Food and Agriculture Organization of the United Nations

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Action Programme: building back better

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Food and Agriculture Organization of the United Nations
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CONTENTS

EXECUTIVE SUMMARY

The increasing pace of urbanization implies a growing demand for basic goods and services and local administrations are finding it more and more difficult to meet the needs for urban populations. The COVID-19 pandemic has added new challenges, worsening conditions for the most vulnerable.

The main objective of the Green Cities Action Programme is to increase people's wellbeing through increased availability of and access to products and services provided by green spaces including urban and peri-urban forestry, agriculture and by sustainable food systems.

The main beneficiaries of the programme will be urban dwellers in the target cities, national and sub-national governments and a variety of stakeholders related to green spaces, urban forestry, and urban agri–food systems.

The Green Cities Action Programme includes four components for which FAO will provide support:

- The **Enabling Environment** component will focus on actions supporting the development of risk and vulnerability assessments, evidence-based and inclusive policies, planning and governance frameworks at national and sub-national levels to foster investments and promote innovations in resilient and green spaces and sustainable urban food systems.

- **Actions for metropolitan cities:** they play a crucial role in contributing to growth and wealth at national level. Actions and FAO support will focus on innovation and green technologies for food systems and green infrastructure, improved food distribution systems and food environments, improved food and water waste management and how to bring this all together through improved urban planning and rural urban linkages.

- **Actions for intermediary cities:** they play a primary role in connecting important rural and urban areas to basic facilities and services. Actions and FAO support will focus on the balance between green and healthy environments and productivity, production of local food, connections between producers and local markets, innovative agro-processing food hubs and green jobs, farmers markets and circular economy.

- **Actions for small cities:** they are characterised by land availability, potential for healthier diets and proximity and close interactions to where food is produced. Actions and FAO support will focus on governance for functional territories, innovation and green technologies for green infrastructures and food systems, improved agro-processing hubs and urban-rural linkages, promotion of off-farm job opportunities, reduction of food losses and better food and water waste management.

The Green Cities Action Programme will involve 100 cities (15 metropolitan, 40 intermediary and 45 small cities) in 15 countries over a period of three years.

The main technical entry points for action at city level include green spaces including urban forestry and urban and peri-urban agriculture, food processing and distribution, food environments as well as food and other waste management. Water and energy are also integrated as cross-cutting issues.

The total budget required to implement the three-year action plan will be financed by FAO regular and extra-budgetary resources and by the concerned countries and cities.

INTRODUCTION

Today 55 percent of the world population resides in urban areas. By 2050 the urban population is expected to reach 68 percent and over 90 percent of this increase will occur in the urban areas of low -income countries, especially in Africa and Asia.

A growing population implies an increasing demand for food, land, water, energy and basic services. As of today, cities already consume 70 percent of the global food supply and almost 80 percent of the total energy produced in the world, while they produce 70 percent of global waste. Many urban and peri -urban communities are exposed to food and nutrition insecurity and undernutrition combined with increasing overweight and obesity and the diffusion of diet-related non-communicable diseases. Cities are over-exploiting water resources and in many cities in developing countries, the lack of wastewater treatment and appropriate sewage systems lead to pollution of the ground and surface water resources. Expanding cities are consuming land: large tracts of agriculture land are converted to urban development and industrial use. Deforestation, linked to urban sprawl, leads to loss of biodiversity and to watershed degradation, with a negative effect on water quality and in increase in landslide, floods and water scarcity in the downstream areas. Cities are also significant contributors to cliamte change, accounting for about 70 percent of global energy-related greenhouse gas emissions. Food systems emit 30 percent of planet Earth's greenhouse gas (GHG), of which food loss and waste is among the top five largest contributors.

The COVID-19 pandemic has added new challenges in meeting urban demands for nature-related goods and services, worsening already precarious conditions in vulnerable areas. Food chains have been disrupted; water needs for sanitation and hygiene, as well as wastewater production have increased and unemployment is on the rise. Those traditionally vulnerable have been particularly affected, while new vulnerabilities have been created. Beyond COVID, many urban and peri-urban communities have shown to be highly vulnerable to extreme events, health or climatic, and to socio-economic stresses.

To address these challenges, national and sub-national governments need to rethink the way in which they plan urban and peri-urban areas identifying more inclusive, resilient and green ways to assure the environmental, social and economic wellbeing of their people.

1. THE FAO GREEN CITIES ACTION PROGRAMME

The main objective of the action programme and of the "FAO Green Cities Initiative"[1] is to increase people's wellbeing through better availability of and access to products and services provided by urban and peri-urban forestry, agriculture and food systems.

The FAO Green Cities initiative will improve the livelihoods and well-being of urban and peri-urban populations of 1 000 cities around the world by 2030, improving the urban environment, strengthening urban rural linkages, the resilience of urban populations to external shocks and contributing to climate change mitigation and adaptation while ensuring access to healthy diets from sustainable systems. Local governments and communities will have the capacity to develop and implement context -specific strategies, actions and investment plans for the integrated design and management of resilient and sustainable multifunctional green infrastructure and food systems to ensure that green technologies, innovation and investments are scaled up.

[1] "The FAO Green Cities Initiative: a concept note", February 2020, FAO, Rome.

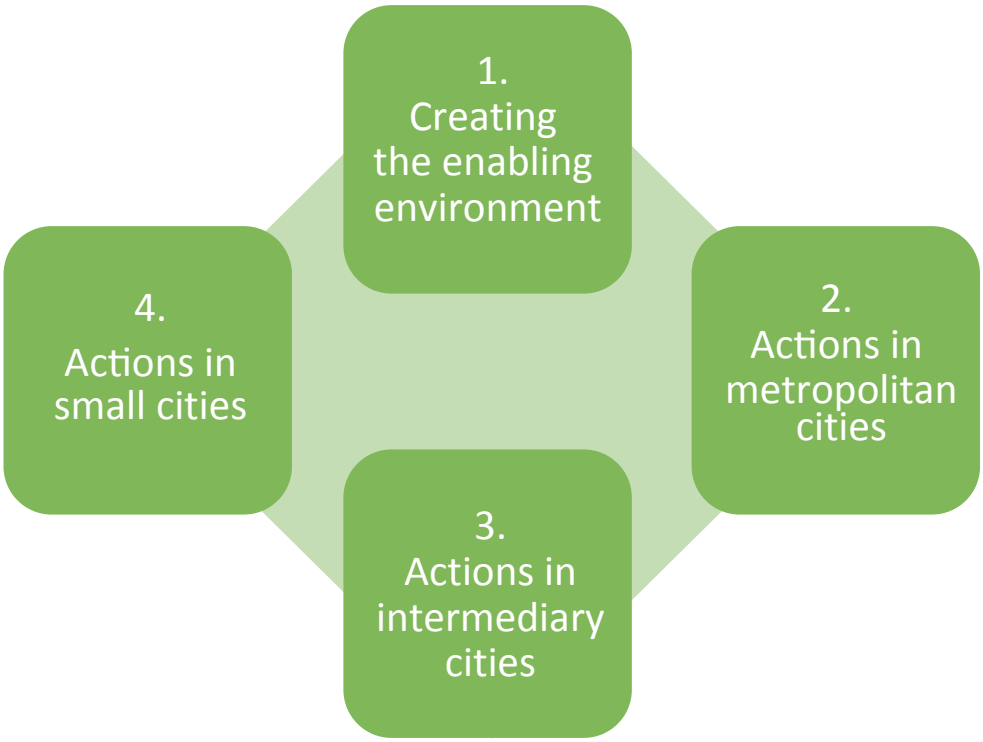
The following will be the main beneficiaries:

