PROCEEDINGS

Regional Workshop
on
Strengthening Urban & Peri-urban Agriculture towards Resilient Food Systems in Asia (UPAFSA-2013)

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Volume - I : KEY NOTES, COUNTRY PRESENTATIONS and RECOMMENDATIONS

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FOREWORD

The world's population is becoming increasingly urbanized.By 2050 it is expected that more than six billion persons, which will make up nearly 70 percent of the population, will reside in urban areas. Fifty years ago, two- thirds of the world's population lived in rural areas and only one-third lived in urban areas. Migration, primarily rural to urban, is a key driver of this growth. However, together with natural growth, reclassification of rural areas is also an important contributor: every year millions of people become city dwellers even without movement, as their communities have transformed into cities because of rapid urbanization.Specifically in Asia, although urban population is just 42.2 percent, in the last twenty years Asia's cities have grown at a faster rate than any other region: 13 of the 20 most populated urban areas in the world are now in Asia. Asia is urbanizing at an unprecedented speed and it is anticipated that two-thirds of the growth in the world's cities will occur in Asia in this decade alone, raising its urban population by another 411 million.

As the cities rapidly expand, so do the food needs of urban families. The urban poor were hit hardest by the financial and food price crises in the recent past as urban consumers were exclusively dependent on food purchases. Changes in life style and dietary habits have further contributed to increased urban malnutrition and non-communicable diseases.

In 1999, during the meeting of the Committee of Agriculture (COAG) in Rome, the member countries reviewed and discussed the role of urban agriculture in the context of the urbanization process, and recommended that FAO develop an integrated approach to assist the member countries in dealing with the UPA issues at the policy and technical level. Since then, various initiatives have been taken by FAO in this area. These include,implementing a project called *Growing Greener Cities* to promote urban and peri-urban-horticulture (UPH), with a multi-stakeholder approach to ensure a stable policy and community support; support to establishing a number of school gardens in a number of countries; programmes to improve water quality which is also used for urban horticulture and launching the Food for Cities programme in 2000.In November 2011, a workshop entitled "Ensuring resilient food systems in Asian Cities" was organized by the FAO Regional Office in Bangkok, wherein urban and peril-urban agriculture was covered in various presentations, although this was not the main focus of that workshop.

In the current workshop, the focus has been on urban and peri-urban agriculture. More than 50 senior representatives from 12 countries representing various sectors – health, agriculture (horticulture/livestock), fisheries, agricultural marketing, agricultural policy planning, urban development, NGOs, academia and industry were present at the workshop. Participants and resource persons shared experiences and ideas on various topics covering policy, planning, global and country perspectives, research priorities, development initiatives and multi-stakeholder collaborations amongst others.The deliberations led to sharing of experiences through case studies and country presentations as well as discussions through working group sessions to bring out recommendations which would guide further activities in the area.

The proceedings of the workshop have been brought out in two volumes, namely:

Volume I Key Notes, Country Presentations and Recommendations, and
Volume II Case Studies, Best Practices and Field Studies

I hope that the proceedings will provide useful guidance to countries and stakeholders in implementing the UPA approach in their countries and thereby reducing food insecurity.

I take this opportunity to convey FAO's appreciation to Dr. Prem Nath Agricultural Science Foundation, Bangalore, India for supporting us in the organization of this workshop. I also express my gratitude to the Ministry of Agriculture and Cooperatives, Ministry of Public Health and Ministry of Urban Development, Government of Thailand for their support and to all the resource persons and participants for their contribution to this important regional workshop.

Hiroyuki Konuma
Assistant Director-General and Regional Representative
for Asia and the Pacific
Food and Agriculture Organization of the United Nations

Volume- I: Key Notes, Country Presentations and Recommendations

EXECUTIVE SUMMARY

World population is becoming increasingly urbanized and by 2050 it is expected to reach a level of 70% of the total world population of around nine billion. People living in urban areas or cities, face enormous challenges, including the rising of food prices, and its consequences in terms of social and economic costs. Despite a great diversity of food available, the urban poor are limited in their choice of locations to purchase food, and often suffer from hunger and malnutrition mostly due to lack of purchasing power and increasing food prices. In addition, there are the issues of increased consumption of highly processed foods with low nutritional content which is leading to increase in non-communicable diseases (NCDs) such as diabetes, hypertension and obesity. There is also increased consumption of processed ready-to-eat street foods where the safety factor is a major challenge due to polluted sites with poor environmental hygiene, lack of safe water and ice, poor hygienic practices followed, uncertain raw material quality, poor waste disposal, low awareness and training.

Promotion of urban and peri-urban agriculture alongwith forestry and fishery is an important means of supporting urban diets while also providing livelihoods, green space and other benefits to city residents. In addition to supplying food, UPA has many other benefits namely generates employment and income for the poor, leads to employment generation for women both for production as well as for processing, provides management of climate change, links with the ecosystem and the management of the natural resources, etc. Urban households who practice urban and peri-urban agriculture as a means of supplementary income and for direct household consumption are generally more food secure and benefit from a more diverse diet. Urban and peri-urban food production also helps increase the availability of healthy and affordable food - mainly fresh fruits, vegetables, eggs and dairy products - for a larger number of urban consumers.

To discuss and debate these issues, review experiences and share best practices, identify priorities and potential investment areas and actions and mechanisms for collaboration on urban and peri-urban agriculture, FAO in collaboration with PNASF organized the Regional Workshop on Strengthening Urban & Peri-urban Agriculture towards Resilient Food Systems in Asia on January 28-30, 2013 in Bangkok, Thailand.

Dignitaries on the dais (L to R): *Dr. Hiroyuki Konuma, Mr. Yukol Limlaemthong, Dr. Chanvit Tharathep and Dr. Prem Nath.*

The workshop was attended by more than 50 participants from Bhutan, Bangladesh, Laos, Cambodia, India, Indonesia, Malaysia, Myanmar, Thailand, Viet Nam and S. Korea. The workshop provided a forum to share experiences, debate issues and come out with key recommendations. A brief overview of the workshop is provided below. The details are covered in the body of the report which is published in two volumes:

Volume - I Key Notes, Country Presentations and Recommendations, and
Volume - II Case Studies, Best Practices and Field Studies

Inauguration

The Regional Workshop was inaugurated on Monday the January 28, 2013 in the forenoon with Mr. Yukol Limlaemthong, Minister of Agriculture & Cooperatives, Bangkok, Thailand, Dr. Chanvit Tharathep, Deputy Permanent Secretary, Ministry of Public Health, Bangkok, Thailand, Dr. Hiroyuki Konuma, Assistant Director-General and Regional Representative, FAO Regional Office for Asia and the Pacific, Thailand and Dr. Prem Nath, Chairman, Prem Nath Agricultural Science Foundation(PNASF), Bangalore, India on the dais.

Welcoming the participants and dignitaries on the dais Dr. Hiroyuki Konuma, Assistant Director-General and Regional Representative, FAO Regional Office for Asia and the Pacific, Bangkok, Thailand gave a brief account of the trend of urbanization across the world and in particular in Asia and explained the importance of Urban and Per urban Agriculture in providing food and nutritional security to the urban population.

Dr. Chanvit Tharathep, Deputy Permanent Secretary, Ministry of Public Health, Bangkok, Thailand, in his opening remarks briefed about the food and nutritional security issues in urban cities and said that nowadays, the lifestyle of people living in cities is adversely affected by social and economic changes. The discussions on strengthening "food environment" in the countries, including safety challenges and concerns, dynamics of agriculture and urban food production, important value chains, trade and market access, regional dimensions, etc, play an important role to achieve food system in a country as well as ASEAN countries to support healthy foods.

A view of the participants

Mr. Yukol Limlaemthong, Minister of Agriculture & Cooperatives, Bangkok, Thailand in his inaugural address said that strengthening urban and peri-urban agriculture is one approach to address the food and nutritionalsecurity of urban and peri-urban populations. UPA is a means to provide food for direct household consumption or even to supplement income. The concept of urban and peri-urban agriculture includes development and maintenance of home or school gardening, landscape gardening, developing and maintaining parks or tree plantations. Such activities can easily be integrated into the development plan of cities. He further explained the philosophy of Sufficiency Economy which was developed by *His Majesty King Bhumipol Adulyadej* would be recommended to all farmers. His Majesty's Philosophy of Sufficiency Economy principles emphasize moderation in performance, reasonableness, and creating immunity for oneself and community.

The inaugural speeches were followed by an introduction to the workshop programme which was given by Ms Shashi Sareen, Senior Food Safety and Nutrition Officer, FAO Regional Office for Asia and the Pacific, Bangkok wherein she highlighted the background as well as the objectives and outputsof the workshop. This was followed by a round of introduction of participants and resource persons.

Keynote Papers

Three keynote addresses basically reviewed the relevance of UPA to food security and the developments in the area; trends of urbanization and the policy and planning aspect along with research priorities for a sustainable UPA; and the global perspectives for resilient food systems. The first keynote by Dr Prem Nath, traced the background of the food production and the food and nutrition security situation and the role and developments of UPA to support food needs of the growing urban populations. Various challenges and opportunities including national and international interventions were highlighted. The keynote concluded that UPA supports food and nutrition security, health improvement, income generation and improved environment; it is time to better define national policy and strategy options with relevant resources and technical support mechanisms for the sustainable management of UPA systems; and thirdly there is the need integrate production, supply and consumption through innovative approaches for decentralized marketing, small-scale processing and nutrition education.

The second keynote addressed by Dr Elumalai Kannan focused on trends in urbanization in Asia and explored policy and research priorities for sustainable UPA. It was noted that in terms of absolute number of people living in urban areas, Asia is the fastest urbanizing region in the world and is second in terms of annual growth rates, next only to Africa. The trends in urbanization in the en most populous countries were analyzed. The relationship between urbanization and economic growth was discussed which showed that these were positively related. The author noted that although many studies are there which focus on different issues related to rapid urbanization across countries in the world, these have not paid much attention to the important role played by UPA. The author discusses the importance of an integrated urban eco system and policy interventions for strengthening UPA and highlights some policy strategies for promoting and strengthening UPA.

The third keynote by Ms Makiko Taguchi focused on the global perspective for strengthening UPA for ensuring resilient food systems. She highlighted that the challenge to address food resilience is to steer urbanization towards greener cities, the core principles of which are resilience and self-reliance, economic development, environmental sustainability, and social inclusion. She highlighted on the role of UPA for improving food and nutrition security and also elucidated additional benefits of UPA in terms of fuel savings due to decreased need to transport produce from rural areas to cities, reduction in carbon dioxide emissions and air pollution, lowering city temperatures, improved landscaping amongst others. The Food for Cities programme launched in 2000 was also highlighted.

Country Presentations

Countries had been asked to make a presentation on the status of UPA in their countries or provinces and various initiatives in relation to the same. A format was provided **(see Annex A).** Cambodia, Indonesia, Republic of Korea and Vietnam made their presentations in the format provided while the other countries namely Bangladesh, Bhutan, Cambodia, India, Laos, Malaysia and Thailand presented their status in the form of country reports. These presentations give a reflection of the focus governments are giving to UPA within their countries.

Reviews and Prospects

A special session on Reviews and Prospects of UPA was organized in which two papers were presented. Dr P.G. Chengappa made a presentation on "Enhancing Multi-stakeholder Collaboration and Investment in Urban and Peri-urban Agriculture". In his presentation Dr Chengappa dealt with Dimensions of Urban and Peri -Urban Agriculture, International Policies for Urban and Peri-urban Agriculture, Policies and schemes

for promotion of UPA, Issues in UPA and Plausible Solutions Through Multi-stakeholder Collaboration, Access to Land and Security of Tenure, Production and Marketing Services in UPA, Urban Waste Water and its Utilization in UPA : Solid Waste and its Utilization in UPA etc and concluded that there is vast scope for urban and peri-urban agriculture, as demonstrated by many studies conducted throughout the world. UPA provides a good contribution to the economy and food security of the nation.

The second presentation was made by Prof. N. Nagaraj, on "Development initiatives in food production, utilization and mechanism of management in developing Urban and peri-urban Agriculture in Asia" Prof Nagaraj in his presentation said that UPA is distinctly emerging as a catchy agricultural sector worldwide for enhancing food, nutrition, health and economic security reducing negative environmental impacts. In the process, the long term impact of rise in land prices associated with reduced size of holding for agriculture and short term impact of rise in agricultural wages are being experienced. Institutional innovations such as formation of Urban Producers Organizations for capacity building in marketing, access to credit through SHGs/micro-financing institutions, Farmers' field schools have immense potential to contribute to productivity. He made presentation of a case study on Economics of Peri-Urban Agriculture at Magadi, Bangalore, Karnataka State, India and narrated its success, lessons learnt, constraints and good practices.

Case Studies

Eight case studies giving examples of best practices representing different aspects of UPA and different country experiences were presented. These covered horticulture, livestock, waste-water fed fish, tree-planting, integrated homestead farming systems for improved nutrition, safety of foods, waste management and utilization and vegetable farms school and are detailed in Volume II of the proceedings.

Working Group Discussions

There were three working group discussions on the subjects of Research Priorities (including Pilot Interventions, Investment Area, etc.) on Horticulture, Food and Waste Management; Development initiatives (including priorities, pilot interventions, investment areas, etc) in food production, utilization and management in UPA; and Mechanisms for Handling Multi-stakeholder Collaborations in Improving Urban and Peri-urban Agriculture. Participants participated in group of their interest and contributed to the deliberations. The work of these groups formed a basis of the final recommendations of the workshop.

Field Visits

The field visits were carried out on the third day and covered visits to a waste management, water treatment and utilization plant; a roof top agriculture; waste-fed fish culture; peri-urban vegetable plantation; and a street market. This was a very educative visit as some of the case studies were demonstrated in actual practice.

Concluding Session

In the concluding session, the recommendations were presented in brief. The final recommendations of the workshop are highlighted below. The workshop was considered successful in that the participants from different countries were able to share their experiences, elaborate national policy regarding UPA, list development areas including pilot interventions, identify priorities and potential investment areas, and to draw multi-disciplinary, multi-sectorial and multi-stakeholder strategy in support of UPA. They also identified the best practices during the case studies and defined the content of the regional information which would be useful in support of training and monitoring of UPA initiatives in respective countries.

Recommendations(UPAFSA-2013)

As a result of discussion during technical sessions as well as of debate during the group discussions, the workshop concluded with the following recommendations to be considered by respective countries.

Strategy

1. In urban planning, the **greener cities** approach should be high on the agenda and UPA should remain the driving force for the same.
2. Integration of UPA into development strategies and programs with multi- sectorial and multi-stakeholders participation should be encouraged for sustainability and should be supported by sound policy guide lines and frame work.

Technology

3. Undertake feasibility studies on socio economic, technological, environmental, policy and governance to understand the need, scope and limitations of **UPA** in the **Green City** concept of **Urban Planning**. This should also include base line survey and study of the region/countries/ cities for a clear understanding of food systems (crop husbandry/ animal husbandry/ aqua culture/ processing/waste management/water recycling and water use efficiency/ food and nutritional security/ supporting services) in the **UPA** context and further improvement of the value chain. These studies may be assigned to agricultural/horticultural universities, agricultural/horticultural research institutes, economic and statistics institutions.
4. Develop a robust data base management system on **UPA** for effective planning and policy implementation including institutional arrangements.
5. Conduct research for improving efficiency technologies for **UPA**covering various aspects like agriculture/horticulture, livestock, fisheries and aqua culture including aquatic plants, social forestry, urban/city solid waste/ water management and recycling, nutrition, women empowerment, supply chain and value chain management, food processing, food safety and value addition, and based on the results develop models of **UPA** applicable for different locations/places and circumstances.
6. Publish popular and technical publications and audio visual materials on the importance and need of **UPA**, case studies giving best practices and success stories of **UPA.**

Policy

7. Promulgate appropriate policy to integrate **UPA** into urban and peri-urban developmental programmes and strategies towards sustained resilient food system.
8. Initiate process for Policy Legislation and Governance Mechanism for land and water use [e.g. creating **UPA Zones** like **Agri-Export Zone (AEZ), Agri-Processing Zone (APZ)** etc already in place in many states], taxation, access to microcredit and finance, investments, incentives, etc., for the sustainability of **UPA.**

Development

9. Bring about specific focus on awareness and capacity building programmes for policy makers, stake holders, target groups and **UPA** general populace to make them understand the importance and need of **UPA,** its role in Urban Planning for disaster risk mitigation, climate change and carbon

sequestration, absorbing shocks and having buffer zones, and the active participation of all stake holders in planning and implementation of **UPA** with **Green City** approach.

10. Develop an enabling framework for UPA with separate institutional mechanism with multi sectoral and multi stake holders' (private and public) involvement in order to strengthen **UPA** within the **Greener Cities** approach of urban planning.
11. Develop **Action Plan** for the implementation of **UPA** for the country/state/city through a participatory approach under the **Greener Cities** concept with possible involvement of private sector as **Corporate Social Responsibility partner** of urban planning.
12. Take up massive extension programmes to popularise the technologies applied in **UPA** with **Greener cities** approach programmes.
13. Identify a few cities and a few **UPA** models (exclusively for urban and periurban situations) for **pilot interventions** to demonstrate UPA centered Greener Cities approach.

International Collaboration

14. Initiate and promote continued dialogue and consultative process facilitated through international organisations like **FAO** with enhanced regional collaboration for the furtherance of the principles and practices of **UPA**within the **Greener Cities** approach.

1 INAUGURAL PRESENTATIONS

WELCOME ADDRESS

Hiroyuki Konuma*

Your Excellency Dr. Yukol Limlaemthong, Minister of the Ministry of Agriculture and Cooperatives, Royal Government of Thailand,

Dr. Chanvit Tharathep, Deputy Permanent Secretary, Ministry of Public Health, Royal Government of Thailand,

Dr. Prem Nath, Chairman of the Prem Nath Agricultural Science Foundation, Bangalore, India,

Distinguished participants from various countries of Asia, resource persons, ladies and gentlemen.

Good morning.

It gives me a great pleasure to welcome all of you to the Regional Workshop on 'Strengthening Urban and Peri urban Agriculture towards Resilient Food Systems in Asia" being organized by FAO in collaboration with the Prem Nath Agricultural Science Foundation (PNASF).Bangalore, Karnataka, India.

First of all, I wish to express my special gratitude to Your Excellency, Dr. Yukol Limlaemthong, Minister of Agriculture and Cooperatives Thailand for his presence here this morning which gives a special value to this important gathering. I am also very grateful for the participation of senior representativesandstakeholders from 11 countries in Asia, despite of their busy work at their home country.

Fifty years ago, two- thirds of the world population lived in rural areas and only one-third was in urban areas. Now, a half of them are in urban areas, and by 2050, nearly two-thirds of them would be living in urban areas which is more than 6 billion.

Welcome aAddress by Dr. H. Konuma, ADG/RR, FAO/RAP.

Specifically in Asia, although urban population is just 42.2%, in the last twenty years Asia's cities have grown at a faster rate than any other region: 13 of the 20 most populated urban areas in the world are now in Asia. Asia is urbanizing at unprecedented speed. Though still predominantly rural, this upward trend is expected to continue for many years to come. In this decade alone, it is anticipated that two-thirds of the growth in the world's cities will occur in Asia, raising its urban population by another 411 million. Migration, primarily rural to urban, is a key driver of this growth. However, together with natural growth, reclassification of rural areas is also an important contributor: every

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year millions of people become city dwellers by this way even without movement, as their communities transformed into cities because of rapid urbanization.

As the cities rapidly expand, so do the food needs of urban families. The urban poor were hit hardest by financial and food price crisis in recent past as urban consumers were exclusively dependent on food purchases. Changes in life style and dietary habit have further contributed to increased urban malnutrition and non-communicable diseases.

Despite a great diversity of food available, the urban poor are limited in their choice of locations to purchase food, and often suffer from hunger and malnutrition mostly due to lack of purchasing power and increasing food prices. As the urban population increases, more food needs to be made available to cities while maintaining its quality and freshness. In addition, increased number of foreign migrants and internally displaced persons (IDPs) in some countries further increased the demand for urban food, and negatively affected the food prices. Overall, the situation poses great concern over social stability and security as it might lead to food riots and increased number of crimes, if appropriate policy measures are not taken.

Indeed, the issue of feeding growing urban population, particularly the poor and disadvantaged, has increasingly become a critical and serious challenge for many countries.

The Fourth World Urban Forum held recently identified a need for clear policies and interventions to ensure that the growing urban poor population would not get left behind. The food dimension of poverty in urban areas is yet to be fully translated into appropriate policy action in many countries. While rural-urban linkages are important, urban policies also need to encourage local food production within the city boundaries and its immediate surroundings. This would include removing barriers and providing incentives for urban and peri-urban agriculture, as well as improved natural resource management in rural areas.

The FAO Committee on Agriculture (COAG) mandated FAO to consider urban and peri-urban agriculture (UPA) as an integral part of agricultural production systems and an important approach towards resilient food systems, with emphasis on its role in feeding the cities, creating employment and generating incomes for the urban poor. Indeed, urban households who practice urban and peri-urban agriculture as a means of supplementary income and for direct household consumption are generally more food secure and benefit from a more diverse diet. Urban and peri-urban food production also helps increase the availability of healthy and affordable food - mainly fresh fruits, vegetables, eggs and dairy products - for a larger number of urban consumers. It also comprises an important environmental protection and sustainable natural resource management dimensions, and their integration into urban development planning.

Yet, there is still no consensus on the precise definition of UPA. However, it does refer to food production systems and value chains within cities or their surroundings, and which effectively contribute to food access and supply while creating jobs and income opportunities for the poor and disadvantaged groups of the society.

The UPA requires both a multidisciplinary approach and multi-stakeholder involvement - a multidisciplinary approach to address not only the production involving sectors such as horticulture, livestock, fodder, trees, milk and dairy products, aquaculture and agro-forestry, but also ensuring the safety and nutritive value of the foods produced as well their processing, marketing and whole food value chains towards reaching table for consumption and beyond including waste treatment. There are other aspects to this issue also such as climate change, gender sensitivity, etc. that are equally important.

A multi-sectorial approach involving different stakeholders is also important to include policy makers and local authorities who takes policy decisions on urban planning and support urban and peri-urban agriculture, and have knowledge of local conditions including social, economic and environmental aspects. They also

need to interact with a wide range of actors to develop new technologies and techniques for production and processing and dissemination through various means.

FAO Activities

The Food and Agriculture Organization of the United Nations (FAO) in the area of UPA has been focusing on various issues such promotion of urban and peri-urban agriculture, animal husbandry, forests and fisheries. Along with this has been the focus on preventing contamination of soil and water in urban areas, as well as addressing the potential risk of salmonella, bird flu and other issues, that pose substantial challenges and must be addressed through appropriate health and safety regulation.

There are aspects such as agro biodiversity, food loss and wastes, food markets, food and nutrition security, and agriculture, natural resources management covering soil, water, land and land tenure issues that also play an important part in UPA. Socio-economic and health factors also are a key to problems of cities such as hunger and malnutrition, shifting diets with increase of non-communicable diseases (NCD), food safety and contamination issues from the production to consumption chain, street foods and others are also being addressed. Let me add that FAO is currently supporting some countries such as Cambodia, Mongolia, in the municipalities' areas of the Philippines in setting up UPA programmers'.

Ladies and gentlemen,

You may recall that a workshop entitled "Ensuring resilient food system in Asian Cities" was organized by FAORegional Office in Bangkok in November 2011, wherein urban and peril-urban agriculture was covered in various presentations although this was not the main focus of that workshop. A report of this was circulated. As an initiative of the workshop, a virtual network on food for cities in the region was created and I am pleased to inform you that this network has been quite successful for communication and sharing of information.

Before concluding, I sincerely hope that this workshop would provide a valuable opportunity to exchange knowledge and experience, and lead to the identification of appropriate and effective priority measures for follow up actions at regional and country levels. We would not require huge investments at the beginning, but need your strong will and commitments, and perhaps we should endeavor to start with some pilot interventions to guide the process. I also hope that this unique gathering of multi-stakeholders including senior policy makers and planners both from agriculture and local administration as well as experts from partner organizations and CSOs, would lead to a formation of long-term plat form to enhance collaboration and concerted efforts on urban and pre-urban agriculture.

Finally, I should like to take this opportunity to assure you of FAO's commitment to strengthening its efforts to promote urban and pre-urban agriculture and also to work together towards implementing the recommendations jointly with you.

It is indeed a pleasure for FAO to be able to organise this important Regional Workshop. I would like to thank the PNASF, Bangalore, India for collaborating with FAO. I would also like to thank all the countries present for sparing their time as well as providing their inputs and sharing their experiences to support this important workshop.

I wish you a successful Regional Workshop and look forward to the successful outcome of your deliberations in this crucial field of Urban and Peri-urban Agriculture.

Thank you.

OPENING REMARKS

Chanvit Tarathep*

Dr. Hiroyuki Konuma, Assistant Director General, Regional Representative of the FAO Regional Office for Asia and the Pacific, Distinguished participants from various countries of Asia, resource persons, ladies and gentlemen:

It is my privilege to deliver the Opening Remarks of "Regional Workshop on Strengthening Urban & Peri-urban Agriculture towards Resilient Food Systems in Asia".

Nowadays, the lifestyle of people living in cities is adversely affected by social and economic changes. Due to time limitation, they are likely to increase the consumption of instant foods or ready to eat products. As a result, nutrition status from less healthy food has become a primary concern. The discussions on strengthening "food environment" in the countries, including safety challenges and concerns, dynamics of agriculture and urban food production, important value chains, trade and market access, regional dimensions, etc, play an important role to achieve food system in a country as well as ASEAN countries to support healthy foods.

Opening Remarks by Mr. Chanvit Tarathep, Deputy Permanent Secretary, Ministry of Public Health,Bangkok, Thailand

Ministry of Public Health Thailand fully realizes the situation and we are now accelerating the implementation of our food system, in response to the Government's policy. To implement a functional food system, emphasis would be placed on hygienic and sanitary conditions throughout the food chain under the "From Farm to Table" concept. At domestic level, GMP is aimed to be more implemented among food industries. Furthermore, advocacy has been done for "Primary GMP" in small enterprises that are not capable of getting GMP standard since 2012. This will ensure the more efficient food production in the whole food chain involving all steps, ranging from production to transportation, processing, and distribution to consumers.

In addition, the Ministry of Public Health has a particular concern on children's health. A 4-years pilot project on Food Safety in Nursery, primary-school, secondary-school and high-school aims to reduce food poisoning outbreaks as well as promote nutritious food among this target group who are very sensitive and strengthening food system to promote good health among the people to cope with gastroenteritis-related

*Deputy Permanent Secretary, Ministry of Public Health, Bangkok, Thailand

diseases has been introduced. To be successful, Ministry of Public Health has planned to integrate the work of all agencies in the food system of food supply chain such as Ministry of Interior, Ministry of Agriculture and Ministry of Education.

In conclusion, this workshop is a good and important step as a starting point towards Strengthening Urban & Peri-urban Agriculture towards Resilient Food Systems in Asia. This will support healthy foods and result in improving Nutrition status of our countries. We shall further review the needs according to the countries' contexts and see how we can proceed to the next step. In this way, multi-agency collaboration; both nationally and regionally will be required.

I would therefore like to end my remarks by wishing you all a successful meeting with very fruitful and productive deliberations.

Thank you.

