

A field of onions in the Mpiangu valley, Mbanza-Ngungu

Phase Two: 2004-2007

Growing season

As the second phase of the project began in October 2004, the Democratic Republic of the Congo was firmly set on a path towards reconciliation and reconstruction. Peace and power-sharing agreements had ended civil strife in most of the country, and annual GDP was growing at a rate of 6.4 percent.

With the security situation steadily improving, the project aimed at consolidating its achievements in Kinshasa and Lubumbashi and extending its approach to three other cities: Kisangani, Likasi and Mbanza-Ngungu. Kisangani was chosen as part of government efforts to stimulate economic recovery in Oriental Province, while Mbanza-Ngungu and Likasi were selected for their close proximity to technical support services and markets in Kinshasa and Lubumbashi.

From lessons learned in the first four years, the project based its

Phase 2 interventions on what became known as the “Three-S” approach, which is now central to FAO’s overall strategy for UPH development:

- *Secure access to land and water for horticulture*, through regularization of land titles and irrigation and drainage works;
- *Secure high quality horticultural produce*, through intensification and diversification of crop production, field demonstrations, pest management training and improved access to quality seed;
- *Secure “ownership” of UPH by stakeholders in the sector*, by establishing horticulture as a profitable, sustainable livelihood, improving growers’ access to credit and strengthening support services.

Implementation of the “Three-S” approach was ensured at national level by closer integration of the project with the programme of SENAHUP. Within 12 months of the launch of Phase 2, municipal horticulture offices and municipal

consultation committees were functioning in Kisangani, Likasi and Mbanza-Ngungu.

In the three “new cities”, the project first identified market garden areas which were to be targets for interventions. Although small-scale growers were already organized in groups, most groups were not legally recognized and lacked secure title to their plots.

In Likasi, the municipal consultation committee arranged leases to two-thirds of the city’s existing market gardens for 38 associations, representing 1 500 growers. In Mbanza-Ngungu, surveys identified 200 ha under commercial horticulture and 1 500 operators, more than half of them women. Agreements between the town’s municipal consultation committee and the growers’ associations provided secure tenure over 18 areas totalling 112 hectares. In Kisangani, all nine of the city’s market gardening zones were secured through leases of up to 10 years.

In Kinshasa and Lubumbashi, meanwhile, the project helped associations gain secure title to 10 of the city’s 23 project sites and expanded its assistance to a total of 11 800 vegetable growers. By 2008, growers participating in the project in Lubumbashi had won secure access to two-thirds of the market garden area. The city’s vegetable growers were organized in 130 associations and in two cooperatives for input supply and credit.

During Phase 2, the project provided almost US\$750 000 for irrigation, drainage and flood control works in the five cities. In Kinshasa, the construction of 10 small-scale irrigation systems helped reduce watering times from nine to four hours per day, and cut by almost half the average distance from water sources to plots (from 50 m to 30 m).

In Likasi, the project introduced drip irrigation systems, while interventions in Mbanza-Ngungu

CONTROLLING PESTS, WITHOUT TOXIC PESTICIDES



Mbanza-Ngungu. A grower (top) tests a bio-pesticide, based on tephrosia leaves, against onion thrip. Above, a chili mix is prepared for use as a bio-pesticide by growers in the Zamba market garden

To ensure the safety of produce, the project introduced FAO’s Integrated Production and Pest Management (IPPM) approach, which helps reduce the need for pesticides. After studying common problems – such as bacterial wilt, aphids and spider mite – growers tested bio-pesticides based on papaya leaf, tobacco, garlic, *tephrosia* and lemongrass. To record their findings, growers use IPP cards – one showing a current cultivation practice and its related pest or disease problem and one showing a “better practice” in line with the IPPM principles. So far, the project has generated more than 200 pairs of IPP cards.



