

# Lessons learned

## Integrated homestead food production (IHFP)

### Food security and nutrition



The **Lessons Learned series** is prepared by IFAD's Policy and Technical Advisory Division and provides a compilation of past experiences relating to a particular topic and a reflection on evidence-based best practices and failures. "Best practices" refer to processes or methodologies that have been proven to produce good results and are thus recommended examples to be replicated.

These notes are "living" documents and will be updated periodically based on new experiences and feedback. If you have any comments or suggestions, please contact the originators.

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## Acronyms

DFID	Department for International Development of the United Kingdom
ESA	Eastern and Southern Africa
GMD	Ghanaian cedi
FAO	Food and Agriculture Organization of the United Nations
FCFA	CFA franc (the currency of Communauté Financière Africaine)
HFPP	Homestead Food Production Programme
HKI	Helen Keller International
HTDN	How To Do Note
ICLARM	International Center for Living Aquatic Resources Management
IDR	Indonesian rupiah
IFPRI	International Food Policy Research Institute
IHFP	integrated household food production
LHDP	Livestock and Horticulture Development Project (in The Gambia)
LOF	liquid organic fertilizer
LRAP	Livelihoods Recovery through Agriculture Programme (DFID-funded)
MIS	micro-irrigation system
NGO	non-governmental organization
PNPM	National Program for Community Empowerment (Indonesia)
PSP	Priority Support Programme (DFID-funded)
SCAMPIS	Scaling up Micro-Irrigation Systems Project
VFM	village farm model
VMF	village model farm
WFP	World Food Programme

## Introduction

This note presents lessons learned on integrated homestead food production (IHFP) emerging from projects and programmes implemented by IFAD and other development actors around the world. It aims to complement the How To Do Note (HTDN) on the same subject by illustrating success stories and good practices through case studies. The emerging lessons are distilled and synthesized in order to provide concrete models that could inform and ideally be scaled up in the design and implementation of future IFAD-funded interventions.

Experience worldwide confirms that, provided certain conditions are met (e.g. adequate access to land, water and input supplies, as well as labour availability), IHFP can be an effective approach to enhancing the production of varied and nutritious home-grown foods from vegetable and fruit crops, small livestock, and fish ponds, thus supplementing and diversifying the diet and meeting the food requirements of resource-poor rural populations.

In order to achieve the desired impact, IHFP should be accompanied by a nutrition education and sensitization component, targeting women and mothers in particular, and embedded in broader intersectoral programmes focusing on areas such as women's empowerment, water supply, capacity-building of extension service provision and grass-root institutional building.

## Lessons learned

From the case studies and literature review it is possible to draw the following lessons:

- To have prospects of success, IHFP activities need to be promoted only when minimum requirements are met (e.g. access to land and water, as well as labour availability) and cultural food preferences and taboos are taken into consideration. However, scarcity in land may be compensated through innovative ways of growing plants (**case study 5**).
- IHFP can enhance household food availability and diversity, primarily through increased production of food grown in the homesteads but in many cases also through the income generated from surplus sales, which is largely used to purchase food – as shown in the programme implemented by Helen Keller International (HKI) in South-East Asia and by the WorldFish Center in Bangladesh (**case study 2**), Mali and Mexico.
- Behaviour change communication and nutrition education are key components ensuring that increased food production translates into a more nutritious and diversified diet, especially among people with special nutritional requirements, such as children and pregnant and lactating women – as has been shown in Bangladesh, Lesotho, South Africa (Box 1) and South-East Asia. Targeting women with such training is one of the most effective ways to ensure that children, young people (especially girls) and the family as a whole receive adequate food. In fact, one of the main problems that affected the impact of a project in Mali was the lack of nutrition information and education provided as part of the project activities. However, as noted in the Bangladesh case study, in contexts where women face restrictions in mobility and, therefore, men are the ones who buy food, nutrition sessions should also target the households' male members. Finally, mobilizing village-based female promoters of nutrition education could help in reaching more women, as has been done by WorldFish in Bangladesh.

### Box 1: Improved maternal knowledge of child dietary needs through nutrition education

A pilot study was conducted in a rural village in KwaZulu-Natal (South Africa), where a home-gardening project was funded by the Thrasher Research Fund. Demonstration gardens and household gardens were established, growing butternuts, carrots, orange-fleshed sweet potatoes, spinach and pawpaw trees. A strong nutrition education component was also implemented using participatory approaches. The study concluded that, as a result of the 21-month training combined with gardening support, maternal knowledge on nutrition and child health improved. The main effects have been the following: most of the mothers in the study could name at least three food sources of vitamin A and at least one symptom related to vitamin A deficiency; the dietary diversity increased; and the intake of dark green leafy and yellow/orange vegetables increased, resulting in a significantly increased intake of vitamins A and C, calcium, iron and riboflavin.

Source: M. Faber and A.J. S. Benadé

- To ensure sustainability after the end of external support, IHFP interventions need to include:
  - the identification of a sustainable mechanism for input supply and regular technical support. Good examples of interventions where this was done include: the village farm model (VFM) implemented by HKI (case study 1), which involved the formation of a network of private fingerling producers; the UNDP-FAO project in Madagascar, which adopted the innovative community procurement approach being piloted by IFAD in The Gambia; IFAD-supported projects in India, Guatemala (case study 3) and Madagascar, which facilitated the development of drip irrigation suppliers and retailers; and the farmer field school (FFS) approach.
  - the establishment of linkages with local service providers, such as veterinary field units and poultry service suppliers. Good examples of interventions where this was done include: the IFAD-supported Rural Micro-finance and Livestock Support Programme in Afghanistan; health and agriculture centres promoted by HKI in South-East Asia; the IFAD-supported grant for Food Security and Ecosystems Management for Sustainable Livelihoods in Arid and Semi-arid Lands in Kenya (Box 2), which established linkages with agro-dealers and government extension officers.

