





# GROWING GREENER CITIES

FAO's Program for Urban and Peri-urban Horticulture



## Family Farming



<http://www.rlc.fao.org/en/about-fao/regional-priorities/family-farming/>

[www.fao.org/ag/agp/greenercities](http://www.fao.org/ag/agp/greenercities)  
[greenercities@fao.org](mailto:greenercities@fao.org)



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Naciones Unidas para la  
Agricultura y la Alimentación

# Objetives

1. Discuss key issues (major challenges) affecting urban and peri-urban communities in developing countries.
2. FAO contributions to urban and peri-urban agriculture.
3. Opportunities: Science, technology, and innovation alternatives for urban and peri-urban farming.



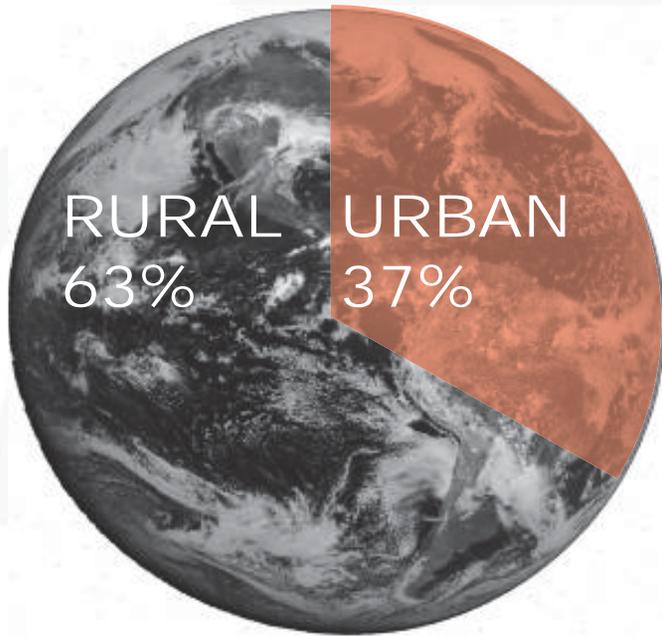
# Net population increases (births – deaths)

second	2.5
minute	152
hour	9148
day	219,559
week	1,536,913
year	80,139,000

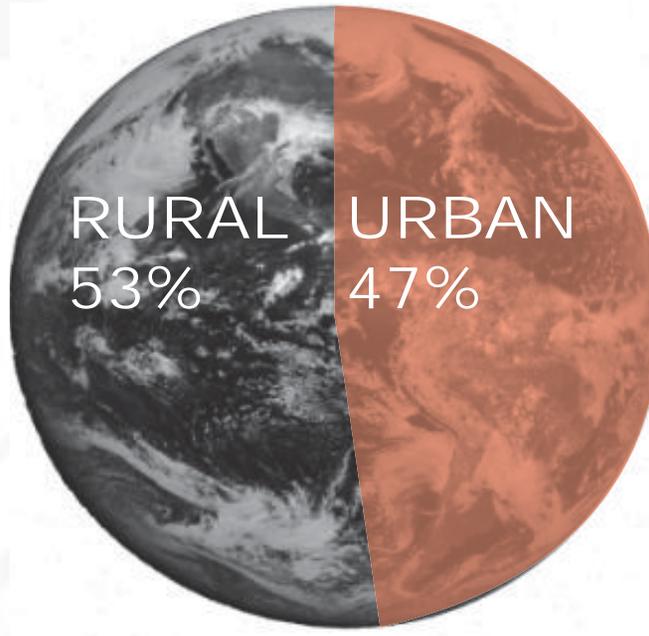
**2,280 births in fifteen minutes of this talk**