Likasi. Growers harvesting onions from a trial plot where they tested integrated pest management



Before and after: IPP cards recommend staking to avoid fungal disease of tomato





The start of a 6 km long canal, one of the project's first interventions



A grower waters his field of white cabbage



Bernard Mwelwa grows capsicum, cabbage and tomatoes and earns around US- 200 a month. G less than a copper miner, he says, Fbut the work is more pleasantH



A gardener and family prepare bunches of onions for sale

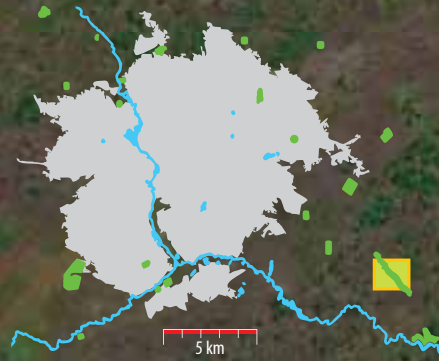


Kilobelobe

Lubumbashi

City's "home garden" provides fresh produce, employment

Located 20 km east of Lubumbashi, the Kilobelobe market garden is the city's biggest producer of leafy vegetables, such as beets, cabbage, sweet potato leaves and spinach. Total vegetable output is estimated at almost 15 000 tonnes a year. The secret of Kilobelobe's success is its good quality soil and ample water supply – one of the project's first interventions was to build a small water regulation structure and a canal that feeds water to the entire 55 ha area. Some 720 growers have gardens in Kilobelobe and provide employment for up to 4 000 labourers.