This becomes more important as the IHFP activities expand – whether in terms of garden size or through intensification of activities, or by moving from subsistence level to greater market orientation – while always maintaining home consumption as first priority.

- Mobilization and capacity-building of community trainers or facilitators have proven effective in enhancing the outreach to the targeted people, as well as in ensuring the acceptability and sustainability of the interventions – as shown by the above-mentioned women promoters in Bangladesh and also by the female village poultry leaders advising women groups supported by IFAD in Afghanistan, the community trainers and volunteers working with HIV/AIDS-affected households in Lesotho and the village-based volunteers deployed by HKI in South-East Asia.
- Organizing the communities into village-based groups is often the best targeting approach to ensure full participation and overcome key constraints, while building social capital – as shown in Lesotho, where community groups were formed to ensure effective people’s participation and project ownership; in Indonesia’s National Program for Community Empowerment [Program Nasional Pemberdayaan Masyarakat] (PNPM Mandiri) supported by IFAD, in which women’s groups provided a platform for labour -sharing; and in Afghanistan, where IFAD supports women’s village poultry producer groups as a mechanism for training delivery and women’s empowerment.

### Box 2: Increased dietary diversity and income from goat and poultry production among IFAD-supported farmers in Kenya

The recently completed IFAD-supported grant for the Food Security and Ecosystems Management for Sustainable Livelihoods in Arid and Semi-Arid Lands, implemented in the Eastern Province of Kenya, aimed to improve food production and nutrition through consumption of, inter alia, goat milk, poultry meat and eggs, and to increase households' incomes from the sale of livestock-related products. The programme introduced improved varieties of chicks and provided training to target communities in chicken housing, feed production using locally available inputs (such as sorghum and cowpeas), disease and pest management (including vaccination) and improved management of goats. The farmers were also supported in terms of enhanced access to vaccines through linkages with agro-dealers and government extension officers. The programme evaluation indicated the following results:

- i) between 116 per cent and 139 per cent increase in egg production per month
- ii) an average monthly increase of 3,386 new chicks produced on a monthly basis
- iii) increased diet diversity
- iv) an increase in income from the sale of eggs and from the sale of chickens by participating households
- v) improved management of goats, including the use of the correct ratio of feeds, suitable shelter, improved breeds, timely vaccination, proper housing and zero grazing, resulting in a better price at sale.

Source: IFAD

- IHFP is not only a women-friendly activity but is also conducive to women's empowerment – both economically and in terms of decision-making within the household – given that most of the IHFP activities are managed and controlled by women. This has been an impact noted in most of the projects reviewed, including in South-East Asia, Afghanistan, Bangladesh, Burkina Faso, The Gambia and Mali. However, projects should avoid causing an increase in women's workload – as reportedly occurred in Bangladesh and Mali – and should identify adequate measures for targeting women.
- IHFP is an activity that can also attract adolescent girls who would only have limited options in terms of income generation if, for example, they dropped out of school (case study 7).
- Homestead gardens have the potential to protect agrobiodiversity, as often plants grown in homestead gardens are local varieties that are not marketed outside the homes (case study 6). Most of those local varieties have a high nutritional value, in particular with regard to micronutrients.
- Successful IHFP activities often lead to spontaneous replication by households or communities not targeted by the project – as in Bangladesh, Indonesia and Lesotho.

### Case study 1: Village model farms for homestead food production in South-East Asia and West Africa

Since the late 1990s, HKI has been implementing and adapting a homestead food production programme (HFPP) among 30,000 households in Bangladesh, Cambodia, Nepal and the Philippines, in partnerships with over 200 local non-governmental and governmental organizations. The main target group consists of women from poor households, who receive support for 3 years to develop homestead gardens on fixed plots of land, where they could grow throughout the year a wide variety of vegetables and fruits, with the integration of backyard livestock (mainly poultry).

Village model farms (VMFs) are also set up as a place for training and demonstrations on improved agricultural techniques, technologies and poultry production activities. HKI and local partners provide all necessary inputs at commencement of a VMF and participating households, including 10–14 vegetable and fruit seed, seedlings and saplings; chicks and poultry vaccinations; training on optimal selection and cultivation of crops; composting and organic pest control; water management and conservation; garden fencing and chicken shelter construction; vaccines; and feed production. VMFs are also used as production centres that provide inputs, such as low-cost quality seeds, seedlings, saplings and chicks.

Each VMF serves two women's groups of about 20 households, each of which is divided into two smaller groups in order to facilitate collaboration among households. The model is also instrumental in establishing linkages with local health and agriculture agencies, and building local partners' capacity to provide continued technical assistance at the end of the 3-year project cycle.

Nutrition education has been a core component of the HFPP. HKI and local NGO partners train health staff and volunteers working at the village level, who in turn host nutrition education sessions for mothers. These sessions emphasize the importance of eating nutritious food during pregnancy and lactation. Mothers are also educated on optimal feeding of infants and young children, including breastfeeding and complementary feeding, and on how to improve the household's dietary diversity and micronutrient consumption through cooking demonstration sessions.

Since 2009, with support from the USAID Office of Foreign Disaster Assistance and in partnership with the International Food Policy Research Institute (IFPRI), HKI has been replicating the VFM in Burkina Faso. IFPRI has been conducting research trials to determine whether the programme is contributing to the reduction of undernutrition among stunted children aged 3-12 months.

According to HKI,<sup>1</sup> the programme facilitated the establishment of the VMF; provided seeds, small agricultural equipment and over 3,000 chickens to targeted women; imparted training in crop and livestock production techniques; installed individual drip irrigation systems; and constructed wells to irrigate the gardens.