OPENING ADDRESS

Yukol Limlaemthong*

Dr. Hiroyuki Konuma, Assistant Director-General and FAO Regional Representative for Asia and the Pacific, Dr. ChanvitTarathep, Deputy Permanent Secretary, Ministry of Public Health,Dr. PremNath, Chairman, PNASF, Bangalore, distinguished invited guests, participants from various countries of Asia, resource persons, ladies and gentlemen:

It is a great pleasure for me to be here at this opening session of the Regional Workshop on 'Strengthening Urban and Peri urban Agriculture towards Resilient Food Systems in Asia" being organized by the FAO Regional Office for Asia and the Pacific (RAP), Bangkok in collaboration with the P.N. Agricultural Science Foundation, India. I first of all would like to take this opportunity to welcome the guests from 11 countries as well as others from Thailand to this very important workshop.

World's population is becoming increasingly urbanized and by 2050, nearly 70% of the population will reside in the urban areas. In the case of Thailand also Greater Bangkok population has increased by over 25% in the last 10 years.

With increasing population issues such as problems of food insecurity, poverty and malnutrition are further gaining significance. Many urban dwellers live in slum areas where such impacts are even higher. In the Asia-Pacific region, an estimated 571 million people are now living in slums – around a third of the total urban population. Though hunger and malnutrition are often considered as rural problems, the urban poor are also at risk. There is low access to agricultural production and the majority of poor urban households are primarily dependent on purchase of food items: this makes them especially vulnerable to loss of income, price shocks or bottlenecks in supply.

Opening Address during the Inaugural Session by Mr. Yukol Limlaemthong, Minister of Agriculture and Cooperatives, Bangkok, Thailand

Strengthening urban and peri-urban agriculture is one approach to address the food and nutritional security of urban and peri-urban populations. UPA is a means to provide food for direct household consumption or even to supplement income. The concept of urban and peri-urban agriculture includes development and maintenance of home or school gardening, landscape gardening, developing and maintaining parks or tree plantations. Such activities can easily be integrated into the development plan of cities.

*Minister of Agriculture and Cooperatives, Bangkok, Thailand

Although UPA has many benefits such as proximity to markets and consumers, easy access to cold storage and transportation facilities, the problems are also significant such as high cost of land, labor, polluting environment due to traffic, less space, water availability, etc. Other issues of food safety such as application of Good Agricultural Practices, use of safe water and inputs, correct use of pesticides and fertilizers, application of safe post-harvest practices are important. It is also important to bring about awareness on safe storage and cooking practices.

To address these issues and make UPA sustainable requires a great deal of policy decisions as well as planning with involvement of multi stakeholders both at Central and Provincial level.

I am informed that the objectives of this Workshop are to review experiences on urban and peri-urban agriculture (UPA) in the region and to identify and advocate best practices from countries across the region. In addition, priorities and key potential investment areas and actions for strengthening UPA including pilot interventions that can be taken up for supporting resilient food systems in the cities of Asia, together with how to make effective coordination between different stakeholders and partners will be identified.

In Asian, by the next three years while there is a high level of focus on preparations for coming together as Asian Economic Community (AEC), one of the most important concerns is the increase of Urbanization among the big cities of the region, leading to food insecurity problem. This workshop will be useful for identifying such issues.

I am very glad to learn that this workshop brings together stakeholders representing various ministries and departments involved in different facets of Urban and peri-urban agriculture as well as researchers, producer associations and representatives who are interested in understanding about the subject. The range of subjects to be discussed is also very comprehensive starting from policy and planning, covering production, waste management as well as food safety and quality including nutrition aspects. In Thailand, in term of food security, Agriculture development can be divided into two areas.

First, in rural area, the philosophy of Sufficiency Economy which was developed by *His Majesty King BhumipolAdulyadej* will be recommended to all farmers. His Majesty's Philosophy of Sufficiency Economy principles emphasize moderation in performance, reasonableness, and creating immunity for oneself and community. This principle in decreasing the dependence and increasing the ability to control the production themselves thus decreases the risk from not being able to efficient control the market system. This philosophy will lead to balance and sustainable development in all aspects including Agriculture.

The most distinct and concrete example of the application of the Philosophy of Sufficiency Economy is The New Theory. His Majesty developed New Theory as a system of integrated and sustainable agriculture, embracing his thoughts and efforts in water resource development and conservation, soil rehabilitation and conservation, sustainable agriculture and self-reliant community development. The aim is to optimize farmland. His Majesty introduced the unprecedented approach to manage farmland. Efficient water management was also developed to ensure year-round farming. This theory helps Thai farmers, who suffer from the impacts of economic crisis, natural disasters and the unproductive natural conditions. The farmers who practice the new theory can live moderately at an economicallevel, without having to starve, and can be self-reliant.

Second, I would like to say that in Thailand different type of Urban and peri-urban agriculture are being practices in Bangkok and big cities, which range from very simple to high technologies, as open fields in

home gardens, school gardens, hospitals, in prisons, even on vacant public lands, etc. The application of horticulture, particularly, vegetables towards enhancing food production make Bangkok and big cities solve shortage of food to a significant extent. Furthermore, small livestock production is predominantly for domestic consumption in local communities though this is facing social pressure due to pollution. We therefore need to work together and explore solutions towards suitability and feasibility of livestock production in urban and peri-urban areas. Waste-fed fish culture is also playing a major role in term of source of protein. Unfortunately, urban land getting replaced by real estate. We further, need to bear in mind that food safety aspects are an important priority across every agricultural activity practiced in urban and peri-urban areas especially for the purpose of use as food, besides other key factors such as species/ variety and technology management.

I understand that field visits to waste management & water treatment, rooftop garden, vegetable plantation, fish culture site, street market, fruit and vegetables market have also been arranged in and around Bangkok and I do hope these will provide useful insights into different aspects of UPA.

Finally, I deeply thank the FAO and the Prem Nath Agricultural Science Foundation (PNASF) for choosing Thailand as a host country organizing this important workshop. During the next three days, I do hope all participants especially from overseas will find their stay here pleasant and memorable despite the busy schedule ahead. I believe this is the first such a comprehensive workshop on the subject of UPA and I wish the workshop success and look forward to the recommendations.

Ladies and Gentleman, it is my pleasure to declare this Workshop officially open.

Thank you very much.

INTRODUCTION TO THE WORKSHOP PROGRAMME

Shashi Sareen*

Background

The world's population is becoming increasingly urbanized as a result of both natural increase and rural-urban migration. According to the United Nations Population Division, the percentage of urban population has exceeded 50% of the total world population, and it will continue to increase for the next decades to nearly 70% by 2050.

In times of man-made and natural disasters and crises, urban populations are facing increasing challenging constraints with regards to their food and nutrition security. Asian cities are constantly growing, and feeding growing urban population is a challenge for many countries. As the urban population increases, more food needs to be made available to cities while maintaining its quality and freshness. Strengthening urban and peri - urban agriculture is one approach towards resilient food systems in cities.

On the occasion of the meeting of the Committee of Agriculture (COAG) in Rome during January 1999, the member countries reviewed and discussed the role of urban agriculture in the context of the urbanization process. It was recognized that in many cities, urban agriculture, which encompasses different facets like horticulture, dairy production, small livestock, aquaculture, and forestry are being practiced by small scale growers not only as a survival activity but also to generate minimum and essential income. However, it was also realized that very few countries had actually investigated the real opportunities and constraints linked to the urban agriculture sector. It was recommended that FAO develops an integrated approach to assist the member countries in dealing with the UPA issues at policy and technical level.

Ms. Shashi Sareen, *Senior Food Safety and Nutrition Officer, FAO/ RAP explaining the Workshop Programme*

The people living in cities have to face important challenges, including the rising of food prices, and its consequences in terms of social and economic costs. Despite a great diversity of food available, the urban poor are limited in their choice of locations to purchase food, and often suffer from hunger and malnutrition mostly due to lack of purchasing power and increasing food prices. Urban households who practice urban and peri-urban agriculture as a means of supplementary income and for direct household consumption are generally more food secure and benefit from a more diverse diet. Urban and peri-urban food production also helps increase the availability of healthy and affordable food - mainly fresh fruits, vegetables, eggs and dairy products - for a larger number of urban consumers.

*Senior Food Safety and Nutrition Officer, FAO Regional Office, FAO Regional Office for Asia and Pacific, Bangkok

During the "Ensuring resilient food system in Asian Cities" workshop in Bangkok in November 2011, although Urban and peri-urban agriculture was covered in various presentations, this was not the main focus of the workshop and therefore UPA has been identified as a focus area for this workshop.

In addition to supplying food, UPA has many other benefits namely generates employment and income for the poor, leads to employment generation for women both for production as well as for processing, provides management of climate change, links with the ecosystem and the management of the natural resources, etc.

Strengthening UPA requires a multi-stakeholder approach to include local authorities who have knowledge of local conditions and should act as key players in coordinating programs to respond to very specific situations regarding the social, economic and environmental aspects. They also need to interact with a wide range of actors at different levels to develop and strengthen UPA for resilient food systems in cities including development of new technologies and techniques for production and processing and dissemination through various means.

It has been realized that successful implementation of urban and peri-urban agriculture requires an integrated approach aiming at securing the following three sectors:

i. Securing the basic resources in order to ensure the availability and use of energy, adequate land and water of good quality in sufficient quantity.

ii. Securing the production of high quality produce based on technologies and practices which are environmentally friendly in the urban context.

iii. Securing the institutional context, monitoring and management of the program.

Objectives

The objectives of the workshop were explained as:

(i) reviewing experiences and sharing best practices on urban and peri-urban agriculture (UPA) from countries across the Region;

(ii) identifying priorities and potential investment areas and actions for strengthening UPA including pilot interventions that can be taken up for supporting resilient food systems in the cities of Asia;

(iii) identifying mechanisms for collaboration among different stakeholders (public, private and civil society) and partners.

Expected Outputs

The Regional workshop on "Implementing resilient food systems in Asia by strengthening urban and peri-urban agriculture"was expected to achieve outputs including:

i) Sharing knowledge, experiences and lessons learnt

ii) Potential priority investment areas to strengthen UPA identified

iii) Pilot interventions identified and agreed

iv) Mechanisms to enhance multi-stakeholder collaboration discussed and agreed

v) A report of Workshop including outlining outcomes as well as case studies which will be published as a technical document

Participants

The 3-days workshop organized by FAO Regional Office for Asia and the Pacific Regional OfficeBangkok in collaboration with Dr. P.N. Agricultural Science Foundation (PNASF), Bangalore, India, had around 58 participants involving multi stakeholders from: governments and local authorities, consumer organizations, NGOs, private sector and/or producers' organizations from countries including Bhutan, Cambodia, India, Indonesia, Malaysia, Philippines, S. Korea, Thailand, Viet Namas well as partner organizations namely UN HABITAT, WFP, UNEP, World Bank, Asian Development Bank, etc,.

Participants of one of the Technical Sessions

A round of introductions followed the introduction to the programme.

* * *

Regional Workshop on
Strengthening Urban & Peri-urban Agriculture towards Resilient Food Systems in Asia (UPAFSA-2013)
January 28-30, 2013, Plaza Athenee Hotel, Bangkok, Thailand

Monday 28, January 2013	
08:00 – 09:00	**Registration**
09:00 – 10:00	**Opening Session** – **Welcome Address** - *Dr. Hiroyuki Konuma, Assistant Director-General and Regional Representative, FAO Regional Office for Asia and the Pacific, Thailand* – **Remarks** -*Dr. Chanvit Tharathep, Deputy Permanent Secretary, Ministry of Public Health* – **Opening Address** - *Mr Yukol Limlaemthong, Minister of Agriculture & Cooperatives* – Photograph
10:00 – 10:30	**Tea Break**
10:30 – 11:00	– Background/Introduction to the programme: *Ms Shashi Sareen, Senior Food Safety & Nutrition Officer, FAO Regional Office for Asia and the Pacific* – Introduction of the resource persons and participants
11:00 – 11:45	**Key Note** 1. Concept and Implementation of Food Security and Its Relevance to Urban and Peri-urban Agriculture: *Dr. Prem Nath, Chairman, Dr. P.N. Agricultural Science Foundation (PNASF), Bangalore, India* 2. Trends of Urbanization, policy and planning and research priorities in sustainable urban and peri-urban agriculture: *Dr. Elumalai Kannan, Associate Professor, Institute for Social and Economic Change, Bangalore*
11:45 – 12:00	Open Discussions
12:00 – 13:00	**Lunch**
13:00 – 13:20	– Global perspective on strengthening UPA towards resilient food systems: *Ms Makiko Taguchi, Agricultural Officer, FAO, Rome*
13:20 – 15:00	**Country Presentations - 1** A presentation of urban and peri-urban agriculture status in participating countries (15 minutes presentation and 5 minutes for discussion for each country) ***Chairperson*** : Dr. Grisana Linwattana, Bangkok ***Facilitator*** : Mr. P.B. Gaddagimath, India Presentations by Bangladesh, Bhutan, Cambodia, India, Indonesia
15:00- 15:30	**Tea Break**
15:30 – 17:30	**Country Presentations - 2** A presentation of urban and peri-urban agriculture status in participating countries (15 minutes presentation & 5 minutes discussion for each country) Contd. ***Chairperson :*** Dr. Elumalai Kannan ***Facilitator*** : Mr. P.B. Gaddagimath Presentations by Laos, Malaysia, Republic of Korea, Thailand, Vietnam
17:30 – 18:20	**Reviews and Prospects** ***Chairperson :*** Dr. Sansak Nakavisut ***Facilitator*** : Wilailak Sommut 1. Enhancing Multi-stakeholder Collaboration and Investment in Urban and Peri-urban Agriculture: *Prof. P.G. Chengappa, National Professor of Agricultural Economics, Institute of Social and Economic Change, Bangalore, India* 2. Development initiatives in food production, utilization and mechanism of management in developing Urban and peri-urban Agriculture in Asia: *Prof. N. Nagaraj, Principal Scientist (Markets, Institutions and Policies), ICRISAT, Hyderabad, India*
18:30 – 21:00	**Welcome Cocktail Reception (with meals)**
Tuesday 29, January 2013	

08:30 – 10:50	**Case studies** ***Chairp:***Prof. P.G. Chengappa ***Rapporteur :*** Mr. P.B. Gaddagimath – Application of Horticulture in Improving Urban and Peri-urban Agriculture Towards Enhancing Food Production in Bangkok City : *Dr. Grisana Linwattana, Horticultural Research Institute, Bangkok* – Contribution of Small Livestock in Developing Resilient Food Systems for Urban and Peri-urban Agriculture in Thailand: *Dr. Sansak Nakavisut, Department of Livestock Development* – Towards Sustainable Wastewater-fed Fish Culture in Kolkata, India: *Dr. Peter Edwards, Emeritus Professor, Asian Institute of Technology and Advisor, Sustainable Farming Systems Programme, Network of Aquaculture Centres in Asia-Pacific, Thailand* – Tree Planting in Urban and Peri-urban Areas: *Mr Roger Steinhardt, FAO Regional Office for Asia and the Pacific* – Integrated Homestead Farming Systems for Improving Nutrition Status of Urban & Peri-urban Populations – Case study/ Experiences from Selected Asian countries: *Dr. Lalita Bhattacharjee, Nutritionist, National Food Policy Capacity Strengthening Programme, FAO, Bangladesh* – Urban and Peri-urban Agriculture (including organic agriculture) for Ensuring the Safety of Foods: *Dr. A Thimmaiah, Advisor, Bhutan Agriculture and Food Regulatory Authority (BAFRA), Bhutan* – Impact of Waste Management and Utilization in Improving Urban and Peri-urban Agriculture: *Dr. Permpong Pumwiset, Office of Public Health and Environment, Thailand*
10:50 – 11:20	**Tea Break**
11:20 – 12:45	**Group discussions** A. **Working group 1**: *Research priorities (including pilot interventions, investment areas, etc) on horticulture, food, waste management* - Chair: Dr Prem Nath, Chairman, D. Prem Nath Agricultural Science Foundation (PNASF). **Facilitator** : Ms. Wilailak Sommut B. **Working group 2**: *Development initiatives (including priorities, pilot interventions, investment areas, etc) in food production, utilization and management in UPA* - Chair: Dr. N. Nagaraj, Principal Scientist (Markets, Institutions and Policies), ICRISAT, Hyderabad. **Facilitator**: Mr.P.B.Gaddagimath C. **Working group 3**: *Mechanisms for handling multi-stakeholder collaborations (including public and private partnership) in improving urban and peri-urban Agriculture* - Chair: Prof P.G. Chengappa, National Professor of Agricultural Economics, Institute of Social and Economic Change, Bangalore **Facilitator**: Mr. Roger Steinhardt
12:45 – 14:00	**Lunch**
14:00 – 15:00	**Group presentations** ***Chair*:** Dr. P.G. Chengappa ***Facilitator*:** Dr. Grisana Linwattana Group 1 - Dr. Prem Nath Group 2 - Dr. N. Nagaraj Group 3 - Dr. P.G. Chengappa
15:00 – 16:00	**Tea Break and drafting recommendations** Dr. P.G. Chengappa, Dr. Grisana Linwattana, Dr. N. Nagaraj, Mr. P.B. Gaddagimath, Ms. Wilailak Sommut, Ms Shashi Sareen
16:00 – 17:00	**Presentation of recommendations & concluding session** ***Chair*:** Mr. Hiroyuki Konuma, ADG/RR, FAO RAP, Bangkok ***Rapporteur*:** Mr. P.B. Gaddagimath *Presenters:* Ms. Shashi Sareen/ Dr. P.G. Chengappa
Wednesday 30, January 2013 : Field Visit	
08:30 – 17:00	***Facilitator*:** Ms. Wilailak Sommut & Mr.Pheeraphat Boonsomphong • **Waste management & water treatment** of Nonthaburi Municipality, Nonthaburi Province • **Rooftop Garden** at Laksi District • **Waste - fed fish culture site**at SuanPrik Thai Sub-district, Mueang Pathumthani • **Peri-urban vegetable plantation** at Bang Duea Sub-district, Mueang Pathumthani • **Street market** at Mueang Pathumthani Municipality

2 KEY NOTE ADDRESSES

CONCEPT AND IMPLEMENTATION OF FOOD SECURITY AND ITS RELEVANCE TO URBAN AND PERI-URBAN AGRICULTURE

Prem Nath [*,1]

A number of times, famine and hunger were highlighted during the 20th century and spot specific measures were undertaken but the world became alarmed of serious food insecurity around the world more than ever before, during the last decade of the century. During 1995-96, the FAO took the lead in defining and launching the global programme on food security. Other international organizations and developing nations followed it seriously with the beginning of the new millennium i.e. 21st Century.

1. Background

- Today the world produces adequate food for everyone but the unequal distribution has created a gap between the countries who produce food more than they consume, and those countries with deficit production.
- Food insecure people ask - Give me neither poverty nor riches but give me my daily bread.
- Every citizen on earth should have a right to food.

2. Rising Challenges

During 1970s, in some of the regions, the Green Revolution with high crop productivity was achieved with high inputs but the post-Green Revolution era proved this step costly throwing following challenges;

- Fatigue on the soil due to heavy fertilization and heavy cropping
- Shortage of water because of indiscriminate use
- Over-use of pesticides creating residue problems and pollution
- Balance between agriculture production and natural resources disturbed
- Signs of stagnation in yield of some major crops which reached plateau e.g. wheat, tomato
- Post-harvest losses up to about 30%
- Subsistence farming for food security vs. commercial farming for export- a conflict
- A wave of food and fuel price rises has swept the globe, causing increased levels of hunger and poverty leading to popular unrest in about 25 countries (WFP, 2011).

3. Food and Nutrition Security

The world-wide recognition of the rising importance of food and nutrition security issues resulted in the following commitments from the intergovernmental organizations;

[*]Chairman, Dr. Prem Nath Agriculture Science Foundation (PNASF), Bangalore, Karnataka, India
E-mail: drpremnath@vsnl.net
[1]Former Asst. Director General, Food & Agriculture Organization of the United Nations (FAO-UN)

The UN General Assembly (1966 & 1976) adopted Article 11 of the International Convenant on Economic, Social and Cultural Rights which "recognizes the right of everyone to an adequate standard of living ———— including adequate food" and "the fundamental right of everyone to be free from hunger"

- Food security is attained when all people, at all times, have the physical and economic access to sufficiently safe and nutritious food to be healthy and active (FAO-1995).

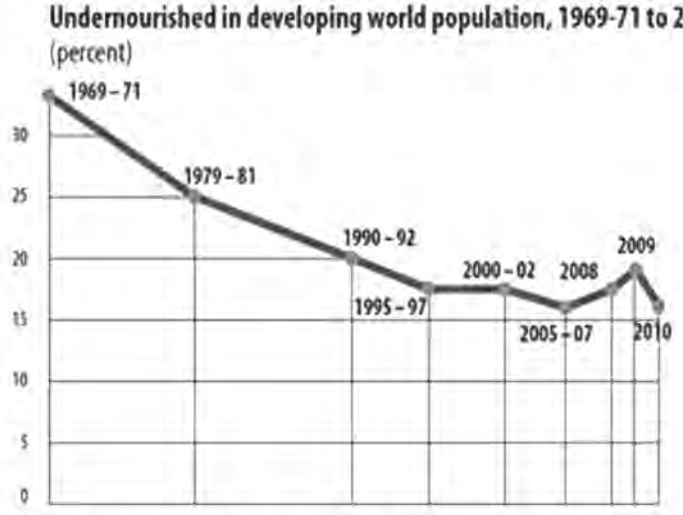
  In the present scenario, the global food security seems to be satisfactory, whereas regional food security is threatened in some areas like some areas of Africa and Asia. National Food security in developing countries is threatened by either shortage of food or by failure of equal distribution at household level.

4. Food Security Situation

Since the assessment made by FAO during 1995, the overall food security situation has improved but some developing countries are still trying to achieve the adequate level both at national and household levels. Some of the following figures available still remind of our efforts of mitigation to continue.

- Food insecurity and malnutrition will persist in 2020 and beyond (IFPRI, 1999).
- With more than 77 % of the developing world's malnourished children in 2020, Sub-Saharan Africa and South Asia will remain 'hot spots' of child malnourished and food insecurity.
- One out of every four children in developing countries will still be malnourished in 2020.

  Hungry school children: About 59 million primary school children attend school hungry throughout the developing world, with 23 million of them in 45 Africa Countries (WFP, 2011).
- One billion people suffering from hunger and malnutrition; about 640 million in Asia and about 230 million in India (FAO, 2009).
- An estimated 2.5 billion people survive on $2/- or less per day. (World Bank, 2008).
- More than 70% people engaged in agriculture in developing countries. (World Bank, 2008).
- It is estimated that 85% of farmers worldwide (or 450 million farmers) own land less than 2 ha. (FAO, 2009).
- Agricultural production and research systems will be challenged to keep abreast of changing dietary preferences in coming years (IFPRI, 1999).
- In order to achieve Millennium Development Goals, the World Bank emphasized on (a) agriculture production and (b) building the gap between rural and urban income capabilities (World Bank, 2009).



FAO. 2010. The State of Food Insecurity in the World: Addressing food insecurity in protracted crises. Rome.

5. Urban and Peri-urban Agriculture

During 1995, the FAO realized the growing shift of population from rural to urban area and recognized the future need of augmenting food security for more than 50% urban population globally. Initially, the FAO took the lead with World Bank and UNDP and the birth of Peri-urban Agriculture took place in support of food security of the growing urban population. During January 1996, FAO/COAG approved Urban and Peri-urban Agriculture (UPA) as one of its agricultural program.

i) Context

- Since long urban population is fed by rural production only
- With the migration of rural young masses urban population is increasing gradually; urban population already increased and expected as follows -1995-50 %(-); 2012-50 %(+); 2030-60%; 2050-70% (IFPRI, 1999; UNDP, 2011);
- Major food production still rests with rural area;
- In urban area, the demand for food, job, space, energy, water and other facilities increasing;
- Food security for urban population needs support, also from its own population;
- The migrated labour with farm skills useful to urban and peri-urban agriculture ;
- Hence, UPA is becoming a **necessity** rather than **demand** only.

ii) Development

- 1995-2000: Urban development, Vertical Horticulture, Hydroponics, Home gardens etc.
- During 1995-96, while launching the global special programme for Food Security, FAO absenced the growing trend of shift in population from rural to urban areas,
- 1995-1996: Realising the need of feeding the teeming rural population, the FAO initiated discussion with UNDP and World Bank which supported the idea to build up Peri-Agriculture to fulfil food demand of growing urban population
- 1996: FAO/COAG: Urban & Peri- Urban Agriculture- Definition and scope framed
- 2005: FAO launched world-wide UPA programme;
- Urban and Peri-urban Horticulture (UPH): Growing Greener Cities
- 2005-2012: Peri-urban/Green Zones covering 2000 to 6000 acres around big cities in Asia and Latin America

- Opportunity for UPA (FAO, 2005)
  - Vicinity to market—reduced transport, packaging, storage expenses/reduced post-harvest losses
  - Easy access to service-electricity, water, inputs, employment
  - Develop green zones-improve environment, utilize waste e.g. Greener Cities
- Integrated approach *required*
  - Basic resources- land, water and energy
  - Production/high quality/technology application
  - Monitoring and management of the programme

iii) Challenges and Opportunities (FAO, 2005)

- Key Challenges- developing policy, strategies and technical support mechanisms for sustainable development of UPA.
- UPA agriculture systems to consider crop and fodder production, animal husbandry, marketing facilities, water use efficiency, and food safety criteria.
- Intensified horticulture units offer 10-40 jobs/ha
- Urban agriculture and related services generate jobs at a ratio of 1 for every 50 to 100 citizens
- Occupations- home-garden, kitchen garden, micro-garden, growers associations, small holdings.
- Homely bred live-stocks e.g. goat, sheep, pigs, poultry, cattle
- Urban forestry- lung space
- Intervention in Food System and availability
- Production of vegetables, fruit, poultry, small-livestock, fish
- Food systems-street food, fast food, restaurants, household kitchen, delivery of food boxes, food stores
- Availability and marketing system

iv) General Recommendations (FAO) : *30% of urban space should be 'green' in order to:*

- Contribute to absorption of CO2
- Release of O2
- Cooling of air temperature enhancing rainwater infiltration
- Utilization of organic waste/increase of soil fertility/solving disposal of waste
- Treated waste water recycled to irrigate crops e.g. orchards, ornamentals, forestry (Baudoin, 2005)

v) National and International Interventions

- In the developing world and at the country level limited UPA activities were in vogue since time-immemorial. These activities have been augmented recently with international interventions;
- Many developing countries worldwide adopted UPA activities
- In Asia, China, India, Thailand, Cambodia, Vietnam, Laos, Bangladesh, Nepal and others reported their programmes and activities
- International Conference on Vegetables (ICV-2002) held in Bangalore during 2002-highlighted importance and role of vegetables in UPH
- FAO/PNASF International Workshop on UPA in Asia held in Bangalore during 2005 recognized horticulture as a major component of UPA
- International Conference on Horticulture (ICH-2009) held in Bangalore during November 2009 -highlighted the role of urban and peri-urban horticulture (UPH)
- FAO/RAP (2011) - Workshop: Ensuring Resilient Food Systems in Asian Cities, Bangkok-highlighted the importance and development strategies of UPA.

- International Seminar on UPA held during Tropical Agriculture Congress in Havana, Cuba (2012) - highlighted the progress and development of FAO's Green Cities Programme.
- International programmes

The awareness and interest in UPA are highlighted by the following regional and global initiatives.

- FAO-Food for the cities
- RUAF and IDRC-Cities Feeding People Programme
- CGIAR-Urban Harvest
- Regional Symposium on High Value Vegetables in Southeast Asia – Production, Supply and Demand, January, 2012, Thailand-(SEAVEG-2012): highlighted the role of vegetables in UPA.

vi) Urban Infrastructure

Success and sustainability of UPA depends on the following as illustrated in the sketch below;

vii) Future Outlook

Lessons learned during this period indicate that the success and sustainability of UPA interventions require national commitment and municipal ownership with the participation of a series of stakeholders both from the public and private sector. This commitment should ultimately result in the integration of UPA in the city development planning process and into the national agricultural development plans.

