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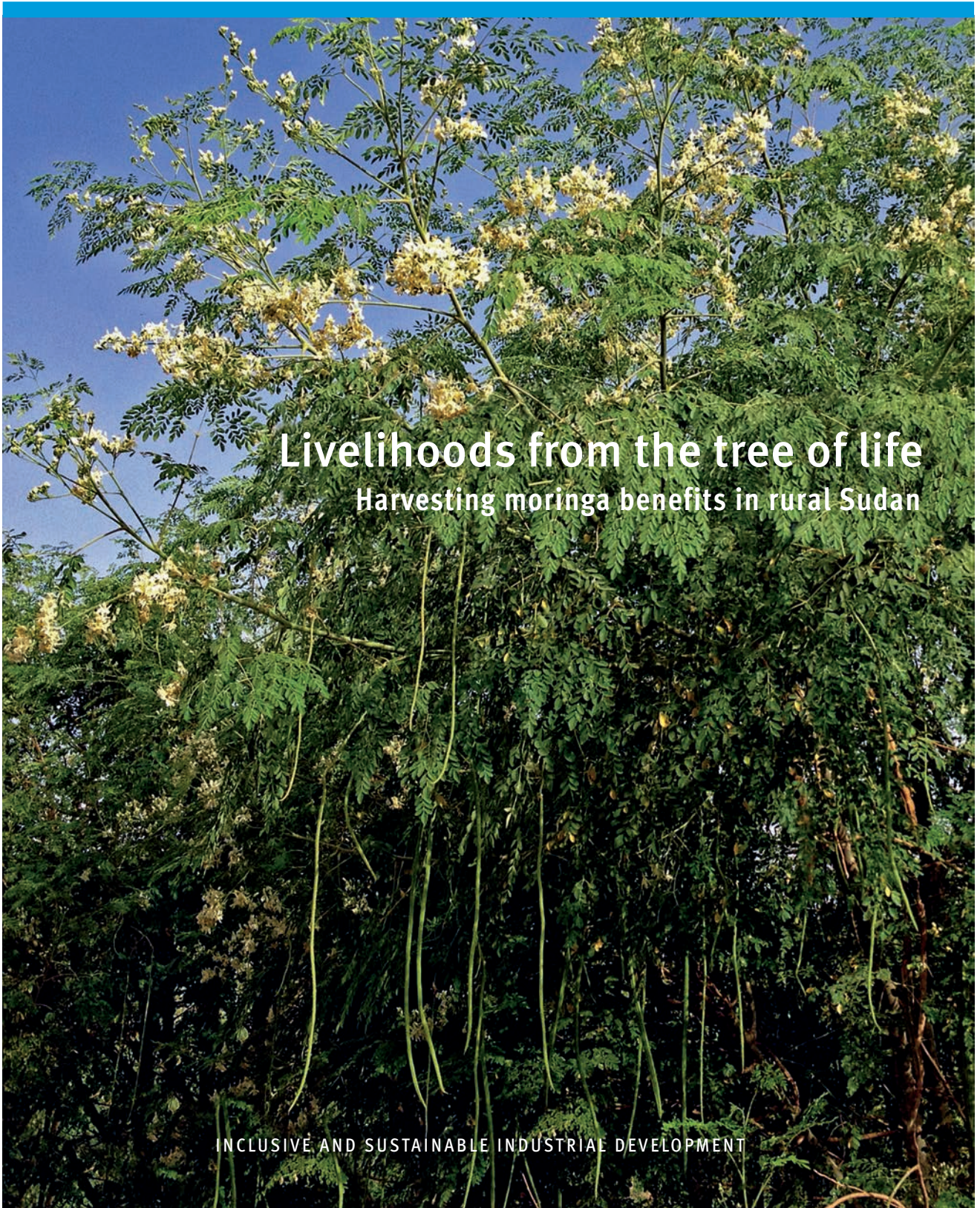
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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Cooperazione Italiana
allo Sviluppo
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Livelihoods from the tree of life