Impact. An evaluation of the programme implemented in South and South-East Asia, conducted in March 2010, showed improvements in household food security, nutrition and female empowerment. In Bangladesh and Cambodia, the total number of varieties and the volume of vegetables produced were highest among households with developed gardens, as compared to households with no gardens, or traditional or improved gardens.<sup>2</sup> Households with developed gardens grew three times more varieties of vegetables and their total vegetable production was four times greater than households with traditional gardens. Children living in households with developed gardens consumed a median of 13 types of vegetables, compared to an average of 4 types of vegetables consumed by children in households with traditional gardens. Moreover, children from a family with a developed garden ate vegetables 1.6 times more frequently than children from households with a traditional garden. Consumption of livestock-related products also increased. Combined results from Bangladesh and Cambodia showed a 22 per cent increase in the number of families that consumed chicken liver. Egg consumption was found to double on average. All this contributed to improved vitamin A intake.

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<sup>1</sup> Helen Keller International (HKI). 2012. Enhanced Homestead Food Production for Improved Food Security and Nutrition in Burkina Faso.

<sup>2</sup> Traditional gardens are seasonal and are often maintained on scattered plots to grow a few traditional fruits and vegetables such as pumpkins and gourds. Improved gardens are maintained on fixed plots with increased vegetable varieties, though such gardens are still seasonal (not year-round). Developed gardens enable year-round production of a greater range of varieties and are established on fixed plots.

Positive impact was also recorded in terms of income generation. In Cambodian households, income earned from sales of vegetables and fruits increased from a two-month average of US\$3.75 to US\$17.50, while the two-month income from the sale of chickens and eggs increased from US\$9.00 to US\$9.75. Increases in the monthly income of Bangladeshi households were much smaller but still doubled from an average of US\$0.62 to US\$1.24. More than two thirds of the households in Bangladesh and over 90 per cent of households in Cambodia used the surplus income to buy additional foods for their households, such as fish, beef, pork, chicken, rice and cooking oil. Other most common uses of income were for children's education, purchasing medicine and reinvesting in the household's food production activities.

Anaemia prevalence among children aged between 6 and 59 months decreased significantly in Bangladesh and the Philippines and slightly in Cambodia, and remained unchanged in Nepal.

The programme was also successful in empowering women, giving them more control over household resources and enhancing their decision-making power, as a result of the income generated from their homestead food production activities. Consolidated results from Bangladesh, Cambodia and Nepal showed that women managed homestead food production activities in almost three quarters of the beneficiary households. In most communities, women decided which crops would be planted and when, which foods would be eaten at family meals and how income earned from surplus produce would be spent.

Women reported increased autonomy due to the new skills acquired for generating food and income for their households, as well as the ability to provide for some of the children's needs (e.g. education) without having to ask their husbands for money.

While the analysis of outcome data is still ongoing, preliminary monitoring data suggest that the programme in Burkina Faso is contributing to improvements in the lives and well-being of women, children and the wider communities. Availability of vegetables was reportedly extended from 3 to 12 months per year in 1,678 new home gardens, including 842 established with project support and an additional 836 established by women using their own financial resources and project training. Home garden produce was also sold on the market, resulting in meaningful income generation: total sales recorded from October 2011 to June 2012 amounted to FCFA 1,049,030 (US\$2,100) among direct beneficiaries and FCFA 578,000 (US\$1,160) among other community women.

Diet diversity also increased due to consumption of home garden produce, such as vitamin A-rich carrots, dark green leafy vegetables and orange-fleshed sweet potatoes, as well as iron- and protein-rich soybeans, cowpeas, sesame and eggs. Trend data also suggest an increase in food security among target communities as compared to those not targeted.

### **Case study 2: Homestead small fish and vegetable production for better nutrition in Bangladesh<sup>3</sup>**

The IFAD-supported small grant for the project titled Linking Fisheries and Nutrition: Promoting Innovative Fish Production Technologies in Ponds and Wetlands with Nutrient-Rich Small Fish Species in Bangladesh was provided to the International Center for Living Aquatic Resources Management (ICLARM), also known as the WorldFish Center. It was implemented for 32 months in collaboration with the national and local Departments of Fisheries and Extension of the Government of Bangladesh and completed in May 2013.

The grant targeted small-scale poor farming households with small ponds and fishers living in the north-western region and the Haor Basins of Bangladesh, covering the sites of two IFAD-supported ongoing loan projects, namely the Sunamganj Community-Based Resource Management Project (SCBRMP) and the National Agricultural Technology Project (NATP). The main goal of the grant was to improve household nutrition through increased production and consumption of nutrient-rich fish and to enhance communities' income. The Bangladeshi diet is dominated by the staple rice, while vegetables and fish are consumed only in small amounts. Fish in particular is an important source of multiple vitamins, minerals and animal protein but it is not included in complementary feeding of children aged 6 months and above. Surveys show that where small fish is not an adequate part of the diet of the poor, the calcium intake of the latter is significantly reduced, as there are no other rich sources of calcium in the diet (e.g. milk).

<sup>3</sup> IFAD, small grant design document; WorldFish, Highlights from the IFAD-funded Small Fish and Nutrition Project in Bangladesh – PowerPoint presentation delivered at IFAD. The authors wish to thank Sarah Hessel, Associate Country Programme Manager, APR, for advising and providing this documentation.

One of the grant-supported fish production technologies involved the production of carp and the nutrient-rich small fish *mola* in small homestead ponds managed individually by households in Rangpur and Dinajpur, the north-western part of the country. This component spanned two full seasons of fish harvesting/production.<sup>4</sup> The second technology focused on increasing small fish production in wetlands through improved management practices.