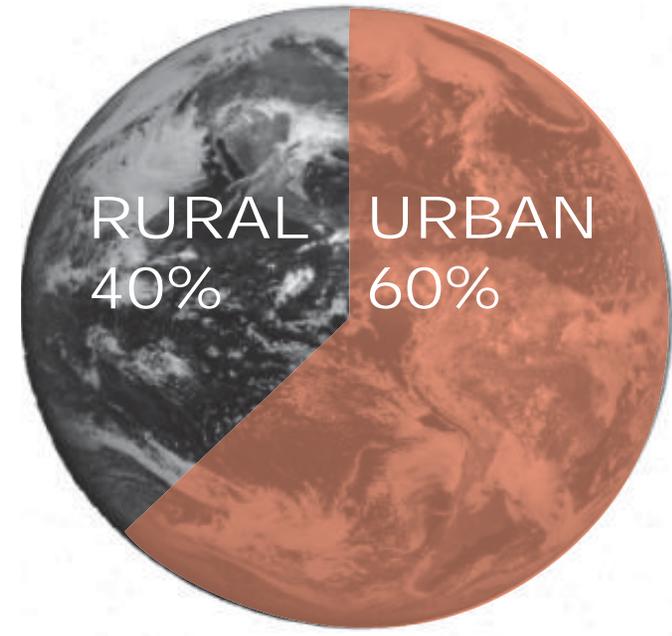
# Urbanization Trends/Predictions



1970



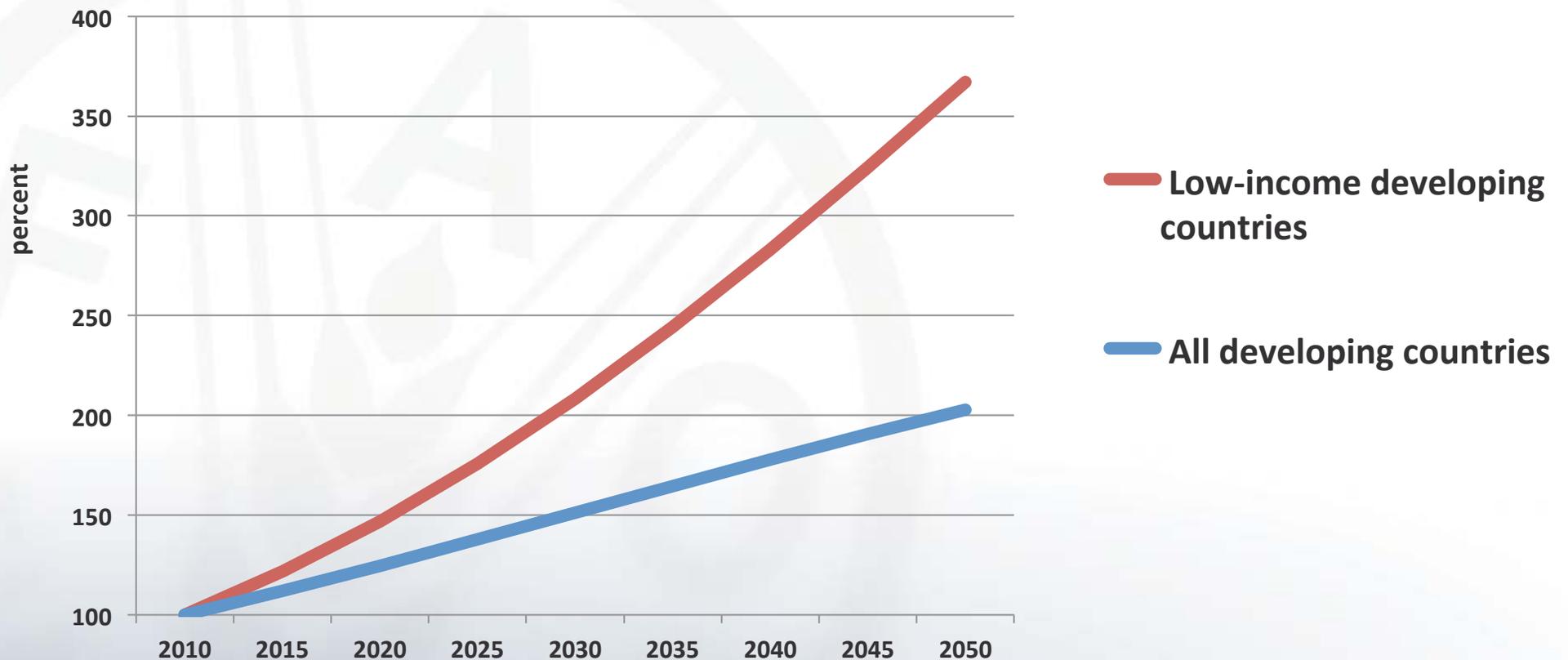
2000



2030

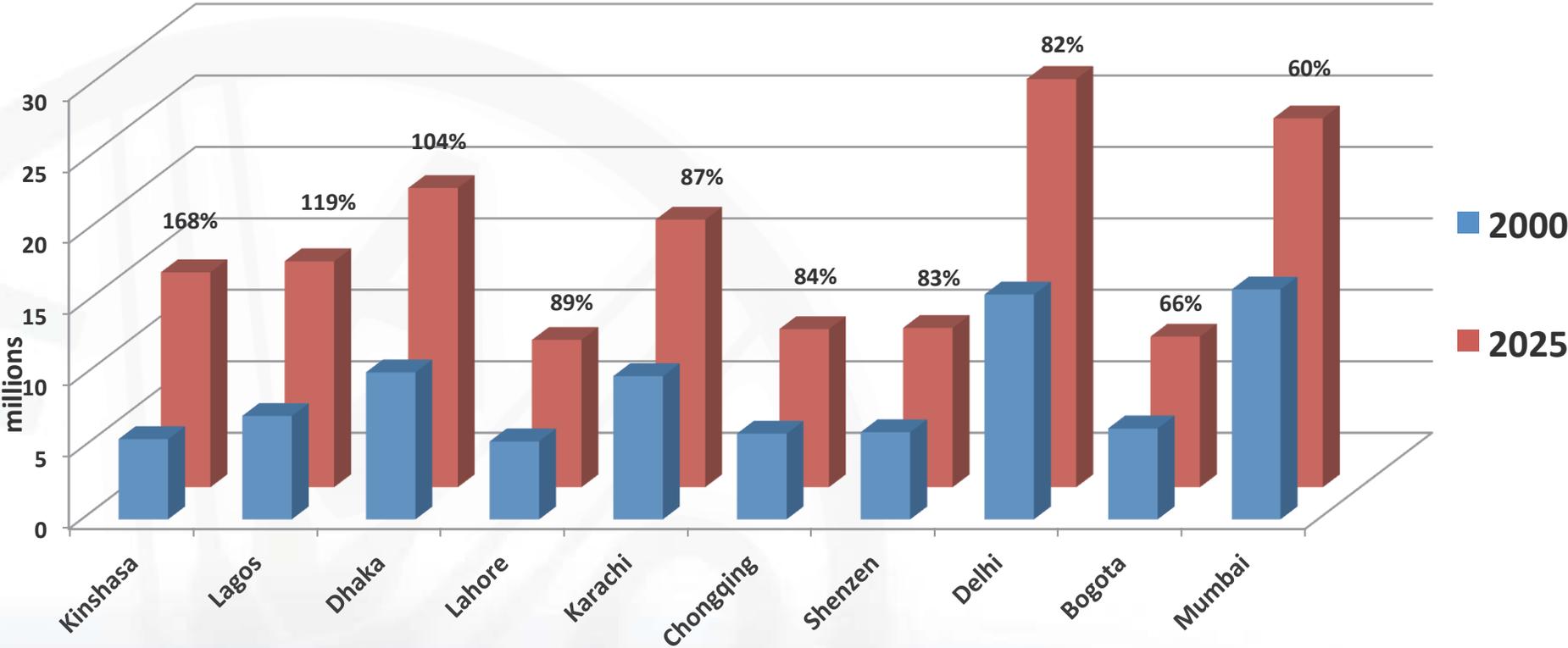
# World's fastest growing towns and cities are in low-income developing countries.

Urban population growth in the developing world, 2010-2050



Source: United Nations Population Division

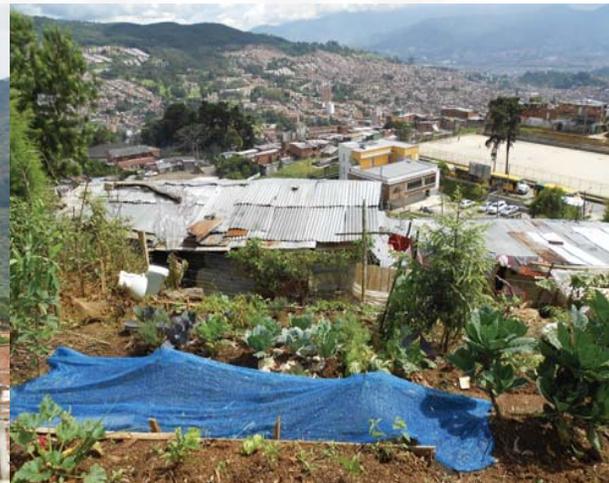
# Population growth in selected cities, 2000-2025