Harvesting moringa benefits in rural Sudan

INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT



Developing the moringa value chain in Sudan

It is a sun-loving, fast-growing tree, which tolerates poor soils and long spells of dry weather. Rich in vitamins, minerals and protein, it is a versatile source of food for humans, while as fodder it benefits livestock farmers by increasing milk and meat production. It yields edible oil and biofuel, and is used to purify water and combat land degradation. It is even said to work health and cosmetic wonders such as preserving the youthful appearance of the human skin. And while its long slender pods gave it its unpretentious name of the “drumstick tree,” it is frequently – and more fittingly – called the “miracle tree” and the “tree of life.”

Native to the southern foothills of the Himalayas in north-western India, *Moringa oleifera* is the most widely grown species of the genus *Moringa*. This robust tree is cultivated in arid, semiarid as well as tropical and subtropical regions, and it grows best in dry sandy soil. It is an important crop in India, Sri Lanka, Pakistan, the Philippines, and Thailand, and it occurs as a wild plant and is cultivated in Central America and the Caribbean, South America, Oceania, and many African countries.

A cornucopia of vitamins, minerals and protein

While moringa is regarded as one of the world’s most valuable multi-purpose trees, it is its nutritional value that has received the greatest attention from researchers and food product developers. Leaves, pods, flowers and roots are all edible. Moringa leaves contain more vitamin A than carrots, more iron than spinach, more calcium than milk, more vitamin C than oranges, and more potassium than bananas, are rich in omega oils and antioxidants, and their protein quality rivals that of milk and eggs.

As a source of nutritious food, moringa is seen as a particularly important crop for African countries plagued by drought, poverty, and rudimentary agricultural infrastructure. During the last three decades, significant efforts have been made to promote the cultivation and processing of moringa in Africa to combat malnutrition, especially among infants and nursing mothers, and to contribute to food security in arid and semiarid environments, where moringa thrives during dry seasons when little else can grow and provide food.

Sudan is among the countries that face these challenges and at the same time are striving to develop capabilities to harvest the benefits of the tree of life. Rural communities in Sudan have used moringa for hundreds of years, mostly as a food source, but also as a medicinal plant and to purify the turbid water of the Nile.



UNIDO's response: integration with CLARIS III

In December 2013, Sudan's Government requested assistance from the United Nations Industrial Development Organization (UNIDO) in "developing moringa crops as well as in manufacturing and marketing of moringa-based products to increase income generation" opportunities. The official request, sent by the Ministry of Science and Communications through its Moringa Science and Technology Council (MSTC), praised UNIDO's experience in developing agro-value chains and building entrepreneurial capabilities with emphasis on the advancement of vulnerable population groups, and outlined the potential of moringa products to improve livelihoods in Sudan's farming communities.

UNIDO's prompt response included a fast-track assessment of the moringa value chain in Sudan, and the decision to add a "moringa rural development component" to the Organization's CLARIS III (Community Livelihood and Rural Industry Support Programme, now in its third phase of implementation), a programme funded by the Italian Development Cooperation. CLARIS III aims to facilitate livelihood recovery among some 40,000 people displaced from South Kordofan State and living in shantytowns in Khartoum State. Hundreds of these internally displaced persons (IDPs), most of them young and many of them women, have already benefited from technical and rural entrepreneurship training and provision of agro-industrial tool-kits and start-up materials.

Within the framework of CLARIS III, UNIDO and MSTC organized the First Moringa National Conference, held in Khartoum in May 2014. Attended by some 400 participants representing national and regional government institutions, universities, potential development partners, and the private sector, the Conference yielded recommendations that helped establish the design and objectives of UNIDO's interventions, which were to consist primarily of the following activities:

- provision of technical assistance to small-holding farmers in processing moringa leaves and seeds, and support in developing entrepreneurial capabilities in particular among women and youth;
- creation of synergies among relevant stakeholders to help scale up research initiatives on products such as baby food, tea, and cosmetics;
- facilitation of product quality improvements to secure sustainable market access by the introduction of product specifications and testing, a traceability system along the value chain, and certification mechanisms.