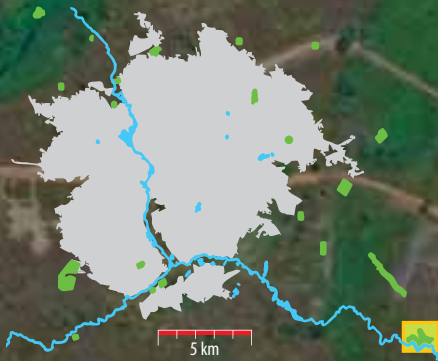


Kamilombe

Lubumbashi

Green acres attract traders

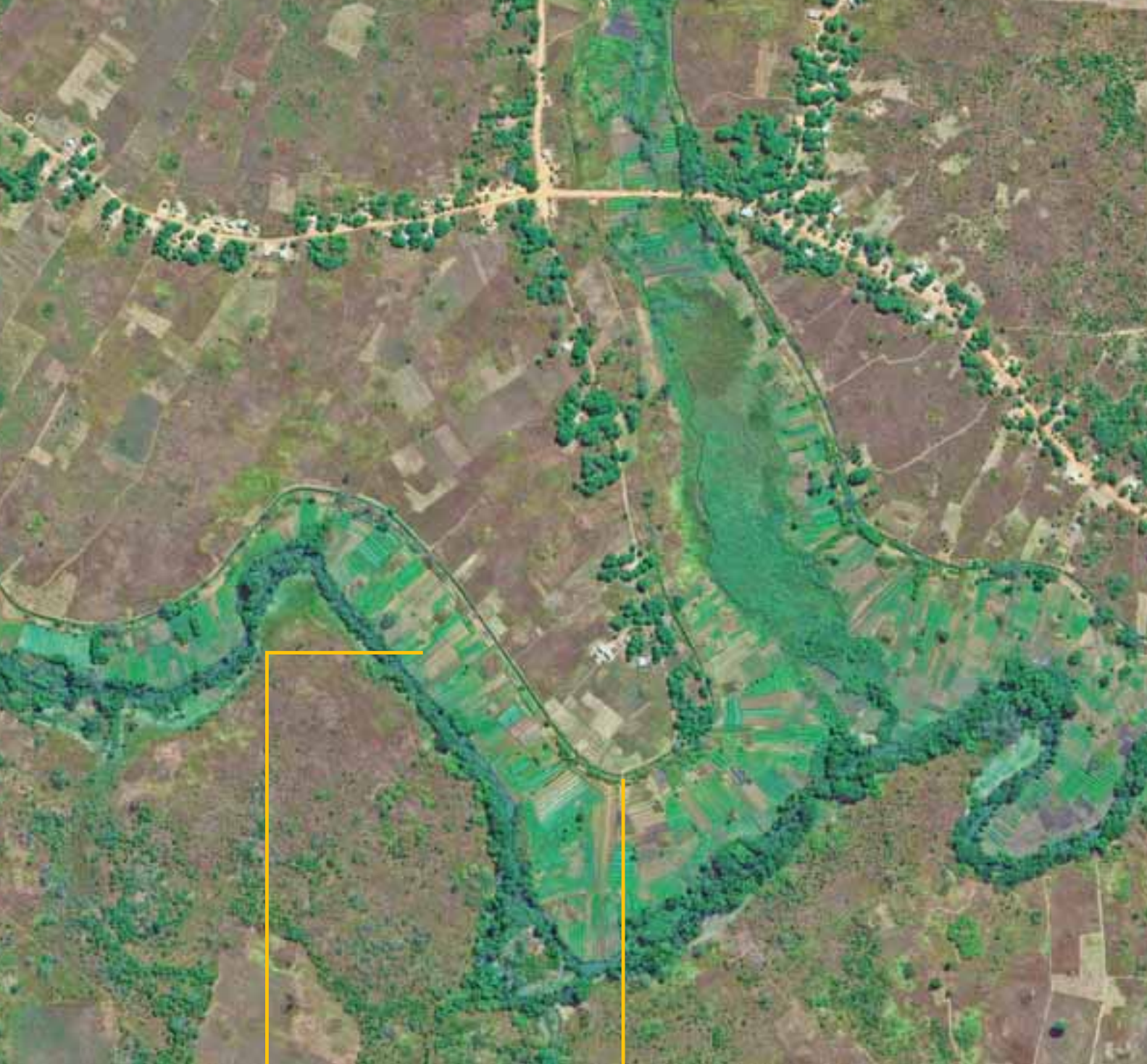
Measuring around 70 ha, the almost perfectly flat Kamilombe market garden curls along the Kafubu river about 2 km south of Kilobelobe. Here, the area's 300 market gardeners grow cabbage, celery, capsicum, onion and leek practically all year round. Traders come from the city to harvest produce and consign it to transporters, who haul it by bicycle to Pande market, 12 km away. Kamilombe's annual vegetable production is estimated at 14 500 tonnes.



Although water is supplied by irrigation canals, watering at Kamilombe is still done by hand



Growers on their way to work pass a field of emerging cabbages



Elizabeth Kaulu with daughter Alpha, the youngest of her eight children. She cultivates a plot of 80 m by - 0 m all year round



Katanga Musonda bicycles to Kamilombe twice a day to collect vegetables and transport them to Pande market

The project supplies seeds of improved varieties for trials by growers' associations, and encourages them to share the results through Hortivar (www.fao.org/hortivar), FAO's online, geo-referenced database on cultivar performance and appropriate cropping practices. In Lubumbashi, project staff added more than 800 entries to Hortivar, based on trial results. In turn, growers regularly consult Hortivar to identify promising varieties and improve their cultivation practices. Thanks to the project, the Democratic Republic of the Congo has become a major contributor to Hortivar, with more than 1 700 entries by November 2010.

DEMONSTRATION PLOTS TEST NEW CROPS AND CULTIVATION TECHNIQUES



Likasi. In the Panda market garden, trials of a high-yielding white cabbage hybrid variety



Kinshasa. Growers test improved varieties of beetroot, chives, cabbage and onion



Lubumbashi. Production of amaranth seeds

included construction of two small dams. In Kisangani, where horticulture was limited to the relatively flood-free months of December to February, new flood control basins helped extend the growing season.

More power to growers' associations. A major aim of Phase 2 was to improve the growers' technical capacity and skills in enterprise management, and to give their associations a greater role in organizing training and basic services. The project helped growers set up demonstration plots to test new crops and cultivation techniques, and enlisted "pilot farmers" to multiply improved plant material and produce seedlings.