Source: United Nations Population Division

# Effects of rapid urbanization

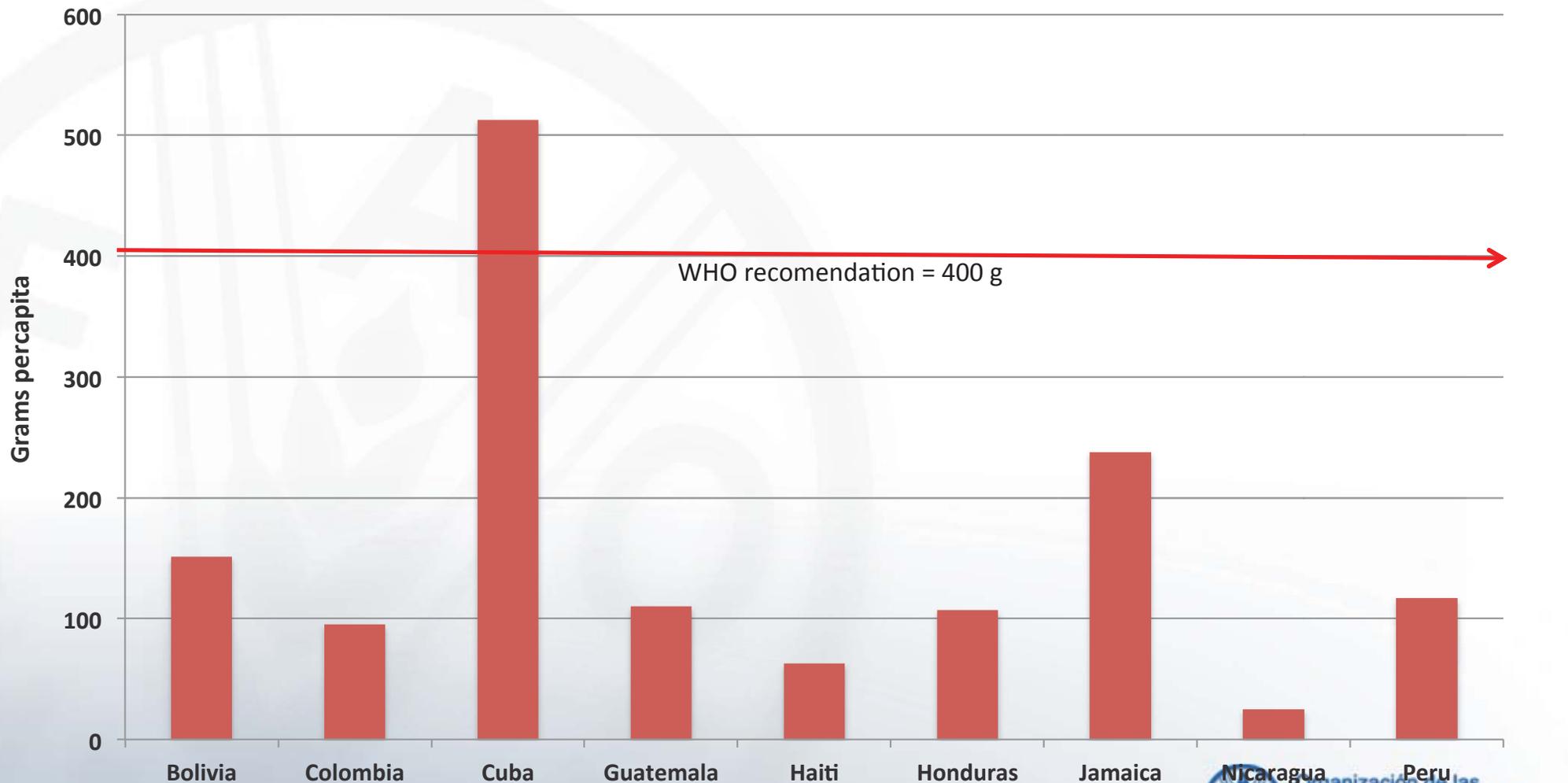
- ✓ High levels of poverty
- ✓ Food insecurity & malnutrition.
- ✓ High unemployment
- ✓ Crime, social disorder
- ✓ Demographic imbalances with associated economic and political implications
- ✓ Pressure on water, waste, social, medical, educational & industrial services.
- ✓ Overuse of local resources.