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Bangladesh - Sunamganj Community-Based Resource Management Project

An integrated approach was adopted, whereby the promotion of vegetables (e.g. orange-sweet potato, which is rich in vitamin A) grown on pond dykes and in homestead gardens was complemented with a strong sensitization and training component that aimed to enhance the consumption of nutrient-rich fish and vegetables and to increase dietary diversity. This component was implemented with HKI and included training in nutrition, awareness-raising and cooking demonstrations; training of trainers (ToTs); and formation of groups of local women promoters. A gender-sensitive approach was adopted in the selection of the target households; the target group consisted largely of women and children, especially pregnant and lactating women, and women with children aged between 6 and 24 months.

**Impact.** Although data are not yet fully available, results so far show large increases in nutrient-rich small fish production and a 3.5-fold increase in the number of homestead small ponds. This led to the increased consumption of nutrient-rich fish, both in terms of quantity and frequency, especially among pregnant and lactating women and among children, with complementary feeding of the latter starting from 6 months of age. Some of the other grant outputs were the development of a pre-prepared complementary food powder (composed of rice, orange-sweet potato, small fish and oil, intended for children between 6 and 8 months of age) and a fish chutney (dried fish, lightly fried in oil and spices, to be eaten by women with the main meal). Greater production has also led to increases in the households' income, which is mainly used for food purchases, school fees and health-related expenses.

Another positive impact was greater gender equality, e.g. a more equitable participation in household decision-making processes, sharing of workloads, fair intra-household food allocation and women's

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<sup>4</sup> The case study will focus on this component, as it is more relevant to the HTDN, although data on impact may refer to the grant as a whole.

involvement in food purchases, which were previously dominated by men. The training of women as community promoters proved to be an effective mechanism in enhancing the production and consumption of nutritious food. This encouraged households not included in the project to adopt small pond aquaculture and production of orange-sweet potato, and translated into women's empowerment, enhanced social status and increased physical mobility.

Among the challenges is the need to find innovative solutions that would help women balance their disproportionately heavy workload, including engagement in productive activities, caring for children and sick and elderly family members, cleaning, cooking and other chores. The role of mothers-in-law in food distribution and the means to ensure that women and adolescent girls, as well as young children, are fed with nutrient-rich foods also need to be addressed.

Furthermore, given that in Bangladesh men do most of the marketing, there is a need to develop strategies that ensure that the messages regarding the importance of a diversified and nutritious diet for all family members also reach the men, so that they could make informed choices when purchasing foodstuffs.

### Case study 3: Low-cost micro-irrigation systems and organic fertilizers for vegetable gardens in Guatemala<sup>5</sup>

The Scaling up Micro-Irrigation Systems Project (SCAMPIS) began in December 2008 and was completed in July 2012, with support from Coopernic [Cooperation Européenne de Référence et de Négoce des Indépendants Commerçants], a consortium of Europe-based private food retailers.<sup>6</sup> It aimed to improve the livelihoods of 30,000 vulnerable farmers, especially women, in Guatemala, Madagascar and India, by providing them with micro-irrigation systems (MISs) and liquid organic fertilizer (LOF). Micro-irrigation has enormous potential as a means of exploiting even small amounts of water to improve agricultural productivity. It can operate without electricity and be used on small plots of land and different terrains. Furthermore, the locally adapted drip irrigation kit signified a low-cost, user-friendly technology, easy to repair locally and flexible enough for the resource-poor households. LOF is equally cheap as it can be produced by farmers themselves. LOF improves soil fertility and increases productivity without the negative effects that are usually associated with chemical fertilizers. SCAMPIS was later scaled up in India and Guatemala. In Guatemala, SCAMPIS was implemented in Occidente, Cobán and Quiché, where IFAD-funded loan projects were being implemented, thus facilitating linkages and targeting of poor rural communities. By the end of the project, a total of 13,880 households were assisted.



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Guatemala - SCAMPIS Micro-Irrigation Project

Guatemala is characterized by high levels of inequality. Nearly 70 per cent of people living in extreme poverty are from ethnic minority groups or indigenous populations. Most of them live in rural highlands and

<sup>5</sup> IFAD, Scaling up micro-irrigation systems: Outcome report; IFAD, The SCAMPIS Project – Case study; Center for Evaluation (CEval), Final evaluation of SCAMPIS – Scaling up micro-irrigation systems in India, Madagascar and Guatemala, November 2012.

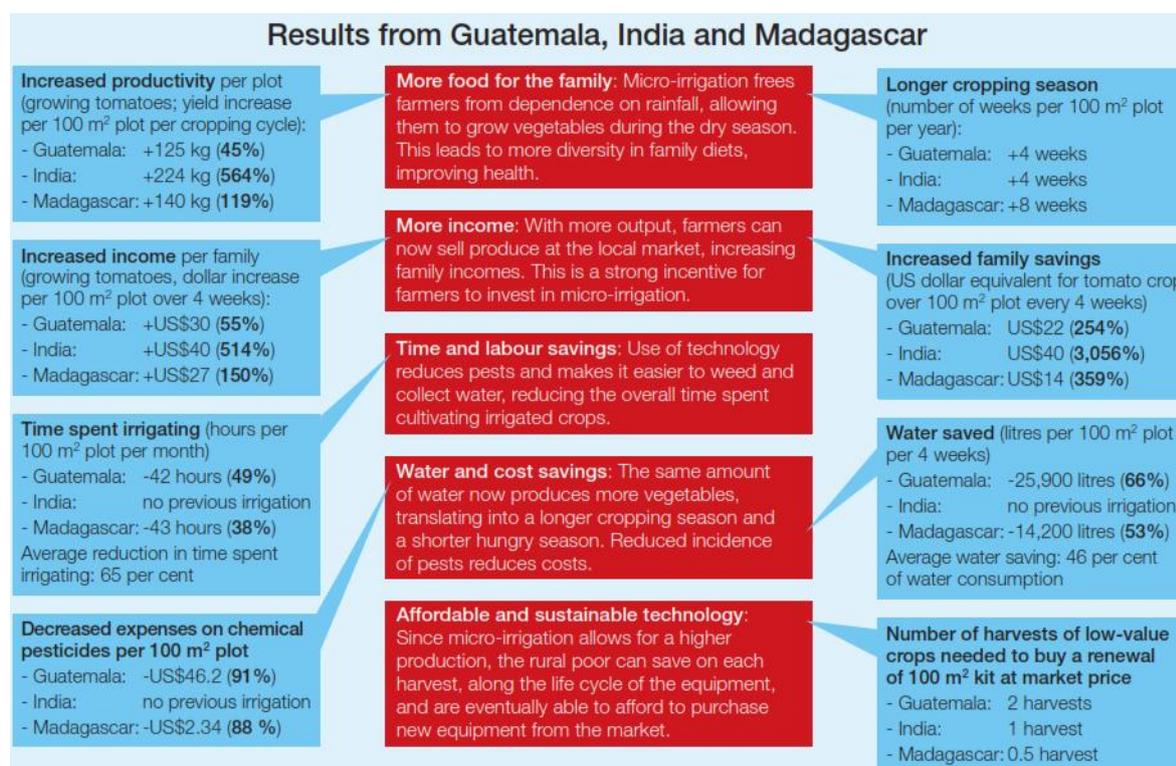
<sup>6</sup> General case study of the SCAMPIS Project available at: [http://www.ifad.org/english/water/scampis/pub/case\\_study.pdf](http://www.ifad.org/english/water/scampis/pub/case_study.pdf)