The Farmer Field School programme was expanded, both to train facilitators selected among the growers and to cover a wider range of production issues, such as nursery management, floriculture and soil fertilization. In all, the project organized more than 200 schools in the five cities, involving some 3 500 growers.

In Kinshasa, SENAHUP organized management training for 200 officers of growers' associations, as well as 50 farmer field schools involving 1 500 producers. A review of Kinshasa's UPH sector in 2007 said that the project "excelled in technical support", providing specialists to assist growers for 12 days a month. It also noted an increase in the supply of seed and fertilizer.

In Mbanza-Ngungu, the municipal horticulture office organized 47 field schools, trained 60 facilitators, and

Field school facilitators in Likasi at the end of a 16-week training course



conducted specialized training at the growers' request on composting, bio-pesticides and accounting. The Kisangani office organized 32 field schools attended by 480 growers, half of them women. In Likasi, some 520 growers took part in field schools that focused on the use of bio-pesticides and organic fertilizers.

The project's approach to micro-credit was also reviewed and improved. The lack of a "repayment culture" among vegetable growers – stemming from long exposure to emergency aid – had led to high loan default rates. In Phase 2, therefore, the project set criteria for assessing associations' "credit rating", while its NGO partners provided practical training in bookkeeping, accounting, financial planning and the value of savings.

In Kinshasa, loans were invested in growing higher value vegetable crops, as well as in micro-enterprises, including the construction of input stores and composting units. One association invested in small-scale pig farming, which had an added benefit: the pigs also provided organic fertilizer for the vegetable gardens. In Lubumbashi, one project assessment reported, "80 percent of women now own farm tools thanks to micro-credit".

The project also took a new direction by encouraging schools to start their own vegetable gardens. It provided tools, seed and practical advice to help start gardens at a total of 40 schools in Kinshasa, Lubumbashi, Kisangani, Likasi and Mbanza-Ngungu.



Growers in Kisangani tripled their average incomes by switching to more profitable crops, such as beans

Lower rents, higher incomes. As Phase 2 neared its end in 2007, the project was providing assistance to some 17 350 small-scale market gardeners working an area of 1 900 ha. An evaluation mission found that the project had helped growers obtain secure title to 1 120 hectares of land, with term of leases ranging from one or two years in Lubumbashi to 10 years in one area of Kinshasa. One effect of increasingly secure tenure for growers was a decline in the rent being charged for land.

In all five cities, growers had expanded the cultivated area and extended production into the rainy season. Thanks to increased productivity, market gardeners' incomes had risen significantly. In Kisangani, where many growers were adopting profitable new crops, such as green beans, cabbage, carrots and lettuce, the average monthly income of a market gardener had risen from US\$18 to US\$60. Between March 2005 and March 2007, the average income of market gardeners in Likasi rose from US\$70 to US\$160 a month, and in Kinshasa from US\$50 to US\$142.

The evaluation recommended a third phase of the project aimed at applying its approach within a nationwide initiative for UPH development. In support of the new phase, the mission called for streamlining procedures for the issuance of land permits. It also recommended action to promote school gardens, improve post-harvest management and processing, and increase the consumption of fruits and vegetables.

ENABLING GROWERS TO BUY THE INPUTS THEY NEED

Between 2000 and 2010, the project disbursed to market gardeners loans worth US\$1.08 million for investment in crop production and other income-generating activities. Most of that credit was channelled through "micro-banks" managed by development NGOs and growers' own associations. Each *micro-caisse* serves from 50 to 75 growers, who contribute 20 percent of the loan amount for approved activities. The loans, averaging US\$60 per grower, are used mainly to buy inputs and farm tools, or invested in small-scale enterprises, such as seedling nurseries, composting units and small-scale animal production.