- all citizens of urban and peri-urban areas, especially the more vulnerable (a people-centered approach);
- national governments;
- sub-regional governments (province, regions and municipal governments) and other stakeholders;
- food systems and green spaces stakeholders.

1.1 Components of the Action Plan

As part of the Green Cities Initiative, the **Green Cities Action Programme** – GC Action Programme – is structured in four components, recognizing the importance of addressing the common but also diverse challenges and opportunities that small, intermediary and metropolitan cities are facing:

1. creating the enabling environment. This includes actions at national and sub-national levels to support integrated policy, planning and governance related actions in order to create an enabling environment for leveraging green infrastructures and food systems. These actions are considered common for the three typologies of cities;
2. actions in metropolitan cities;
3. actions in intermediary cities;
4. actions in small cities.



The document also includes two annexes: Annex 1 includes a (provisional) list of on potential countries and cities of different sizes and Annex 2 presents the special case of Small Island Developing States.

1.2 Some important caveats

1. The distinction between the different city typologies (metropolitan, intermediary and small) has to be flexible and context-specific, as there is no global definition that can fit all the complexities and specificities of the different cities and national legal frameworks and definitions. In addition, a specific focus is given to Green Cities in the Small Island Developing States (SIDS) – (see Annex 2), as they are particularly threatened by climate shocks.
2. It is understood that actions for all three city categories will include FAO actions to support: i) the establishment of multi-stakeholder and multi-sectorial governance mechanisms (e.g. local policy councils); ii) needs and vulnerability assessments; iii) needs assessment for capacity building; iv) and the participatory integration of food systems and green infrastructure in the existing local (but aligned with national) policy and planning processes. Therefore, these actions are deliberately not repeated in the different components of the action plan.
3. This proposal includes a menu of actions for each one of the key technical entry points: i) Urban and peri-urban forests and green spaces; ii) urban and peri-urban agriculture; iii) food processing and distribution; iv) food environment; v) food and other waste management. Water and energy are integrated as cross-cutting issues in most of the components.

1.3 Target countries and cities

The GC Action Programme will involve 100 cities[2] (15 metropolitan, 40 intermediary and 45 small cities) in 15 countries over a period of three years. The following criteria are considered for the selection of countries and related cities: i) countries/cities that are already engaged in the FAO Urban Food Agenda's work; ii) cities that are signatories of the Milan Urban Food Policy Pact (MUFPP); iii) countries engaged in the FAO's Hand in Hand Initiative.

Moreover, some cities from Small Island Development States (SIDS) are also included given their specific needs. Urban population in SIDS is increasing and it is particularly vulnerable to climate change and external shocks and are subject to global market fluctuations given the large share of imports in their total food supply. Malnutrition and the nutritional quality of imported foods is a concern for cities in SIDS. Moreover, there are unique aspects of SIDS when compared to the mainland: rising sea levels, groundwater salinization, increasing air and sea surface temperatures, ocean acidification and changing rainfall patterns, frequent natural disasters and the degradation of coastal and marine ecosystems that affect the livelihood of the urban population.

1.4 FAO's comparative advantage

FAO has long been at the forefront of engagement towards promoting sustainable cities. Building on the extensive experience on sustainable urban and peri urban agriculture and forestry and urban food systems, the FAO Green Cities Initiative will support local, subnational and national governments and other stakeholders to plan, design and implement innovative green actions bringing together sustainable, resilient and inclusive agri-food systems, multifunctional green infrastructure and natural resources management, linking them with supporting investments.

[2] See Annex 1 for a detailed list.

1.5 Budget and timeline

The Green Cities Action Programme will be implemented in three years, targeting 100 cities and mobilizing USD 100 million. The programme will start through the mobilization and leverage of FAO internal human and financial resources (including trust funds) with the aim to gradually mobilise further contributions from resource partners and the countries/cities participating in the programme.

The table below summarises the programme budget.

TABLE 1. Budget

15 Countries 100 Cities	BUDGET (million USD)				
	Establishing enabling environment, including national programmes (15 countries)	The FAO Urban green cities action fund (FUGA Fund)			TOTAL
		Actions in metropolitan cities (15)	Actions in intermediary cities (40)	Actions in small cities (45)	
FAO contribution	20 M	12 M	24 M	24 M	80 M
Country contribution	5 M	3 M	6 M	6 M	20 M
TOTAL	**25 M**	**15 M**	**30 M**	**30 M**	**100 M**

FAO will establish a FAO Urban Green Actions Fund (FUGA–Fund) will be set up for the implementation of "quick wins" innovative urban green actions identified mainly (but not exclusively) at city level.

The FUGA-Fund will serve to catalyze additional resources:

- attracting co-financing from other internal and external resources (e.g. private sector);
- enabling cities to prioritize green spaces, agriculture and food systems in their planning and actions;
- attract resources from other global funds such as the Global Environmental Fund (GEF) and the Green Climate Fund (GCF) and;
- promote innovative financing schemes and mechanisms involving private and public partnerships.

To facilitate the process, FAO will set up a dedicated Resource mobilization task force (at global level as well as at country level) for the programme to act as a coordination and advocacy platform.

2. THE ENABLING ENVIRONMENT

In many countries, especially low- and middle- income ones, multiple government departments (such as agriculture, forestry, health, trade, social protection and environment) have overlapping responsibilities for the different components of multifunctional green infrastructure and food systems. Countries often lack a holistic view and actions are un-coordinated leading to lack of effectiveness and efficiency. The recent experience regarding COVID-19 is a glaring example. A national integrated policy, governance and planning approach, based on information and evidence, consultation and proper institutional mechanisms (including monitoring, evaluation and accountability) is needed.