in dry areas that are affected by regular droughts and soil degradation. Hence, land is often not suited for intensive cultivation of crops, which leads to high rates of severe malnutrition among the local population. Furthermore, women face great inequalities in access to education and in decision-making at the household level.

In Guatemala, SCAMPIS was implemented by the Fundación de la Caficultura para el Desarrollo Rural (FUNCAFE), the social arm of the national coffee producers' association, together with the Municipality of Cobán and the association AGRISEM. FUNCAFE already had experience and know-how in training but not in drip irrigation. It supported the development of school vegetable gardens using MIS and LOFs, and training in installation of MIS equipment, sowing seeds, harvesting and cooking vegetables, farming practices and preparation of organic fertilizers and pesticides. This support was complemented by training in nutrition, health and hygiene, which ensured a comprehensive and successful approach to improving food security of the target communities.

A number of innovative technologies were tailored to poor farmers' needs by the SCAMPIS project. The commercially available MIS kits, intended for plots as large as 600 square metres, were downsized to cover plots of 100 and 50 square metres, thus making them more suitable for vulnerable smallholders. Natural fertilizers (vermiwash and vermicompost) were introduced to maintain soil fertility, increase production and reduce crop losses at little cost. In addition, filters were provided to improve the quality of drinking water, while new practices for intensive cultivation, crop diversification and promotion of synergies between crops were taught to the farmers.

**Impact.** An evaluation was conducted at the end of the project to assess its impact, which can be summarized as follows for all three countries.



### Case study 4: Empowering Papuan women through IHFP in Indonesia<sup>7</sup>

IFAD is a strategic partner in Indonesia's National Program for Community Empowerment [Program Nasional Pemberdayaan Masyarakat] (PNPM Mandiri), one of the world's largest community-driven development (CDD) programmes. PNPM, which was launched in 2007 in collaboration with the World Bank, reaches more than 30 million people nationwide and has significantly reduced the percentage of impoverished citizens nationally.

The small agricultural pilot programme PNPM specifically targets poor rural communities living in remote areas of Papua, West Papua and Sulawesi. These communities are provided with training in farming and gardening techniques, as well as enhanced access to financing for agriculture-related proposals developed by farmers' and women's groups with the goal of improving food security.

In Indonesia, 90 per cent of poor people live in rural areas and 94 per cent depend on agriculture. Papua and West Papua provinces have the highest rates of rural poverty. For generations, Papuans have relied on forest plants and animals for survival, and slash-and-burn agriculture to support their diet.

As part of the project's agriculture-related activities, IFAD assists farmer communities, particularly women, to develop homestead or community gardens, some of which also integrate pig, goat, poultry and rabbit production. In the beginning, the farmers were reluctant to use new seeds and techniques for soil preparation. However, after successful project-supported farmer-led demonstrations, they were willing to change their cultivation practices, formed groups and were trained on how to till the land and water plants properly. Since water is a key constraint to agricultural production in the area, women received training and support in proposal writing, so that they could apply for financing to purchase water supply tanks and pipes that would enable them to bring water closer to their gardens. This would save a significant amount of their money and time, as women usually have to walk two hours in the morning and two more in the evening to fetch water.

**Impact.** The Supervision Mission conducted in July 2013 revealed that food diversity and availability had greatly improved. Previously, the women in the upland villages of Wemina (Papua Province) cultivated and consumed only sweet potato and cassava but with the introduction of vegetable demonstration plots, new crops – including new vegetables and maize – have been introduced. Families are learning from the demonstrations and cultivating these crops in their homestead gardens for consumption. As a result, these crops are now becoming a staple part of their diet along with tubers. The women were also trained in record keeping and accounting, good agricultural practices and pest management, and marketing. The training was provided by extension workers from the local agriculture department and project staff. One of the groups used the block grant received from the project to purchase inputs for the cultivation of new vegetable crops: onions, beans, cabbages, maize and carrots, along with sweet potato. Encouraged by the success achieved on the demonstration plots, about 40 households have started to cultivate the new crops in their own homestead gardens.