While rural agriculture will continue to be the primary food source for urban dwellers, UPA is emerging with intensified production systems that often concentrate on supply fresh and perishable products of high value – particularly fruit and vegetables – with the comparative advantage of being produced close to the consumer's market. However, the lack of country specific strategies and the limited specialized technical capacity are hampering or delaying the implementation of organized intervention in tune with the urban resources management and urbanization process.

The FAO/PNASF International workshop (Anonymous 2005) suggested that government and municipalities pay attention to the following objectives with outputs and activities tailored to the national context and specific environments;

i. raise awareness about UPA;

ii. organize adequate technical advisory services and training of extension staff and growers;

iii. develop and promote Food Agriculture Practices (GAP) in terms of intensified, cost-efficient and environmentally friendly production packages aiming at high quality project;

iv. improve the efficiency of the supply chain and reduce the post-harvest losses, including transport marketing and small scale processing strategies; and

v. promote a healthy diet including fruit and vegetables through nutrition education and advantage initiative in conjunction with the FAO-WHO program on Fruit and Vegetables for Health growth of the regions in future.

6. Conclusion

- The Urban and Peri-Urban Agriculture (UPA) supports food and nutrition security, health improvement, income generation and improved environment.
- It is time to better define national policy and strategy options with relevant resources and technical support mechanisms for the sustainable management of urban and peri-urban agricultural systems, considering crop and fodder production and animal husbandry in conjunction with water use efficiency and food safety criteria.
- Equally important is the need to implement innovative approaches for decentralized marketing, small-scale processing and nutrition education in order to address the integrated production, supply and consumption.

* * *

TRENDS OF URBANIZATION, POLICY AND PLANNING AND RESEARCH PRIORITIES IN SUSTAINABLE URBAN AND PERI-URBAN AGRICULTURE

Elumalai Kannan*

I. Background

Urban agriculture has long history across countries in the world and it has been practised in different forms for meeting food and recreational requirements of the urban dwellers. The different types of urban agricultural system generally found are growing plants in home gardens, kitchen garden, roof top cultivation, container gardens, public gardens in schools and rearing of small scale livestock, poultry and fishery. Urban agriculture provides livelihood to urban poor and helps to generate additional income through sale of food products in the local market. While urban agriculture is small scale based and largely subsistence oriented, peri-urban agriculture is capital intensive, market oriented and often undergoes dramatic changes with changes in delineation of city boundary, influx of migrants and rising land prices. Nevertheless, urban and peri-urban agriculture (UPA) remains as an important feature of city growth and it has been a dynamic component of urban landscapes.

There is growing body of literature on UPA since early 1990s recognising its potential contribution to local economic development (FAO 2007; FAO 2009; de Zeeuw 2011). Various studies have highlighted its increasing importance in urban food security and poverty alleviation, and hence have emphasised the need for policy attention by the national governments for strengthening of UPA. This also assumes great significance from the point of view of rising urbanization and increasing urban per capita income in the last two decades that warrant recognition and policy support for promotion of urban and peri-urban agriculture. Many international organisations like Food and Agriculture Organisation (FAO), International Development Research Centre (IDRC), United Nations Development Programme (UNDP), Consultative Group on International Agricultural Research (CGIAR) and RUAF Foundation have taken lead in conducting policy and action oriented research in different countries. However, potential contribution of UPA to economic growth still remains unrecognised by the city development authorities. There is underrepresentation of value contribution from the UPA in national income accounting. For instance, in India three years average output from kitchen garden is valued at Rs. 26,540 million (0.49 per cent of agricultural output) during 2010-11[1].

The rising urbanization, which is traditionally measured as the share of population living in urban areas, puts pressure on existing urban resources like land and water within core of city and hence pushes many economic activities and new migrants to the periphery of cities. Increasing population in urban areas also exert pressure on rural land resources to produce and transport more food to urban consumers. In this context, rural agriculture and urban agriculture should be seen as continuum that urban agriculture complements the rural agriculture through supplying food to urban consumers and releasing land in rural areas for growing traditional staple food and export crops. Therefore, agriculture within city shall be strengthened in different forms and scale, while agriculture on periphery of city undergoes significant changes due to demand for fresh vegetables, fruits, milk, meat and other high value products. Despite significant roles played by UPA for improving food and nutrition security and employment provisions, UPA lacks strong institutional and policy support for economic and environmental sustainability, and social acceptability (Mougeot 2005; UN-HABITAT 2008). The present study focuses on trends in urbanisation in Asia and explores policy and research priorities for sustainable UPA.

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[1]This is a crude estimate as 0.21 per cent of net sown area has been used as area under kitchen garden and average yield of certain crops and their prices are used in the value estimation.

II. Trends in Urbanization in Asia

Trend in urbanization across regions in the world are provided in **Table 1**. Latin American and the Caribbean has been the most urbanized region in the world with 79 per cent of their population living in urban areas in 2010 and it is expected to increase to 83 per cent in 2025. However, in terms of annual growth rates, Africa registered the highest rate of urbanization followed by Asia across different periods under study. The increase in urban population has been attributed to natural increase due to high fertility rate and net migration from rural to urban areas in these two regions (Jack 2006; Kundu and Kundu 2010). In terms of absolute number of people living in urban areas, Asia is the fastest urbanising region in the world. The Asia's urban population in 1970 was 0.5 million which has increased to 1.8 million in 2010 and it is projected to increase to 2.5 million in 2025. In fact, over 50 per cent of the Asia's population will live in urban areas by 2025. Further, rapid urbanization of Asia is also significant from the fact that over half of the global urban population live in Asia as on 2010 and it is projected to 58 per cent by 2025 even though annual growth rate of urban population is likely to slow down during this period.

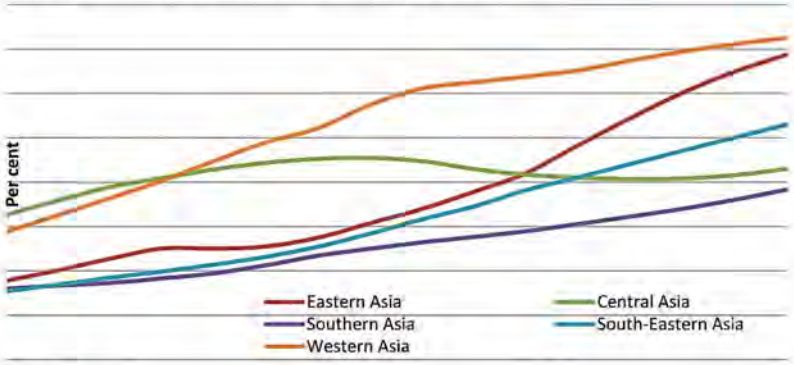
Table 1. Trend in urbanization across regions in the world

	% of Urban to Total Population					Annual Growth Rate (%)			
	1950	1970	1990	2010	2025	1950-70	1970-90	1990-10	2010-25
Sub-Saharan Africa	11.2	19.5	28.2	36.3	43.2	5.2	4.7	3.9	3.6
Africa	14.4	23.5	32.0	39.2	45.3	4.9	4.4	3.4	3.2
Asia	17.5	23.7	32.3	44.4	53.1	3.7	3.6	3.0	2.1
Europe	51.3	62.8	69.8	72.7	76.1	1.9	1.0	0.3	0.4
Latin America and the Caribbean	41.4	57.1	70.3	78.8	82.5	4.4	3.3	2.0	1.2
Oceania	62.4	71.2	70.7	70.7	71.1	2.9	1.6	1.5	1.4
World	29.4	36.6	43.0	51.6	58.0	2.3	2.8	2.6	2.4

Source: United Nations (2012)

There are significant differences on trend in urbanization across the regions within Asia. The western Asia is the most urbanised region followed by eastern Asia and south-eastern Asia (**Figure 1**). The urbanization in western Asia is mostly induced in nature, because it had often came under the influence of investments from western countries for strategic influence in the region, as compared to eastern Asia and south-eastern Asia where urbanization process was driven by forces of industrialization and urban economic growth. Exceptional was the central Asia, which showed decline in urbanisation from 1990 to 2010 and thereafter it is projected to increase in the next two and half decades. Similarly, all other regions are projected to increase in urban population with western Asia and eastern Asia leading the group.

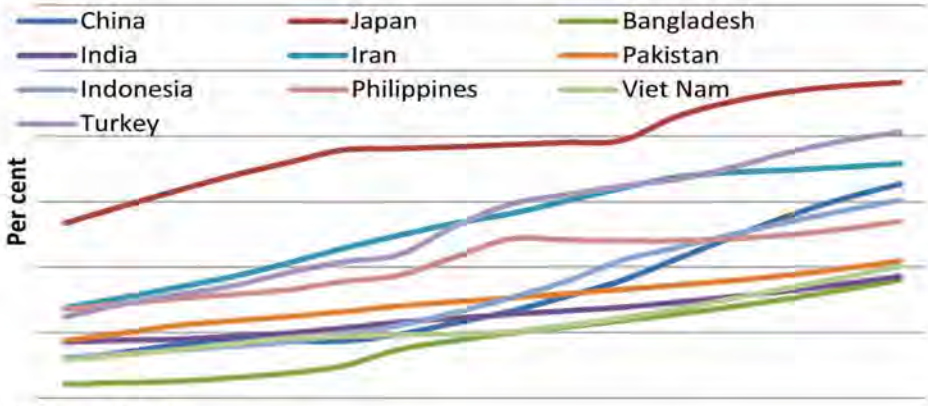
Figure 1. Per cent share of urban population across regions in Asia



Source: United Nations (2012)

According to the United Nations' World Urbanisation Prospects, there are 51 countries in Asia and the rate of urbanisation is quite varied across these countries. Here, attempt has been made to analyse the trend in urbanization in ten most populous countries in Asia, which is shown in **Figure 2**. It can be observed that in all the countries urbanisation is projected to increase remarkably in the next two and half decades. However, in the past trend in urban population in these countries was quite fluctuating due to reclassification of urban limits and consequent inclusion or exclusion of urban areas or towns in the definition of urban agglomeration (Kundu and Kundu 2010). Interestingly, Japan, Turkey and Iran emerged to be the top three urbanising countries, while China and India the two most populous countries occupied fourth and ninth position, respectively. However, the rate of growth in urban population is relatively high for China and India as compared to other Asian countries.

Figure 2. Trend in urbanization in 10 most populous countries in Asia



Source: United Nations (2012)

As discussed, the trend towards rapid urbanization is quite high in Asia. Further, the number of mega cities (with population of 10 million and above) is emerging in sizeable numbers across Asian countries. In 2011, Asia had only 13 mega cities out of 23 in the world and it is expected to increase to 22 out of 37 such cities projected for 2025 (**Table 2**). There were four mega cities in China, three in India, two in Japan and on each in Bangladesh, Pakistan, Philippines and Turkey during 2011. By 2025, additional mega cities will emerge from China, India, Pakistan, Thailand and Indonesia. These Asian mega cities alone will account for about 8 per cent of Asia's population and 4 per cent of world population. It is clear from the discussion that the urbanization is inevitable and hence it is imperative to provide sufficient urban infrastructure and supply adequate food in various forms as per the changing consumption pattern of urban dwellers.

Table 2. Number of mega cities (population of 10 million & above)

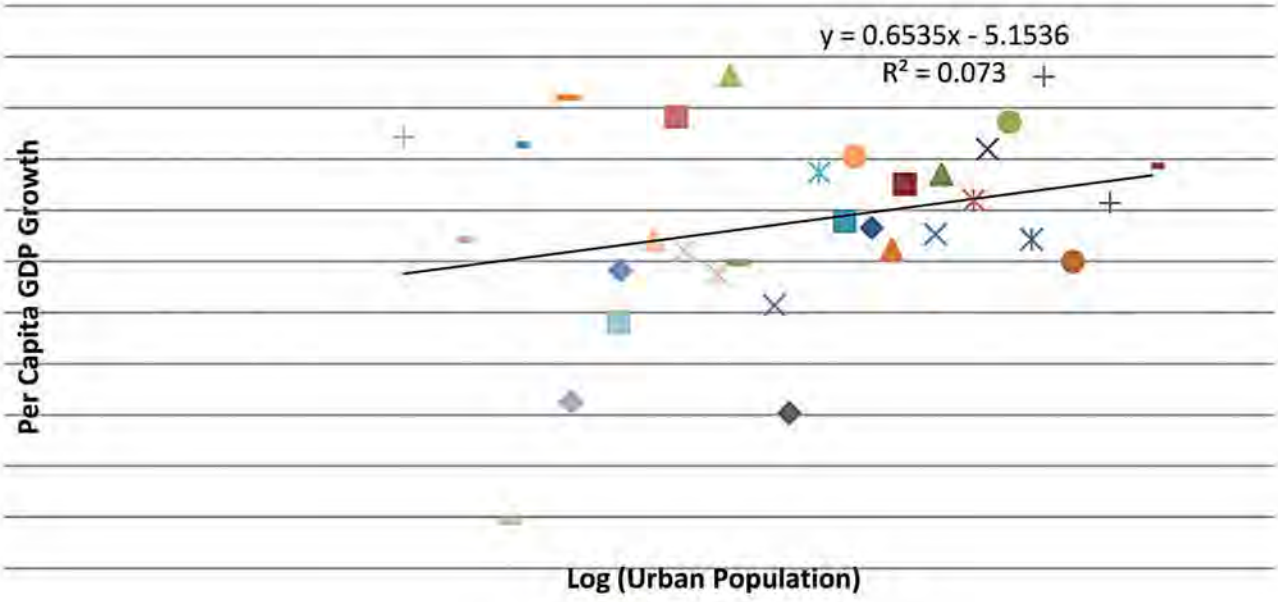
Country	2011	2025
Japan	2	2
India	3	6
China	4	7
Bangladesh	1	1
Pakistan	1	2
Philippines	1	1
Turkey	1	1
Thailand	-	1
Indonesia	-	1
% of Asia's Population	5.17	7.70
% of World Population	3.12	4.26

Source: United Nations (2012)

III. Urbanization and Economic Growth

According to the economic theory, urbanization leads to higher economic growth through increase in employment opportunities, investment and per capita income. Generally, manufacturing clusters and service producing centres are located in urban areas, which substantially contribute to national gross domestic product. Most of these sectors are located close to the urban areas due to concentration of inputs like labour, materials and proximity to financial institutions, government departments and access to consumer markets. Further, liberalisation of national economies led to their greater integration with rest of the world favouring flow of technology and investment in urban and peri-urban areas. Even if investment takes place in an industrial cluster located away from the city, that location will soon get urban status. Therefore, there is a strong linkage between investment, urbanization and economic growth. The relationship between urbanization and economic growth, measured as annual growth in per capita gross domestic product, in the Asian context is shown in **Figure 3**. It can be observed that urbanization and economic growth is positively related. That is, one percentage increase in urbanization results in 0.65 percentage increase in per capita gross domestic product growth.

Figure 3. Economic growth and urbanization



Note: 1. Per Capita GDP growth is computed at five year intervals from 1970 to 2010 and the Corresponding logarithm of urban population is from 1970 to 2005

2. Analysis excludes Central Asia

In the last two decades, Asia had registered a spectacular economic growth as compared to other regions in the world. Even during the period of global economic crisis of 2007-08 to 2009-10, Asian countries registered respectable growth and thereby thwarting global economy sliding to a lowest level. In fact, during 1990 to 2010 Asia registered annual GDP growth of 7.0 per cent and increased its per capita income in 2005 purchasing power parity (PPP) terms to $5,133 from $1,633 (ADB 2012). It has been argued that high GDP growth in Asia had greater poverty reducing effects and lifted substantial number of poor people above the poverty line. In fact, the Asia-wide poverty reduced from 53.9 per cent in 1990 to 21.5 per cent in 2008.

Table 3. Urban and rural inequality (Gini Coefficient) in selected Asian countries

	Year	Urban	Rural
China	1990	0.2559	0.3057
	2008	0.3515	0.394
India	1993	0.3437	0.2856
	2009/10	0.3935	0.2995
Indonesia	1990	0.3466	0.2646
	2011	0.4215	0.3402

Source: ADB (2012)

However, these achievements were marked with rising inequality between and within countries in Asia. For Asia as a whole, Gini coefficient had increased from 0.39 in early nineties to 0.46 in late 2000s (ADB 2012) indicating that raising income has concentrated only in a few hands. Further, the rate of increase in inequality has varied by rural and urban regions. Among the selected Asian countries, the rate of increase in urban inequality was higher than rural inequality for China and India, and it was opposite for Indonesia (**Table 3**). Therefore, it has been argued that although urban growth positively affects overall economic growth but such growth is exclusionary in nature (Kundu and Kundu 2010; Kanbur and Zuang 2013).

Table 4. Poverty head count ratio at National Poverty Line of selected Asian countries

Country	Rural Poverty	Urban Poverty	Year
Armenia	34.9	33.7	2009
Afghanistan	37.5	29.0	2008
Bangladesh	35.2	21.3	2010
India	33.8	20.9	2010
Georgia	27.8	17.5	2008
Lao PDR	31.7	17.4	2008
Nepal	27.4	15.5	2011
Pakistan	27.0	13.1	2006
Indonesia	18.9	11.6	2008

Source: ADB (2012)

Further, along with rising inequality a high level of poverty continue to exist in various Asian countries. Therefore, appropriate developmental strategies are needed to ensure that the benefits of growth are equitably shared by socially disadvantaged and poor sections of society. It can be seen from the **Table 4** that the large number of poor live in urban and rural areas of the selected Asian countries. It has been pointed out that with increasing urbanization there is shift in incidence of poverty from rural to urban areas and the proportion of urban poor has been increasing over time (Ravallion et al 2007)). Hence, massive challenge is to provide requisite urban infrastructural facilities like transport, housing, health care, water and sanitation, creation of productive employment opportunities and most importantly affordable food to urban poor. In this context, promotion of economically viable, socially acceptable and ecologically manageable urban and peri-urban agriculture will play a key role in alleviating urban poverty and ensuring food and nutritional security to urban poor.

IV. Urbanization and Significance of Urban and Peri-urban Agriculture

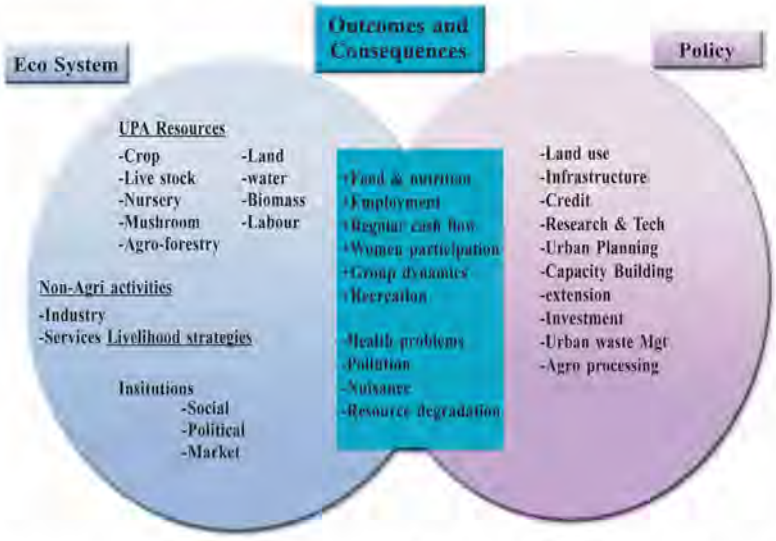
Many studies have focussed on different issues related to rapid urbanization across countries in the world (Kundu and Kundu 2010; Fan et al 2011; Kanbur and Zhuang 2013). But, these studies have paid little attention to the important role played by the UPA in urban socio-economic and ecological spheres in general and their contribution to urban food and nutrition security, urban waste management, employment generation and improving quality of life in particular. It has been well established that overall agricultural growth reduces poverty and leads to a small change in inequality as compared to the growth effects of non-agricultural sectors (Datt and Ravallion 1998; Pauw and Thurlow 2010). In a similar vein, it has been argued that developing a sustainable UPA hold a promise to reducing urban poverty (Mougeot 2005; FAO 2007) and enable access to education and health care facilities for urban poor (FAO 2007).

Similar to heterogeneous structure of rural agricultural system, UPA has also diverse farming system ranging from part time to full time farmers; subsistence oriented to semi-commercial and fully market oriented farming; and single enterprise to mixed crop-livestock, poultry and fishery system. An important distinguishing feature of UPA from rural agriculture is that it is fully integrated with urban socio-economic and ecological system (Mougeot 2005; de Zeeuw 2011) and that it utilises urban resources like land, water and solid waste as inputs and supplies food to urban consumers. With the expansion of urban population, range of goods and services provided by UPA also gets expanded and strengthened to meet the rising demand. Therefore, urbanization provides greater opportunities for farmers through direct access to consumers, access to market information, inputs availability, reduced transaction cost and low wastage. But, there are some challenges for ensuring sustainable development of UPA. These included land tenure, health risks and pollution, which however, can be effectively resolved through appropriate policy intervention, technology and stakeholder participation in production, marketing and processing of urban agricultural products. In contrast, increased urbanization with improper urban planning often results in competition for land use in agriculture and non-agricultural purposes like residential building, roads and industrial establishments. Further, as city expands the customary rural land rights get diluted and urban laws take over without recognizing agriculture as a part of urban land use system.

There is increased pressure on land in urban and peri-urban areas due to high demand for residential requirements by migrants, construction of factories and building of public utilities by the local governments. Consequently, price of land goes up leading to forced sale of land by the farmers for real estate purposes. Further, operational holdings of land get fragmented and intensification of agricultural takes place particularly in peri-urban areas with intensive use of inputs for achieving higher agricultural production (Mougeot 2005). The agricultural production also shifts from traditional food grains based to market oriented perishable products like vegetables, fruits and milk. However, it has been pointed out that market oriented agricultural production is risky without proper institutional and policy support for its promotion and strengthening the economic viability (Anders and Lebailly 2011). Another important issue associated with land is that it is often kept idle within and periphery of city for speculative purposes to take advantage of skyrocketing land prices in most cities. However, a proper governance of land with appropriate legal framework to take over the temporarily un-utilised land and vacant land around the public utilities like park and roads that can be leased out to urban poor for cultivation. There are successful policy interventions in the City like Cape Town, South Africa and Havana, Cuba for regulation and utilisation of vacant land for cultivation (FAO 2007) and their experiences can be used for possible emulation in other cities.

V. Integrated Urban Ecosystem and Policy Approach for UPA

Figure 4. Integrated urban ecosystem-policy approach



For strengthening UPA, an integrated urban ecosystem and policy intervention is necessary. It is important to recognise that UPA is part of urban ecosystem, which comprises several elements that interacts each other to produce some output even without any policy interventions (**Figure 4**). Urban ecosystem, like any other ecosystems, consists of biotic, abiotic and physical components. For the sake of simplicity, it is assumed that in addition to agriculture and allied activities, urban ecosystem may include urban resources, non-agricultural enterprises, institutional interactions and livelihood strategies that urban dwellers adopt for survival.

Policy intervention is exogenous and it can influence or modify the type of outcomes and consequences generated from the urban ecosystem. These policy interventions are wide ranged; appropriate land use planning, incorporation of agriculture in town/urban planning, development of urban infrastructure, technology and capacity building, urban waste management, investment promotion and extension related aspects. The type of outcomes generated through policy intervention in the inter-related ecosystem can be both positive and negative. Therefore, any policy interventions for supporting UPA should aim at maximising the positive outputs and minimising the negative outcomes.

VI. Policy Strategies for Development of UPA

As discussed above, there is need for an integrated policy approach which essentially takes into account the important components of urban ecosystems and the likely outcomes from such policy intervention. Here, some of the policy strategies for promoting and strengthening UPA have been highlighted.

1. Urban Land Use Plan

The national and local governments should recognise that urban agriculture is a part of municipal, city and town planning. Separate land should be demarcated for practising urban agriculture and effectively integrate it with urban land use planning even if city expands over time. The local government should also set up a separate Urban Agriculture Department to provide technical advice and inputs to promote UPA in environmentally sustainable manner. However, to convince the planners and change the mind set of those who believe that agriculture should be pushed to rural areas only, research should focus on economic valuation of goods and services produced by the UPA.

2. Land Availability and its Access

As city expands, there is competing use of land for different purposes within and periphery of city and consequently the land price tend to rise quite sharply. Therefore, availability and accessibility of land is of

great concern for promoting urban agriculture. However, local governments can make available land for urban poor through various means.

- Identification of vacant land and unutilised land through participatory approach involving different stakeholder like urban farmers, city dwellers, municipal/town planners, agricultural experts and government officials
- The land thus identified can be utilised to create Urban Agricultural Land Bank through which land can be leased out to urban poor households for cultivation. At present, there does not seem be any mechanism to regulate the urban and peri-urban land market operations and monitor land price movements. Therefore, a systematic analysis of operation of land markets need to be conducted across cities in various countries for better understanding of market conditions to be reflected in urban planning.
- There is huge scope for utilising open spaces within residential premises and rooftops for cultivation of plants. According to UN-HABITAT (2012), rooftops account for about 30 per cent of a city's total area and offer great scope for cultivation.

3. Mapping Urban Agricultural Typologies

The urban landscapes are quite varied and type of agriculture practiced within and fringes of city also vary across different landscapes. The study of urban farming systems is necessary for designing appropriate technology and policy interventions for improving productivity and income. Therefore, research priority is to identify common criteria for studying urban farming system that can be compared across cities in the world. The common criteria adopted could be a single indicator or multiple indicators based on location, size, crop-livestock mix, degree of commercialisation and ownership type (individual or community managed).

4. Urban Agriculture Programme

At present most national governments undertake developmental programmes for improving rural agriculture with a view to strengthening domestic food production and maintaining price stability. However, without undermining the importance given to rural agriculture, there is a need for developing a separate urban agriculture programme with earmarked budget allocation for improving the social welfare of urban dwellers. The separate urban agriculture programme should be designed in a holistic manner encompassing all UPA activities.

- Aim at improving economic viability of different forms of UPA
- Provide incentive structures for producing improved seeds and organic inputs like compost and bio-fertilisers prepared from urban solid waste and water
- Arrangements to provide institutional credit to ultra-marginal and marginal urban farmers whose plot size for cultivation is small and generally they do not access to institutional credit
- Promote low space technology with complete technical assistance from Urban Agriculture Department
- Provide education and training to practice environmentally safe farming and involve existing social institutions like self-help groups for extension services

5. Urban Agriculture Service Delivery

Provision of basic inputs and technical know-how is crucial for promoting UPA. It needs to be explored for possibility of replicating rural extension system for providing urban agricultural input services. Research and technology should be promoted for development of low cost implements like hand sprayers suitable to use in UPA. Further, involvement of urban local bodies to monitor input service delivery system and formation of Urban Farmers' Association for facilitating group extension services will significantly contribute to increasing urban agricultural production. Since the quantity of output produced by urban and peri-urban farmers is so small for sale by individual farmers, group or cooperative marketing avenues should be explored. The urban non-farming communities can be encouraged to purchase food products produced by the local farmers, which will help to improve the local economy and ensure guaranteed income to the farmers.

6. Prevention of Health Risks

The UPA has not only positive impact on urban people in the form of food, ready cash flow, group dynamism and clean air, but also negative environmental consequences due to use of chemical fertilisers and pesticides, contaminated water for irrigating crops and spread of diseases through animals. Because of perceived health risks and nuisance, the city planners refuse accept the importance of agriculture as part of urban land use planning. It is important to identify areas with potential exposure to industrial toxic materials and avoid promoting agriculture in those areas from contaminating with heavy metals. Regular testing of food produce for possible contamination is also necessary. Further, attempt should be made to integrate UPA with the policies of Departments of health and nutrition, environment, water supply and sanitation for holistic and appropriate interventions to support the urban poor.

