-keeping and budgeting, markets and marketing, the role and function of committees, conflict resolution, communication skills, etc.

Besides formal and informal educational training courses, pre- and post-harvest focus group discussions, information days, farmer-to-farmer training and water harvesting festivals held over periods of four to five days were also used to build the capacity of farmers.

Regular interpersonal contact and group activities were important for mutual learning and for developing leaders with the competence to guide others.

IRWH institutions

In every community farmers were initially encouraged to form committees. At first these consisted of only a few members who were given roles linked to the community demonstration plots and the additional task of involving villagers in IRWH activities and meetings.

As more farmers and communities adopted IRWH, committees grew, leading to the establishment of community-based water harvesting interest groups (CB:WHIGs) in each community.

Ultimately, CB:WHIGs for small-scale farmers had been formed in 42 communities around Thaba Nchu and Botshabelo. Subsequently, a decision taken by representatives of interest groups and communities led the formation a municipal-based water harvesting interest group (MB:WHIG), named the Tswelelopele Small Farmers Cooperative (TSFC).

This is a semi-formal umbrella body for the various informal CB:WHIGs. Institutions co-opted into the MB:WHIG structure include the municipality, the tribal authority and the local agriculture office.

In general, a CB:WHIG operates at the community level in assisting members to meet their day to day challenges. Roles may include scheduling collective labour utilisation, the collection of subscription fees, mobilisation of farmers to assist one another in preparing IRWH basins and collectively performing activities like planting, weed control and pest control.

The MB:WHIG, on the other hand, serves as a mouthpiece for the farmers from all the communities and is able regularly (once a month) to call meetings to discuss challenges that arise from individual CB:WHIGs, to address them as collective issues and to seek the necessary solutions.

IRWH guidelines

IRWH training guidelines have been developed for farmers and extension officers. The applicability of these attractive and colourful guidelines has been ensured as a result of testing and evaluation by researchers, technical assistants, extension officers and farmers.

Success factors in IRWH adoption

A crucial factor relating to technology adoption is successful engagement with the beneficiary community. Experience relating to the best way of entering into engagement with the community with regard to IRWH adoption has been documented.

Various additional motivating and de-motivating factors that could influence the adoption of the IRWH technique have been identified. The motivating factors exploited during this research obviously outweighed de-motivating factors in the case of the many adopters of IRWH. In the case of non-adopters, perceptions and reasons for not implementing IRWH have been documented for future reference, if needed.

Further reading:

On-Farm Application of In-field Rainwater Harvesting Volumes 1 & 2 (**Reports No: TT 313/07** and **TT 314/07**). To order these reports contact Publications at Tel: (012) 330-0340; Fax: (012) 331-2565 or E-mail: orders@wrc.org.za; Web: www.wrc.org.za