The objective of the **Enabling Environment Component** is to ensure that evidence-based policies, risk and vulnerability assessment, planning frameworks and inclusive governance are in place, adapted to different contexts to promote and foster investments and innovations in resilient and green infrastructures and sustainable urban food systems.

Challenge 1. Data and spatial information

Availability of disaggregated data and spatial information needed to identify hotspots, assess vulnerability to shocks and climate change, develop monitoring and evaluation systems and support investment.

FAO will support countries to:

- set up a National Green Cities Observatory[3] with sub-national data, indicators and analysis on needs and progress in food systems and green infrastructure. The observatory will include a Geo-Lab containing geo-referenced data and indicators to *inter alia* rapidly assess and map needs and vulnerabilities to shocks;
- use the observatory to establish baselines and support the design and development of monitoring and evaluation systems;
- draft guidelines for assessing green infrastructures and sustainable food systems "hotspots" where urgent action is needed:
  - biodiversity hotspots and areas with the potential for the restoration of existing urban ecosystems and more efficient use of natural resources;
  - urban and peri-urban ecosystems and production areas (existing and potential) particularly vulnerable to limited access to water and;
  - areas vulnerable to extreme climate change events, including impact of changes in food systems and green infrastructure, and with particular adaptation and mitigation needs.

[3] The shape of the observatory will depend on the status of decentralization of the country. In some countries the focus will be at the sub-national level where much of the work will be done and the national level may be considered for facilitating the information exchange between cities.

Challenge 2. Policy, planning and governance

Development of integrated policies and planning linking health, environmental challenges, food security and nutrition and resilience to shocks and climate change.

FAO will support national and sub-national governments to:

- conduct an analysis of "ease of doing business" in collaboration with the World Bank in urban and peri-urban contexts in selected cities using a set of indicators and indices to identify actions needed to attract private investments to support initiatives in green cities;
- take stock of existing actions/frameworks/policies/resources and investments at country level aiming at food systems and green spaces in urban and peri-urban areas and collect good practices;
- review the existing regulatory environment and contribute to the identification of potential innovative resource mobilization/financial mechanisms to support investments in urban and peri-urban areas;
- support the analysis of efficiency of risk transfer mechanisms (social protection, and insurance) to the decentralized level with a view of improving their efficiency;.
- propose terms of reference and reporting mechanisms of policy "facilitators" at national level to better coordinate city/sub-national initiatives with national policies;.
- review existing national frameworks (climate change policy and plans, land and water use and watershed/basin plans, green action plans, food policy, masterplan, city development strategies, land use plans etc.) and provide recommendations, on the inclusion of urban and peri-urban needs and actions relating to green infrastructure, agriculture and food systems;
- facilitate the establishment of multi-stakeholder governance mechanisms (e.g. Policy councils or integration in existing multi-stakeholders governance mechanisms);
- explore possibilities and propose the establishment of national or regional technology innovation hubs to validate and adapt innovations, share experiences and create opportunities for start-ups.

Challenge 3. Raising awareness and scaling up

Establish linkages of cities/local authorities with global processes to raise awareness of capacities and actions but also challenges they face in developing functional green infrastructure and food systems.

FAO will help national and sub–national governments to:

- establish platforms for undertaking city-to-city exchange, including South-South and North-South cooperation;
- help bridge-twinning arrangements between cities that expand the reach of solution to urban/peri-urban areas;
- facilitate partnership with existing networks (Milan Urban Food Policy Pact – MUFPP, ICLEI city Network, C40, UCLG etc.).

Budget: This component will represent 30 percent of the overall GC Action programme budget (i.e. USD 15 million for metropolitan cities, USD 30 million for intermediary cities and USD 30 million for small cities).
Duration: 3 years.

3. METROPOLITAN CITIES

According to the United cities and local government network (UCLG), metropolitan areas today house 41 percent of the world´s population and contribute significantly to the wealth of nations (around 60 percent of the global GDP). As a result, most growing cities now span several municipal territories and other political boundaries, including different types of peripheral cities as part of inner and outer rings.

Rapid urbanization, coupled with more frequent and extreme weather events linked to global climate change is exacerbating the impact of environmental threats such as flooding, tropical cyclones, heat waves and epidemics. Due to the physical and population density of metropolitan cities, such threats often result in both devastating financial loss and deaths. Making cities more resilient against these environmental threats is one of the biggest challenges faced by city authorities and requires urgent attention. The metropolitan areas is where there is an evident change in lifestyle and dietary patterns with a shift towards more limited physical exercise and an increased consumption of food away from home (e.g. from street food vendors) often with packaged and processed food rich in salt, sugar and fat. Therefore, metropolitan areas face huge challenges in terms of prevalence of nutrition-related non- communicable diseases. At the same time, the poorest living in the congested and overcrowded slum areas and their access to a healthy environment and nutritious, safe and affordable food is one of the key challenges to be addressed in metropolitan cities.

Metropolitan cities need increasing resources such as food, water and energy to be viable. Urban sprawl reduces available green spaces, agricultural lands, water catchment areas and increases demand for energy. Food and water waste are additional challenges to be addressed due to poor planning and management, inadequate packaging, storage and improper behaviour. Technology will be increasingly used in the development and running of cities of the future. Better application of technology in all the green infrastructures and food systems activities is a key element of the city sustainability. To make the best out of urbanization, good governance is imperative. Cities will increase in size and their populations become more diverse. Governing these cities will be crucial to address issues of equity, livability and sustainability in cities of the future.

For metropolitan cities key actions include FAO's support on: i) increasing the adoption of innovations and green technologies for food systems and green infrastructure (e.g. green walls, rooftop and vertical farming, pocket parks, retrofitting of public spaces, etc.); ii) improving food distribution systems, particularly last mile logistics; iii) improving the food environment to increase access to nutritious food; iv) improving the food and water waste management; v) improving governance mechanisms.

Challenge 1. Urban and peri-urban forests and green spaces

Improve the quantity and quality of urban forests and green spaces in and around cities to maximize the provision of ecosystems good and services to urban populations.