7. Creation of Database on UPA

There is a lack of comparable database on UPA activities across cities for policy formulation and designing urban farming system specific developmental interventions. It is essential to develop a world-wide database on urban and peri-urban farming and document workable policies and practices. Regular information on UPA can be captured through the data collection mechanisms, which are already in place in different countries. For instance, complete enumeration of UPA activities can be undertaken as a part of Human Population Census, which among others, also records information on household amenities periodically. Similarly, UPA activities can be documented through agricultural census of operational holdings and household consumption surveys also conducted periodically across countries in the world. The participation of different stakeholders in surveys will ensure quality and timeliness of data available for planning.

VII. Conclusions

There is a growing body of literature supporting urban and peri-urban agricultural activities on the grounds that UPA provides food and nutritional security to poor, helps to tide over food price volatility, generates employment and recreational services. The UPA provides livelihood to a large proportion of urban poor and it is considered as an important tool for poverty alleviation. The UPA makes use of available land for producing food and utilises urban waste as inputs, which otherwise is dumped as garbage for disposal. There are also disadvantages associated with UPA, but these problems should not be seen as a hurdle for strengthening agricultural activities in urban and peri-urban areas.

Urbanization provides greater opportunities for urban farmers through direct access to consumers, access to market information, inputs availability, reduced transaction cost and low wastage. However, UPA still remains unrecognised by many national and local governments for the perceived heal risks, nuisance and

environmental pollution. But, these challenges can be overcome with appropriate policy interventions and multi-stakeholders participation in designing suitable UPA developmental programmes. This may also facilitate flow of private investment and technology for improving goods and services produced by UPA, which will go a long way in improving the economic conditions of urban poor.

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GLOBAL PERSPECTIVE ON STRENGTHENING UPA TOWARDS RESILIENT FOOD SYSTEMS

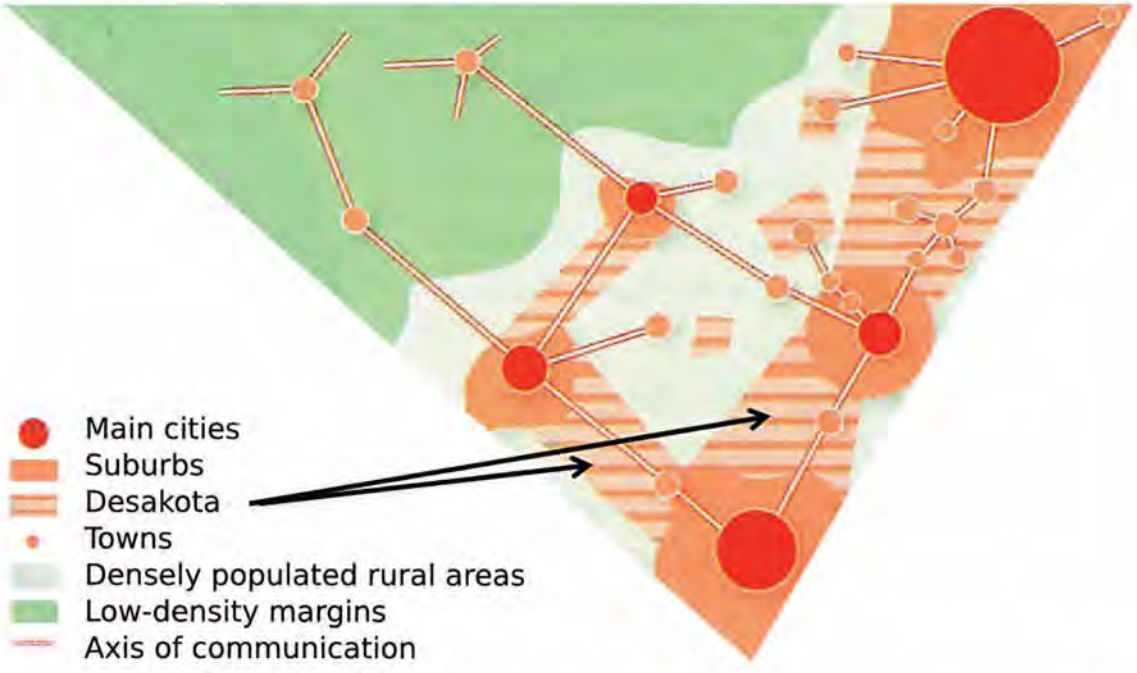
Makiko Taguchi*

Introduction

It is estimated that by 2050, close to 70 percent of the world's population will be residing in urban areas. Many of the megacities already existing, and fast growing, are in Asia. For millions of people in the world's developing cities, life is characterized by high levels of poverty, high levels of food insecurity, the persistence of malnutrition, especially among children, high unemployment and under-employment, and associated increases in crime and the risk of social disorder.

With the recent soaring of food prices in 2007 and 2008, many cities have experienced the vulnerability of the basis for the urban population. We have also witnessed other urban challenges such as flooding in Bangkok and Jakarta, earthquake and tsunami disasters, etc. In order to have food and nutrition security in the cities, building resilient food systems is a must to avoid further human caused damages during such challenges.

Climate change resilience is taken up as one of the most important natural phenomenon in political arenas such as Rio+20, and at economic arenas such as World Economic Forum in Davos. UPA can play a significant role in improving a city's climate change resilience by providing green space in the dense urban cityscapes, and also through smart landscape management.



Source: T. Sanjuan, "La mégalopole asiatique" In Atlas de la chine, les mutations accélérées, Autrement, Paris, 2007, p.39, reproduced from Ginsburg, Koppell, McGee, dir., The Extended Metropolic. Settlement Transition in Asia, University of Hawaii Press, Honolulu, 1991

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This graphic shows the situation of urban development in megacities. The term "*desakota*", coined by Prof. McGee from Canada, derives from two Indonesian words "*desa*" (village) and "*kota*" (city). These areas are typically considered "rural" but strategically placed to supply the cities with produce and in danger of land development. Megacities commonly have multiple city hubs that were originally separate cities but have grown to become a part of the megacity. The desakota area, or peri-urban areas become targets for land speculation and rapid urban development. In many cities, the existing agricultural activities that take place in these areas are not considered or protected.

The challenge is to steer urbanization towards sustainable, ***greener*** cities that offer choice, opportunity and hope. The core principles of greener cities are:

- *Resilience and self-reliance* – the capacity to resist and bounce back from shocks and stresses, such as water scarcity, extreme climate events or threats to the food supply
- *Economic development* that provides decent work and income for low-income urban populations
- *Environmental sustainability*, achieved by minimizing pollution and converting wastes to productive resources
- *Social inclusion* – a city where all citizens feel valued and their basic needs are met

The Role of Urban and Peri-urban Agriculture

FAO estimates that the number of chronically hungry in the world has risen to more than eight hundred million people. The greatest increase has been among the urban poor, women and children. How does UPA help improve the food and nutrition security of cities? Urban and peri-urban agriculture (UPA) is characterized as cultivation of fruits and vegetables, dairy, small livestock, aquaculture and forestry products in and around cities and towns. UPA can play a significant role in building resilient food systems for urban areas. It can improve food and nutrition security for the population directly through better and affordable access, provide means for income generation for the urban poor, contribute towards safe and cleaner environment through solid and waste water recycling, create an atmosphere of good governance through multi-stakeholder approach, and ultimately contribute towards building healthy communities both physically and socially.

Within UPA, urban and peri-urban horticulture (UPH) is the most common activity observed. However, in most cases they are not acknowledged by agricultural policies nor urban planning strategies. Since 1999, FAO has been implementing a project called *Growing Greener Cities* to promote UPH, with a multi-stakeholder approach to ensure a stable policy and community support.

UPH can increase the physical supply of fresh, nutritious produce, available all year round. It also improves the urban poor's economicaccess to food when their household production of fruit and vegetables reduces their food bills, and when growers earn a living from sales. Several countries promote UPH as part of their urban food security strategies. For example, China has integrated food production into urban development since the 1960s. Today, more than half of Beijing's vegetable supply comes from the city's own market gardens. Horticulture in and around Hanoi produces more than 150 000 tonnes of fruit and vegetables a year. In Cuba, more than half of the country's fruit and vegetable supply is produced in Havana. As urbanization accelerates in sub-Saharan Africa, many countries are seeking to develop their commercial horticulture sectors to ensure urban food security.

A starting point for growing greener cities is to recognize and integrate **agriculture** into urban development policy and planning. For a successful UPH development, FAO's approach[1] takes the following five components as essential.

1. Ensuring political and institutional commitment
2. Secure land and water for agricultural purpose
3. Ensure product quality while protecting the environment
4. Ensure participation by all stakeholders in the UPA sector
5. Secure new markets for fruit and vegetables

Safety and Quality

Highlighting the third point in the above approach, the important aspects of safety and quality are:

- Food safety: presence of pathogens, agricultural or other chemicals, veterinary drug residues, etc. needs to be regulated and monitored
- A threat to safety and quality may arise at any stage of the food chain
- Preventative risk-based approach is essential to minimize damage to producers, consumers and the environment.

In order to tackle this problem, good practices at various levels can be implemented. At farm level (GAP, GAHP, GAqP, GVP), improvement in the quality of inputs, water, hygiene and handling can be made. For post harvest practices, improvement in handling, packing, storage, and transport is needed in many food chains. At the retail level, markets, street foods, organized retailers, and restaurants all play a role in ensuring the food safety and quality. It is important that all actors in the chain, from producers to retailers, each take the responsibility in their control, and the government also plays a key role as enabler and regulator of this process.

FAO has been involved in promoting Good Agricultural Practices (GAP) modules for fruits and vegetables and capacity development initiatives. The initiatives also include training and capacity development on traceability and recall, food safety emergency systems (FSER), legislation and standards, and their monitoring and surveillance capacity such as testing and risk categorization. At the retail level, projects have been implemented to raise awareness and improve street foods and organized retail. Education and awareness raising at all levels are crucial for improving safety and quality.

Nutrition and Education

Another important aspect that UPA can play a role, is in the improvement of nutrition through consumption and education. School gardens are proven means of promoting child nutrition. Over the past 10 years, FAO has helped establish thousands of school gardens in more than 30 countries.

- School gardens familiarize children with horticulture / agriculture
- They can provide fresh fruit and vegetables for healthy school meals
- They help teachers develop nutrition courses and when school gardens are replicated at home, they improve family nutrition as well

School gardens have also made positive impact in community building by involving parents and neighbors surrounding the schools in taking part in the activities.

Establishing healthy eating habits at a young age is important to avoid development of non-communicable

[3] FAO 2010, *Growing Greener Cities*

diseases such as diabetes or heart diseases. Obesity is not a problem only in developed countries but increasingly in many developing countries among the middle class. The urban poor often have less access to fresh fruits and vegetables compared to the rural population, which result in consuming unhealthy processed foods. UPA can contribute to improving the health of the urban poor, which also enables them to be a more productive member of the society.

UPA and Waste Management

Growing urban areas inevitably have to deal with the issue of rapidly increasing waste. UN-HABITAT estimates that, in the world's developing regions, only a third of wastewater is treated. Less than half of solid municipal waste – or garbage – is disposed of. In many cities it is simply left to rot in the streets. UPA can turn these wastes into a productive resource. In North America, cities recycle solid organic waste into compost for home gardens. In Addis Ababa, a private company collects each day some 3.5 tonnes of organic waste and converts it to almost two tonnes of fertilizer. Cuba's national programme for UPA prohibits chemical fertilizer in cities and encourages instead organic composting.

Often people living in urban slums are engaged in urban horticulture for their own consumption or for sale. But the source of water is often contaminated as their access to safe water is limited. Land is also contaminated often due to the industrial activities nearby.

FAO is actively engaged in the water quality and reuse through collaborations with WHO, UNEP, UNU, UNWDPC, ICID and IWMI.

Other Benefits of UPA

Further environmental and social benefits of UPA can be made. It reduces the need to transport produce into cities from distant rural areas. That generates fuel savings, and reduces carbon dioxide emissions and air pollution. UPA lowers city temperatures – in Cairo, rooftops planted with vegetables are 7° C cooler than those next door. When practised on greenbelts, agriculture improves landscapes and citizens' quality of life. Greenbelts and urban forestry also stabilize fragile land, such as hillsides and river banks, and protect them from being used for unsafe residential development. Building a sustainable UPA sector provides a laboratory for innovative approaches to urban development and good governance.

FAO's approach underscores the need to transform UPA into a fully acknowledged commercial and professional activity, integrated into national development strategies and urban planning. To give some examples, Argentina has a national policy and a programme, called Pro-Huerta, for urban agriculture. In Brazil, the Ministry for Social Development and Combating Hunger sets urban agriculture guidelines, and agriculture support centres have been created in major cities. In Egypt, the government launched a "Green food from green roofs" programme that encouraged urban residents to grow their own vegetables on rooftops. In the Democratic Republic of the Congo, city mayors preside over municipal committees which are integrating UPH into urban planning. A national UPH support service provides technical advice to growers.

UPA also fosters healthy communities. In cities, hunger, poverty and lack of hope can lead to high rates of crime, prostitution, child neglect and drug abuse. The young are particularly vulnerable. In the developing world as a whole, almost half the population is under 25 years old, and those that migrate to the urban areas often end up unemployed. As high birth rates and rural migration add millions to the youth population over the coming decade, urban frustration could reach boiling point. Agriculture can provide food and income, a focus for shared enterprise, and a constructive channel for young people's energy.

Some concrete examples include:

- In Colombia, the Bogotá community gardening programme involves former combatants, the elderly, prison inmates, the disabled and people affected by HIV/AIDS.
- In outlying areas of Mexico City, women have switched from city jobs to horticulture because it generates income and gives them more time to care for their children.
- In Port Elizabeth, South Africa, an NGO has started school gardens and backyard plots for orphan-headed households, linked to a health clinic.
- In Philadelphia, USA, it was observed that shooting crime rates reduced significantly after vacant lots were turned into urban gardens.

Food for the Cities

Encompassing all the above aspects of UPA and recognizing the importance of urban food systems, FAO launched a programme called Food for the Cities in 2000. This programme enables and facilitates a multi-stakeholder approach. The network connects governments, development practitioners, universities, research organizations, civil society organizations and all the stakeholders of urban food systems.

For more information
Food for the Cities-www.fao.org/fcit/en/food-for cities@dgroups.org
Growing Greener Cities-www.fao.org/ag/agp/greenercities greenercities@fao

* * *

3 COUNTRY PRESENTATIONS

3.1 COUNTRY FRAME WORK

Framework for Action based on the Concept Note Received from Participating Countries (Cambodia, Indonesia, Republic of Korea, Vietnam)

CAMBODIA

Work Plan 2013

Technical Working Group on Food Security and Nutrition (TWG-FSN) - Cambodia

No.	Task	Time frame	Responsible/ Involving Government Agency	Supporting Agency	Estimated Amount (US$)
	Policy Review and Update				
1	Develop a Strategy for Food Security and Nutrition 2012-2016	By June 2013	CARD, MoP, MAFF, MoH, MoWA, MRD, MoI	USAID, WHO, UNICEF, WFP, FAO	
2	Develop a comprehensive Nutrition Action Plan	By June 2013	CARD, MoP, MAFF, MoH, MoWA, MRD, MoI	USAID, WHO, UNICEF, WFP, FAO	
3	Prepare inputs on FSN for the new NSDP formulation process		CARD, MoP, TWG-FSN	WFP	
	FSN Information Management				
4	Operate and manage quarterly Food Security and Nutrition Bulletins 1. Compile information, analyze data and produce bulletins 2. Annual retreat of FSNDAT 3. Strengthen CARDs capacities with regard to information management 4. Publication of the bulletin	Every quarter	CARD, NIS/MoP, MAFF, MoH, MoWA, MoWRAM, NCDM	WFP, FAO	
5	Operate and manage the FSNIS website 1. Regularly update its contents – Review all outdated sections 2. Produce FSNIS CDs and promotion materials 3. Organize 2 FSNIS promotion workshops at sub-national levels (Siem Reap, Banteay Meanchey)	On-going	CARD	WFP FAO FAO	
	Capacity building				
6	Conduct trainings on food security and nutrition for planners and decision-makers at sub-national level	Continued	CARD, MAFF, MoH, MoWA	ADB, FAO, CARITAS	
7	English Courses and Website Management for FSN Department Staff	Continued	CARD	ADB, CARITAS	

	Monitoring and Evaluation				
8	Coordinate monitoring and evaluation of major FSN-related large programs/projects, including summarizing and compiling annual plans and budgets	on-going	CARD, TWG-FSN		
	Production of Annual monitoring Report on FSN	4th Quarter	CARD, TWG-FSN		
	Coordination and Advocacy				
9	Regularly organize FSN related meetings 1. Organize quarterly FSN Forums 2. Organize and conduct regular meetings of the Technical Working Group on FSN (TWG-FSN) 3. Hold the meetings of the FSN Info Management Task Force 4. Produce progress reports of TWG-FSN to CDC	continued	CARD, MoP	TBC	
10	Strengthen and enhance profile of TWG-FSN 1. Discuss and agree on necessary steps 2. Strengthen capacities and support TWG-FSN (seconded junior staff , incentives for staff secretariat and running costs) 3. Ensure effective linkages to other relevant TWGs (TWGAW, Health, Poverty and Planning etc.) by conducting a more regular/systematic follow-up discussions with other TWGs.	continued continued	CARD, MoP, TWG-FSN	WFP	
11	Establish and support FSN coordination mechanism at subnational level in 5 provinces (Takeo, Kg Speu, Svay Rieng, Siem Reap and Banteay Meanchey	2nd quarter	CARD, MoI	ADB, FAO, CARITAS	
	IPC issue				

TWG Co-Chair(s): **Lead Donor**

Coordinator(s):

Date: _____ Date:

Signature: _____ Signature _____

Name: Rath Virak Name: Jean-Pierre de Margerie

Position: Secretary General of CARD Position: Representative/Country Director of WFP

Date: _____

Signature: _____

Name: Nuth Chansokha

Position: Undersecretary of State of MoP

[NOTE: for consultation on CARD's FSN information and data, go to: ***www.foodsecurity.gov.kh****]*

INDONESIA

1. Program Context and Justification of UPA

Urban Agriculture (UA) is a dynamic concept that comprises a variety of livelihood systems ranging from subsistence production and processing at the household level to more commercialized agriculture. It takes place in different locations and under varying socioeconomic conditions and political regimes. The diversity of UA is one of its main attributes, as it can be adapted to a wide range of urban situations and to the needs of diverse stakeholders. UA or Urban and Peri-urban Agriculture (UPA), as it is referred to in this paper, can make an important contribution to social, economic and ecological objectives of Sustainable Urban Development (SUD).

The definition of food security according to Law No. 18/2012 regarding Food, is a state of condition that food is sufficiently fulfilled for all people from macro (national level) to individual level, which is sufficiently available in term of its quantity and quality, safety, nutrient content, equitability/evenly distributed, affordability, diversity, and in compliance with community religions, beliefs and cultures in order to live healthy, active, and productive in sustainable manner.

As an effort to strengthen national food security, General Food Security Strategy has been implemented through Twin-Track Approach, which are:

a. Emphasizing agriculture-based and village-based economic development with the target of regional economic growth, job opportunity creation and community income; and

b. Providing food for the poor and undernourished people through food provision and community empowerment.

Several approaches used by the agency are consist of: (a) Strengthening food supply by optimizing available resources in a sustainable manner; b) Improving food distribution system to ensure a stable food supply and public access to food; (c) Encouraging diversification in food production and consumption; and (d) Preventing and resolving food insecurity.

Strengthening urban and peri-urban agriculture towards resilient food systems has been conducted in Indonesia for years through its development programs such as: (1) Food Diversification: Acceleration of Diversification of Food Consumption (P2KP) and Sustainable Food-Reserved Garden (KRPL) and (2) Village Food Resiliency (Desa Mapan).

1.1. Food diversification

The acceleration of food consumption diversification: Mindset changing toward the diversified, nutritious, balanced, and safe food consumption

- To optimize the home yard utilization ("Area of Sustainable Food Resilience around Home" / Kawasan Rumah Pangan Lestari – KRPL),
- To strengthen small and medium enterprises on food products of local flour based.
- Improvement of family and special needs (pregnant women, breastfed mother, children under five and food vulnerable community)
- Development, control, and handling of food safety (fresh and processed food)

1.2. Village food resiliency (Desa Mapan)

Village food resilience Program (Desa Mapan) is an effort for community empowerment. With this program, they are expected to utilize their local resources (natural resource, human resource, technology resource, social culture and economy resources) to achieve food security. The approaches used are as follows:

(1) Empowerment (self-help),

(2) A participatory, inclusive, synergistic, and

(3) Optimization of local resources with a market perspective. The community empowerment in food insecure area aims to help poor community to break the poverty cycle. It is done through enhancing their ability to produce food, open food market access, increase the purchasing power (independent of food).

2. Components of a National Strategy on UPA

2.1. Food diversification

Sustainable Food-Reserved Garden (SFRG)

- The Potency of national home yard : 10,3 million ha (14% of total agricultural land)
- Large amount of available genetic resources
- Food crops (rice, tubers)
- Livestock's and fish
- Horticulture(vegetables,fruits,bio-farmaca/standardized home yard medicinal plants)

Principles of Sustainable Food-Reserved Garden

1) Food security and food authority at house hold level
2) Crop diversification based on local resources
3) Genetic resources conservation on food for future
4) House hold and community welfare improvement

SFRG Plus

1) Training and education
2) Health and Nutrition for community
3) Capital and market
4) Climate change adaptation and mitigation

Goals

- To promote a more diverse, nutritious, balance, and safe food diet.
- To reduce rice consumption/capita by 1.5%/year.
- To increase diverse staple food availability and create economic activities/job opportunities in rural area.

Activities

- Campaign/socialization to change people mindset to have diverse, nutritious, balance and safe food in their diet for women empowerment and community awareness.

- Optimization of home-yard garden as food and nutrition sources around a house: a small plot of land can be used for vegetables, poultry, and/or fish farming (Kawasan Rumah Pangan Lestari).
- Promotion of micro, small and medium scale of food processing based on local food sources (cassava, sweet potato, corn, sago, corn)

First Stage (2009-2011)

Operational Strategies

a. Campaign, socialization, advocating, and promotion of safe, nutritious, and diverse food diversification (P2KP).
b. Education on food consumption in terms of its diversity, nutrition content, and safety through formal and non-formal education.
c. Dissemination of the effect of consuming varied, nutritionally balanced, safe food to housewives and teenagers, especially pregnant women, breastfed women, and child-bearing age women.
d. Utilization of home yard and local food resources.
e. Guidance to household and small scale food industries.
f. Development, dissemination, and application of applied food process technology;
g. Guidance on safety and quality of food product for household and small and medium food industries;
h. Facilitation on the development of food business, capital funding, and marketing to fresh, processed, and ready to eat food producers.
i. Providing the award to the individual / individuals and community groups who have acted as a pioneer in implementing and advancing efforts to accelerate the diversification of food consumption;
j. Evaluation and control of food consumption diversification in the 1st stage.

Second Stage (2012–2015)

a. Facilitation on the development of fresh, processed, and ready to eat food based on local resources in terms of infrastructure and water resourced supports.
b. implementation of food quality and safety standard in household and small and medium scale local based food industries;
c. Providing the award to household and small and medium scale local based food industries;
d. Evaluation and control of food consumption diversification in the 2nd stage.

2.2. Village food resilience

The components of Village Food Resiliency (Desa Mapan) activities are:

(1) Strengthening and empowering Group of Farmers (Poktan), Group of Society (Pokmas) and Village Food Team (Tim Pangan Desa),
(2) Optimization of local natural resources,
(3) Development of suitable agricultural and nonagricultural local potency to produce food and generate income (purchasing power);

(4) Application of suitable technology as needed,

(5) The movement to save money in the community,

(6) Assistance, and

(7) Provision of social assistance fund for business amounted to Rp 100 million.

Desa Mapan has been implemented since 2006. It has the duration of four years assistance to implement the four stages of development which are: preparation, growth, development and independence stages. The goal of Desa Mapan is to reduce food insecurity and nutrition at the household level to achieve food security and nutrition of the rural communities.

Desa Mapan is a continuation of the activities of Food Independence Movement, which in essence is an extension of the process of community empowerment for food security by encouraging the role of Local Government and the larger society. This movement is expected to have continuation on food self-sufficiency development through community empowerment approach.

Objectives, goals, beneficiaries and indicators of successful village food resilience program (Desa Mapan)

Objectives

The objectives are:

(a) to accelerate the level of food self-sufficiency, especially the food-insecure communities, fostering productive efforts, handling of food reserves and food processing as well as empowerment and community assistance in specific locations,

(b) to increase the empowerment of the poor rural community in managing and utilizing the resources owned or controlled in an optimal way to achieve food self-sufficiency in the household and community.

Goals

The ultimate goals of Desa Mapan at the poor households in rural food insecure are to achieve the resilience and the state of food security at community levels. Whereas the specific goals of the project are:

(a) Increasing the community independency;

(b) Increasing the role and function of village community institutions;

(c) Developing rural food security system;

(d) Increasing people's income,

(e) Increasing public accessibility.

3. Beneficiaries

The location of target villages and target poor households are determined using the Food Insecurity Atlas 2005 (FIA) based data, Food Security and Vulnerability Atlas (FSVA) 2009 and the household database (DDRT)

Successful Indicators

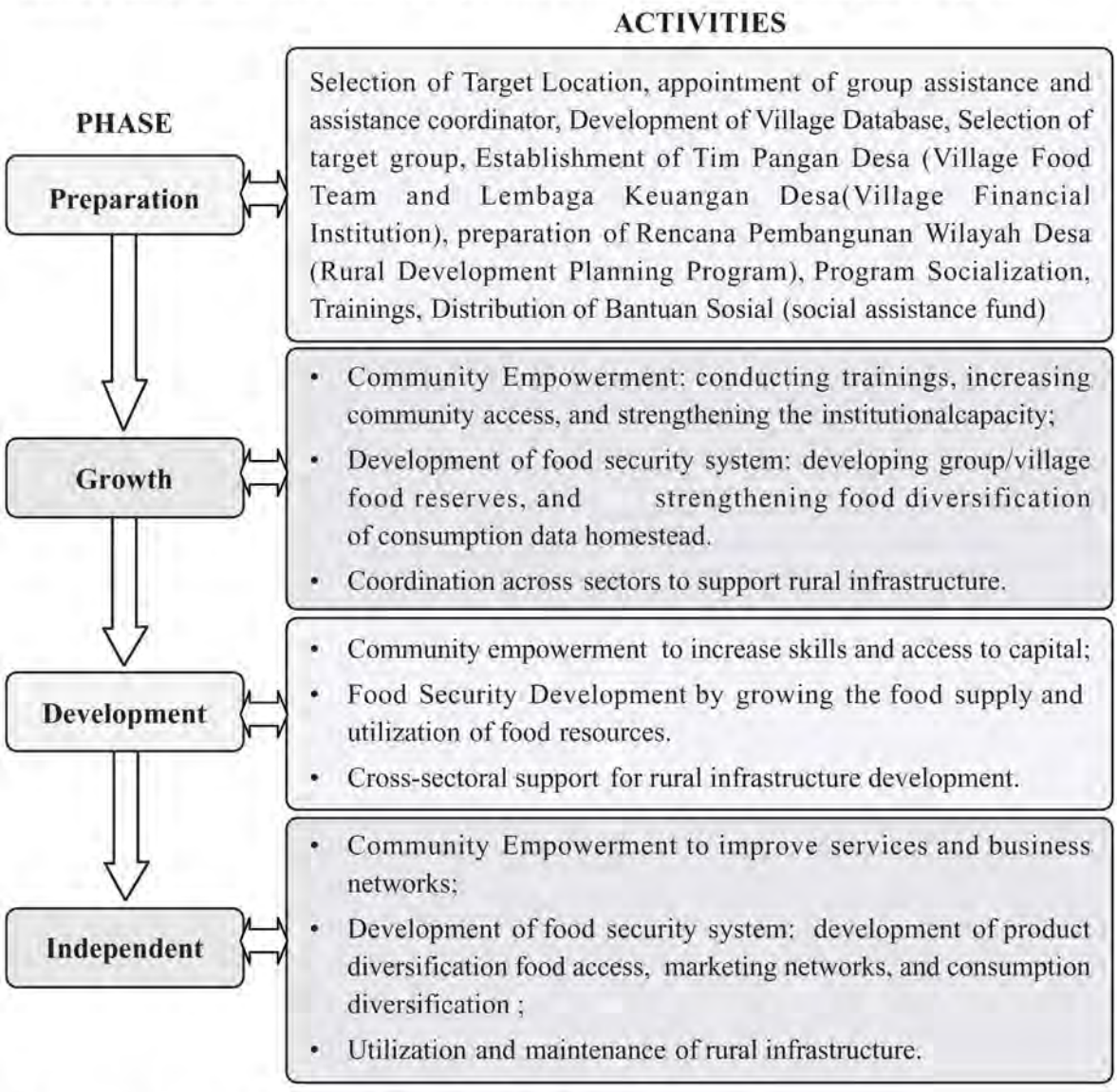
(a) Output: (1) The formation of affinity groups; (2) Establishment of Village Financial Institutions (LKD); and (3) The distribution of social assistance funds (Bansos) for productive activities.

