CASE STUDY 1: Maiuni Sand Dam and Shallow Well

Maiuni sand dam credit The Water Proiect

The Maiuni Self Help Group was formed in Kithuiya village, Kiambwa, Kenya in 2011 with 46 members, 33 of whom are women. They embarked on a project with Africa Sand Dam Foundation (ASDF) and The Water Project to build a sand dam and a hand dug shallow well. This was in response to increased pressure on the water supply from a growing population and a drying of the local climate.

The main source of water for the village is the River Ngwani which dries up between August and October. Before the sand dam was built, during the dry periods people typically dug deep scoop holes, averaging 1.5 meters deep, and queues at these scoop holes meant waits of over 4 hours per day to collect water, often of poor quality. The time spent collecting water severely limited the farmers' ability to engage in other agricultural or economic activities.

The Maiuni group built their sand dam using technical advice and assistance from ASDF field officers. Some materials were provided by ASDF, while others were sourced locally. The sand dam is a concrete wall built across the seasonal riverbed that captures and stores water beneath the sand. The sand reduces evaporation and filters out parasites such as mosquitos in the water, making it cleaner and safer. Water is then abstracted through the shallow well.[1]

Hellen Munini, a member of the group, said "We don't buy vegetables such as kale from the market anymore, because we can now grow it ourselves, thus putting the money to other use... Water collection time has reduced significantly. It only takes us 30 minutes to get water from the sand dam and we have plenty time to dig terraces and till our farms." Another member, Peter Kititu, said "I have so far planted 130 trees, dug adequate sized terraces on my farm and planted banana trees in them. I have also started growing French beans on my two acre piece of land... I hope to earn more than kshs 70,000 [USD $821.00] from the beans." When ASDF staff revisited the dam in 2015 they found it was maintained and still functioning.[2]

CASE STUDY 2: Zai planting pits in Burkina Faso

Extreme droughts leading to the failure of agricultural systems from 1968-1973 caused a human and environmental crisis in Burkina Faso. Between 1975 and 1985, some villages lost one-quarter of their population as people migrated to areas with higher rainfall. Many wells dried up and the average yield of sorghum and millet dropped from between 0.5-1 tonne per hectare[3] to 300kg per hectare, resulting in an annual food deficit of 50% for most households.

Zai planting pits in the Sahel. Credit, M Tall, CCAFS

In the 1980's farmers began experimenting with farming methods to reclaim severely degraded land that water could not penetrate. They developed variations of the

Zai practice (digging a grid of planting pits), increasing the depth and diameter of the pits and adding organic matter. The pits were prepared in the dry season, enabling early planting for increased yields. Although very labour intensive to construct, by 2001 more than 100,000ha of degraded land was rehabilitated by farmers, with current estimates of the total rehabilitated land at 200,000-300,000ha. Villages with a long history of soil and water conservation rehabilitated an estimated 72-94% of their agricultural lands.[4]

Cereal production is estimated to have increased by an average of 400kg per hectare per year, translating into an annual increase of 80,000 tonnes of grain. Zai planting pits have shown a greater impact when combined with stone bunds or other water conservation methods, and the effects were also synergistic with adding manure. Households that had suffered food shortages of 6 months or more were able to reduce their deficit periods to 2-3 months, or 0 months in some cases. The whole movement improved food security for 3 million households.[5]

CASE STUDY 3: Drip Irrigation

Drip irrigation in Kenya. Credit, CIAT

Kenya suffers from unreliable rainfall leading to drought conditions subsequently increasing household vulnerability to food insecurity, especially when alternative risk management or coping strategies are unavailable or ineffective. Until recently, Kenyan smallholders, who are mostly women, use hand-watering to cultivate vegetables for their families. The practice of hand-watering is tedious and inefficient especially where water is scarce.

To improve productivity, the Kenya Agricultural Research Institute (KARI) introduced drip irrigation technologies. Bucket drip kits help deliver water to crops effectively with far less effort than hand-watering and for a minimum cost compared to irrigation. Use of the drip kit is spreading rapidly in Kenya and the majority of drip users, 70- 80%, are women.[6] Drip kits do have some disadvantages but there are also many positive socioeconomic impacts. Farmers reported profits of Ksh4,000-10,000 (US$80-200) with a single bucket kit, depending on the type of vegetable and between Ksh20,000-30,000 (US$400-600) per season with the one-eighth of an acre kit.[7]

Mrs. Mutai[8] is 1 of 150 women who are members of a group that started using drip irrigation in Eldoret. Four months after installation, she sold enough vegetables to invest in more lines and make her garden bigger. Another member, Anne Butia, sold Ksh10,000 (US$200) worth of vegetables in 3 months from her garden. She used the extra income to pay for school fees and buy clothes for her family.

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[8] Ngigi, SN, Thome, JN, Waweru, DW & Blank, HG 2001, *Low-cost irrigation for poverty reduction An evaluation of low-head drip irrigation technologies in Kenya* International Water Management Institute, Nairobi.