FAO will support local administrations to:

- design awareness raising campaigns on the links between wellbeing and green spaces;
- develop training of trainers (ToT) capacity building programmes on planning, design and management of urban forests and green spaces for local staff;
- identify criteria for selecting appropriate species, including fruit trees, through environmental and socioeconomic modelling (the right tree in the right place);
- develop protocols for the collection and propagation of plant material of suitable tree species;
- enhance local capacity on nursery management and seed collection, handling and storage;
- produce analysis for the creation of multi-functional urban forests and green spaces and the restoration of priority areas in existing urban ecosystems;

- design water-sensitive green infrastructure to provide habitat for various species and, secure temporary space for migratory birds;
- create standards for tree management and train technical staff on their implementation;
- develop tools to assess tree species performance and resilience and develop monitoring systems for urban forests, including through citizens' science;
- identify suitable technologies and retrofit existing urban fabric through vertical forests, public building, green walls and rooftops, and pocket parks.

Challenge 2. Urban and peri-urban agriculture

Increase the adoption of green technologies and mechanisms to increase local production and promote short supply chains.

FAO will support local administrations to:

- develop capacity-building programmes on innovative urban agriculture practices (e.g. community urban agro-parks, household rooftop and backyard gardens), identify spaces suitable for urban farming (indoor, vertical, community, aquaponics, etc.) and water availability and intensity;
- carry out policy revision/review, guidelines, finance mechanisms and investor pairing on vertical farming (e.g. skyscraper farms, indoor farms using abandoned structures) and high-tech aquaculture (e.g. RAS, aquaponics, microalgae);
- design programmes to train producers on the mechanization/digitalization of high value crops (green house, rooftop and vertical farms, hydroponics, etc.), and identify/train relevant service providers using innovative business models;
- analyze incentives including financial mechanisms, training and input supply schemes to support farmer adoption of water saving irrigation techniques (e.g. solar irrigation, micro-drip irrigation) and high-tech tools (e.g. drones, aerial imagery, etc).

Challenge 3. Food processing and distribution

Establish more green agro-processing hubs and mechanisms to improve urban-rural linkages and efficient food distribution, while increasing job opportunities, and promoting sustainable use of natural resources (water, energy, etc.).

FAO will support local administrations to:

- assess available guidelines and recommendations on establishing public procurement schemes (for school canteens, hospitals, etc.) and farmers markets linking urban markets to rural producers with a view to increase their efficiency;
- take stock and evaluate incentive schemes to increase the adoption of green technology in minimal food processing for selected food products with a view of making recommendations for improvement (reducing processing time, water and energy consumption and CO_2 emissions);
- develop tools/platforms to facilitate the exchange of innovations and for incentivizing public -private partnership to support small-medium size agrifood enterprises (SMEs and start-ups) and their access to finance;
- make guidelines and recommendations available to establish business incubators for start-up green businesses and facilitating connections between investors (public and private) and businesses (start-up, expanding and green-pivoting) through social events, online listings/portals and other mechanisms;

- evaluate incentives for investments in cold storage, using renewable energy, and in storing food close to the consumption site;
- provide guidelines and recommendation for optimizing the last mile logistic establishing food hubs (e.g. including mobile and temporary markets) and promoting inclusive e-commerce and food delivery service;
- provide guidelines to increase the food safety within formal and informal marketplaces and for street food vendors.

Challenge 4. Improving food environments

Improve the food environment to increase the consumption of nutritious food and promote healthy diets.

FAO will support local administrations to:

- map the food retail environment and developing specific protocols identifying the areas with limited access to nutritious food (e.g. slum areas, inner cities);
- provide guidelines and recommendations on mechanisms to improve the food retail environment (e.g. incentives, zoning regulations, ordinances and regulatory recommendations for supermarkets, mobile food vendors around schools and for promotional material developed on food high in fat, sugar and salt);
- provide nutrition-education campaigns fostering consumer behavioural change encouraging consumption of more diverse, nutritious and safe food and reducing food waste.

Challenge 5. Food and other waste

Improve the management of agricultural, water and food waste by developing plans and actions along circular economy principles.

FAO will support local administrations to:

- develop proper metrics for putting together targets, timelines and guidelines for reducing food losses and waste;
- use proven successful modalities to improve incentives for the use of unavoidable food waste to produce bioenergy and bio-products (e.g. insect farming, fish silage production and mushroom feedstock);
- provide guidelines and training on combined wastewater and biogas capture technologies for collecting nutrients in manure as well as waste for biogas generation (renewable energy and nutrient recycling;
- produce training material for clusters of SMEs on the use of innovative technologies for treating food waste and wastewater (recovery, reuse, recycling and irrigation);
- design methodologies for innovative technologies and infrastructures to process green waste (e.g. tree branches, grass clippings) into mulch (PPP) and post-consumer food waste (e.g. municipal collection) into compost and returned to farms/green spaces;
- develop guidelines and promote strategies (e.g. incentive mechanism and appropriate regulations) to recover and redistribute the surplus safe and edible food (from markets and retail shops).

Budget: USD 15 million.
Duration: 3 years.
Geographic scope: 15 metropolitan cities in selected countries.

4. INTERMEDIARY CITIES

According to the United cities and local government network (UCLG), intermediary cities (i-cities) are cities that generally play a primary role in connecting important rural and urban areas to basic facilities and services. I-cities are the link between large cities and rural areas and can provide an opportunity for rural population not to migrate to large cities, while strengthening their identity. They can act as regional market centers or hubs, offering innovative employment opportunities for smaller cities and they can connect traders and producers with customers and markets in larger metropolitan areas. They may also be providers of government services, education and knowledge resources.

However, i-cities do not always receive sufficient attention from international organizations or their national governments. This is because their priorities/challenges are being overshadowed by those of large cities such as overcrowding, mobility and security. Moreover, despite their increasing population, i-cities have limited financial and technical capacities to invest in infrastructure and public services needed to meet the growing demand. In addition, I-cities tend to attract limited private and foreign investments, as most investors tend to focus on large cities or capital cities.

From an integrated planning prospective, i-cities have the opportunity to: i) provide a good balance between green and healthy environment and productivity through green and blue infrastructure; ii) increase the volume of local production/regionally sourced food and improve the connection between producers and local markets; iii) establish innovative agro-processing food hubs which become an opportunity for offering innovative green jobs; iv) support the establishment of farmers markets; v) recover, reuse, and recycling of food and food packaging waste. For the i-cities, possible key actions might include FAO support on: i) increasing the adoption of innovation and green technologies and sustainable practices for food systems and green infrastructures (e.g. green belt/corridors); ii) improving the agro-processing hubs while strengthening the urban-rural linkages and promoting off-arm job opportunities; iii) reducing food losses and improving food and water waste management.

Challenge 1. Urban and peri-urban forests and green spaces

Improve the quantity and quality of urban forests and green spaces in and around cities to maximize the provision of ecosystems good and services to urban populations.