(b) Outcome: (1) The formation of the productive enterprises; (2) The role of capital institutions; (3) the increase in productive enterprises;

(c) Benefit: Rising incomes, purchasing power, and access to community food

(d) Impact: The realization of food security and nutrition community

Action Plan (Phase – Activities): Implementation Phase of Desa Mapan Program



2. Normative tools and guidelines for UPA initiatives:

- Guideline for Program Implementation : guidance, training modules
- Type of Data Collection : village profile, baseline survey village
- Trainings: Participatory Rural Appraisal, Gender Activity, Capacity building, etc.

3. Agenda for Action

3.1. Policy Orientation to Promote Local Resources Based Food

- As a country in the tropical region, Indonesia has - a large biodiversity that can be utilized for food resources.

- In the perspective of food provision/or supply, food diversification has effectively adapted to reduce the risk of food production failure due to climate change, and it is also important to support the development of local resources based food.
- In the consumption side, food diversification broadens the spectrum of food choices, and it is also a significant way to increase the pattern of food expectations
- Development of food diversification is in the integral part of strengthening sustainable food security
- Rice has a strategic position in food security, yet the national economy is not excessive considered in the short-term political aspect
- Development of food diversification refers to the principle that production, agro-food, and consumption is in the same system
- Development of food diversification is designed based on holistic interdisciplinary and cross-sectorial approach in a harmonious and consistent way
- Development of food diversification is interpreted as an effort to equity and increase revenues, expansion of business and employment opportunities, and relevant to the principles of environmentally sound development
- Strengthening food security program is one of the national development principal.
- From the strategic role of agriculture in food security side, achieving the target of diversification program is related to the performance of the revitalization in agricultural sector
- In strengthening national food security, development of food diversification program is in a higher priority, but it remains in line with the rice self-sufficiency program
- Coordination is the key to keep the success of diversification program
- Development of food diversification is a long process and needs the contribution of education in the formation of perceptions, attitudes, and behavior of the present and future generations,
- Research and development is crucial for the development of food diversification

4. Policy Orientation to develop Village Food Resiliency (Desa Mapan)

These villages can be used as a reference center of development and learning place to accelerate poverty reduction and to achieve a firm food security community. They also act as a pilot village community empowerment to build a firm food security household.

Governors, regents and mayors are expected to take the initiative to allocate local resources that is sufficient for food security development, to synergize all development efforts for food security and poverty alleviation in the region, and to mobilize community participation, including private entrepreneurs. If the concept of this development is implemented properly, the target acceleration in the reduction of poverty and food-insecure population will be met effectively.

Sustainability strategies (Exit Strategies) for this project are: (1) the affinity groups will be the self-help groups in conducting productive business and food security. Those groups will develop further into a combination of Gabungan Kelompok Tani (farmer groups association), (2). The Food Village Team acts as an embryo of the village food security coordination body, (3) the Village Financial Institution acts as a Village-Owned Enterprises, and (4). The development of accessibility in the form of business partnership.

5. Assignment of Tasks

Desa Mapan has constructed and conducted planning activities in several stages, started from community groups, village, district, provincial until national government.

a. Planning in the group, is participatory, involving all members of the co-facilitated the group, to develop and strengthen the business development group into the Group Action Plan (RKK).

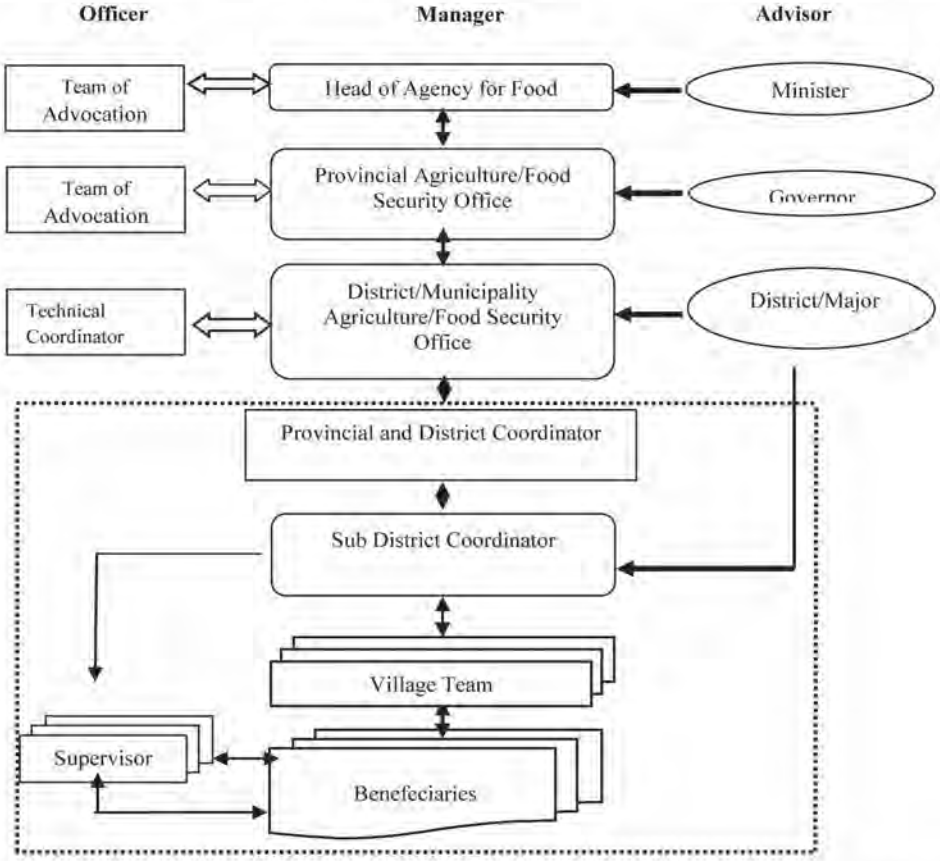
b. Planning in the village, the village head that had been developed to integrate programs in villages in the Village Development Planning Meeting (Musrenbangdes), which involves: community, TPD, companion, and community leaders in a participatory manner.

c. Planning in the District, with the Head Coordinator to coordinate with Companion / instructor of local villages, TPD, LKD, KCD, POPT, Team Coordinator of PKK and the District of BPP in the District by integrating the results of Musrenbangdes.

d. Planning at District / City, Regent / Mayor as Chairman of the DKP Regency / City, coordinating the implementation of programs / activities sub-sector and cross sector by integrating the results of village-level planning Musrenbang delivered in the District.

e. Planning in the province, the Provincial Governor as Chairman of the DKP, coordinate the implementation of programs / activities sub-sector and cross sector by integrating the results of the planning district.

f. Planning at the Central Level, Ministry of Agriculture as Chief Executive of the Ministry, to coordinate the implementation of programs/activities sub-sector and cross sector by integrating the planning of the province. Planning of programs/activities carried out by the center, intended for the development of food security and reduce poverty in vulnerable areas of food



6. ProgramPprogress Evaluations andIimpact Assessments

During the 5 year implementation of the Village Food Resilience Program from 2006 to 2011, it has been successfully implemented in 2851 villages or 11.8 percent more than the number previously planned that was 2550 villages spread over 399 districts / cities in 33 provinces. It consists of: (1) 1912 Core / Regular Villages or 6 rural villages more than 1906 villages planned, and (2) 939 rural village replicates or 37.94 percent of the 1906 villages planned. The replicates are the villages that were built by the core / regular villages of 2006, 2007, and 2008. The development of replicate villages was initiated at the last phase of the Desa Mapan program, for example 2008 villages will start replication in 2012. The detailed number and location of Desa Mapan villages can be seen in table 1.

Table 1: The development of Desa Mapan location in2006-2011

Description	Plan			Realization		
	Province	District	Village	Province	District	Village
Fiscal Year (FY)	**30**	**122**	**1.000**	**30**	**122**	**985**
2006:	30	122	250	30	122	250
• Regular	30	122	750	30	122	732
• Replication						
FY 2007:	**32**	**58**	**1.416**	**32**	**58**	**561**
• Regular	32	58	354	32	58	354
• Replication	32	58	1.062	32	58	207
FY 2008:	**32**	**21**	**884**	**32**	**21**	**221**
• Regular	32	21	221	32	21	221
• Replication	32	21	663	0	0	0
FY 2009						
• Regular	33	74	349	33	74	359
FY 2010						
• Regular	33	107	470	33	106	466
FY 2011:						
• Regular	33	18	262	33	18	262
Total:	**33**	**400**	**4.381**	**33**	**399**	**2.851**
• Regular	33	400	1.906	33	399	1.912
• Replication	33	201	2.475	33	180	939

For every new village and its replicate, the government allocated Rp. 100 and 25 millions of social assistance fund respectively. The amount of money spent by Indonesian government for Desa Mandiri Pangan program for each year is shown in figure 2. and its replicate respectively.

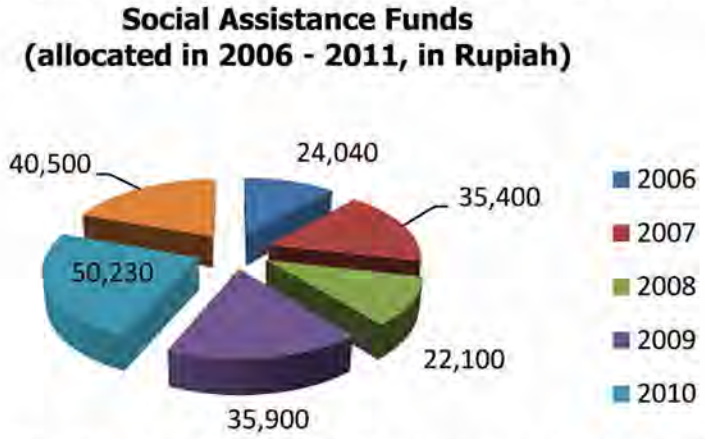


Figure 2. Desa Mapan Social Assistance Funds Allocation.

Inputs are used to produce outputs which are:

(1) The number of Food Resilience Village reached 2561 villages in 399 districts / cities, or 99.53 percent of the 2573 village targets, consisting of: (a) 262 Preparation-phase villages, (b) 466 growth-phase village, (c) 359 Development-phase Village (d) 221 Independence-phase Village, (e) 939 Replication villages, and (f) 314 independent village was;.

(2) Three groups of food security institutions have been established in each village, which are: (a) TPD (Team Food Village), (b) LKD (Village Financial Institutions), and (c) Affinity Group.

The resulting outcome from the inputs used to develop the Desa Mapan program is 825 villages (99.87%) have achieved food self-sufficiency, which consist of: (1) 221 villages in the Fiscal Year of 2008, (2) 354 villages in the Fiscal Year of 2007, and (2) 250 villages in the Fiscal Year of 2006.

The benefit resulted from this program can reach as many as 898,250 billion poor households of the targeted villages. In comparison to the previous years, along with the development phase of the Village Independent Food, Desa Mapan activities have flourished. Until 2011, Desa Mapan covered approximately 11.404 communities in 2851 food insecure villages in 399 districts / cities in 33 provinces.

(1) Desa Mapan developed in 2006: 250 villages in 122 districts in 30 provinces, had entered the stage of independence in 2009, and made the Core Village in the Independence Movement of Food (Food Echo);

(2) Desa Mapan developed in 2007: 354 villages in 58 districts in 32 provinces had entered the stage of independence in 2010, and its further task is as the Core Village to carry Food echoes;

(3) Desa Mapan developed in 2008: 221 villages in 21 districts in 32 provinces have entered the stage of self-reliance;

(4) Desa Mapan developed in 2009: a total of 349 villages in 74 districts in 33 provinces entered the stage of development,

(5) Desa Mapan developed in 2010: 829 villages in 350 districts in 33 provinces were in the growth phase;

(6) Desa Mapan developed in 2011: 838 villages in 399 districts in 33 provinces were included in the preparation stage;

Table 2. Developments of Target Location and the Affinity from 2006 to 2011

Year	Position of Development Phase	Location			Affinity Number of Head of Family Group			Number of Business Capital Assistance (Rp.000)
		Pro-vince	District	Village	Family Head	Poor Family		
						Head of Family	%	
2006	Movement	30	122	250	459.869	240.097	52,21	25.000.000
2007	Movement	32	180	354	467.514	242.825	51,94	35.400.000
2008	Independence	32	201	221	61.232	31.326	51,16	22.100.000
2009	Development	33	275	349	61.082	27.922	45,71	34.900.000
2010	Growth	33	350	829	92.272	41.970	45,48	50.890.000
2011	Preparation	33	399	838	90.222			44.230.000
Amount								

Source: Final Report of Desa Mapan 2011

In every village, 3-4 affinity groups with 15-20 members each group have been formed to facilitate village development through its community empowerment.

Until mid-201, the Desa Mapan program has nurtured approximately 175,000 households in 10,000 affinity groups, including 38 percent or 66.000 poor households. If every household has 5 household members, then through the Village Food Resilience program, it has helped 875.000 people, including 332.500 poor people in rural areas out of poverty cycle.

In accordance with the activities guidelines to reduce food insecurity and simultaneously reduce poverty in rural areas, each affinity group member is given financial aid in the form of social assistance fund for the development of productive enterprises. The Amount of capital distributed into their respective affinity groups are100 millions and 25 million rupiah for regular village and village replication respectively. The total amount Bansos already distributed until 2011 reached Rp.214, 6 billion. The capital received by the villages is managed by LKD. LKD relied on a revolving system to distribute the fund among its members. The capital managed by LKD has increased 20 percent or approximately 257.6 billion rupiah in 2011. Social assistance fund has been used by each group member affinity for the development of many activities as follows:

1. Agriculture Business (on-farm): around 2235 businesses are growing, which are: (a) cultivation of food crops: rice, corn, peanuts, sweet potatoes, cassava, (b) cultivation of vegetables: green beans, cucumber, taro, peppers, onions, spinach, tomatoes, eggplant, vegetables, (c) cultivation of fruit crops: bananas, oranges, rambutan, mangosteen, bark, papaya, strawberries, (d) cultivation of plantation crops: tobacco, chocolate / cocoa, oil palm, rubber , nutmeg, patchouli, (e) livestock farming: chickens, ducks, goats, sheep, rabbits, cows, (f) catfish aquaculture and other freshwater and fishing activities;
2. Agricultural processing businesses (off-farm) in the form of small-scale household industries: around 510 business have been created: the manufacture of palm sugar; processing of palm oil; manufacture of various types of chips from cassava, sweet potato, taro, corn, bananas; sale (dried banana product),rice trading; and the production of instant tiwul(food made from cassava flour);
3. Businesses outside of agriculture (non-farm): around 955 businesses have been initiated, such as: woven mats, bamboo matting, roving trade, crops trading, plantation trading, saprodi kiosks, kiosks rice / food, sewing, furniture making, brick craftsman, overhaul, manufacture of manure, and savings and loans.

Of the 668 groups in 158 villages, 62% is on farm business, 20% is off farm business, and 18% is non-farm business.

7. Conclusion

Based on the analysis of the implementation in the Year 2006-2011 it can be concluded that the Village Food Resilience program is a community empowerment program that one of his goals for poverty reduction in food-insecure areas / rural poor. In addition, decreased levels of poverty in the Village Food Resilience in the significant main villages are perceived to successfully entering the Phase of Independence.

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REBUBLIC OF KOREA

1. Programme context and justification of UPA

At first, urban agriculture was developed by civic movement. Recognizing the social functions of urban agriculture, the government began to support and encourage UA.

2. Components of a national strategy on UPA

A. At Policy and decision making level:

Create awareness for the urban agriculture issue at the level of the Government officials and city councils. UPA is a reality which has to be accepted, understood and enabled.

The expected result is the introduction of UPA in the city planning process and to have UPA on the agenda of the city council meetings with the involvement of different stakeholders.

B. At the technical level:

Define, demonstrate and disseminate adequate and cost-effective technologies for sustainable intensification of agriculture production systems within the urban environment.

C. At grass-root level:

Foster grassroots' initiatives through participatory training process (Farmers Field Schools) and decentralised programme monitoring with the involvement of NGO's

3 Action plan:

*Overall objective:*Revitalization of Urban agriculture, leading to improved quality of life and urban &rural interchange.

Project activities are commonly centred to achieve quantifiable outputs related to the following three specific objectives:

i) Securing land as the key resources for UPA,
ii) Securing product quality and environment preservation through the implementation of the good agricultural practices.
iii) Securing the institutional context and the appropriation of the UPA programme by the stake holders.

Target focus:
Decision makers, Urbanites

Stakeholders:
Ministry of Agriculture; Mayor of the cities; NGOs, growers associations, schools, Associated Ministries: education

Time frame for the implementation of national (municipal) action plans.
Phase 1: (1 year)
Creating awareness, base-line study, analysis of opportunities and constraints, definition of national and local (municipal) institutional context and stakeholders. Formulation of a national strategy and action plan with identification of progress and impact indicators.

Phase 2: 3 years
Implementation of field activities on a limited scale in selected cities
Technical review and appraisal
Phase 3: 5 years
Consolidation of the strategy and expansion of the national action plan to other cities as appropriate. Appropriation of UPA and its integration into the city planning and resources management process and into the national agriculture development planning.

4. Normative tools and guidelines in support of UPA initiatives:

- A comprehensive plan for UA(A 5-year plan)
- An annual plan for UA
- Law for Promoting and Supporting Urban Agriculture

5. Agenda for action

(i) Amendments to the laws and ordinances
(ii) Advertise the values and positive functions of UA
- Hold exhibitions on urban agriculture(annual)
- Host various events (UA contest, open market, etc.)

Medium term

(iii) Set up various land spaces for UA purposes
(iv) Train UA experts
(v) Elaborate technical guidelines for intensified production systems and develop related services (extension and credit)

Longer term

(vi) Expand research and development related to UA

5. Assignment of tasks

Actions to be undertaken by Central Government, State Government and/or Municipal authorities

(i) Express or confirm political commitment towards UPA
(ii) Recognise UPA and integrate it in the agriculture development planning as complementary to rural agriculture
(iii) Co-ordinate legal review to facilitate urban and peri-urban agriculture including planning of land use

Actions to be undertaken by the private sector or NGO's

(i) Provide services (extension and credit) and inputs
(ii) Promote the participatory approach for farmers' training and organising farmer's communities
(iii) Participate in promotional activities for on-farm research and demonstration programmes.

Actions to be covered by international technical assistance and support by donors

(i) Guidance for the institutional set up, the organisational and managerial aspects of multi-sectorial UPA initiatives, including the formulation of UPA master plans to be included in the Agriculture development plans and urban resources management and land use planning.

(ii) Support/carry out health impact and improved livelihood studies of UPA and follow-up policy, based on accurate risk assessment.

7. Programme progress evaluation and impact Assessment:

UPA progress indicators:

Number of participants: 766,000 participants

Number of stakeholders

Area covered in hectares:558 ha

Area secured for UPA by legal documents,

Quantities and diversity of food produced and

UPA impact indicators:

Level of income

Quantity, quality and diversity of food consumed

Improved access to services and education

Different social benefits:10 million dollars (estimated value)

Better health care

VIETNAM

1. Program Context and Justification of UPA

Like many other developing countries, Vietnam is now faced by a range of challenges such as high population growth rate; poor urban socio-technical infrastructure; and rapid urbanization resulting in reduction of peri-urban agricultural land, traditional handicraft production villages, and widening gap in quality of life between urban and peri-urban residents. Therefore, the Government of Vietnam pays much attention to the "sustainable development of peri-urban areas in Vietnam". It has been making great efforts to mobilize its internal resources and calls supports from organizations to solve the problems.

"For a sustainable urbanization of the periphery of Vietnamese cities" is one of the typical activities carried out to deal with the above said problems. This event was held by the Ministry of Planning and Investment in cooperation with French Development Agency and French Embassy in Hanoi in March 2012 in the framework of the 9th Vietnam-France Economic and Financial Forum. At this forum, specialized reports were presented on some issues such as job change of the farmers in urbanized areas, potentials of peri-urban handicraft production villages, land management in urbanized areas, impacts of urbanization on socio-economic life, solutions and supporting financial tools, and transport in Hanoi. Some discussions focused on challenges, risks and opportunities of urbanization in peri-urban areas. A lot of ideas mentioned human and social aspects of the peri-urbanization process and present state of agriculture, industry and handicraft. The French participants shared their experiences and models in building industrial zones and handicraft production villages; and commented upon potentials of production village development and new urban area planning in Vietnam. In terms of urban planning, Mr.Christian Jacob, co-chairman of the forum, said that in order to have effective planning and attract investors the coordination among industries and agencies must be maximized and long-term vision must be formulated with 3 main objectives: (i) to ensure the sustainability in economic development activities, (ii) to take environmental protection into consideration and (iii) the approach to public services to bring benefits to the people. Mr. Marc Cabane, a scientific consultant of the forum, underlined that the growing urbanization in Vietnam means worsening environmental pollution. Therefore, the urbanization planning must have strategic vision to ensure the sustainability, economic development and environmental protection. The studies and recommendations of the specialists mentioned the tools for land management and urban planning that were reported to the Government. The forum has helped Vietnam to have practical experience to identify solutions, mechanisms and policies on management and sustainable development of peri-urban areas in a modern and sustainable way.

In fact, some large programs have been proposed by the Government or Ministries and implemented in provinces/cities. These programs are relevant to sustainable development of urban agriculture. For example, the safe vegetable production program proposed in 1995 by the Ministry of Science and Environment has been conducted in provinces. Firstly, it was implemented in 1996, and the safe vegetable products were introduced in 1997. Then it was carried out in Ho Chi Minh City in 1998. To date it has been implemented in 54 out of 64 provinces/cities in Vietnam.

In 2008 the Central Executive Committee X issued Resolution 26/TW-NQ on agriculture, farmer and rural area (also referred to as "Tam Nong") and this has been implemented nationwide as a new framework for rural policies. The resolution identifies the following tasks and measures:

1- Develop a comprehensive agriculture in the light of modernization, rural industry and service. Particularly:
   + Develop crop production
   + Develop livestock production
   + Develop forestry
   + Develop seafood exploitation programs in the sea economic development strategy.
   + Develop rural industry and service.
2- Build socio-economic infrastructure in parallel with development of urban areas.
3- Improve the spiritual and material life of rural people, especially in the areas with disadvantaged areas.
4- Reform and build effective types of production and service in rural areas.
5- Develop quickly research, transfer and application of science and technology, train the human resource, and create breakthroughs to modernize agriculture and industrialize rural areas.
6- Reform policies and mechanisms to mobilize resources, develop quickly rural economy, and improve farmers' the spiritual and material life.
7- Enhance the leadership of the Party and management of the State, bring into play the strength of socio-political organizations in rural areas, especially the farmer union.

In order to conduct these tasks, the units of MARD have prepared specific plans with measures to support the program. For example, the Crop Production Department has formulated a "2020 crop production development project, with vision to 2030". This project identifies the orientations of crop production planning and development until 2020, and measures for implementation.

In other words, urban metropolis such as Hanoi, Ho Chi Minh cities have their own programs which are integrated into the sectorial national programs. Their activities include the management in a sustainable way of the peri-urban and urban agriculture. However, so far no national programs have been formulated specifically for peri-urban agriculture development.

2. Components of a National Strategy on UPA

A. At policy and decision making level

During previous years, the policy and law system on agriculture, farmers and rural areas in general have received special attention by the Communist Party and the State. This includes implementation of activities related to the development of urban and peri-urban agriculture. Therefore, all provinces and cities, including large cities need to enforce these legal documents. There have been 14 legal documents issued at national level; additionally, Hanoi and Ho Chi Minh City have studied and issued some key documents on specific advocacies and policies for the concretization and direction of the implementation of the "agriculture, farmers and rural areas" policy in the cities.

These documents concentrate on following issues:

- Agriculture development, adopting a commodity approach to bring about high and sustainable economic effectiveness.
- Development of peri-urban economy and gradual modernization of rural areas.
- Agriculture development, construction of new rural areas, step-by-step improvement of living standards of farmers.
- Management of investment projects in the cities.

In fact, for issues relating to urban and peri-urban agriculture, the two cities launched relatively synchronous and similar activities. Hereinafter we will present the case study of Hanoi city.

Beside legal documents issued relating to above mentioned issues, Hanoi People's Committee has issued other legal documents approving programs, projects and plans with an aim to promote investments in agriculture, such as:

- Planning of irrigation systems of Hanoi;
- Master plan of agriculture sector;
- Water supply and environment sanitation planning;
- Proposal on production and consumption of safe vegetables;
- Orientations of planning and development of safe vegetable production network;
- Aquaculture development program;
- Policies on encouragement and support of investments in husbandry development far away from residential areas.

Based on the general legal framework at the central level, the City has issued concrete advocacies and policies on peri-urban agriculture development adopting following orientations:

- The agriculture sector of the city will adopt a sustainable development approach, using high and environment-friendly technologies.
- The structure of household production will be shifted in a positive trend to improve incomes for families through reducing the number of agriculture, forestry and aquaculture households and increasing the industrial and service households.
- Farm economy will continue to be developed and will play more important role in agriculture, forestry and aquaculture production.
- The above mentioned policies are aimed in the period 2010-2020.
- An agriculture revenue growth of 2% per annum;
- An increased average income per rural labor of VND 25 million per annum (US$ 1 200);
- Average agriculture production value is as high as VND 100-150 million per ha (US$.4200-7200);
- Investment in the construction of rural infrastructure adopting modern trend and focusing on transport projects helping to promote rural connection activities.
- Emphasis set on waste water treatment and environment, irrigation, clean water and public welfare facilities service lives of local people.

B. At the technical level

The competent technical agencies such as Plant Protection and Livestock Production and Aquaculture Sub-Departments under the Departments of Agriculture and Rural Development of Hanoi and HỒ Chí Minh city have prepared specific plans for the transfer of advanced technologies to farmers directly involving in production. There are different forms of transfer such as Farmers Field Schools, visits to models, experience exchange etc.