In Handuk village in West Papua – located in the Indabri Valley, high in the Arfak Mountain Range, about 70 kilometres away from the capital city of Manokwari – the leader of the women's farmer garden group, Marlina Iwou, proudly showed her cabbages and spring onions. According to her, farmers could only produce 10 to 12 cabbages using the old traditional farming practices, whereas up to 100 cabbages can now be grown in the same area. Marlina indicated that training in the preparation and application of organic composting is what made this big difference. She also noted that the success of her group's garden is attracting attention and generating demand for more training in improved agricultural practices, including by men and leaders of other villages.

In the coastal villages, women's groups reported that they had more fish to consume after they began the fish-drying activity. Many of these women not only buy vegetables but also grow them in their home gardens after seeing the success achieved on the demonstration plots. Food security has greatly improved, especially among the highland groups that grow vegetables, reducing the period of local food shortages from three to one month.

<sup>7</sup> IFAD, Empowering the Papuan women of Indonesia ([http://www.ruralpovertyportal.org/country/voice/tags/indonesia/indonesia\\_women](http://www.ruralpovertyportal.org/country/voice/tags/indonesia/indonesia_women)); Aide Memoire, PNPM Supervision Mission, June-July 2013. The author wishes to thank Ron Hartman, IFAD Country Programme Manager for Indonesia, and Tony Ryan, Senior Consultant, for their advice and inputs to the case study.

The Supervision Mission also indicated that the project was a catalyst for economic and social empowerment, especially among participating women. The members of women's groups have increased their income by around IDR 73,900 (US\$5.50), generating a total of IDR 100,000 (US\$7.50) per month by producing snacks made of banana, cassava, sweet potato, fish and seaweed, and selling them in the local markets. The farmers' groups producing seaweed have increased their income by IDR 2 million to IDR 3 million per production cycle. The farmers in the nutmeg grower groups are already earning IDR 2 million per month from their existing plantations and are expected to further increase their income by a similar amount once



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Papua New Guinea - Productive Partnerships in Agriculture Project

the gestation period of the plantations is over by the end of the project period. Members of the women's groups involved in fish drying earn about IDR 25,000 per kilogram by supplying 6 kilograms of fresh fish to their groups for drying. In turn, the group sells the dried salted fish in the city for IDR 40,000 per kilogram. A similar prospect was observed for groups involved in producing fattened pigs in the highland villages of Wamina. The opportunity to earn money and be part of a group that is free from male dominance translated into some changes in gender relations: the women acquired greater control of their lives and have started to take some decisions on their own.

According to the PNPM Mandiri Rural Agriculture Annual Report, women in Kampung Kota Baru, Kokas subdistrict of the West Papua Province, showed enthusiasm in establishing a vegetable farmers' group. They actively participated in discussions and have benefitted considerably from the new technology in developing the seedbed and preparing land for planting vegetables. They did not hesitate to hoe and cultivate the land, which are traditionally men's tasks. Women enjoyed farming together in community gardens also because this provided them with the opportunity to share labour and better cope with their daily workloads.

### Case study 5: Supporting keyhole gardens for HIV/AIDS-affected households in Lesotho<sup>8</sup>

Originally introduced to the country by StockAid Lesotho, keyhole gardens were promoted in several areas by the DFID-funded Livelihoods Recovery through Agriculture Programme (LRAP) and have been increasingly gaining popularity in the country.

More recently, DFID also funded the Priority Support Programme (PSP), which was implemented between 2006 and 2009. PSP aimed to enhance food security by disseminating homestead food production approaches introduced by LRAP – including the keyhole garden model. In Litšeling village of Berea district targeted by PSP, the Falimehang Support Group was set up in 2003, consisting of volunteers wishing to help HIV/AIDS-affected households and orphaned children. It comprises ten members, eight of whom are women. Mrs 'Mamahloli Rantsebe is one of the group members who built a keyhole garden in her yard. Her husband works in South Africa, while she cares for the home and their four children. She waters the keyhole garden with freshwater from a nearby communal tap, as well as with grey water from the

<sup>8</sup>Nutrition and HIV/AIDS – Keyhole gardens in Lesotho, Food Security, Nutrition and Livelihoods: Lessons from the Field, produced by FAO's Nutrition and Consumer Protection Division (AGN), 2008, [http://www.fao.org/ag/agn/nutrition/docs/FSNL%20Fact%20sheet\\_Keyhole%20gardens.pdf](http://www.fao.org/ag/agn/nutrition/docs/FSNL%20Fact%20sheet_Keyhole%20gardens.pdf); S.D. Turner, Promoting Food Security in Lesotho: Issues and Options, April 2009, [http://www.mokoro.co.uk/files/13/publication/Promoting\\_food\\_security\\_in\\_Lesotho\\_issues\\_and\\_options.pdf](http://www.mokoro.co.uk/files/13/publication/Promoting_food_security_in_Lesotho_issues_and_options.pdf)

household. She is impressed by the amount of food the garden produces and, together with other group members, she supports some 20 HIV/AIDS-affected households by providing them with vegetables from her garden. She and her fellow support group members have been taking turns to help each other build keyhole gardens. PSP-supported communities – especially women – have been enthusiastic about keyhole gardens because of their high productivity and easy use. Nearly every household built one or two such gardens, and a few even a third one.

Between November 2004 and May 2008, a pilot project was implemented in Lesotho to support food and nutrition security and livelihoods of vulnerable HIV/AIDS-affected communities, particularly orphans and vulnerable children, living in the district of Mafeteng. This area was affected by recurrent droughts and high rates of HIV/AIDS. The project, supported by FAO, WFP, UNICEF, the Government of Germany and the NGO Send a Cow Lesotho, focused on facilitating the development of keyhole gardens among target communities.

Since the initial garden construction is labour-intensive (and this was identified as a key constraint in that specific vulnerable context), the keyhole gardens were built by the whole community in order to alleviate the burden on the elderly and the chronically ill. The construction was preceded by the formation of community groups, comprising teachers, priests, peer group farmers and others. These groups, together with community management committees, were trained on group dynamics, conflict resolution, meeting management, record keeping and social skills to enable the communities to collaboratively undertake development activities and to ensure effective participation, ownership and sustainability.