FAO will support local administrations to:

- design awareness raising campaign on the links between wellbeing and green spaces;
- develop capacity building programmes on planning, design and management of urban forests and multifunctional green spaces for local staff;
- identify criteria for selecting appropriate species, including fruit trees, through environmental and socio-economic modelling (the right tree in the right place);
- develop protocols for the collection and propagation of plant material of suitable tree species;
- enhance local capacity on nursery management and seed collection, handling and storage;
- produce analysis for the creation of multi-functional urban forests and green spaces and the restoration of x (number will be context-specific) hectares of existing urban ecosystems;
- design green infrastructure to provide habitat for various species and, secure temporary space for migratory birds;
- create standards for tree management and train technical staff on their implementation;
- develop tools to assess tree species performance and resilience and develop monitoring systems for urban forests, including through citizens' science;
- identify suitable technologies and retrofit existing urban fabric through vertical forests, green walls and public building rooftops and pocket parks.

Challenge 2. Urban and peri-urban agriculture

Increase the adoption of green technologies and mechanisms to increase local production and promote short supply chains.

FAO will support local administration to:

- develop capacity building programmes on different extensive and intensive urban and peri-urban climate smart agriculture practices including high-tech (e.g. open and protected cultivation, community urban agro-parks, household rooftop and backyard gardens, identify spaces suitable for urban farming (indoor, vertical, community, aquaponics, water access, use intensity, and reuse potential etc.);
- carry out policy revision/review, guidelines, finance mechanisms and investor pairing on vertical farming (e.g. skyscraper farms) and high tech aquaculture (e.g. RAS, aquaponics, microalgae) within city;
- design programmes to train producers on the mechanization/digitalization of high value crops (green house, rooftop and vertical farms, hydroponics, etc.), and identify service providers;
- analyze incentives including financial mechanisms, training and input supply schemes to support farmer adoption of water saving irrigation techniques (e.g. solar irrigation, microdrip) and high tech tools (e.g. drones, aerial imagery, etc.).

Challenge 3. Food processing and distribution

Establish more green agro processing hubs and mechanisms to improve urban rural linkages and efficient food distribution, while increasing job opportunities, and promoting sustainable use of natural resources (water, energy, etc.).

FAO will support local administration to:

- assess available guidelines and recommendations on establishing public procurement schemes (for school canteens, hospitals, etc.) and farmers markets linking urban markets to rural producers with a view to increase their efficiency;
- take stock and evaluate incentive schemes to increase the adoption of green technologies in food processing for selected food products with a view of making recommendations for improvement (reducing processing time, water and energy consumption and CO_2 emissions);
- develop tools/platforms to facilitate the exchange of innovations and for incentivizing public private partnership to support small medium size agrifood enterprises (SMEs and start ups) and their access to finance;
- establish guidelines and recommendations to establish business incubators for starting up green businesses and facilitating connections between investors (public and private) and businesses (start up, expanding and green pivoting) through social events, online listings/portals and other mechanisms;
- evaluate incentives for investments in cold storage using renewable energy and storing food close to the consumption site;
- provide guidelines and recommendations for optimizing the last mile logistic establishing food hubs (e.g. including mobile and temporary markets);
- provide guidelines and recommendations on how to promote inclusive e commerce and food delivery services to optimize the food distribution system;
- provide guidelines to increase the water and food safety within formal and informal market places and for street food vendors.

Challenge 4. Improving food environments

Improve the food environment to increase the consumption of nutritious food and healthy diet.

FAO will support local administrations to:

- map the food retail environment and developing specific protocols identifying the areas with limited access to nutritious food (e.g. slum areas and areas surrounding the schools);
- provide guidelines and recommendations on mechanisms to improve the food retail environment (e.g. incentives, zoning regulations, ordinances and regulatory recommendations for supermarkets, mobile food vendors around schools and for promotional material developed on food high in fat, sugar and salt);
- provide nutrition education campaigns fostering consumers' behavioural change encouraging consumption of more diverse, nutritious and safe food and reducing food waste.

Challenge 5. Agriculture food waste

Improve the management of agricultural, water and food waste by developing plans and actions along circular economy principles.

FAO will support local administration to:

- develop proper metrics for putting together targets, timelines and guidelines for reducing food losses and waste;
- use proven successful modalities to improve incentives for the use of unavoidable food waste to produce bioenergy and bio products (e.g. insect farming, fish silage production and mushroom feedstock);
- provide guidelines and training on combined wastewater and biogas capture technologies for collecting nutrients in manure as well as waste for biogas generation (renewable energy and nutrients);
- produce training material for clusters of SMEs on the use of innovative technologies for treating food waste and wastewater (recovery, reuse, recycling, irrigation);
- design innovative methodologies and appropriate infrastructures to process green waste (e.g. tree branches, grass clippings) into mulch (PPP) and post consumer food waste (e.g. municipal collection) into compost and returned to farms/green spaces;
- develop guidelines and promote strategies (e.g. incentive mechanism and appropriate regulations) to recover and redistribute the surplus safe and edible food (from markets and retail shops).

Budget: USD 30 million.
Duration: 3 years.
Geographic scope: 40 Intermediary cities in the selected countries.

5. SMALL CITIES

Today 85 percent of the world population live in or within 3 hours of an urban centre of at least 50 000 people. Rural populations account for 45.3 percent of the world's total population yet make up almost 70 percent of the poor in the world. Of the 588 million rural poor, the majority live close to an urban center. World Bank research shows that smaller cities have higher rates of poverty compared to large cities. Stronger links between rural areas and small cities can lead to more dynamic growth of economic opportunities and reduce out migration as a means of escaping poverty. Multiple small towns, being more distributed over a territory, provide livelihood options for a larger share of the rural population, allowing under employed farming households to diversify activities and overcome constraints imposed by the seasonality of agriculture. In Asia and Latin America, growth in the rural non farm economy was driven by growth in the population of towns and small cities that had strong links to other urban areas and the rural hinterland.

Being in close proximity to the surrounding landscape, the quality of the environment is generally good, however, it is essential to put in place plans to preserve the functionality of natural spaces to maximize the provision of ecosystem goods and services and preserve biodiversity. Blue and green corridors also have a key function in strengthening urban rural linkages.

From a food systems perspective, territorial approaches can leverage the potential and address the needs of each area and thinking of the rural small urban territory as a functional area where most food is produced and where the bulk of the world's poor and food insecure people are.