Moreover, professional institutes and NGOs are also implementing many technology assistance activities. By so doing, not only farmers but also local staff and technical staff in institutes are provided with technical knowledge through capacity building training courses (e.g. GTZ provided capacity building training courses for plantation staff on GAP, Global GAP)....

For Hanoi city, the following technical activities can be summarized:

Table 1: Some technical supporting activities in Hanoi (2010-2012)

Fields	Activities	2010	2011	2012
Crop production	- Plant protection:	-Forecasted pest situation. -Provided guidelines for timely control of pests. -Applied Integrated Pest Management (IPM) program. - Organized 2 Training of Trainers (TOT) on IPM; safe vegetable for 90 technical staff of provincial Plant Protection Sub-Departments (PPSD). Held 110 farmer field schools (FFS) on IPM for vegetables, with 3,300 farmers; 23 SRI training courses for 690 farmers; 40 training course on safe vegetable production in compliance with Viet GAP for 3,200 people. - Compiled and printed 100,000 leaflets on technical guidance for safe vegetable production; 100,000 leaflets on safe use and storage of pesticides.	-Forecasted pest situation. -Provided guidelines for timely control of pests. -Applied Integrated Pest Management (IPM) program.	-Enhanced wide introduction of pest control measures. -Provided consulting service for formulating pro-ject "concentrated production of safe vegetables". -Continued to implement the national target program on food safety.
	Field trial and seed selection	- Conducted field trials for 34 rice varieties; 9 soybean varieties, 6 peanut varieties		
Livestock production		-Prevented and controlled disease epidemics. -Enhanced the management of breed and feed. -Organized 90 training courses on meat cow production, trained 9,000 households involved in cow breeding production. -Organized 13 study tours to learn experience in cow production. - Printed and distributed leaflets on livestock disease control.	-Prevented and controlled disease epidemics. -Organized4 training course on dairy cow production for 100 farmers. -99technical training courses on production of meat cow, dairy cow and pig for more than 10,000 people.	-Prevented and controlled disease epidemics. -Implemented the livestock production development program by focal areas and communes, and large scale production outside residential areas. - 19 technical training course for around 400 farmers, 66 technical training courses on meat cow, dairy cow and pig for more than 5,520 farmers. 4 study tours in Vietnam for 188 managers in this field.
Fisheries and animal health		- 11 technical training courses for more than 600 people on production of special seafood. - Cooperated with other bodies to organize 50 technical training courses for more than 4,000 people on aquaculture and food safety.	- 39 training courses on introduction of legal documents related and sustainable intensive aquaculture. -12training works-hops for 660 participants on disease control in aquaculture.	-Implemented programs on aquaculture management and fishery resource protection in the city; awareness raising for the people involved in sustainable intensive aquaculture in the city; controlled and warned environment and aquatic diseases. -Organized 66 training courses and 32 workshops on communication and management of aquaculture.

As mentioned above Vietnam has so far no specific programs for peri-urban agriculture and, therefore, the activities related to implementation and assignment have not discussed by the study group. Vietnam hopes to receive consulting service for sustainable peri-urban development in order to meet the city people's higher demands for food.

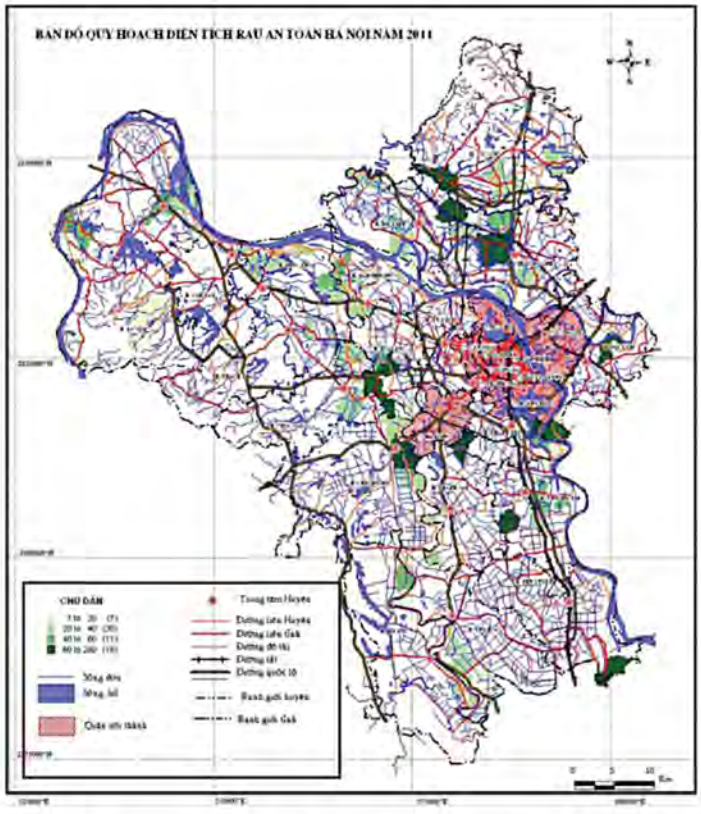
3. Action Plan

Vietnam does not have any national plan concerning urban or peri-urban agriculture. The main cities however, Hanoi and Ho Chi Minh City, which are most directly concerned, have both been developing for more than ten years policies directed to the sourcing of vegetables, which are the most sensible peri-urban commodities.

These policies launched and monitored by the urban authorities of the 2 major Vietnamese megapolis have been focused on the quality of vegetable production, by introducing a "clean vegetable " certification (rau an toan) which relies on the use of non-polluted land, non-polluted waters, and of responsible production techniques. The monitoring of these rules and the attribution of the "clean vegetable" certificate are under the responsibility of the PPD (Plant Protection Department) of the respective municipality.

The limitation of these policies is that they are "quality reasurement policies" rather than fully-fledged integrated peri-urban agriculture or UPA policies. They do set requirements for quality, giving consumers the opportunity to identify safer and more trustable products. But they do not tackle the source of the problem (polluted waters and soils) by securing land and water as key resources for a sound and sustainable UPA.

For example, in some areas where safe vegetable production had developed considerably well around Hanoi, such as in Dong Anh, Thanh Tri and Gia Lam, urban development finally occupied most of the land, displacing vegetable production. This situation obviously is a clear disincentive for the remaining producers to invest in long-term water and soil protection practices. The precariousness of peri-urban vegetable producers is high because producers do not own the land but only enjoy a right of use, while the state maintains official ownership and has large powers to claim the land.



Map of areas qualified for safe vegetable production in Hanoi in 2011

Urban planning documents such as the Hanoi 2030 Master plan often mention the development of safe agriculture areas. In the case of Hanoi, maps of areas "with aptitude for clean vegetables" have been designed (see below map for 2011). But these documents are not binding and are not accompanied by mandatory enforcement measures to secure the land for such use.

4. Conclusion

Through the study of peri-urban agriculture in the Hanoi administrative area, we can draw the following conclusions:

- Agriculture plays a crucial role in food, employment and the economy of the suburbs and of the new district of Hanoi.
- This agriculture is specific because it is managed under urban governance. Therefore, planning its future requires an alliance with urban needs and a multifunctional approach.
- A long-term zoning with mandatory compliance is essential to secure agricultural land and agricultural projects in peri-urban areas.
- A 'value chain' approach including investments logistics and food distribution is required to strengthen the new suburban village producers.

We identify 3 key points for a successful alliance between agriculture and urban needs:

First, to incorporate in urban planning the needs of peri-urban agriculture, through:

- an urban Master plan that is detailed into an agricultural Master plan and provides secure land and water access with binding power;
- an integrated support to new specialized villages in the "green belt" area of the city;
- appropriate logistics platforms;
- and a new design of irrigation and flood risk management.

Second, to develop quality products, by:

- Encouraging cost-effective quality standards, lowering the cost for smallholder producers of existing certifications such as VietGAP;
- Transmitting clear information to consumers on the peri-urban products' origin and quality.

And third, to take on board the new urban demands through peri-urban agriculture:

- Services related to rural tourism.
- Stimulate direct sales and processed products.

Urban agriculture of the great Hanoi can have a sustainable future if it relies on:

- An organization of localized food systems in urban areas;
- The recognition by political authorities of the positive role of peri-urban agriculture for employment, food, and environmental services.

* * *

3.2 COUNTRY REPORTS

URBAN AND PERI URBAN AGRICULTURE IN BANGLADESH

Md. Moshiur Rahman*

Abstract

Urban and peri urban agricultural products historically serve suppliers to cities of various extents. Agricultural production dynamics in peri urban areas changes with the rapid expansion of cities in different countries. Absence of distinct programs and plans to address the urban and peri urban agricultural production mainly interfere getting potential output from the same. This intensive and market driven production can dominantly help in achieving overall production of agriculture and help in achieving in food security of a country.

Achievements of Bangladesh in agriculture sector are tremendous in the last four decades. The country could produce about 34 million metric ton of cereals in 2011 compare to it produced about 9 million metric tons per annum in late sixties. The achievements in vegetables, fish and poultry& egg production are also remarkable. But program or plans as special measures were not reflected in the national plan to address the urban and peri urban agriculture development in the past. It is felt need that addressing the issue through specialized departments of the government may contribute significantly in achieving food security and reducing the extent of poverty in urban and peri urban areas. This paper highlights some of the contributions of agricultural production in urban and peri urban areas of Bangladesh which may be considered as inputs for future development.

1. Introduction

Bangladesh is a country of total area 143,998 sq. km of which land and water cover 130,168 sq. km and 13,830 sq. km respectively. It is a deltaic plain, cress-crossed by a number of mighty rivers like the Ganges, the Brahmaputra and the Meghna and their tributaries and distributaries. Bangladesh lies between 20°24-26°38 N latitude and 88°01-92°41E longitude. The country is fenced by the Bay of Bengal on the south and by India on the north, east and the west. There is a small strip of frontier with Myanmar (Burma) on the southeastern edge. Located in one of the wettest regions of the world, Bangladesh has a tropical monsoon climate characterized by rain bearing winds, warm temperatures and high humidity.

The total cultivable area is estimated as 8.42 million hectares, which is about 58% of the total area. In 2010, the total gross cultivated area of the country was 14.47 million hectares with a cropping intensity 183 percent. In 2010-11, total irrigated area of the country in the dry season was 7.45 million hectares and amount of rice produced 33.54 million metric tons (GoB, 2012). Cereal deficit in the country accounts about one million metric tons in a year.

Agricultural growth has accelerated from less than 2.0% per year during the first two decades after independence in December 1971 to around 3.0% during the last decade. Despite such a steady growth in agriculture as well as in food production, Bangladesh has been facing persistent challenges in achieving food security. This is mainly due to natural disasters and fluctuations in food prices from the influence of unstable international marker for basic food items. Sudden increase of price of staple food such as rice and wheat intervene the purchasing capacity of the poor people. Since almost half of the labor force still depend

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on the agricultural sector for employment, growth of this sector and favorable terms of trade for agricultural commodities are crucial for increasing incomes of the low-income people and to expand their capacity for accessing food.

Over the past 40 years since independence, Bangladesh has increased its real per capita income by more than 130 percent, reduce poverty rate by sixty percent and is well set to achieve most of the millennium development goals (SFYP, 2011).

Rural and Urban &Peri urban Agriculture (U & PA) are not distinctly differentiated in terms of approach and planning in Bangladesh. The country is a land scarce country and about 1000 people on an average live in one square kilometer and having a population growth rate of 1.34 percent (GoB, 2012).The country is losing almost one percent of agricultural land out of cultivation for other uses every year. Foreign remittance, garments products and agricultural productivity are distinctly visible economic pillars of the country. Landless, small and medium farmers constitute most of the farm house holds of the country and contribute in keeping steady growth in agriculture. Government provides added supports to these households to keep pace in growth of the same for future development.

Local and individual initiatives on agricultural production in urban and peri urban areas become the growing practice over the decades in different cities of Bangladesh. This practice has developed through the felt needs of dwellers with the motives of more intensive production for addressing demands of markets.

2. Agricultural Development in Bangladesh

Agriculture sector is comprised of four sub sectors, e.g. crops, livestock& poultry, fisheries and forestry with crop sub sector being the predominant one. In addition flowers and plant nurseries have been becoming important components of agricultural production in these areas in the last two decades. In spite of the gradual decline of the relative importance of crop sector in agriculture and in national economy, it still has remained the most important sector of agriculture. More importantly, the crop sector provides staple food such as rice and wheat and other daily necessities like pulses, oil, sugar, vegetables, spices and fruits.

Farmers' managed irrigation system developed by Bangladesh Academy for Rural Development (BARD) in Bangladesh brought a revolutionary change in food grain production. The average annual food grain production was about 9 million metric tons in 60's which has increased to about 34 million metric tons in 2011 (Ahsan and Khan, 2012).

Non-crop agriculture (livestock, poultry, fisheries, forestry, flowers and plant nursery) also plays a significant role in terms of employment generation and contribution to GDP. Although livestock accounts for only 3 per cent of total GDP, it employs about 20 per cent of rural labor force. Fisheries sub-sector contributes about 5 percent of total GDP and employs about 13 percent of rural labor force.

Forestry sector contributes about 1.8% of the total GDP. Forests also play an important role in protecting watersheds, irrigation and hydraulic structure and also in keeping the rivers and ports navigable and protect coastal areas from natural calamities.

3. Definition and Scope of Urban and Peri urban Agriculture

3.1 Definition: Urban agriculture has been defined as an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, applying intensive production methods, using and reusing natural resources and urban wastes, to yield

a diversity of crops and livestock (UNDP, 1996). U & PA includes products from crop, livestock, fisheries, forestry, flowers and nurseries in the urban and peri-urban areas.

3.2 The Scope: U & PA comprises a set of different possible activities. The scope of urban and peri-urban food production varies from continent to continent. The main components of U&PA are agriculture, animal husbandry, forestry and aquaculture

a) **Peri-urban Agriculture :** Peri-urban agriculture happens on farm units close to town that operate intensive semi or fully commercial farms to grow vegetables and other horticulture, raise chicken, livestock, produce milk and eggs. Peri-urban agriculture embraces other activities too, such as fish farming. Based on research results, practitioners and researchers have expressed the need for a clear differentiation between urban and peri-urban agriculture to recommend differences in the approach towards these two methods.

b) **Urban Agriculture:** Urban agriculture is practiced on small to medium size areas within the city for growing annual and tree corps, raising small livestock and fish for home consumption or sale.

i. **Livestock and poultry:** Livestock keeping in cities in common in many development countries. Goats, sheep, cows, horses, chickens etc. can be found in cities around the world. Each of these animals has its specific advantages and disadvantages. Particularly small animals are adaptable to backyard conditions, they require little capital to start with.

ii. **Chicken:** Poultry production can be distinguished into traditional backyard poultry, semi-commercial, commercial and industrial poultry systems. Large poultry enterprises are found everywhere and small scale poultry production is also widespread in urban areas. Poultry officially include chickens, ducks etc. Large scale and market oriented chicken production is found in and around urban situations across the world where access to young chicks for broiler and egg production, inputs (feed) and markets is relatively easy.

Urban forestry practices promote the best use of trees within urban agriculture.

iii. **Forestry:** Innovative and other urban services. Urban forestry is not only street for beautification and parks for recreation. Many urban trees suitable for resources poor settlements can provide food, particularly fruits, but also edible leaves, shoots and even flowers.

iv. **Fuel wood supply:** People in many developing countries continue to depend on fuel wood and charcoal for their energy needs which are consequently satisfied by uncontrolled collection, often resulting in the extensive degradation of areas around urban settlements in developing countries. This energy sources is relatively expensive; studies report expenditures of 30 to 40 percent of total income by low-income groups to meet domestic energy requirements. Wood-based building materials-poles branches and leaves for thatching are also in high demand in many urban areas.

v. **Aquaculture:** There are many options for the development of aquaculture in urban and peri-urban areas. The following is a selected example:

c) **Integration of Aquaculture with Rice Farming:** It is estimated that about 20% of the irrigated rice fields may be considered suitable for fish culture. Integrated rice culture system could dramatically increase income and food supply, particularly protein food supplies. Culture of fish in conjunction with rice can yield 50-300 kg/ha/crop. Alternatively fish can be reared in rotation

with the rice crop yielding an average of 300-30000 kg/ha/crop depending on the intensity of management, and on the climatic conditions prevailing in the location of the rice fields. Rice fields are found in peri-urban areas within a few hours distance from most cities in these countries (FAO, 2001).

4. **Urban and Peri urban Agriculture in Bangladesh:** The production system in Urban &peri-urban agricultureis intensive and the technology used is much more advanced than that in the rural areas. People who live closer to the city centers produce vegetables, mainly for their own consumption. City dwellers living within the cities use rooftops, very small backyards or pots for horticultural production. Some rooftops are also used for chicken raising egg production.

The scenario of Urban &peri-urban agricultureis not significantly different from one area to another, except in smaller towns where no different exists between rural agriculture and urban fringe agriculture. Also, urban fringe agriculture is more dynamic around large cities such as Dhaka, Chittagong and Rajshahi. To avoid repetition, this paper introduces the Urban & Peri-urban Agriculturescenario of Dhaka.

Present Status of Urban& Peri-urban Agriculture Production System: Vegetable cultivation is a major component of the Urban &peri-urban agriculturesystem. A few years ago, commercial vegetable production in Dhaka was mainly confined to flood free land, 4-5 km from the city center. The output supplied about half of the market demand in the city. However, now most of that agricultural land has been converted to industrial and housing plots, and the remaining area is steadily declining. As results, less than 5 percent of the vegetables marketed Dhaka comes from that area. Low-lying areas are utilized for the cultivation of *Boro* rice in winter season.

Small and medium farmers, cultivate vegetables which meet no more than about 1-2 percent of total urban demand. Tomatoes, hyacinth beans and bottle gourds are the main winter corps.

At present, the main Urban &peri-urban agricultureproduction areas of Dhaka are about 30 km from the city, with one on the western side and the other on the north side. The agricultural areas around Dhaka do not influence the farming system and production or marketing of the same. Cropping intensity is about 210 percent, which is higher than the national average182 in 2009.

Production technology adopted by the farmers is more advanced than that used in the average rural area. The farmers always try to produce early to get prime prices. They are well-acquainted with the latest high-yielding early vegetable varieties and they procure good quality imported seeds from the city. They also buy healthy seedlings from the nurseries. Raised beds are used for early production, and polyethylene covers are widely utilized to protect the corps from late rains.

Fisheries: Pond fish culture is an important production system in Urban &peri-urban agriculture. In Savar Upazila (a sub district of an area of 280 sq. km) which is about 10 km away from Dhaka city, out of 4,019 ponds 1,544 ponds were less than 0.56 ha in size on average were used to culture fish (Islam, 2002). Almost every homestead has a pond, the size of which varies from 0.04 ha to 2 ha. Since most of the homesteads have small ponds, fish from an indispensable component of the farming system. Large ponds generally belong to large, well-to-do-families. About 20 percent of ponds have grown shallow through the years due to siltation. Estimation says that total annual production of fish from ponds is 904MT, providing a total income of Tk. 28.6 million.

Poultry: Poultry farms are important components of UPA since daily sales of eggs earn cash returns for farmers, thus helping to maintain their families while also providing operating capital for the farms. About 3 million eggs are supplied daily from urban and semi urban areas to the city markets, of which some 1 million eggs are provided by the Savar area. There are over 1,000 poultry farms in operation and in addition, a small poultry component exists on almost all small and medium scale farms. The number of poultry birds varies from farm to farm. Farmers with bigger areas of land have more poultry, ranging from 50 head to 500 head and they earn between Tk. 150 and Tk. 1,500 per day (Islam, 2002).

The annual production of eggs in the UPA is much higher than in rural areas. For example, in saver the annual production of eggs per hen is 150 compared with only 22 eggs in the rural areas. This difference is due to the varieties for poultry birds used the production system employed and marketing opportunities. The estimated poultry farm was 25,400 in 2005. The number of broilers that consumed in the country in the year 2005 was over 100 million (Waste Concern, 2005).

Flowers: In Dhaka flower markets, supplies mainly come from Gazipur, Konabari and Savar in the previous greater Dhaka district and also from several villages in Jessore district. In some villages in Jessore district, cultivation of different kinds of flowers for commercial purposes has become a large-scale agricultural industry employing more than a thousand families.

According to the Export Promotion Bureau of Bangladesh, there are bright prospects for earning substantial foreign exchange through export of flowers after meeting the internal needs. At present the turnover in the global flower market is reportedly valued at more than 160 billion dollars. In the 2004-05 financial year, the country had earned over Tk. 166 million.

Although the natural quality like fragrance and color of indigenous flowers looks fascinating and more natural than the flowers of any other countries like Pakistan, India, and the Netherlands, Bangladeshi growers had no scientific training on how to preserve the flowers.

Others: Plant nurseries, feed industries of poultry and livestock have also been growing remarkably in urban and peri urban areas since last two decades of the country.

Marketing: In rural Bangladesh, farmers generally market vegetables, eggs and other produce directly to consumers, except in the case of some important production pockets where some types of vegetables are grown in such huge quantities that traders or commission agents buy from the farmers. Vegetables grown in and around Dhaka are marketed by the growers directly to consumers through city retail markets in amounts not exceeding 5-10 percent of total production. Marketing of these agricultural products has created employment opportunity in the city areas too.

5. **Conclusion:** Bangladesh achieved its real per capita income by more than 130 percent and cut poverty rate by sixty percent in the last four decades. Increased agricultural productions play significant roles in this regard. Cereal production increased almost four times during this period to meet up the demand of rapid growing population of the country. Vegetables, fish, poultry & egg production also increased remarkably in this time and flowers and plant nurseries have been evolved in large scale in urban and peri urban areas in the last two decades. Different industries like poultry, livestock and fishery feed have been emerged to support these agricultural productions in urban and peri urban areas which also created scope for employment of local youths.

With the rapid expansion of urban areas particularly big cities like Dhaka, Chittagong and Rajshahi shifting of peri urban areas take place over the years. But agricultural production continues in new areas with similar trend to meet up the ever growing demand of agricultural produces. Inadequate address of this vital area to the national plan squeezes the potentiality of agricultural production as a whole of the country.

Readdressing agricultural sectoral plans or programs in more comprehensive ways through including long term land use plan, dynamics of urban and peri urban agricultural issues, production techniques and storage & marketing facilities etc. would the potential options for policy consideration. In addition climate change issues would also be the crucial factors to be considered in the whole process for practical reasons.

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URBAN AND PERI-URBAN AGRICULTURE STATUS IN BHUTAN

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Defining Urban and Peri-urban Agriculture

Agriculture is the vital source of livelihood mainly for rural areas, where more than 80% of the employed people are engaged in it, unlike in urban areas where only 7% of employed people carries out agricultural activities(NSB 2007). Hence agriculture in Bhutan is more of a rural affair. With the average urban population growth rate of 7.3% annually, more people are expected to be living in urban than in rural by 2050(MOWHS 2008; Chophel and Yanagishima 2012); resulting to compete for scarce resources (human, natural, physical, social and financial) and spread of urban poverty, if appropriate measures are not put in place. Urban and Peri-urban Agriculture (UPA), therefore, could be adopted as a strategic measure to address urban poverty in the face of resource scarcity. There are difficulties, however, to explicitly define UPA since rural, peri-urban and urban are intricately linked and function as holistic system rather than an isolated entity (laquinta and Drescher 2000).

The definition of UPA according to FAO (2012) is:

"UPA is perceived as agriculture practices within and around the cities which compete for resources (land, water, energy, labor) that could also serve other purposes to satisfy therequirements of the urban population. Important sector of UPA include horticulture, livestock, fodder and milk production, aquaculture and forestry."

UPA is claimed to have more potential to address urban poverty and food insecurity in the developing countries. Of the15 developing and transition countries assessed, 11 countries were found to engage 30 % of the household in UPA and the share of contribution towards household income ranged from 11%in Indonesia to almost 70% in Vietnam and Nicaragua(Zezza and Tasciotti 2010).

- As in most developing countries the main aim of UPA in Bhutan would be:
- To contribute towards securing food and nutrition insecurity of the urban poor households.
- To contribute in enhancing the living conditions of the urban poor households.
- The broader aim will be achieved by putting in place the following instruments:
- Establish effective legislation: policy, act, rules and regulations, and guidelines.
- Identify the relevant stakeholders and build up the dynamic institutional framework to function the UPA.
- Identify and promote resource efficient and environment friendly technologies to minimize both carbon and water footprint.
- Strengthen the market linkage between local producers and local consumers to reduce the food mileage and also to enhance the social bond and mutual respect between producer and consumers.

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Status of UPA Management System

UPA as a formal concept in Bhutan is new but historically agriculture and livestock production and in urban and peri-urban area has been an integral part of urban livelihood. Allotment of 26 % of total municipal area in Thimphu for agriculture production (RGOB 2008) is a good evidence of agriculture production in urban area. But, like in any part of the world, agriculture land in core urban area is gradually getting occupied and used for other prioritized infrastructure development despite the promising potential of agriculture in urban area in addressing urban poverty and food insecurity. Under the current circumstances, peri-urban area seems to be most favorable for agriculture and livestock production owing to better access to market, new technology and services. Although, there are no precise record of amount of vegetables and fruits produced specifically in urban and peri-urban areas but the empirical observation suggest peri-urban as the major producer of vegetables for the urban market.

Dairy is the main livestock commodity favorable for production in peri-urban areas. In the 9th Five Year plan (FYP) of the Royal Government of Bhutan (RGoB), Peri-urban dairy project was established to enhance milk production and marketing efficiency through institution of groups and cooperatives. Between, 2004 to 2008 four functional dairy groups in the peri-urban areas of Thimphu produced 423 MT of milk and generated income of 11 million Ngultrum (NU[1]) with the group saving of Nu. 0.8 million(DOL 2008). Besides income (financial capital), the group employed seven executive members to function the groups. The intangible benefits and groups and cooperatives were social interaction and cohesion among the group members which enriched the social capital. The peri-urban dairy project motivated farmer of other regions to form additional groups and today we can witness the effect of peri-urban dairy project with available fresh milk and milk products in the market.

National Strategy on UPA

Integrated policy formulation and advocacy for implementation of UPA

UPA will be implemented under the domain of different agencies: technical departments, *Thromde*, urban and peri-urban farmers, National Land Commission Secretariat (NLCS), Ministry of Work and Human Settlements (MoWHS), National Environment Commission (NEC), Ministry of Agriculture and Forests (MoAF), Ministry of Finance (MoF) Banks and Insurance companies; each agency with specific roles. To carry out specific function harmoniously by each stakeholder, enabling policy must be framed either separately specific to UPA or incorporate to the existing policies, acts, and guidelines of different agencies. Prior to either formulation or incorporation of policy, good advocacy in UPA is essential to make every agency aware of the role and their potentials to contribute towards successful implementation of UPA. Some of the critical areas that require immediate and urgent policy intervention are on land use, and access to credit.

Land use and policy support

Land could be the single most constraint for UPA in Bhutan. Major towns of Bhutan (Thimphu, Paro, Wangdue, Punakha, Bumthang, Mongar, Tashiyangtse) are established either adjacent to or in the prime agricultural land. By 2020, keeping the current population density, and population growth of 7.3%, land requirement for urban areas would be four times more land than the current allotted area (MOWHS 2008). This implies that we could further loose the potential agricultural land making us more vulnerable to food insecurity. Therefore, vertical expansion (higher building) could be opted to accommodate the increasing no. of urban population and to enable agriculture production in urban areas.