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# Daily consumption of fruits and vegetables for selected countries in LAC

Chile: 2011: 231 gr/ cápita; 15% population complies

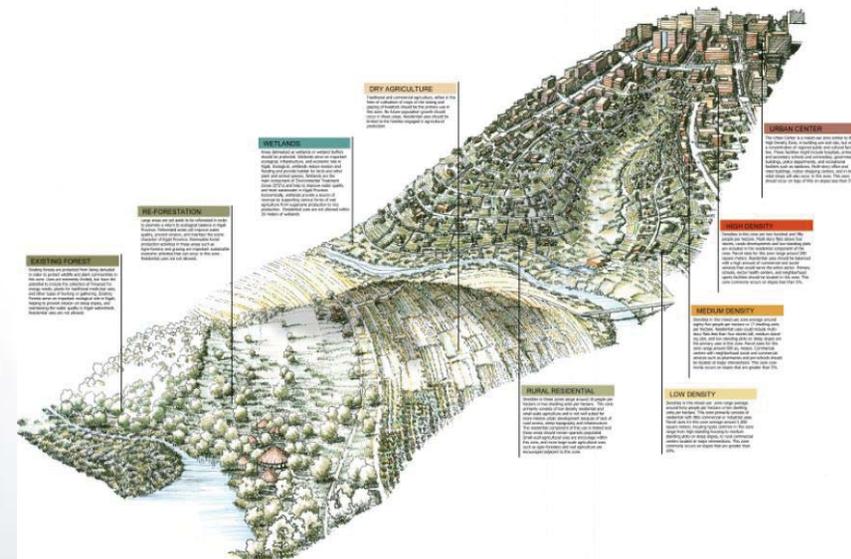


Fuente: FAO

# The promise of “greener cities”

## Urban development that fosters:

- ❖ Resilience and self-reliance
- ❖ Economic development
- ❖ Environmental sustainability
- ❖ Social inclusion
- ❖ Food and nutrition security
- ❖ Sustainable livelihoods
- ❖ Safe, clean environment
- ❖ Good governance
- ❖ Healthy communities



# Urban and peri-urban agriculture: Livelihood/survival strategy

**Africa: 130 million producers**

**Latin America: 230 million producers**

- ❖ **Beijing: 50% of fruit and vegetables**
- ❖ **Havana: 60% of Cuba's vegetables**
- ❖ **Hanoi: 150,000 tons annually**
- ❖ **Kinshasa: >75,000 tons of vegetables**



# Major Challenges

- Lack of:
  - legal, institutional frameworks for the integration of agriculture in urban areas
  - quality planting material & seed production facilities
  - access to soil, land, and water in cities
  - lack of extension services for small grower
  - lack of financing opportunities for urban agriculture
- Difficult for growers to integrate into existing urban produced food chains



# Alternatives

- Technology for urban farming
  - Greenhouses
  - Seed production
  - Bio-insecticides
  - Vertical gardening
  - Hydroponics and aquaponics
  - Water recycling and harvesting
  - Back yard gardening
  - Distribution chains
  - Facilitating market entry (information)
  - Competitive access



# Learn by doing: Methodology and manuals



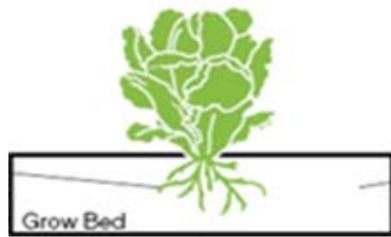
# Models for UPA in small areas and hard soil