Concerted action for higher impact

Developed after further consultations with Sudan's Government, the UNIDO project (Establishing a Moringa-Based Economic Development Programme to Improve the Livelihood of Rural Communities in Sudan) targets the states of Khartoum and Kassala with the overall objective



of improving nutrition and food security and creating income opportunities in farming communities by developing the moringa value chain. In line with UNIDO's partnership and integration approach to the pursuit of its mandate to promote inclusive and sustainable industrial development (ISID), the Organization is implementing its project in close coordination with its on-going programmes and it envisages cooperation with other moringa initiatives in Sudan. By integrating its various interventions and acting in concert with other related initiatives, UNIDO aims for higher and sustainable impact.

In Khartoum State, project activities carried out within the scope of CLARIS III will support women with training and employment counselling; the project will also help establish women's cooperatives and production clusters. Moreover, the Khartoum State Ministry of Agriculture promotes family farming and fruit and vegetable processing in a project involving some 14,000 women; this project includes training in the use of moringa as food supplement, fodder, and water purifier, and cooperation with the Sudanese Red Crescent and UNIDO's Claris III is being contemplated in order to expand this initiative to the IDP areas around the capital.

In Kassala, the project will also benefit from the Integrated Food Security Programme, funded by Canada and implemented jointly by UNIDO and FAO, which includes assistance to farmers in the cultivation and processing of moringa. Cooperation with other providers of development assistance is also likely given the interest expressed by Plan International and the German Agro-Action in the potential of moringa products to combat child malnutrition.

Project activities in both states will benefit from R&D insights gained by local partners, primarily the Government's MSTC, but also the Moringa Research and Development Group, a volunteer initiative launched in 2008 by researchers and private companies.

A three-stage roadmap

After an initial six-month preparation period, the project is now embarking upon a two-year phase of actual implementation, to be followed by a scaling-up stage. The recently completed inception phase included assessments of the present policy framework and of market opportunities, a feasibility study on the establishment of moringa transformation centres, the selection of direct beneficiaries, as well as pilot training activities at both locations.

The main timeframe for project activities is the second phase, which consists of the following components:

- assistance in developing a coherent national strategy for moringa cultivation, processing and marketing, and dissemination of strategy guidelines in cooperation with MSTC;



- development of agro-industrial and managerial training capabilities for the benefit of small-holding farmers, and direct support services to moringa growers and processors with emphasis on improving livelihoods among women and youth;
- exchange of experiences through local, regional and international study tours and trade fair participations;
- provision of facilities (transformation centres) and equipment needed to develop moringa-based products;
- pilot product development and trial marketing;
- development of product standards and establishment of a traceability system, conformity assessment schemes, and certification mechanisms.

Upgrading products for sustainable market access

The third and final project phase will disseminate R&D results and upgrade products for commercialization through national and international marketing initiatives.

Apart from combating malnutrition, providing purified water, and increasing livestock productivity, the UNIDO project aims to reduce poverty by developing marketable moringa-based products as a source of income for disadvantaged population groups and small-holding farmers. This requires upgrading the informal moringa-related activities that are currently predominant in Sudan by introducing cultivation, post-harvest and processing best practices, and by establishing a quality management and certification system.

The project will focus on moringa leaf powder and moringa oil as high-end products with good prospects in international markets. As a food supplement belonging to the “green superfoods” category, moringa leaf powder is a front-runner of the global nutritional supplement industry, which has enjoyed significant growth in recent years.

In the cosmetics industry, the marked trend in favour of vegetable oils has triggered a steadily growing demand for oils extracted from exotic plants, with moringa oil seen as having great potential as a key ingredient for face and body cream due to its anti-ageing properties.

The UNIDO project will seek to build up the export potential of Sudanese moringa products by developing food safety and quality assurance standards to ensure conformity with international norms. Organic and GMP certifications and Fair Trade labelling are also expected to play an important role in this endeavour.



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