Certification and registration of land type to be determined by *Thromde*[2] plan includes: residential, industrial, commercial and recreational land(RGOB 2007)and there is no specific mention of agricultural land in urban areas implying less priority for agriculture production in urban areas. Realizing the potential of urban agriculture towards socio-economic and environmental development, it is vital to include urban agriculture as a part of *Thromde* planning and identify specific zones in consultation relevant stakeholders for implementing urban agriculture. Urban poor must be targeted as the primary implementer of UPA and accordingly any identified zones under public ownership must be allotted on lease with good regulation on use of leased land for intended purpose.

Special credit policy support for urban farmers

Lack of access to credit for farmer is a potential deterrent factor to implement UPA (Quon 1999). Credit support in Bhutan provided by commercial banks cannot be accessed by farmers due to lack of mortgage on one hand and safety net in times of crop failure or livestock mortality caused by natural calamities.

Urban agriculture would mostly be operated in small area with intensive inputs and efficient technologies which would demand investment especially at the initial stage. Access to credit, therefore, is crucial for efficient operation of UPA. To enable access to credit, alternative model of financing source other than existing commercial banks have to be explored. One of the possible model to be established is Urban and peri-urban Agriculture Farmers Group (UPAFG) àGovernment linkage model. To develop the functional model, institutionalization of UPAFG with enabling framework (rules, procedures, guidelines and bylaws) is essential. Under this model, role of the government is to lend money to the group as soft loan, repayable within the agreed time frame; whereas, role of farmers group is to cater credit, manage group savings and explore for investment opportunities to foster growth of financial capital and social unity and wellbeing among group members. Experience elsewhere showed that functioning in groups empower and strengthen linkage to market and other stakeholders.

Intervention is not just confined to policy and financial matters; appropriate technology must be made readily available to farmers. The concept of urban farming being new to Bhutan, not much of technology relevant to urban farming is being promoted; however, the existing technologies can be easily adopted in peri-urban areas, where land and space is not a major hurdle. Provided there is favorable policy and ready access to credit, strategic technical intervention could be made for production, postharvest processing and storage, and marketing interventions.

Production technological intervention

Due to scarcity of land and sometimes water, coupled with varying type of climatic conditions across different agro-ecological zones and urban areas; UPA demands promotion of efficient and all season technologies. Technology starts right from seed production on your own, land preparation depending on the growing system which includes: raised bed, nursery pots, patio garden, hydroponic growing and vertical system. Appropriateness of growing system could depend on availability of required resources (land, water, labor) and inputs (seeds, fertilizer and equipment).

Livestock rearing in some urban town is informally restricted due to concerns on public health and of spreading zoonotic diseases. Livestock, therefore, is more suitable for promotion at larger scale in peri-urban areas. Small species like poultry, however, could be promoted on a smallscale for household consumption. Marketing is the single most determining factor on types of agriculture and livestock activities to be pursued under UPA.

Postharvest and processing technological intervention

Advocacy and promotion of postharvest technologies and handling practices is important for value addition and diversification of products. Such interventions assure consistent market for good quality products. Depending on the type of agriculture and livestock product produced, appropriate handling techniques and treatment method – variation of temperature needs to be promoted.

Processing and product diversification is more appropriate for livestock products. For instance, pork could be processed into ham, bacon and sausages. Likewise, milk could be processed in to pasteurized milk, yoghurt, butter and cheese and other value added products. The most important factor for efficient processing and delivery of products to consumers is to install efficient processing and storage equipment at the strategic location.

Grass root level interventions

UPA depends on precise and efficient technologies that enables effective utilization of scarce resources. For that matter, farmers must be exposed and trained to handle the technologies by initiating UPA at a pilot scale in few selected urban and peri-urban areas with good linkage to market.

Marketing is a critical factor that determines the future of UPA. For successful marketing, producing the right product alone is not enough; equally important the organization of market chain where producers must have power to control the market chain. Formation of groups and associations is one of the strategies to gain control of the market; however, the group must be guided by self-formulated agreed norms and principles. Through group approach, besides gaining control of market chain; farmers can have better access to credit and other financial services and also they can formulate group savings, loans and other schemes for their members.

For formation of group, it is vital that the group have similar and common interest. UPA farmers with similarity in work and interest could make it easier to form the group. Nevertheless, to sustain the group as an institution that unifies the members, and enables to control the market chain, constant training and guidance must be given to the group members.

Action Plan

UPA concept is new; hence, relevant stakeholders must be made aware of UPA and its potential benefits. For the success of UPA, concerted effort will be required from all the relevant stakeholders to carry out the following tasks after awareness campaign: review of legislative tools, area zonation, identification and selection of UPA farmers, market survey, pilot production, and up-scaling and replication of pilot UPA in other potential urban areas. The details of action plan are given in **table 1**.

Normative tools and guidelines

There is no tools and guidelines specific to UPA; nonetheless, existing policies, guidelines, training materials developed for general guidance could be used. For instance, in terms of policy, Food security policy, environment policy, livestock act, livestock rules and regulations, land act, cooperative act, water act etc. would provide a broad guidance and direction in adoption of UPA. Within these broad directives, specific directives could be provided by specific manuals on cultivation of crops, vegetables, fruits, seed production and extension. Under livestock production, technical guidance could be adopted from specific manuals and guideline on dairy, poultry, swine, feed and fodder production.

UPA is characterized by intensive production technological precision. It, therefore, demands for more sophisticated technologies and adequate training of farmers to familiarize and adopt technologies. Specific manuals and guidelines would be required for proper guidance and adoption of technologies in implementing UPA activities.

Table 1. Detail action plan of UPA

Action	Responsible agencies	Time frame	Resources required	Who should be informed?
Conduct awareness activities on UPA concepts and collect baseline data on UPA and market potential	MoAF, *Thromde*, *DAMC*	July 2013 – December 2013	Fund support for awareness campaign and baseline studies	City planner, bureaucrats, Urban and Peri-urban residents.
Develop institutional framework and working modalities among stakeholders	MoAF, *Thromde*,MoWHS	July 2013 – December 2013	Funds for coordination of meetings	All stakeholders
Review urbanization policy and plan and explore UPA potential	MoWHS and *Thromde*, NLCS, MoAF	Jan2014 - May 2014	Human resources to review the plan and explore potential for UPA	City planner, bureaucrats, Urban and Peri-urban residents.
Carryout zonation of UPA in potential urban areas	MoWHS and *Thromde*, NLCS, MoAF	May 2014 - Nov 2014	Fund and human resources to carry out land survey and zonation	City planner, Urban and peri-urban residents
Identification of potential UPA farmers allocate land on lease	MoAF, *Thromde*, NLC*S*	December 2014-February 2015		City planners, MoAF, UPA farmers
Carry out pilot production of livestock and agriculture products in selected urban areas	UPA farmers, MoAF	March 2015 – June 2018	Fund support for technical facilitation and support including purchase of relevant goods and equipment	Thromde, MoWHS,
Institution of UPA farmers groups with effective rules and byelaws	MoAF	March 2015 – March 2016	Fund support to train UPA farmers on organization and functioning of groups	UPA farmers, MoAF, *Thromde*
Develop national strategic framework on UPA	MoAF, MoWHS, *Thromde*,	October 2017 – June 2018	Fund support for development of strategic framework	All stakeholders
Mainstream UPA in *Thromde* and agriculture plan and upscale UPA farming in other urban areas	MoAF, *Thromde*	July 2019 onwards	Fund support for technical facilitation, group formation, and marketing support	City planner, bureaucrats, Urban and Peri-urban residents.

Agenda for action

In the first phase (July 2013-February 2015) ground activities that are fundamental for smooth implementation of UPA will be carried out which includes: carrying out awareness campaign, developing institutional framework and working modalities, reviewing policies and guidelines, zoning UPA area, identification of UPA farmers and leasing of land. In the next phase (March 2015- June 2018) coinciding with the end of 11th five year plan, UPA will be initiated on pilot scale in selected areas with technical support from MoAF. Thereafter, national strategic framework will be formulated based on the lesson drawn from pilot UPA activities. In the final phase – from 12th five year plan onwards – UPA will mainstream in agriculture and *Thromde* plan and it will be replicated in all feasible urban and peri-urban areas. The detail agenda of action is given in table 2.

Table 2. Detail agenda of action

Short term(July 2013- February 2015)	Medium term (March 2015 – June 2018)	Long term (July 2019 onwards ...)
Conduct awareness campaign on UPA and collect baseline data of UPA activities	Implement UPA activities on pilot scale in selected areas	Mainstream UPA in *Thromde* and agriculture plan and upscale UPA farming in other feasible urban areas
Develop institutional framework and working modalities among stakeholders	Institute UPA farmers groups with effective rules and byelaws	
Review policies and guidelines and incorporate UPA components if required Zonation and UPA area	Develop national strategic framework based on the lesson drawn from pilot UPA	
Identify potential UPA farmers and allocate land on lease		

Stakeholder responsibilities

Table 3 show the stakeholders and respective roles and responsibilities. UPA farmers, *Thromde* and MoAF will have the major role to play for the successful implementation of UPA. Success will also be determined by support and facilitation by other agencies: MoF, NEC, NLCs and MoWHS, though they may not have large concern over the success and failure of UPA (figure 1).

Table 3. Stakeholder and respective roles and responsibilities

Stakeholders	Roles and responsibilities
UPA farmers groups	Implement UPA and produce UPA productsOrganize and manage UPA
MoWHS	Provide policy support to mainstream UPA activities in urbanization plan.
Thromde	Incorporate UPA in municipality planFacilitate zonation of UPA areasIntegrate UPA facilities: water, electricity, market outlet, and UPA waste material recycling facilities.
NLCS	Survey and map UPA zones.Approve allocation of land to UPA farmers
NEC	Provide environmental clearance to carry out UPA activities in identified zones.
MoAF	Cater technical and extension service to UPA farmersFacilitate farmers in acquiring UPA farming technology.Facilitate for formation farmers' group with development of bye-laws and guidelines.Facilitate farmers in developing marketing strategiesSupport in establishing processing and storage facilities at strategic locationFacilitate in acquiring loan from finance ministry
MoF	Provide soft loan to farmers group
Urban consumers	Serves as consumers of UPA products

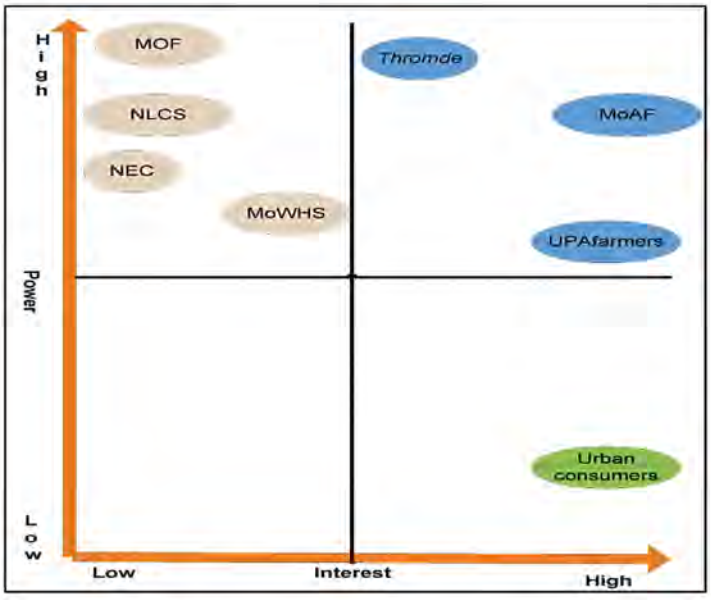

Figure 1. Stakeholder prioritization grid

Area of international technical assistance

UPA is emerging concept, which would require inputs and assistance to firmly establish the concept in Bhutan. UPA experiences gained elsewhere could help in adjusting the concept within the existing institutional framework or it would call for adjustment of institutions to fit in the UPA concept. Whichever adjustment we adopt, guidance of experts will be required. TA will be needed at specific period to provide advisory services. Capacity of technical service provider (extension staff) and UPA farmers have to be upgraded through tailor-made trainings, filed experiments and study tours to few UPA practicing countries.

The broad areas of assistance required are in:

- Development of institutional framework and working modalities among stakeholders.
- Development of UPA master plan
- Technical and professional capacity building to define and implement intensified and sustainable production systems adapted to the urban environment based on the Good Agricultural Practices (GAP).

Conclusion

Agriculture production in urban area is not a new concept but applying intensive agriculture with use of resource efficient and environmentally friendly technologies – characteristics of UPA – is new to the urban and peri-urban areas of Bhutan. So far, there are neither policies nor technologies specific to UPA. With increasing trend of rural to urban migration and the definite increase of competition for resources in urban and peri-urban areas, the need for UPA is urgent, which has the potential to address food insecurity, poverty, unemployment, and environmental problems – the increasing phenomena witnessed in urban and peri-urban areas.

UPA is a system that requires engagement and commitment of various stakeholders, without which, its potential cannot be harnessed. Hence, support and commitment from bureaucrats, technocrats, politicians, farmers, business communities, and consumers is equally needed to promote and mainstream UPA as a sustainable and potential tool to derive economic, ecological and societal benefits.

With holistic support: policy, technology, financial, and societal support, UPA can definitely contribute in addressing issues of both local and global scale.

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PLAN OF ACTION- PHNOM PENH MUNICIPALITY, CAMBODIA

Hin Pech*

Issues of Urban Poor

The urban poor face a number of common issues which affect their daily life.

The main issues include:

- limited access to income and employment;
- inadequate and insecure living conditions;
- poor infrastructure and services;
- vulnerability to risks such as natural disasters, environmental hazards and health risks particularly associated with living in slums;
- spatial issues which inhibit mobility and transport;
- food insecurity.

Income and Employment

At the core of poverty is limited access to income and employment opportunities. While the urban economy provides opportunities for many, not all those living in cities benefit from these opportunities.

The urban poor face challenges of low skills, low wages, unemployment and under-employment, and unsatisfactory working conditions. In many cases, the spatial location of slums, inadequate infrastructure, and negative stigma are also constraints to employment.

The majority of the urban poor work in the informal sector. While the informal sector provides employment for many that cannot enter the formal labor market and supplies goods and services typically not offered by the formal sector, it is also characterized by relatively poor working conditions, and generally operating outside the legal system.

Living Conditions

The living conditions of the urban poor are difficult. Poor urban residents face burden of overcrowded and often unsanitary living conditions.

According to a definition proposed by an Expert Group commissioned by UN-HABITAT in 2002, a slum household is "a group of individuals living under the same roof in an urban area with at least one of the following four basic shelter deprivations: lack of access to improved water supply; lack of access to improved sanitation; overcrowding (three or more persons per room); dwellings made of non-durable material."

Infrastructure and Services

The infrastructure needs that go along with urbanization can be enormous in terms of investments in housing, water and sanitation, transportation, power, and telecommunications.

The problems of accessing infrastructure and services are particularly acute for the urban poor.

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Risks

Living in cities, particularly in high density slum settlements, can also mean exposure to a number of disaster, health, and environmental risks which particularly affect the poor. These settlements are often in sites vulnerable to floods, landslides, Infrastructure is weak or lacking, and housing is substandard and can be prone to fire damage or collapse.

There are several factors related to urban living, particularly in slums, that can result in negative health outcomes. The high concentration of slum populations, inadequate water supply and sanitation facilities, poor drainage and solid waste management, and indoor pollution contribute to acute respiratory diseases, diarrheal disease and a wide array of other infectious diseases (e.g.,, tuberculosis, hepatitis, dengue fever, pneumonia, cholera and malaria)(Montgomery and Hewett, 2004). Particularly, children are at high risk of health problems in poor urban areas.

Environmental problems affect the urban poor because of poor quality and overcrowded housing, and inadequacies in provision of water, sanitation, drainage, health care and garbage collection.

Though impact from climate change on the urban poor has not been fully studied, this is an area of increasing concern, as it may further exacerbate the risks of negative environmental effects for the urban poor through warming temperatures, uncertain effects on ecosystems, and increased variability and volatility in weather patterns.

Location, Mobility and Transport

As the poor, often, live remotely in order to inhabit affordable space, they incur high travel costs and long travel times.

Living in a peripheral urban location, particularly without adequate access to transport services, can mean exclusion from a range of urban facilities, services, and jobs, resulting, for many cases, in difficulty or impossibility to fully benefit from goods and services of the urban economy.

Food Insecurity

A high percentage face the issue of food insecurity linked to their irregular/insecure incomes. That translates particularly in high rates of malnutrition, as investigated by WFP (Food Security Profile of Phnom Penh, 2005).

Project Summary Presentation

In order to contribute to tackling the above-mentioned urban issues with focus on food security, FAO has formulated a project entitled "Micro and Small Enterprise Development to achieve Food Security, Food Safety and Self-Reliance for Urban Poor in Phnom Penh", (2011-2014) whose overall objective is improved food security, food safety and nutrition security of poor and vulnerable urban and peri-urban dwellers living along Phnom Penh's river banks

This project is funded jointly by the European Union and FAO and is being implemented in partnership with the Fisheries Administration of Ministry of Agriculture, Forestry and Fisheries (MAFF).

For the geographical scope, the project covers two Khans (Districts) of Phnom Penh, namely Russey Keo and Mean Chey, with a target population of approximately 2,500 urban households.

In the early phase of the project implementation, FAO called upon an expert team to conduct a baseline survey.

The objective of the baseline assessment was to obtain a clear picture of food and nutrition security situation, socio-economic status and livelihood strategies of the target population at the commencement of the project.

This baseline assessment shows the following urban issues:

High percentage of children, both boys and girls under 5-year age, who are underweight –

- boys: 26% and girls: 39% in Khan Russey Keo,

26% for both boys and girls in Khan Mean Chey.

More than 50% of the children are stunted (Boys: 56% in Mean Chey and 55% in Russey Keo; Girls: 47% in Mean Chey and 65% in Russey Keo).

On the contrary, Household Dietary Diversity (HDD) and Child Dietary Diversity (CDD) are not very low (HDD: 6.6 in Mean Chey and 6.5 in Russey Keo; CDD: 5.1 in Mean Chey and 5.2 in Russey Keo).

This is due to the fact that food diet of Cambodian people is traditionally mixed.

Average annual household (HH) income was about 5.5 to 6 million KHR (about US$ 1,500) in 2011 (about 6 million KHR/HH in Mean Chey and about 5.5 million KHR/HH in Russey Keo).

Annual income does not vary much across different livelihood zones, but it is five times higher in the highest quartile group than that in the lowest quartile group (about 2.2 million KHR/HH for lowest quartile group and about 10 million KHR/HH in highest quartile group).

Most of the income comes from non-farm activities. Remarkably, more than 50% of the annual income is spent on food items (Russey Keo: 58%; and Mean Chey: 57%).

Regarding employment, more than 80% of economically active members in the interviewed households have full time employment.

However, they have to change employment from time to time based on available opportunities.

The daily income is low (about 15,000 KHR per day = US$ 3.9), which makes it difficult to feed the whole family if there is only one income earner per household.

Due to this situation, both active men and women many families have to accept employment opportunities wherever and whenever they are available.

The following table give a concrete idea of the urban issues as revealed by the most recent baseline survey commissioned by FAO:

Main results of the survey	**Khan Russey Keo**	**Khan Mean Chey**
6-59 months children growth status		
Underweight for boys	26%	26%
Severely underweight for boys	3%	14%
Underweight for girls	39%	26%
Severely underweight for girls	14%	6%

Main results of the survey	Khan Russey Keo	Khan Mean Chey
Stunted boys	55%	56%
Severely stunted boys	26%	36%
Stunted girls	65%	47%
Severely stunted girls	37%	31%
Dietary Diversity Scores		
Household Dietary Diversity (HDD) [Standard Score: 12]	6.5	6.6
Children Dietary Diversity (CDD) [Standard Score: 12]	5.2	5.1
Household incomes and food expenditures		
Annual household incomes (KHR/HH per year)	5,556,133	5,937,346
Annual food expenses (KHR/HH per year)	3,213,627	3,396,084
Percentage of food expenses from total households	58%	57%
Current incomes from agricultural and non-agricultural activities (average)		
Net income from livestock (KHR/HH/year)	313,794	187,040
Net income from fish (KHR/HH/year)	2,747,891	1,862,316
Net income from all crop (KHR/HH/year)	1,040,786	1,819,737
Net income from non-agriculture (KHR/HH/year)	5,442,890	5,261,982
Gender and employment		
Percentage of male active members with permanent employment	91%	86%
Percentage of female active members with permanent employment	92%	89%

(E.R.: US$ 1 = Khmer Riels KHR 4,000)

Flood is a major risk in the study areas in both Khans.
Many families fear that they could be forcefully evicted from their current homes.
They perceive having irregular jobs as a source of risk and vulnerability.

In order to address the food security and related issues as revealed by the survey, the project includes following activities:

Saving and Social Mobilization

The shortage of financial capital is one of the major constraints in performing small-scale business as well as in their daily lives. The associated problem is that the poor households often access the loan with high interest rate.

An appropriate solution for the poor would be to strengthen existing financial services and then promote the Saving Initiative. Saving could help resolve indebtedness and also help in the starting or expanding of a household business.

Household's small enterprise development and advisory services for the poor

In addition to shortage of financial capital, poor households also face technical difficulties to set up a household enterprise.

Many training packages can be made available, as main inputs for starting micro, small and medium enterprise (MSME).

Nutrition and health for pre-school age children (children below 60 months)

Pre-school age children in poor households face malnutrition problems, which mainly stems from financial incapacity of the parents to purchase adequate and diverse dietary foods.

In addition, parents have no time to prepare adequate food for the children, and thereby not ensuring diverse and nutritious diets on a regular or permanent.

Thus, direct and indirect intervention to improve nutritional status of the children in pre-school age will be implemented.

Health education & services and sanitation

Households are living in poor sanitation condition. Health education and awareness are important to improve their health status. Poor people often purchase medicines without prescription from a doctor, which could be risky. When those people get seriously ill, they have to bring the patients to a public hospital, and most often, they have to borrow money at high interest rate.

The ID Poor program has helped poor households to access to health service free of charge, particularly in Khan Russey Keo.

The project will contribute to improving this health service, through cooperation with government and other concerned donors, so that poor people could get better health services.

6 results are expected from this project such as follows:

Result 1

Strengthened entrepreneurship capacity of existing and newly developed micro and small enterprises

Result 2

Strengthened safe and sustainable production systems of land owners

Result 3

Strengthened capacity of the poorest and most vulnerable population – particularly women – in food processing and value adding

Result 4

Enhanced ability to invest in scaling up and expanding livelihood activities for target households

Result 5

Improved food safety and nutrition practices adopted among target households

Result 6

Enabling environment for urban and peri-urban food security, food safety and nutrition security.

This result 6 includes Policy Analysis and Recommendations on Urban Poor Communities and Households, that will also take into account issues of Policy on Urban and Peri-Urban Agriculture, in cooperation with Council of Agricultural and Rural Development (Strategy for Food Security and Nutrition 2012-2016), Municipality of Phnom Penh, Ministry of Agriculture, Forestry and Fishery, Ministry of Health (National Nutrition Program), Ministry of Planning (Nutrition Action Plan) and other concerned agencies/institutions/ institutions such as Ministry of Women's Affairs, WFP, WHO, UNICEF, USAID, etc.

VEGETABLES INITIATIVE IN URBAN CLUSTERS IN INDIA

Jyoti Singhal*

India is world's second largest producer of fruits and vegetables. It is the highest producer of several horticulture crops such that mango, banana, papaya, sapota, pomegranate, amla, areca nut, okra and peas. An area of 21 million hectare is under horticulture in the country and contributes over 230 million MT to the food basket of the country. It occupies 14% of the cultivable land in the country, which is 142 million ha. Approximately 17% of India's GDP comes from agriculture sector, however, 35% of agriculture GDP is contributed by horticulture. Thus horticulture contributes 35% share to the agriculture GDP using only 14% land.

For the last 5 years, horticulture sector has registered an annual growth of 6% in production. The population of the country has grown at the annual growth rate of 1.5%. The per capita availability of fruits and vegetables grew at 4.5%. This achievement became largely possible due to the interventions made through National Horticulture Mission (NHM) and Horticulture Mission in North East and Himalayan States (HMNES), the Government of India schemes for horticulture development in the country.

Challenges

Indian economy is growing by more than 8% for last few years and the population of the country is growing consistently @ 1.5% annually for the last two decades. The economic growth has led to life style changes which are expected to drive the growth of agro industry and it is also expected to result in the transition of Indian consumer consumption pattern. At present, over-all consumer spending on food is Rs.10, 000 billion which constitutes the largest portion of the Indian consumers spending – more than 31% share of wallet. During 2004, spending in food items was Rs. 7050 billion. Thus, about 21% of India's GDP is spent over food by the consumers. The total domestic spending is expected to reach Rs.13, 000 billion in 2015, Rs.16, 000 billion by 2020 from the current level of Rs.10, 000 billion at a compounded annual growth rate (CAGR) of 4.8%.

As much as 70% of current food spending by the Indian consumer is on agri-products. Additionally, 2/3rd of this spending is on primary and secondary process products. In agri-products, fruits and vegetables (F&V) is the largest consumption category and accounts for over 50% of the total consumption.

The key socio-economic changes that impact the growth of food industry could be well imagined by recognizing the fact that there would be a fourfold growth in the size of Indian households in the middle to very rich class, resulting in doubling of Indian household consumption by 2015. There is going to be immense increase in the youth population in the country annually and continuous migration of population from rural India to urban India.

The new middle and rich class would result in growing number of nuclear working families having little time for cooking and hence will be driven by a high need for convenience of food items. Life style changes would also result in diseases such as diabetes, asthma and obesity resulting in demand for healthy and fresh food products and these all are expected to grow the demand for products which meet the needs of convenience, health and variety.

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Structural and systemic challenges are many – from constraints in land availability, low labour productivity with slow adoption of technology, inadequate support infrastructure, lake of partnership approach, non-availability of institutional credit, lack of availability of quality and standard input to supply chain problems. In this scenario, it becomes imperative for the government to intervene by way of policies for adequate and quality supply of fruits and vegetables to the population. Fruits have largely been included in government programs earlier.

Vegetable Initiative in Urban Clusters

In 2011-2012, the Government of India launched a scheme entitled Vegetable Initiative in Urban Clusters for implementation of a vegetable initiative to set in motion a virtuous cycle of production and income for the farmers and assured supply for consumers. To begin with, this program has been launched near major urban centers.

Enhancing Production and Productivity of Horticulture

India is fortunate to be endowed with a variety of agro-climatic zones and has a tradition of growing a wide range of horticultural crops. Among the horticulture produce, vegetables have the largest share of production (60.8%). Vegetables not only contribute to the food basket of the country but are also a highly remunerative crop, providing quick returns to the farmer per unit of area. Production and productivity of crops and profitability of farmers can be enhanced by encouraging 'off-season' production under protected cultivation in green houses, shade net houses, etc. for generating income round the year. Moreover, vegetables form the most important component of a balanced diet.

Assured Availability of Affordable, Safe and Good Quality Vegetables

Availability of vegetables, particularly to the urban population, presents many challenges. Issues such as assured availability of safe and good quality vegetables at affordable prices continue to be a major challenge. Addressing this concern calls for concerted action on several fronts viz., production, logistics covering post-harvest handling, storage, transportation, marketing, distribution and policy reforms. In this background, a special initiative for the development of vegetables has been mooted with 100% central assistance by the Government of India.

Coverage and Scope

Initially, the scheme has covered one city in each state during the year 2011-12 and 2012-13, which is either the state capital or any other city with a population of over one million. In case, in any state there is no city which satisfies this criteria, then other urban cluster closer to one million population will be selected for the purpose.

Objectives

Main objectives of scheme are;

(a) Addressing all concerns related to both the demand and supply side of the vegetable sector in selected cities.

(b) Enhancing vegetable production and productivity, improve nutritional security and income support to vegetable farmers.