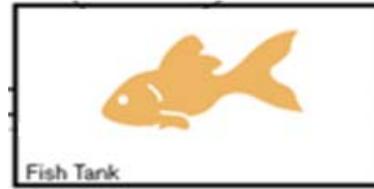
# Hydroponics: No soil



# What is Aquaponics?



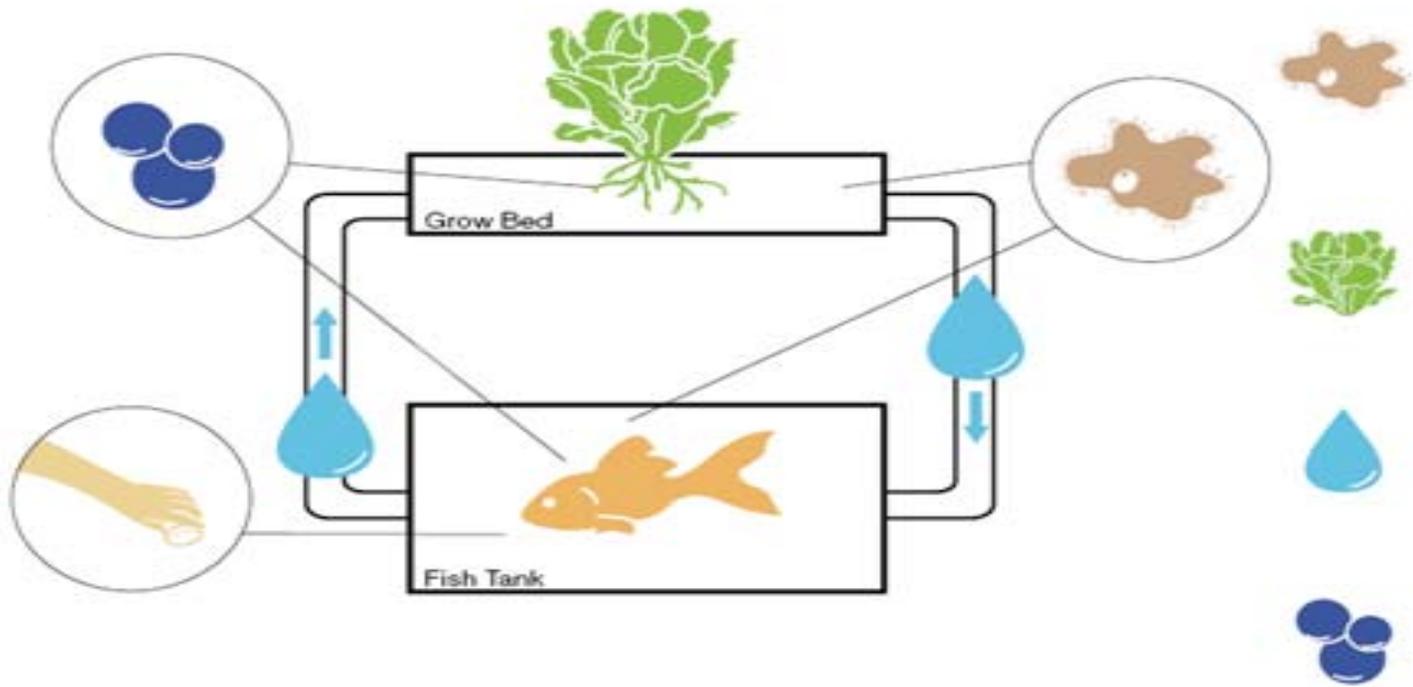
hydroponics



aquaculture



## Aquaponics



Fish producing ammonia

Bacteria converting ammonia to nitrate

Plants Taking up nitrate

Re-circulating water

Oxygen for plant roots and fish

Aquaponics is the combination of soil-less vegetable growing (**hydroponics**) and fish farming (**aquaculture**) within a closed re-circulating system