Lubumbashi. The president of a growers' association (at right) signs an agreement with a development NGO for a loan to buy seed, compost and bio-pesticides



Likasi. A course in micro-credit management for officers from 72 growers' associations



Kinshasa. A growers' association used credit to start a profitable business making nutrient-rich fertilizer in a vermicomposting unit

A brisk trade in locally grown produce

A pavilion built with project support in Lubumbashi's Pande market in 2003 now serves as the main hub for the marketing of horticultural produce grown at Kilobelobe and Kamilombe. The pavilion hosts some 30 vendors, most of them women, who report incomes of up to US\$50 a day. Thanks to the project, the vendors say, locally grown vegetables have replaced produce that, until recently, was imported from neighbouring Zambia. Business is so brisk that the vendors have requested at least three times more space in order to meet consumer demand.



A steady stream of transporters delivers fresh produce from the city's peri-urban market gardens



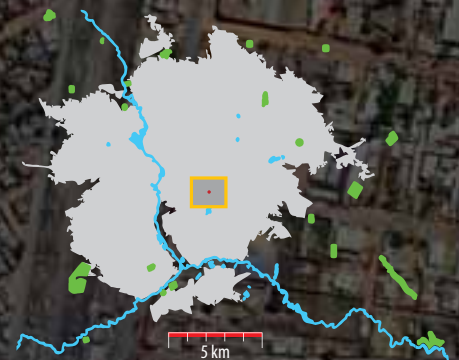
The pavilion newly constructed



Scenes from a typical day in Pande market



Vendor Kally Nyembo (at right) buys vegetables directly from market gardeners in Kilobelobe



Pande market

Lubumbashi





Traders harvest crops directly from growers' fields

Phase Three: 2008-2012

Harvest

By 2008, the Democratic Republic of the Congo had finally achieved the stability it needed for its sustainable socio-economic development.

Multiparty presidential elections in 2006 – the first since 1960 – had given the country a broad coalition government committed to drastically improving the Congolese people's living conditions within a generation.

In the agriculture sector, the government was preparing an agriculture master plan giving full recognition to the role of urban and peri-urban horticulture in ensuring

food and nutrition security and alleviating urban poverty. It was also implementing constitutional reforms that would decentralize agricultural planning and decision-making to provincial governments.

The third phase of the project, which began in January 2008, is contributing to the country's recovery by laying the foundations for UPH development programmes at national and provincial levels.

It is helping to set up municipal consultation committees in all provincial capitals, and sponsoring workshops to formulate horticultural development plans for each province. Meanwhile, SENAHUP has opened new offices in eight cities.

“Five-S” approach. Building on the strategy validated in Phase 2 – securing access to land and water, improving the quality of produce and professionalizing growers – the project has developed a “Five-S” approach with two new objectives.

Because vegetable consumption is



Horticulture Day in Lubumbashi. The key to increased production is boosting demand

still below FAO/WHO recommended levels, FAO says the key to increased production is interventions focused on boosting demand. One of the new objectives, therefore, is to secure increased consumption of fruits and vegetables by offering consumers a wider variety of safe, quality produce, promoting school gardens, and creating a more efficient horticulture supply chain.

The project is sponsoring public information campaigns, investing in the construction or improvement of neighbourhood markets, and encouraging the labelling of produce to build consumer confidence.

The project's second new objective is to secure capitalization of methodologies and technologies developed over the past decade, and to transfer the project's approach to other cities of the Democratic Republic of the Congo and to other African countries. The project is bringing together all municipal UPH advisers for regular consultations, and preparing manuals for trainers and briefing kits for decision-makers.

It has sponsored regional dialogue on UPH with neighbouring countries, such as Burundi, Rwanda and Zambia, and forged links with the Dimitra programme, a Belgium-funded initiative that shares development ideas and good practices throughout Africa.

Taking stock. In July 2010, FAO took stock of the project's achievements since 2000. It found that the project is now assisting directly some 16 100 vegetable growers working an area of 2 000 ha in and around Kinshasa, Lubumbashi, Kisangani, Likasi and Mbanza-Ngungu.

