

SUPPORTING THE ESTABLISHMENT OF AN URBAN FARM USING RENEWABLE ENERGY AND SUSTAINABLE PRACTICES

PROJECT'S AIM: TO DEMONSTRATE THE POTENTIAL FOR ENHANCING ENERGY AND FOOD SECURITY IN URBAN COMMUNITIES VIA THE ESTABLISHMENT OF A PILOT FARM ON A RESIDENTIAL UNIVERSITY CAMPUS IN THAILAND

Location:

Pathumthani,
Thailand

Technology:

Solar Photovoltaic

Costs:

Total: € 11,650
WISIONS financial support: € 11,650

Partners Involved:

Asian Institute of Technology (AIT)
(www.ait.ac.th)

Duration:

April 2015 – October 2016



Picture: WISIONS

This project aimed to develop and test the concept of a renewables-powered urban farm in a plot of arable land on the Asian Institute of Technology (AIT) campus. This is a residential campus for postgraduate students, staff and faculty members from over forty countries. This community-based venture made use of solar energy for the irrigation of vegetables and over seventy campus residents collaborated across the whole supply chain: in cultivation (soil preparation, planting, maintaining, harvesting etc.), fish farming, processing and storing.

The first six months of the project were used to develop the concept, motivate the community and design and install the systems. The remaining period was used to conduct training sessions, cultivate the crops, release the fingerlings into the fish pond and monitor the progress. Following the end of the WISIONS-supported phase, AIT is conducting a second project phase based on lessons learned during the first phase. In this second phase the

management and financial responsibility for the running of the farm will be completely handed over to the community members.

TECHNOLOGY, OPERATIONS & MAINTENANCE

As part of this project, eight 80W PV panels powered two water pumps, which together with storage tanks, pipes, valves and drip sprinklers supplied the water to the plot of land. Awareness-raising and capacity-building sessions on organic farming were conducted by AIT experts, alongside regular coordination meetings. The capacity-building covered crop cultivation, soil preparation and maintenance, weeding, irrigation, pest and disease management of different crops, harvesting and fish farming. A workshop on vegetable drying using solar dryers was also delivered.

The 73 participants were divided into thirteen groups. For the vegetable farming,

each of the thirteen groups was allotted a plot of land of approximately 40msq and given the freedom to plant the vegetables of their choice. About fifteen different crops were planted in the 500msq area. For the fishing, a total of 100 tilapia fingerlings were released into the canal surrounding the vegetable farm. The fish were fed with a combination of pelleted feed and plant waste from the farm.

To monitor the project's impact, a baseline study was carried out via a questionnaire issued to the participating households on their current market/location of vegetable purchases, frequency of vegetable purchases, distance of this market from AIT etc. At the end of the project, a follow-up questionnaire asked about the patterns of time expenditure and satisfaction of the participants, as well as inviting feedback and lessons learned.

DELIVERY MODEL & FINANCIAL MANAGEMENT



The community participated on a voluntary basis. WISIONS supported the costs associated with land preparation (levelling and ploughing), planting materials (seeds and compost) and the establishment of the energy and irrigation systems, as well as the capacity-building sessions.

The initial goal of the project was to market the farms' produce. However, participants stated that they preferred to consume the produce themselves and to share the produce with their friends on campus. Monitoring revealed a considerable reduction of the frequency of vegetable purchasing at the market by the participants, as well as on their expenditure.



ENVIRONMENTAL ISSUES

The use of solar panels as a source of power for water pumping displaced emissions from fossil fuel-based electricity. No chemical fertilisers were used in the cultivation and the soil quality was carefully monitored for any impacts from the use of organic fertilisers.

The drip irrigation system aimed to demonstrate best practice in resource conservation. However, monitoring revealed that the water was not always efficiently used. Many participants were new to farming and, when in doubt, overwatered the plants. In certain other cases, participants did not switch off the water valves properly after irrigating their plots. Plans for the second phase of the project include emphasising this aspect during the training period, as well as

monitoring more carefully the water used by each group to prevent overuse.

SOCIAL ISSUES

The community members ran the project through a participatory management approach, making their own decisions about what to grow, sharing maintenance tasks and collectively planning for the future. The vast majority of the community farmers were AIT staff, while one quarter were students and the rest were relatives of staff. Lack of time was the key challenge faced by the participants: on average, everyone worked on the farm once a week or less, but some worked almost every day. Other challenges included the maintenance of shared farming equipment.

RESULTS & IMPACT

In the monitoring surveys, the participants reported high levels of satisfaction with the initiative. Over two thirds of the interviewees reported that they consumed the vegetables at home, and nearly 30% had experienced a decrease in their shopping frequency. Eating high-quality self-grown fresh vegetables, working on a farm and collaborating with others were perceived as the key positive outcomes of this activity. Currently, a subset of the initial participants is continuing the initiative in a second phase. The second phase is designed to be self-financing through monetary contributions from the members, while AIT staff will provide in-kind contributions for capacity-building and skills transfer. The management model will be improved to become self-sufficient in the mid and long-term.

REPLICABILITY

Combining drip irrigation with solar pumps is increasingly cost-effective and can boost farm productivity, especially for remote communities which do not have reliable access to electricity or fuel. By showcasing organic community farming using renewable energy, AIT gave its international community members first-hand experience

of farming and of the problems faced by farmers in the developing world. This perspective will broaden the participants' knowledge and they will take back this new understanding to their respective countries.

This project aligns with AIT's ongoing initiative, "Sustainability Living Laboratory", which aims to showcase sustainability principles and practices to the AIT community and its visitors. AIT is undertaking efforts to disseminate the model and support the replication of this initiative through workshops with various stakeholders (e.g. regional leaders and their communities).

LESSONS LEARNED

The initiative highlighted the potential for renewable energy technologies in agriculture, as well as the interlinkages between renewable energy technologies and urban farming systems, even in communities with little or no farming experience. Specifically, the project provided hands-on experience in the running of campus sustainability initiatives. One of the lessons was that the motivation of participants waned over time. Out of thirteen groups, only seven remained active until harvest time. It was also observed that most groups tended to bring together participants of the same nationality or culture.

The main lessons learned from this project relate to urban farming. In urban farming, the main motivation for farmers is often not subsistence or income generation but the enjoyment of manual work, the production of one's own food and the contribution made to the local community and the environment. These are key drivers of success in sustainability experiments. It is important to note, however, that the AIT community has on average a higher awareness of sustainability issues than that of Thai society in general, and consequently not all experiences are directly transferrable.

Source: Final Report submitted to WISIONS by AIT. Picture: WISIONS