Each garden was divided into four parts, three of which were allocated for leafy plants (except spinach), root crops and spinach, and peas and beans (or other legumes). The fourth section was left fallow and covered by a thick layer of manure and mulch. Communities were taught that crops should rotate approximately every 2 months. Household gardening interventions were complemented with backyard livestock rearing, hygiene and food processing interventions (e.g. fuel saving stoves) in order to maximize impact.

Community trainers received training on group dynamics and environment-friendly horticulture techniques, such as building and maintaining keyhole gardens; making liquid manure and natural pesticides; saving wastewater (i.e. grey water) from household use for irrigation; protecting plants from excessive temperatures and hail stones through the use of mulch and hail-nets; and growing medicinal and insect repellent plants.

Communities also benefited from nutrition education (e.g. nutrition for children, nutrition and HIV, etc.) and training on marketing of surplus production in order to increase household income. Relevant government and NGO staff benefited from capacity-building interventions that raised their awareness on nutrition issues and on the linkages between nutrition and HIV.

**Impact.** According to the programme's beneficiary impact assessment, the homestead gardening techniques promoted by PSP were widely appreciated because they met household needs; were efficient (i.e. low-cost, implemented using local materials); not labour-intensive once they were put in place; and, through the use of household wastewater, they made it possible to produce food all year round.

As reported by FAO, qualitative assessments have highlighted that the promotion of vegetable gardens – in particular, keyhole gardens – improved access to a variety of foods even during the winter months. Participating households were also able to sell surplus vegetables and generate some income. It was reported that neighbouring villages outside the project intervention area were replicating the keyhole garden model on their own initiative.

### Case study 6: Enhancing food security and preserving agrobiodiversity through IHFP in Mexico

An ethnographic study<sup>9</sup> was conducted in 2011 in X-Mejía, a district in the town of Hopelchén in Campeche State, to assess the role of home gardens in the conservation of agrobiodiversity and, through it, in complementing or achieving rural households' daily food needs.

The products deriving from homestead gardens include, among others: the achiote (*Bixa orellana*), a shrub or small tree whose fruit is used as a colourant and condiment for traditional dishes; chive (*Allium fistulosum*), a perennial onion; chaya (*Cnidoscolus chayamansa*) or tree spinach; the sour orange (*Citrus aurantium* or *amara*) or citrus tree; the habanero (*Capsicum chinense*), a variety of chili pepper; cilantro or coriander (*Coriandrum sativum*), an annual herb; and backyard livestock such as hens, pigs and turkeys. These species represent a rich agrobiodiversity that is preserved through cultivation in the home gardens.

**Impact.** Mayan homestead gardens represent an important women's strategy to preserve the agrobiodiversity that suits local environmental conditions, and also social and cultural preferences. Together with other production systems, such as farming fields (*milpa*), bee-keeping, hunting and mining, homestead gardens are part of an important livelihood strategy based on the multiple use of natural resources under conditions characterized by social, cultural and economic pressures.

The results of this research show that the strategy of multiple use of natural resources adopted by the surveyed Mayan farming families enables them to obtain 62 per cent of the ingredients needed to prepare their meals. Therefore, the households only need to buy 38 per cent of the needed ingredients in the form of other food items. In particular, out of 55 ingredients, 18 (33 per cent) are vegetables, fruits or backyard livestock produced in the homestead gardens, while the remaining ingredients are either produced on farms or are big livestock or bee-keeping products. Families need to purchase only 21 ingredients from shops or markets in order to prepare these traditional daily dishes.

A similar study carried out in Calakmul (Campeche) showed that most of the ingredients that are needed for the preparation of various traditional dishes are grown in the homestead gardens or can be obtained as gifts or purchases from relatives and neighbours. Backyard livestock is also a primary source of ingredients found in daily dishes, contributing to protein intake.

Among the products that need to be purchased by the rural families of X-Mejía, the most frequently used are salt, onion, garlic, oil, tomato, cabbage, potatoes, cumin and cloves. In order to buy these ingredients, some of the families interviewed, including indigenous groups, indicated that they sell surplus from their homestead gardens in order to generate some income.

Another important factor contributing to household food security and nutritional needs is the use of garden space for infrastructure that allows for better food preparation. Rainwater collection systems are often built in the gardens, as local women – despite having access to water – believe that food tastes better when cooked with rainwater collected during the rainy season.

Another technique that is used for food processing is the *pib*, which is distinctive of Mayan groups in south-eastern Mexico. This Mayan term refers to a method of cooking in underground ovens heated by means of red-hot stones. Food wrapped in banana leaves is placed in such ovens and covered with tree leaves and earth. According to women, these underground ovens built in the gardens make the food more tasty. Men are usually responsible for attending to the *pib*, which is the only occasion when they are involved in cooking, together with the male children.

In summary, home gardens of the Mayan families of X-Mejía are part of an agrobiodiversity conservation system that enables women to obtain inputs for the preparation of various traditional dishes to feed their families on a daily basis, and which responds not only to food security and nutritional needs but also social and cultural concerns. In fact, agrobiodiversity and the associated traditional knowledge allow the women to maintain their social and cultural identity and transmit it to their descendants.