(c) Encouraging establishment of an efficient supply chain thereby leading to employment opportunities and incomes for intermediate service providers, and safe, good quality, fresh as well as processed agri produce at competitive price for urban consumers.

(d) Promote, developing and disseminating technologies for enhancing production and productivity of vegetables in peri-urban areas of major cities.

(e) Assisting states in addressing the entire value chain, right from the stage of pre-production to the consumers table through appropriate interventions.

(f) Creating employment generation opportunities for skilled and unskilled persons, especially unemployed youth.

Strategy

To achieve above objectives, the scheme will adopt the following strategies:

- Baseline survey to assess the extant vegetable supply chain to city selected; identify bottlenecks and vegetable growing clusters, existing as well as potential.
- Organize vegetable growers into Farmers Association/Groups.
- Coordinate with public sector agencies/Municipal Corporations for making land available for cultivation, and for Farmers Markets to ensure direct/transparent transaction of produce.
- Identify/select Aggregators and enable tie-up with Farmers Associations/Groups.
- Coordinate with Research Institutions/Agricultural Universities to provide improved varieties of vegetable seeds/seedlings and to introduce innovative technologies as required.
- Addressing issues in the credit supply chain.
- Measures for production and productivity enhancement by adopting improved cultivars, production technologies using precision farming techniques, protected cultivation, micro irrigation etc.
- Primary processing, sorting, grading, washing, packaging and value additional clusters.
- Logistics from farm to market including post-harvest management, storage and transport infrastructure, Aggregators for suitable tie ups in the supply-chain.
- Establishment of Farmers Markets including electronic platform for transparent transactions.
- Support to urban local bodies to promote controlled atmosphere (CA), static/mobile kiosks etc.
- Support to institutions/farmers associations/cooperatives/private sector for seed/seedling production, vegetable cultivation, INM/IPM/organic farming, GAP, capacity building etc.

Procedure for Approval and Implementation

Strategy and Roadmap

States identify the city they wish to take up in and develop the project for vegetable supply to the city. Perspective plan/strategic plan will be prepared based on the Baseline survey to assess the extant vegetable supply chain to the identified city, identify bottlenecks and potential vegetable growing clusters, existing as well as potential. The project report formulated by States should invariably contain information on geography and climate, potential of vegetable development, availability of land, SWOC analysis, and strategy for development and plan of action proposed to be taken to achieve goals in the identified city of the State. The document should focus on adoption of cluster approach for production and linking with available infrastructure, or to be created, for post-harvest management, processing, marketing and export. Vegetable Initiative beneficiaries would also be entitled for assistance under other Schemes of DAC/other Departments of Government of India so that these schemes can ensure appropriate synergy and convergence for maximum benefit in the field.

Ministry of Agriculture will communicate tentative outlay for the year by April to each State which will prepare the project on vegetable supply to the identified city through the State Horticulture Mission (SHM)/

Directorate of Horticulture/Agriculture within allocated sum. SHM will attempt to address all issues relating to vegetable development, covering organization of farmers group, identify/select Aggregators and enable tie-up with Farmers Associations/Groups, production, post-harvest management and marketing.

Implementing Agency

1. Directorate of Horticulture/Agriculture/State Horticulture Mission/State Governments
2. National level Agencies (NLAs).

Role of National Level Agencies Working in the Areas of Horticulture/Vegetable

1. *Small Farmer's Agri Business Consortium (SFAC)*
   Small Farmers Agribusiness Consortium will provide professional support services towards baseline surveys, organization of farmers groups in identified clusters, provision for credit with support from NABARD, assessment of technology gaps and farmers group/association tie-up with aggregators, establishment and development of PHM infrastructure.
2. *National Horticulture Research & Development Foundation (NHRDF), Nasik.*
   NHRDF will be involved for monitoring programs relating to development of vegetables through vegetable seed/seedling production, demonstration and HRD and analysis of data with regard to area under production, market arrivals, farm gate, wholesale and retail prices.

Scheme Components and Pattern of Assistance

The Scheme will cover all aspects relating to formation of farmers' association/groups, training/capacity building of farmers, linking farmers group with aggregators/markets, vegetable production and supply to urban centers starting from planting material to marketing to retail level. Funds for implementation of scheme will be leveraged through RKVY. The existing cost norms and pattern of assistance for individual components under National Horticulture Mission (NHM)/Horticulture Mission for North East and Himalayan States (HMNEH) would be guiding factors.

The scheme will be demand and need based in each segment. Technology will play an important role in different interventions. The interventions envisaged for achieving desired goals would be varied and regionally differentiated with focus on potential vegetable crops to be developed in clusters by deploying modern and hi-tech interventions and duly ensuring backward and forward linkages.

National Level Executive Committee

At national level, procedure adopted for technical approval and implementation will be as per guidelines of RKVY. Horticulture Division in DAC will provide the necessary technical support to RKVY Division.

A national level committee will be constituted to monitor under the chairmanship of Secretary (A&C) and Joint Secretary and Mission Director (NHM) as Member Secretary with Additional Secretary (Horticulture), DDG(Hort), ICAR, Horticulture Commissioner, Joint Secretary (RKVY), Joint Secretary (Marketing), Joint Secretary (MoFPI), MD(SFAC) and MD(NHB) as Members. At state level, procedure adopted for sanctioning and implementation will be the same as for RKVY. At the operational level, state governments may nominate the SHM or the Directorate of Horticulture/Agriculture for implementation of the scheme.

State and sub-state level structures will be evolved, keeping in view the need for getting adequate returns for vegetable produce of farmers and eliminating middlemen to the extent possible.

State level implementing agency will have the following functions:

a) Organize base-line survey and feasibility studies in identified cities to determine status of vegetable production, potential and demand, and tailor assistance accordingly. Similar studies would also be undertaken for other components of the program;

b) Prepare the project for vegetable supply to the identified city in consonance with scheme's goals and objectives and in close co-ordination with Municipal Corporation, Technical Support Group, SAUs and ICAR institutes and oversee its implementation;

c) Involve national level agencies/NGOs or any other agency to facilitate organization of farmers group/association for promoting vegetable cultivation in open and protected condition and linking them with Aggregators for marketing of produce. Contract farming models can also be adopted for this purpose.

d) Release funds to implementing organizations and oversee, monitor & review implementation of the programs.

e) Organize workshops, seminars and training programs for all interest groups/associations of state level, with help of SAUs, ICAR Institutes, KVKs and other institutions having technical expertise.

f) Furnish monthly, quarterly and annual progress reports to DAC.

g) Operationalize Information Communication Technology (ICT) enabled Management Information System (MIS) up to grass root level and if need be develop and host its own web site.

Technology Development and Dissemination

Indian Council of Agricultural Research (ICAR) and Council of Scientific and Industrial Research (CSIR), in association with SAUs and other research institutes/organizations in the public and private sectors having capabilities in this area, will develop new technologies relating to production, protection and post-harvest management, processing and value addition and ensure its effective transfer and dissemination to the farmers.

Support to Cooperatives and Other National Level Agencies/Organizations Involved in the Scheme

Under the Scheme, provision has been made for supporting Cooperatives and other National Level Agencies/ Organizations which may be involved in organizing vegetable growers into Farmers Association/Group and to identify/select Aggregators and enable tie-up with Farmers Associations/Groups and financial institutions.

Base Line Survey, Evaluation and Other Studies

Under the Scheme, provision has been made for conducting Baseline survey/study to assess the extant vegetable supply chain to the identified city centers to identify bottlenecks and vegetable growing clusters, existing as well as potential. The study will be conducted by SHMs/NLA. The study will give a holistic picture of entire supply chain.

Various Components and Pattern of Assistance

Activity	Cost range (Rs. in lakh)	Level of Assistance
Base Line Survey	7.50 to 15.00 per city	100%
Formation of FIG of 15-20 farmers and tie up with FI and Aggregators	2.00/group &/year	100%, 75% and 50% in 1st, 2nd and 3rd year.
Seeds & Seedling Production	0.5 to 104.0 per ha.	50% to Private Sector, 100% to Public Sector
Vegetable cultivation	0.30 to 0.45/ha.	75% of cost
Protected cultivation	30.00 to 146.50/ha	50% of cost
Organic cultivation	0/40 per ha	50% of cost
PHM	1.00 to 300.00	40% to 55% of cost
Markets (including modern vending carts)	1.00 to 20.00	40% to 55% of cost

Over a period of 15 months and 3 seasons, baseline surveys have been completed in 29 cities. Mobilization of around 1, 47,000 farmers into 7500 FIGs has been done. Almost 66 FPOs either registered or under on edge of registration. Resource Institutions have been deployed for FPO formation. Vegetable cultivation has been taken up over 42,970 ha. in urban fields and 46 ha. under protected cover.

Further Improvisations to be taken up

- Addition of new cities
- FPO formation in all States, including new cities along with training of FPO members.
- Hand holding of FIGs and registration of FPOs.
- Linking FPOs to extension and input services of State Horticulture Departments.
- Strengthening Infrastructure for PHM and marketing.
- Analyze market arrival and price of vegetables in metro cities.
- Engagement with market players, financial institutions and input suppliers to leverage collective bargaining power.

Success Story of Andhra Pradesh

Under the Scheme, 17.00 crores was sanctioned to Andhra Pradesh during 2011-12. Project implementation area is Medak, Mahaboobnagar and Ranga Reddy districts covering 77 mandals which are the major feeders of vegetables for the Metro City Hyderabad.

Progress for 2011-12

- 150 Farmers Groups were formed in three districts i.e., Ranga Reddy, Medak, Mahabubnagar and to address the wastage in production "**Farm fresh vegetables on wheels**", a four wheeler with one ton capacity was fabricated to transport the vegetables and maintain their keeping quality and supplied 42 such vehicles to the farmers groups.

Progress for 2012-13

- Government of India has sanctioned an amount of Rs.17.00 Crores during 2012-13 for implementation of VIUC program.
- Quality Management Program is the new initiative during this year and the main components of the program are:
  - Formation of farmers into groups (FPPOs)
  - Preparation of production plan as per the demand in the district & Implementation of recommended practices of inputs
  - Harvesting practices like usage of plastic crates etc.
  - Packaging with label & hologram
  - Marketing in identified demand centers throughout the year.

Details of Assistance

- Per Farmer : Rs. 50000 (50% Subsidy)
- Per FPPO : Rs.14.00 lakh
- Integrated Value Chain in 3 years : Rs.2.72 Cr.

- Against the target of 37 Farmers Producers Processors Organizations (FPPOs) in 5 Districts 70 FPPOs were formed as on date for implementation of Quality Management Program for Vegetables.

Impact of VIUC in Ranga Reddy District

The area and production details of vegetables in Rangareddy district is followed.

S.No.	VIUC	Year	Area(Ha)	Production(Mt)
1	Before VIUC	2010-11	16,690	200280
2	After VIUC	2011-12	18710	350903
3		2012-13	16890	337800

- From the above table it is clear that after implementation of VIUC i.e. during 2011-12 the area and production of the vegetables is increased by 2020 Ha and 150623 Mt respectively when compared to 2010-11.
- In Ranga Reddy district against the target of 7 no. of groups as on today 45 no. of groups were formed under QMP-vegetables.
- So far for the year 2012-13 an area of 16,890 Ha is covered under vegetable crops with the production 337800 tonnes. By the end of this year the area and production of the vegetables will be increased.

Conclusion

India is already second most populous country of the World with 1.2 billion citizens. Projected population of India is approx. 1.3 billion for 2020 which may grow up 1.6 billion by 2050. With the resources being the same in terms of area and more mouth to feed, the growing demand is to be met through better technological interventions like protected cultivation, hybrid seeds, better production technology, reduced wastage, better post-harvest management , strengthening of value chain, precision farming technique etc. Semi Urban and Peri-Urban Agriculture thus is the way forward to bring urban hinterland into Productive activities and bridging the gap between demand and supply especially for perishable items like vegetables. Indian initiative in the form of Vegetable Initiative for Urban clusters is one of the way forward in this direction.

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3.3 CASE STUDIES, REVIEWS AND PROSPECTS

A total of eight case studies representing different components of UPA such as horticulture, livestock, waste-water fed fish, tree-planting, integrated homestead farming systems for improved nutrition, safety of foods, waste management and utilization and vegetable farms school, were presented and discussed. A separate case study on wood fuels was not presented but was submitted and is therefore included. A list of these case studies is given below.

1.1. Application of Horticulture in Improving Urban and Peri-urban Agriculture Towards Enhancing Food Production in Bangkok City by Dr. Grisana Linwattana, Horticultural Research Institute, Bangkok, Thailand

1.2. Contribution of Small Livestock in Developing Resilient Food Systems for Urban and Peri-urban Agriculture in Thailand by Dr. Sansak Nakavisut, Department of Livestock Development, Thailand

1.3. Towards Sustainable Wastewater-fed Fish Culture in Kolkata, India by Dr Peter Edwards, Emeritus Professor, Asian Institute of Technology and Advisor, Sustainable Farming Systems Programme, Network of Aquaculture Centres in Asia-Pacific, Thailand

1.4. Tree Planting in Urban and Peri-urban Areas by Mr. Roger Steinhardt, FAO Regional Office for Asia and the Pacific, Bangkok, Thailand

1.5. Integrated Homestead Farming Systems for Improving Nutrition Status of Urban & Peri-urban Populations – Case study/ Experiences from Selected Asian countries by Dr. Lalita Bhattacharjee, Nutritionist, National Food Policy Capacity Strengthening Programme, FAO, Bangladesh

1.6. Urban and Peri-urban Agriculture (including organic agriculture) for Ensuring the Safety of Foods by Dr. A Thimmaiah, Advisor, Bhutan Agriculture and Food Regulatory Authority (BAFRA) ; Bhutan

1.7. Impact of Waste Management and Utilization in Improving Urban and Peri-urban Agriculture by Dr. Permpong Pumwiset, Office of Public Health and Environment, Thailand

1.8. Vegetables Farm in School at Sisa Ket Province by Ms. Jirapa Austin, Sisaket Horticultural Research Centre, Muang, Sisa ket, Thailand

1.9. The Woodfuels Integrated Supply/Demand Overview Mapping (WISDOM) methodology by Mr. Roger Steinhardt, FAO Regional Office for Asia and the Pacific, Thailand

In addition, a special session on Reviews and Prospects of UPA was organized in which two papers were presentedwhich highlighted on multi-stakeholder collaboration and investment, and development initiatives undertaken in food production, utilization and mechanism of management in implementing UPA.The first paper was by Dr P.G. Chengappa, who made a presentation on "Enhancing Multi-stakeholder Collaboration and Investment in Urban and Peri-urban Agriculture".In his presentation Dr Chengappa dealt with dimensions of urban and peri-urban agriculture, international policies for urban and peri-urban agriculture, policies and schemes for promotion of UPA, issues in UPA and plausible solutions through multi-stakeholder collaboration, access to land and security of tenure, production and marketing services in UPA, urban waste

water and its utilization in UPA;solid waste and its utilization in UPA etc and concluded that there is vast scope for urban and peri-urban agriculture, as demonstrated by many studies conducted throughout the world. UPA provides a good contribution to the economy and food security of the nation.

The second presentation was made by Prof. N. Nagaraj, on "Development initiatives in food production, utilization and mechanism of management in developing Urban and peri-urban Agriculture in Asia" Prof Nagaraj in his presentation said that UPA is distinctly emerging as a catchy agricultural sector worldwide for enhancing food, nutrition, health and economic security reducing negative environmental impacts. In the process, the long term impact of rise in land prices associated with reduced size of holding for agriculture and short term impact of rise in agricultural wages are being experienced. Institutional innovations such as formation of Urban Producers Organizations for capacity building in marketing, access to credit through SHGs/micro-financing institutions, Farmers' field schools have immense potential to contribute to productivity. He made presentation of a case study on Economics of Peri-Urban Agriculture at Magadi, Bangalore, Karnataka state, India and narrated its success, lessons learnt, constraints and good practices.

The details of the case studies and reviews and prospects are covered in **Volume-II of the Proceedings.**

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4 TECHNICAL DISCUSSIONS and WORKING GROUP SESSSIONS

4.1 TECHNICAL SESSIONS

Discussions on Technical Sessions

After the presentations by each speaker in various sessions including key notes, country presentations, reviews and prospects and case studies, the sessions were opened fordiscussions and interaction through questions as well as suggestions by participants. Some of the issues raised by the participants and responses are given below:

- ***Question:*** *Generating cash surplus, economic stability with food and nutritional security would be the main issue for the sustainability of UPA. How is UPA equipped with tools to address this?*

  Answer: Various types, practices and UPA models are being implemented at various places. An institutional arrangement for carrying out the economic feasibility studies of these has to be done. It is also essential to initiate research work on these aspects by the agricultural/horticultural universities and research institutes as a part of their ongoing research programs. If need be funding arrangements may be made from some international organizations to take up such studies.

- ***Question****: There would be inequality between urban and rural economic growth. How could this be addressed?*

  Answer: I think there is some confusion about the concept of UPA and in understanding of various sectors of UPA. In no way the urban agriculture is going to put pressure on the economic growth of rural agriculture. In fact thes would supplement and complement economic growth of each other.

- ***Question:*** *Land value and economics plays important role in implementing UPA.There is a need to create urban land bank. What measures could be taken for this purpose?*

  Answer: This is policy issue to be tackled by the government. However, recommendations from such forums like this would definitely influence the policy makers and politicians in favor of UPA.

- ***Question:*** *There is a need to define UPA properly.*

  Answer: A good number of definitions have tried to explain UPA. However, FAO has recently come out with the definition, which perhaps would be acceptable to all.

- ***Question:*** *Nutritional security and healthy diet are most important. How this could be incorporated in to UPA.*

  Answer: Thiscould be achieved by massive awareness programs, policy and planning of food courts and street foods by the governments. There is also a need to take up projects like nutritional gardens by school children.

- Question: *What are environmental issues of e UPA?*

  Answer: Managements of urban organic waste and urban solid waste and waste water management are some of the important issues that need to be tackled. Investments in these are more crucial. The governments should think in the direction of PPP model.

Suggestions

a) UPA should be Rural Urban continuance rather than divide.

b) There is an urgent need to create awareness about UPA amongst the policy makers and urban planners including the general public in order to educate and convince them about the importance and role of UPA towards resilient food system in the urban areas so that land and investments could be tapped easily for implementing various programs and activities of UPA. Advocate this concept to Governments so that risk sensitive urban planning can be made.

c) Find out policy pressure points of UPA to present to the governments.

d) There is a need to create greener areas for the urban cities for recreation and leisure for the urban populace. A new approach like UPA Tourism involving crop demonstrations and food parks needs to be created.

e) In UPA, the migrants to urban cities are the most vulnerable and their voice needs to be heard. Develop a mechanism for this. The migration from rural to urban areas is going to increase tremendously unless the government provides economic security to the rural poor.

f) Food wastage and food distribution in urban cities are major concern which need to be improved by appropriate means.

g) There is a need to develop the approach of Green city with UPA as the driving force in urban planning.

h) Projects like aquatic agriculture more particularly on aquatic vegetable production has scope which need to be taken up in UPA.

i) Inland fisheries and fresh water fisheries have better scope in the UPA. This needs to be strengthened.

j) More emphasis needs to be given on peri urban as compared to urban agriculture for which more infrastructure facilities need to be created in peri urban areas.

k) Integrate UPA into National Agriculture Planning.

l) Agriculture is to be identified as a land use activity.

m) In developing landscapes for various gardens and parks, edible landscaping principles have to be kept in mind for which there is need to identify appropriate crops and varieties.

n) Low lying areas of rice cultivation may be converted in fish farming; duck farming may also be integrated.

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4.2 WORKING GROUP DISCUSSIONS AND PROPOSED RECOMMENDATIONS

Three working groups had been set up to discuss on the subjects of Research Priorities (including pilot interventions, investment area, etc.) on horticulture, food and waste management; Development initiatives (including priorities, pilot interventions, investment areas, etc) in food production, utilization and management in UPA; andMechanisms for handling multi-stakeholder collaborations in improving urban and peri-urban agriculture. Participants participated in the group of their interest and contributed to the deliberations. The work of these groups formed a basis of the final recommendations of the workshop. Details are given below including the recommendations proposed.

Working Group 1: Research Priorities (including Pilot Interventions, Investment Area, etc.) on Horticulture, Food and Waste Management

Chair: Prem Nath,

Facilitator: Wilailak Sommut

Proposed Recommendations

Consequent upon brainstorming discussion, the following relevant commodities, priority studies and investment opportunities were identified.

Relevant commodities: Horticulture, Soil and water conservation, Livestock and Dairy, Fishery, Farm forestry, Waste recycling, Food processing and value addition

Field of Studies

- Base - line survey;
- Key interventions-crop improvement, management practices and market linkage;
- Impact assessment on social, economic and environmental aspects;
- Pilot interventions.

Research topics

- Introduction and selection of commodities,
- Farming systems - Urban Horticulture, and Peri-urban Horticulture, Vegetables, Fruit, Flowers, poultry, Livestock, fishery,
- Utilization of crops
- Types of cropping: home garden, terrace garden, vertical garden, parks etc.
- Utilization of waste water,
- Assessment of negative impacts,
- Assessment of existing structures and provision of green space in new buildings
- Urban Food System :
  - Improved cooking,
  - Hygienic waste management

- Improved marketing system : street market, roadside, hotel, etc.,
- Quality seed availability
- Value chain
- Waste collection and process
- Land availability

Agro- Industry and Investment (Peri urban area)

- Prospect of Agro-industry and investment required- fruit and vegetables, processing, poultry, dairy, flour mills, vermin-composting etc.,
- Handling and marketing potential of UPA of products
- Ensuring land, water and energy

Working Group 2: Development initiatives (including priorities, pilot interventions, investment areas, etc) in food production, utilization and management in UPA

***Chair*:** N. Nagaraj

Facilitator: P.B.Gaddagimath.

The following points were considered;

Proposed Recommendations

- Establish Green City under UPA Concept.
- Given the constraints of land, water, labor, degradation of natural resources, there is a need to policies and legislation with respect to UPA.
- Integrate UPA into the national development plans/ strategies adhering to basic principles allowing flexibility to promote UPA.
- Establish healthy markets in peri urban/urban areas with facilities for proper sanitation and clean water for sale of fruits, vegetables, fish and animal products.
- Identify potential areas for investment viz., technology, extension, infrastructure, capacity building, waste management, organic farming and UPA tourism.
- Promote appropriate processing techniques to preserve the quality and nutrient contents of the produce, enhancing shelf life and to facilitate transport and sales.
- Establish UPA Fields Schools and promote awareness building campaigns including gender mainstreaming
- Develop different models of UPA focusing on integrated-Farming approach, notably, horticulture, small livestock, aquaculture and plantation crops, underutilized foods, waste water management, and aquatic plants as well as trees for improved nutrition.
- Recognize UPA as a an independent entity and accord separate status in each country, as appropriate; it maybe an independent institution/quasi government or as part of agriculture / horticulture/animal husbandry/urban development departments linked with line ministries.
- Strengthen nutrition education and farming systems to enhance consumption of different foods at household level including women, infants and young children.
- Incorporate UPA into urban development initiatives including disaster risk reduction and management programmes and social protection programmes.

- Develop country specific action plan for UPA and help development of regional strategy for UPA
- Economic incentives for organic certification, organic farming, integrated nutrient management, integrated pest management

Pilot Interventions

- Following Cluster based approach, organize Farmer Interest Groups for providing input supply, technology, credit infusion and strengthening value chain from grading, packaging, transporting, storing to marketing.
- Generate robust database on UPA for effective planning and policy implementation

Working Group 3: Mechanisms for Handling Multi-stakeholder Collaborations in Improving Urban and Peri-urban Agriculture

Chair: P.G. Chengappa

Facilitator: Roger Steinhardt

Proposed Recommendations

On discussion the following points emerged;

- Set up multi-stakeholder organisation led by government for planning, integration and implementation of UPA- farmers, environmental groups, water resources, NGOs, local bodies, private sector and community members leading to extension and technology transfer.
- Enact/amend laws for promotion and regulation of UPA e.g. rain water harvesting and building construction.
- Incentive mechanisms to promote UPA-policies and tax incentives.
- Encourage corporate sector to allocate more of their corporate social responsibility budget for promotion of UPA- certification and labeling, green building etc.
- Encourage private investment for solid waste management and waste water treatment- capital subsidy, tax concessions, etc.
- Promote International collaborations for further promotion of UPA principle and practices- to be brought under a framework of UPA conventions; education and capacity building.

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5 RECOMMENDATIONS

RECOMMENDATIONS (UPAFSA-2013)

As a result of discussion during technical sessions as well as of debate during the group discussions, the workshop concluded with the following recommendations to be considered by respective countries.

Strategy

1. In urban planning, the **greener cities** approach should be high on the agenda and UPA should remain the driving force for the same.
2. Integration of UPA into development strategies and programs with multisectoral and multistakeholder participation should be encouraged for sustainability and should be supported by sound policy guide lines and frame work.

Technology

3. Undertake feasibility studies on socio economic, technological, environmental, policy and governance to understand the need, scope and limitations of **UPA** in the **Green City concept** of **Urban Planning**. This should also include base line survey and study of the region/countries/ cities for a clear understanding of food systems (crop husbandry/ animal husbandry/ aqua culture/ processing/waste management/water recycling and water use efficiency/ food and nutritional security/ supporting services) in the **UPA** context and further improvement of the value chain. These studies may be assigned to agricultural/horticultural universities, agricultural/horticultural research institutes, economic and statistics institutions.
4. Develop a robust data base management system on **UPA** for effective planning and policy implementation including institutional arrangements.
5. Conduct research for improving efficiency in technologies for **UPA**covering various aspects like agriculture/horticulture, livestock, fisheries and aqua culture including aquatic plants, social forestry, urban/city solid waste/ water management and recycling, nutrition, women empowerment, supply chain and value chain management, food processing, food safety and value addition, and based on the results develop models of **UPA** applicable for different locations/places and circumstances.
6. Publish popular and technical publications and audio visual materials on the importance and need of **UPA**, case studies giving best practices and success stories of **UPA.**

Policy

7. Promulgate appropriate policy to integrate **UPA** into urban and peri-urban developmental programmes and strategies towards sustained resilient food system.
8. Initiate process for Policy Legislation and Governance Mechanism for land and water use [e.g. creating **UPA Zones** like **Agri-Export Zone (AEZ), Agri-Processing Zone (APZ)** etc already in place in many states], taxation, access to microcredit and finance, investments, incentives, etc., for the sustainability of **UPA.**

Development

9. Bring about specific focus on awareness and capacity building programmes for policy makers, stake holders, target groups and **UPA** general populace to make them understand the importance and need of **UPA,** its role in Urban Planning for disaster risk mitigation, climate change and carbon sequestration, absorbing shocks and having buffer zones, and the active participation of all stake holders in planning and implementation of **UPA** within the**Green City** approach.
10. Develop an enabling Frame Work for UPA with separate institutional mechanism with multi sectoral and multi stake holders' (private and public) involvement in order to strengthen **UPA** within the **Greener Cities** approach of Urban Planning.
11. Develop **Action Plan** for the implementation of **UPA** for the country/state/city through a participatory approach under the **Greener Cities**concept with possible involvement of private sector as **Corporate Social Responsibility partner** of urban planning.
12. Take up massive extension programmes to popularise the technologies applied in **UPA**under**Greener cities** approach programmes.
13. Identify a few cities and few **UPA** models (exclusively for Urban and Peri-urban situations) for **pilot interventions** to demonstrate UPA centered Greener Cities approach.

International Collaboration

14. Initiate and promote continued dialogue and consultative process facilitated through international organisations like **FAO** with enhanced regional collaboration for the furtherance of the principles and practices of **UPA**within the **Greener Cities** approach.

ANNEX

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