Project sites account for more than half the total area dedicated to commercial horticulture in the five cities. Secure land tenure to 1 225 ha has been guaranteed through leases, permits and zoning facilitated by the project.

Water control structures, built or

TOOLS, SEEDS AND PRACTICAL ADVICE FOR SCHOOL GARDENERS



Mbanza-Ngungu. Pupils of the Kola primary school at work on their school garden

The project has helped establish vegetable gardens in 74 primary schools and high schools. School gardens are powerful tools for improving child nutrition: they familiarize children with horticulture, provide fresh food for healthy school meals and help teachers develop nutrition courses. When replicated at home, they improve family nutrition. In 2010, more than 18 700 students were participating in the project's school gardens programme. One objective of Phase 3 is to foster a national programme in collaboration with health and education ministries and WHO.



Lubumbashi. At the Maadini school, children clear scrub, prepare seed beds and tend their cabbage nursery



Tshamalale

Lubumbashi

With drip irrigation, intensified production

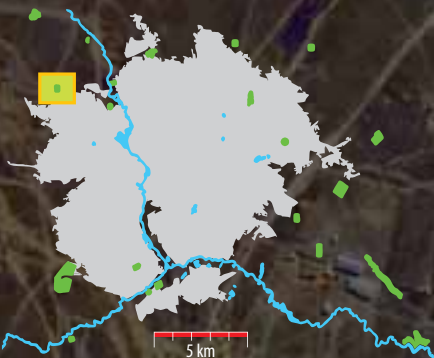
Tshamalale represents the future of Lubumbashi's urban and peri-urban horticulture sector. On 6 ha of land on the city's western outskirts, three growers' associations dug five wells 5 m deep to tap into the area's rich groundwater resources. Then they used a project loan to buy a low-pressure drip irrigation system for their fields of tomatoes, cabbages, green beans, onions and zucchini. The area currently produces around 2.5 tonnes of produce a week, all year round, for sale mainly to the city's supermarkets. The project is using Tshamalale to train other market gardeners in sustainable intensification of production.



Five wells 5 m deep provide water to Tshamalale's fields



The wells supply groundwater to cabbage fields through a low-pressure drip irrigation system





A drainage canal dug through marshes helped increase the cultivable area from - to 6 ha



A field of ripening tomatoes at Tshamalale



The onion nursery



Likasi. Members of the Hodari Mothers' association, who grow vegetables in the Nguya area 18 km from the city centre

INVESTING IN **WOMEN** – AND THE NEXT GENERATION

Of the more than 16 000 growers participating in Phase 3 of the project, almost 10 000 are women. In Lubumbashi, more than 6 000 women have taken out micro-credit loans over the past 10 years, using them to buy inputs and farm tools. Thanks to training through farmer field schools, the women now cultivate 15 types of leafy vegetables, compared to just four when the project began. Some women have also invested in small-scale livestock, dressmaking and child-care enterprises. Higher incomes mean improved child nutrition – one study found that market gardeners' children ate on average 3.3 meals a day, compared to "less than two" when the project began.



Mbanza-Ngungu. A bumper crop of cabbage in the Kinzau market garden



Lubumbashi. Thanks to micro-credit, many women can afford pedal-pumps

upgraded, now provide water for market gardens throughout the year in Kinshasa, Lubumbashi, Kisangani and Likasi, and have extended water availability from four months to eight months in Mbanza-Ngungu.

Through farmer field schools involving a total of 350 growers' associations, the project has introduced and disseminated new production and processing technologies, and doubled to 50 the number of vegetable varieties being grown. Organic fertilizers and bio-pesticides are steadily replacing more expensive chemical fertilizers and synthetic pesticides. More than 75 percent of growers are using improved seed and have adopted other good practices – soil preparation, crop diversification, improved nursery management and crop rotation.

Thanks mainly to the project, vegetable production in Kinshasa has increased from an estimated 30 000 tonnes in 2000 to around 80 000 tonnes in 2009. The city's market gardens now account for 65 percent of its vegetable supply. In Lubumbashi, the area under commercial horticulture has grown from less than 100 ha in 2000 to 720 ha, and production from 2 250 tonnes to an estimated 60 000 tonnes. Women there make up more than 70 percent of growers benefiting from project activities.