This might entail, for example, assessing urban and rural demands on the food system and how to meet that demand by investing in measures that overcome bottlenecks. The proximity of rural and urban spaces means that actions in the "agri food system" to support the wellbeing of rural and urban populations will have spillover effects: urban policy actions (e.g. to support nutrition) will affect agriculture and rural wellbeing and vice versa. Agricultural development in rural areas can tap on agglomeration economies and services provided in small cities while resulting in lower prices and improve access to food and nutrition.

Small cities are an opportunity in terms of land availability, access to nutritious food and proximity where food is produced. Creation of alliance between small cities and the rural hinterland could be an opportunity for strengthening territorial governance systems. Moreover, small cities can become hubs for the growth of small and medium enterprises and can house opportunities for green non agricultural work, including agro tourism.

The main challenges are related to limited human and financial capacities, low agglomeration economies, weak governance and coordination and their vulnerability to extreme climate events and disaster/crisis preparedness. Barriers to be addressed may be in infrastructure, such as the lack of rural roads or cold storage as well as at institutional level (e.g. requiring improved coordination with producer groups so as to better understand their needs for information, financing and rural services) and governance.

For small cities, possible key actions might include FAO support on: i) multi stakeholder governance for functional territories which includes urban areas and the hinterland; ii) increasing the adoption of innovation and green technologies for agriculture and the rest of the food supply chain and green infrastructures; ii) improving the agro processing hubs while strengthening the urban rural linkages, and promoting off farm job opportunities; iii) reducing food losses and improving food and water waste management.

Challenge 1. Governance for functional territories

Identify and assess functional territories and improve the governance systems among small cities.

FAO will support local administrations to:

- develop platforms and tools (or use existing ones) for identifying functional territories based on sets of criteria;
- assessing food systems (including identification of the catchment areas for the food consumed in the identified territory);
- develop guidelines, training and promoting city to city exchange on creating alliance of small cities for strengthening the governance at territorial level.

Challenge 2. Urban and peri-urban forests and green spaces

Improve the quantity and quality of urban forests and green spaces in and around the cities and strengthen linkages with the surrounding territory.

FAO will support local administrations to:

- map existing urban and peri urban ecosystems and identify biodiversity hotspots;
- create or restore green and blue corridors linking town centre with surrounding rural areas;
- assess seed (crop, forestry and aquaculture) supply systems and nursery capacity;
- collect plant material, develop propagation protocols and propagate native tree species;
- enhance local capacity on nursery management and seed collection, handling and storage;
- assess the potential of developing multifunctional green and blue infrastructure integrating productive functions with the provision of ecosystem services;
- analyze incentives for the adoption of alternatives to use of woodfuel use through adoption of more efficient cooking techniques.

Challenge 3. Urban and peri-urban agriculture

Increase the adoption of green technologies and mechanisms to increase local production.

FAO can support local administrations to:

- set up vocational training hubs on climate smart agriculture, mechanization and set up service providers, facilitating linkage with larger city markets;
- develop training tools and promote living lab (demonstrations plots) on sustainable agriculture in peri urban and rural hinterlands (commercial open field, protected cultivation, staple crops, fruits and vegetables, integrated agri aquaculture, etc.);
- provide training on a broad range of climate smart open field, indoor/covered agriculture greenhouses, small livestock production, appropriate aquaculture and hydroponic technologies and practices;
- provide guidelines on nature based water solutions in urban storm water capture for flood prevention and support for irrigation/agriculture/aquaculture and forestry – community food gardens and school food gardens;
- provide guidelines and training on water harvesting at household level and building complexes for home gardens.

Challenge 4. Food processing, distribution and food environments

Encourage off-farm green job opportunities while improving food distribution, access to nutritious food and strengthening urbane rural linkages.

FAO will support local administrations to:

- set up training hubs to support small medium size agri food enterprises (including farm enterprises, packaging and primary processing) and promote off farm green job opportunities;
- develop guidelines for supporting investments in establishing food collection centers (Food collection hubs), packaging centers, cold store infrastructures which can cater to supermarkets in cities to optimize the logistic and minimize waste;
- living lab and city-to-city exchange for promoting agro tourism and other innovative off-farm activities;
- training to improve the access to finance promoting gender equity and encouraging for youth participation;
- provide guidelines and recommendations for incentivize the establishment of permanent and mobile farmer markets and promote agroecology;
- provide training to improve the farmers' linkage to larger urban markets through public procurement schemes (determining what food will be purchased and how, who will produce it, how it is delivered, stored and prepared and how waste is managed);
- analyse the potential for linking small city food systems to larger agro corridors connecting rural areas to larger national and international markets;
- provide training for supporting the branding of products (e.g. specific geographic origin and sustainable practices);
- advocate for use of local products through inter alia consumer education and campaigns;
- provide guidelines on incentive systems (e.g. award based) to promote fresh food in convenience stores (e.g. small shops around the schools).

Challenge 5. Circular economy

Improve agriculture, water and food waste management by developing plans and actions along circular economy principles.

FAO can support local administrations to:

- provide training to support adequate access to reliable energy to reduce food losses;
- provide training on the use of unavoidable food waste to produce composting, bioenergy and bioproducts;
- provide guidelines and training on combined wastewater and biogas capture technologies for collecting nutrients in manure as well as waste for biogas generation (renewable energy);
- develop guideline and promote strategies (e.g. incentive mechanism and appropriate regulations) to recover and redistribute of surplus safe and edible food (from markets, retail shops);
- develop strategies (e.g. educational campaigns) promoting behavioral change aiming at cutting food waste at household level.

Budget: USD 30 million.
Duration: 3 years.
Geographic scope: 45 small cities in the selected countries.

ANNEX 1

TABLE A1.1 Target countries and potential cities (provisional)