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<sup>9</sup> D. Cahuich-Campos, El huerto maya y la alimentación cotidiana de las familias campesinas de X-Mejía, Hopelchén, Campeche, in R. Mariaca Méndez, ed., El huerto familiar del sureste de México, 2012, pp. 197-229. ([http://cuencagrijalva.ecosur.mx/cuenca\\_grijalva/pdfs/publicaciones/libros/SP01\\_Lib\\_El\\_huerto\\_familiar\\_del\\_sureste\\_de\\_Mexico.pdf](http://cuencagrijalva.ecosur.mx/cuenca_grijalva/pdfs/publicaciones/libros/SP01_Lib_El_huerto_familiar_del_sureste_de_Mexico.pdf))

### Case study 7: IFAD-supported women's and youth groups engaging in IHFP in The Gambia<sup>10</sup>

The IFAD-funded Livestock and Horticulture Development Project (LHDP) currently being implemented in The Gambia is assisting small-scale rural producers to increase their incomes by improving the yield and quality of their horticultural and backyard livestock products. To this end, women and young people are especially targeted and assisted to establish affinity/group-based vegetable gardens and market-oriented small ruminant, pig and poultry production units.



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The Gambia - Livestock and Horticulture Development Project (LHDP)

According to the LHDP baseline survey, the target communities, including children, suffer from moderate to severe undernourishment and malnutrition. Key informant interviews also indicated that the limited access to markets and the oversupply of produce immediately after each harvest result in income losses associated with the low prices during this period. Lack of storage and processing facilities, pest and disease infestations, high cost of fertilizers and limited extension support are the main obstacles to engagement in sustainable horticultural production. Farmers also indicated that they face problems with limited access to water supply sources, especially during the dry season; inadequate fencing; and limited access to high quality seeds that precludes stable vegetable production.

LHDP supports the provision of fencing for the common gardens; the construction of boreholes and nursery sheds; the construction or rehabilitation of agro-wells; the installation of pumps, water tanks and solar pumps; and capacity-building in good agricultural practices. These interventions aim to increase vegetable production in terms of yields and area. Backyard livestock activities supported by LHDP involve poultry, small ruminant and pig production.

**Anticipated impact.** The project supervision report of 2013 noted that due to the provision of fencing materials (barbed-wired, chain-linked and reinforced chain-linked), farmers are increasingly reporting reduced production losses on the account that stray animals are no longer able to destroy their vegetables inside the fenced gardens. Another important outcome of the project is the granting of land user rights to

<sup>10</sup> IFAD, Livestock and Horticulture Development Project, Baseline Study Report (May 2012), Annual Progress Report(2011), and Supervision Report (April 2013). The author wishes to thank Moses Abukari, IFAD Country Programme Manager for The Gambia, and the Project Staff for their advice and even direct inputs to the case study.

women in order to enable them to carry out IHFP activities. Generally, women in The Gambia have no access to productive assets such as land. The project managed to improve women's access to and secure their user rights over productive land by leasing it for horticultural and livestock production. Under a memorandum of understanding (MoU) signed between the project and the community, any land allocated to the *kafo* (land user group) by the landlord or the local authority must be leased to the *kafo*. Through this MoU, most of the *kafos* have now completed their leasing process. As a result of this, women have become more vocal in local decision-making and have gained control over the land they work on.

A traditional community meeting was held to allocate user rights over rice land to the local women, which everyone in the community attended. Decisions taken were recorded and recognized by the existing legislation.

Both the constructed and rehabilitated wells are enabling women to irrigate their vegetables during the dry season. This is boosting production, although yield still remains a major challenge, as not all agronomic practices have been fully adopted by the farmers, in part due to the limited public extension services delivery. Data from vegetable samples collected by the project coordination unit in two rehabilitated gardens in Dobong Kunda and Jahaly showed promising results. In March 2013, women gardeners in Dobong Kunda produced a total of 768 kilograms of assorted vegetables (namely onions, lettuce, hot pepper, okra, tomato, sorrel and amaranthus) on 0.133 hectares of land, of which 21.6 per cent was consumed and 78.4 per cent was sold, generating an income of GMD 15,925 (about US\$483 or US\$0.63 per kilogram). A similar trend was observed for the women's group (*kafo*) in Jahaly, which recorded a total production of 941 kilograms of assorted vegetables (onions, lettuce, okra, tomato, bitter tomato, sorrel and amaranthus), of which 17 per cent was consumed and 83 per cent sold, generating an estimated income of GMD 23,475 (about US\$771 or US\$0.82 per kilogram). The average income from sold vegetables is, therefore, estimated to be about US\$627 per month.

The project also supports the establishment of fodder plantations. Some farmers have harvested, (sun) dried and stored *Moringa oleifera* leaves and seeds from their well-established fodder tree plantation in Wellingara Ba. The leaves have been found to be a good supplementary feed for small ruminants.

Furthermore, local knowledge and experience have revealed that the Moringa plant, especially its leaves and roots, are also of benefit to humans. Knowledge documented at Baniko Kekoro village in the Upper River Region indicates that the Moringa plant can also be used as food for the family and for medicinal purposes. The leaves cooked with groundnuts make a nutritious soup. The leaves can also be boiled and consumed to treat malaria and to control hypertension. The roots, cleaned and placed in a bottle filled with water, can be used to treat urinary tract infections. The community of Firdawsi in Central River Region uses pounded Moringa seeds to make soap and oil. Boiled leaves are used to prepare a local dish called *mboom*, which is eaten with *chere* or rice, while pounded dried leaves are used to stuff fish.

The project has trained a number of young people in agricultural entrepreneurship and other relevant skills at the vocational training centre of Songhai. Market-oriented vegetable gardens are currently at various stages of development and are expected to provide income-generating opportunities that could incentivize young people to remain in rural areas.

The community procurement approach adopted by livestock-related activities has been one of the more remarkable features of project implementation, whereby a community is provided with some funds to buy rams to establish a breeding stock and buys them from within the community rather than from outside. The purpose of this approach is to ensure sustainability and, more importantly, to promote and maintain the indigenous breed (Jalonke) in a manner that improves productivity and disease resistance. Generally, the approach was found to be fast and reliable.

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