Meanwhile, growers in Mbanza-Ngungu are shifting to highly profitable cultivation of potatoes, achieving yields of up to 30 tonnes per hectare, and the town is now supplying seed potatoes to farmers in Kinshasa. In Likasi, the average monthly income of the city's vegetable growers is almost US\$300 a month, compared to less than US\$70 five years earlier.

In all cities, the project has promoted simple post-harvest technologies for popular vegetables – for example, chili paste is being sold in local supermarkets. Market

collection and sales points have been constructed or improved in 15 neighbourhoods to link growers to consumers.

Because they are cultivating larger areas with more profitable crops, market gardeners have higher profit margins, and are better able to meet health and child care costs. In 2000, less than 30 percent of growers in Kinshasa and less than 20 percent of those in Lubumbashi said they had cash reserves. Today, the proportion has reached 80 percent in Kinshasa and almost 100 percent in Lubumbashi. Savings are being invested in children's education and home improvements, and many growers have opened accounts with credit unions or banks.

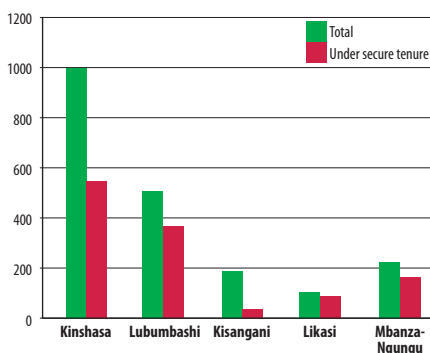
FAO concluded that the "Five-S" approach to UPH development has produced a truly bountiful harvest. By securing growers' access to land and water, and registering their associations as formal organizations, the project stabilized the sector and provided the basis for its sustainable development. The technical guidance and capacity building provided through farmer field schools have proven effective in improving the quantity, quality and safety of horticultural produce.

Finally, the decade-long collaboration between FAO, SENAHP and municipal authorities has laid a solid foundation for national and provincial programmes for UPH development. FAO believes that the project in the Democratic Republic of the Congo will serve as a platform for dissemination of sustainable urban and peri-urban horticulture in the Great Lakes sub-region of Africa, and beyond.

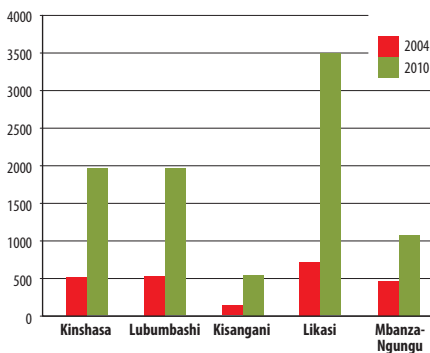
MEASURES OF IMPACT

Source: FAO/SENAHUP

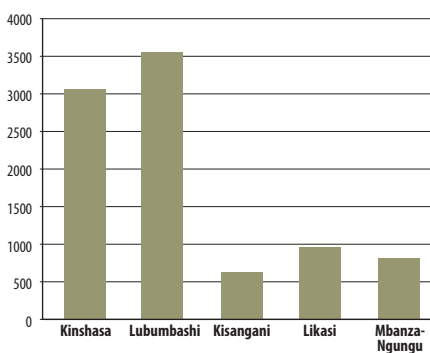
Market gardens covered by project activities, 2010 (hectares)



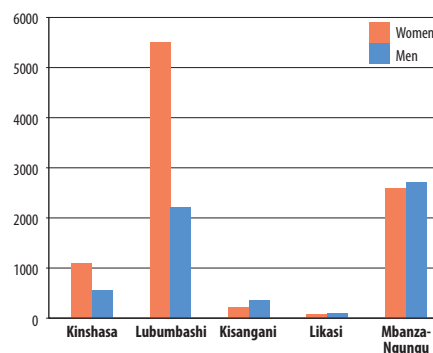
Average annual income of market gardeners (US\$)