COUNTRY	SMALL CITIES	INTERMEDIARY CITIES	METROPOLITAN CITIES
Bangladesh	Kaliakair, Bhaluka. Sreepur Kishoreganj	Narayanganj, Gazipur.	Dhaka
Cameroon	Salak, Mindif, Guider, Pitoa	Garoua, Bamenda, And Maroua	Douala
Cabo Verde	Mindelo, Sao Vicente	Praia	
Colombia	Rio, Negro, Envigado, Bello, Copacabana, Marinilla, Itaguí,	Medellin, Santa Fe Cali	Bogota
Ecuador		San Vicente And Porto, Viejo	Quito
Ethiopia	Goba, Bale Robe Shashamane	Adama, Mekele, Bahir Dar, Hawassa, Dire Dawa	Addis Ababa
Ghana	Savelugukumbungu, Techiman Mankranso	Tamale, Kumasi	Accra
Kenya	Yala, Ahereo, Voi, Lunga Lunga	Kisumu, Mombasa	Nairobi
Madagascar	Tsiroanomandidy, Fenoarivo, Miarinarivo, Manjakandriana, Ambohimanga, Behenjy	Antsirabe, Tomasina	Antananarivo
Peru	Chanchamayo, Januja, Concepcion, Catacaos, Tambogrande	Piura, Hancayo, Arequipa	Lima
Rwanda	Rulindo Mbogo, Buyoga, Tumba, Mugambazi	Huye, Muhanga Musanze	Kigali
Senegal	Sangalkam, Koungheul	Thies	Dakar
Sri Lanka	Kesbewa, Dambulla, Sigirya Digamadulla, Palugaswewa.	Kandy, Jaffna, Anuradhapura, Batticaloa, Moratuwa	Colombo
Solomon Islands	Honiara, Tulagi, Taro Island, Kirakira, Gizo, Auki,		
Tanzania	Karatu, Babati	Arusha	Dar Es Salaam
Tunisia	Beya, Mornag, Kebili	Sous	Tunis
Zambia	Mazabuca, Chongwe, Chilanga, Mwembeshi, Chisamba, Kalulushi,	Kitwe, Ndola	Lusaka

ANNEX 2

As already mentioned, some cities from Small Island Development States (SIDS) are also included given their peculiarity. Urban population is increasing in SIDS and it is particularly vulnerable to external shocks, including food price and supply volatility, and fluctuations in global food markets due to the large share of imports in their total food supply.

Malnutrition and the nutritional quality of imported foods is a concern for cities in SIDS. Moreover, there are unique aspects of SIDS when compared to the mainland: rising sea levels, increasing air and sea surface temperatures, ocean acidification and changing rainfall patterns, frequent natural disasters and the degradation of coastal and marine ecosystems that impact the livelihood of the urban population. The following cities in the SIDS are proposed:

TABLE A2.1 Green cities in small island development states (SIDIS)

COUNTRY	SMALL	MEDIUM	LARGE
Caribbean			
Cuba	Santiago	Havana	
Haiti		Port au Prince	
Jamaica	Montego Bay	Kingston	
Pacific			
Kiribati	Tarawa		
Samoa	Apia		
Solomon Islands	Honiara, Tulagi, Taro Island, Kirakira, Gizo, Auki,		
AIMS			
Cabo Verde	Mindelo	Praia	
Maldives	Malé		

ANNEX 3

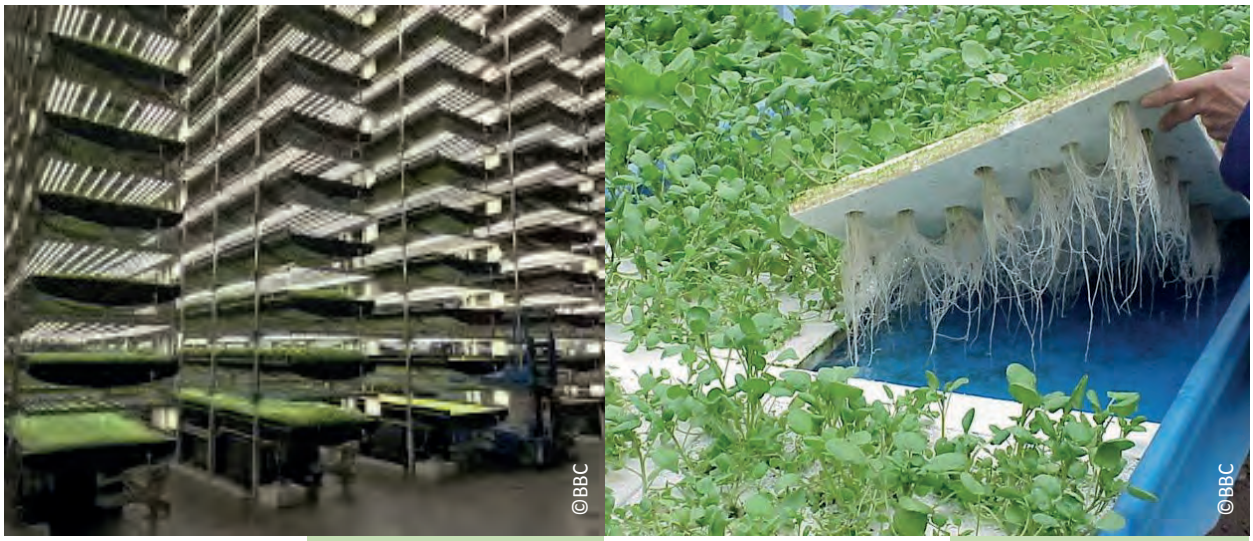
Some illustrative cases

Venture capital investment in indoor vertical farming is getting a strong traction as food security, food quality and resources scarcity pose main challenges in the global agri food system. Vertical farming attempts to address these challenges by producing locally and efficiently fresh, chemical free, soil free and nutritious food. Companies are developing net zero comprehensive solutions with innovation in LED lighting and closed water loop systems with enormous land use savings. For example:

1 ha indoor farming = 390 ha in traditional farming:

- cutting-edge sustainable technologies;
- reduced excess pesticides;
- foliar and/or root zone sprays of fertilizers containing micronutrients;
- soil less agriculture for urban food and fodder without soil/land impacts;
- renewable LED lights that are energy and nutrient efficient;
- water recycling with 95 percent less water to grow an average plant.

FIGURE A3.1 Closing the loop in vertical farming – Solutions in future urban farming



Aerofarm in Newark, NJ

Soil less agriculture

Source: BBC Follow the Food, How to detox our food systems, July 15, 2019

FIGURE A3.2 An organoponic garden near Havana (Cuba)

Cuba's, most famous landmark, Plaza de la Revolución, produces lettuce, chard, radish, beets, beans, cucumber, tomatoes, spinach and peppers

FIGURE A3.3 Curitiba (southern Brazil)

Curitiba, in Southern Brazil, is considered a smart city because of its close relationship with nature. In this image, an example of an urban park preserving the endangered natural tree of this region, the Araucaria angustifolia

FIGURE A3.4 Suzhou (China): a national ecological garden city

Suzhou has over 2 500 years of history. A good example of the harmony relationship between human and nature of thousand years.

FIGURE A3.5 Crops growing on the outskirts of Fayoume (Egypt)

FAO Project: TFD 03/EGY/002. Rooftop Garden Vegetables Free of Pesticides. To help decrease unemployment rates in the two Governorates involved in the project and income generation for families; to increase the production of free of pesticides vegetable crops; access to fresh and safe vegetables with reasonable prices; and houses with productive, healthy, green, and clean roof tops.

FIGURE A3.6 Caracas (Venezuela): urban and peri-urban agriculture

Urban and peri urban agriculture to improve nutrition and livelihoods of poor families.

FIGURE A3.7 Chongquing (China): urban agriculture for supporting the food security

Chinese farmers are farming, tilling tiny jewel like plots in Chongqing city.

China has 22 percent of the world's population, but less than 10 percent of its arable land. People find ways to make up for the shortfall. Chinese farmers have been geniuses of agricultural improvisation, making use of whatever land they could find when they needed it even in the cities.

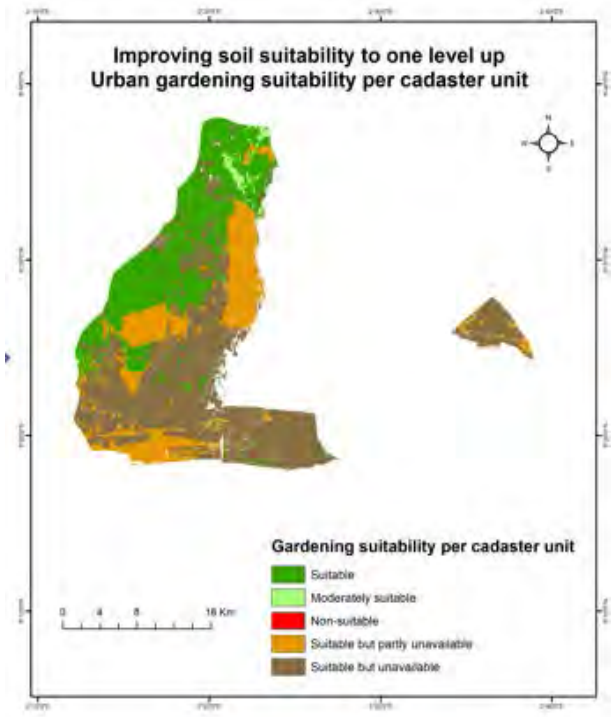
FIGURE A3.8 Urban gardens

Urban gardens in Ouagadougu, Burkina faso (top), Teresina, Brazil (center left), Abidjan, Ivory Coast (center right), and Lubumbashi (bottom)

FIGURE A3.9 Dakar (Senegal): horticultural micro-garden training center and nursery

FIGURE A3.10 Mexico City: vegetables grow in containers on the roof of the Federal District's Youth Institute in Miguel Hidalgo

FIGURE A3.11 Tool for expanding cities

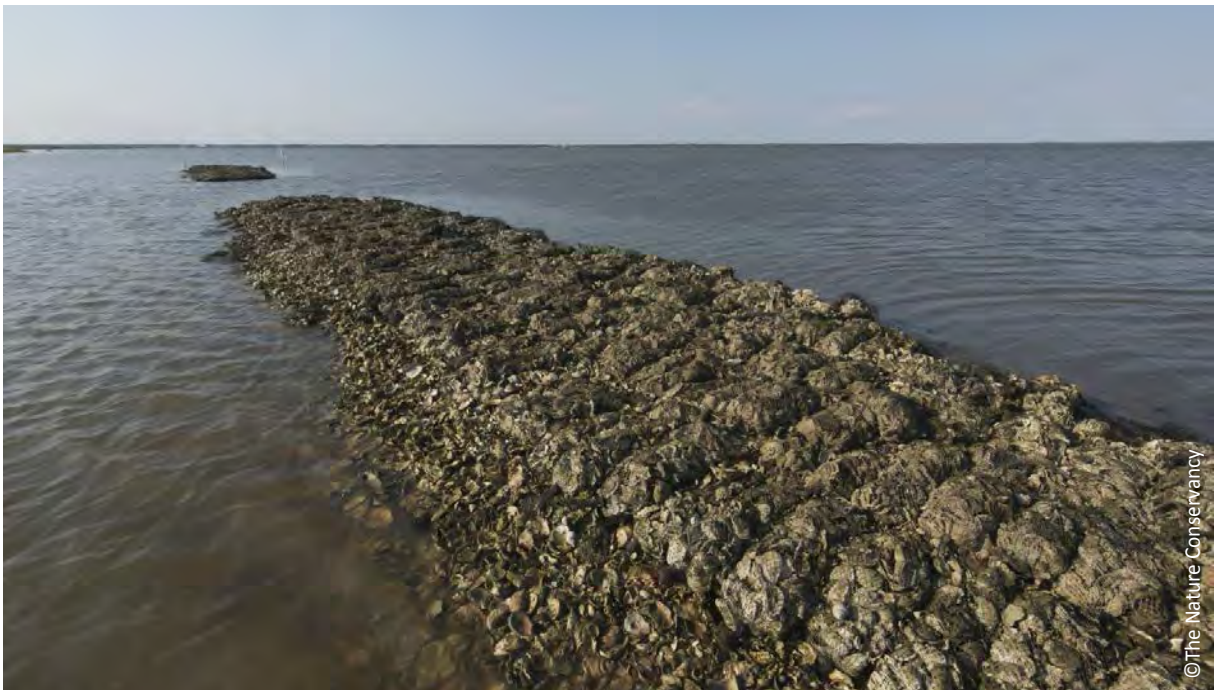


A tool developed by the Amsterdam Centre for World Food Studies for three rapidly expanding cities in Benin (Cotonou, Abomey Calavi and Porto Novo), based on a qualitative response model, relates expert assessments on site suitability to georeferenced information on soil, land use, water (volume and quality), vicinity of markets and safety for women.

By upscaling overall cadastral units and informal sites, the tool generates detailed baseline maps on site suitability and unavailable areas. The tool supports policy makers on site suitability changes under various scenarios.[1]

Source: Adapted from United Nations World map, February 2019
The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dashes lines on maps represent approximate border lines for which there may not yet be full agreement.

FIGURE A3.12 Nature based solution of artificial oyster reef



Nature Based Solution of artificial oyster reef in preventing USD 50 billion in coastal flooding while creating food source.

[1] Sonneveld, B.G.J.S., D. Houessou and G.J.M van der Boom (2020, forthcoming) Where do I allocate my urban gardens? Development of a site selection tool for three cities in Benin. Amsterdam Centre for World Food Studies, Vrije Universiteit, Amsterdam.

FIGURE A3.13 and A3.14 Examples of urban renewal policies

Example of urban renewal policies turning contaminated brownfields into local community food gardens through government funding and subsidies. There are an estimated 18 000 community gardens in the U.S. and Canada managed by park departments or by volunteer organizations. Source: U.S. EPA (www.epa.gov/brownfields).

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