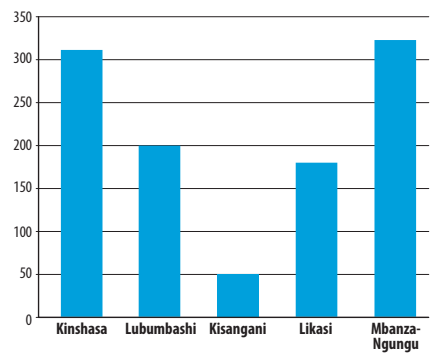
Number of market gardeners attending field schools, 2000-2010



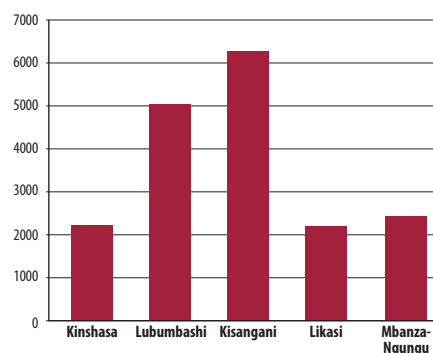
Number of market gardeners participating in project, 2010



Loans disbursed to market gardeners, 2000-2010 (US\$ thousands)



Number of students participating in school gardens programme, 2010



"All of my life is here"

In 2004, Irène Kalenga joined fellow growers at the Kashamata market garden in digging a 3 km-long canal to divert water from the Kafubu river to their fields. It took them three months, using machetes, picks and shovels, and a route survey carried out by the project. Their hard labour now provides a year-round water supply that has allowed them to expand their vegetable gardens from 3.5 ha to 9 ha. "All of my life is here," says grower Irène Kalenga, who earns monthly income of around US\$375 from the sale of cabbages, onions, tomatoes and eggplant.

Kashamata

Lubumbashi



Two growers' associations with 71 members cultivate vegetables at Kashamata



Belgium's Minister of Development Cooperation, Charles Michel (centre), visits the Kashamata canal in 2009



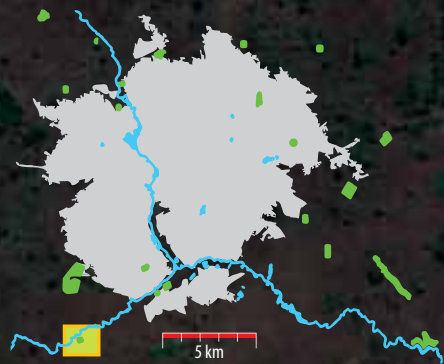
The canal provides water to 9 ha of vegetable gardens

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Route of the canal





*Irène Kalenga
beside her fields
at Kashamata*



Partners in urban and peri-urban horticulture

Ministry of Rural Development, Democratic Republic of the Congo

Boulevard du 30 juin,
Commune de la Gombe, Kinshasa



The Ministry promotes UPH through its National Support Service for Urban and Peri-urban Horticulture (SENAHUP), which has municipal horticultural offices in 13 cities.

Food and Agriculture Organization of the United Nations

Viale delle Terme di Caracalla,
00153 Rome, Italy



FAO's Programme for Urban and Peri-urban Horticulture helps governments and city administrations to optimize policies, institutional frameworks and support services for UPH, to improve production and marketing systems, and to enhance the horticulture value chain.

Belgian Development Cooperation

Rue des Petits Carmes, 15
B-1000 Brussels, Belgium



Belgium has provided funding of US\$15 million in support of FAO-assisted projects for UPH development in Bolivia, Burundi, the Democratic Republic of the Congo, Côte d'Ivoire and Namibia, and for an ongoing global initiative aimed at disseminating lessons learned.

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(1,2), FAO/SENAHUP

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The FAO/SENAHUP project office in Lubumbashi



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