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# Aquaponics in Palestine



# Water Harvesting for AUP in Collaboration-Climate Change Group

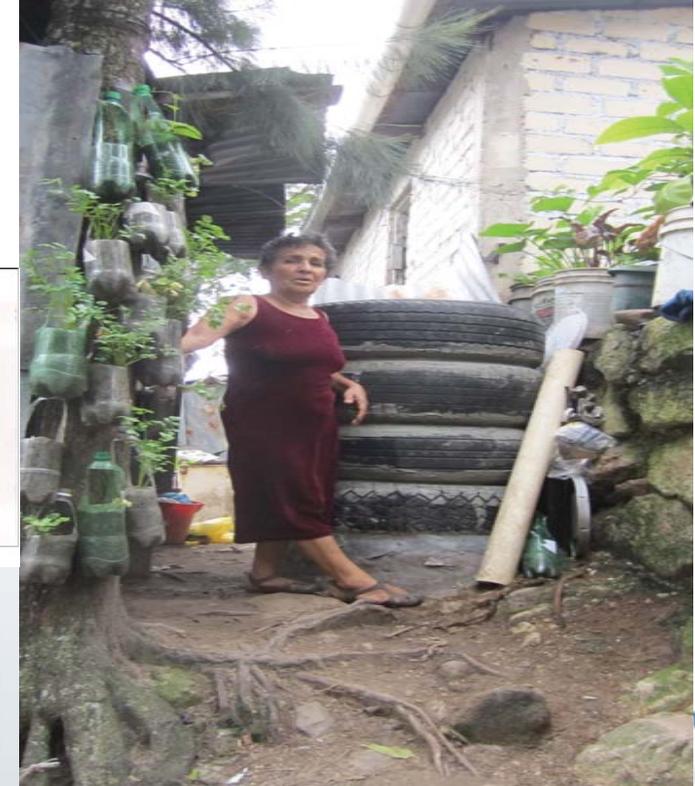
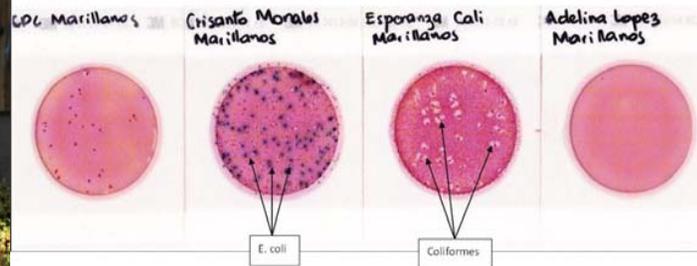
## Gestión del agua

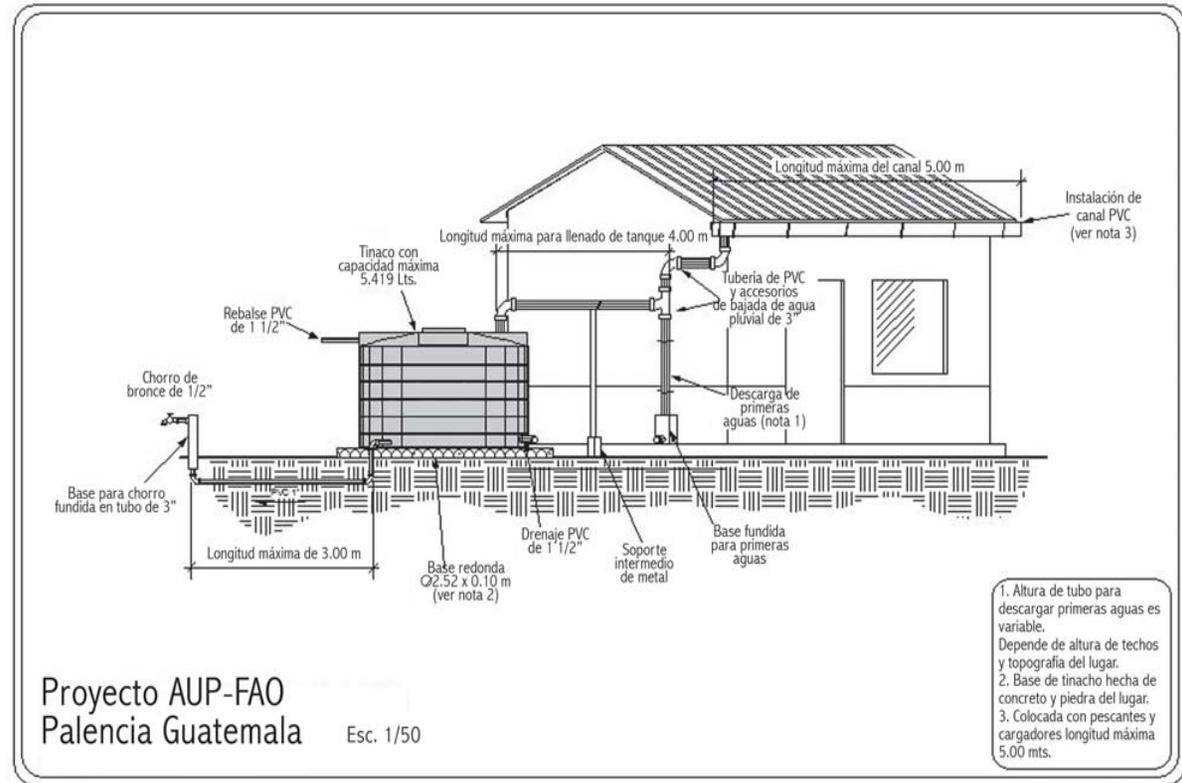
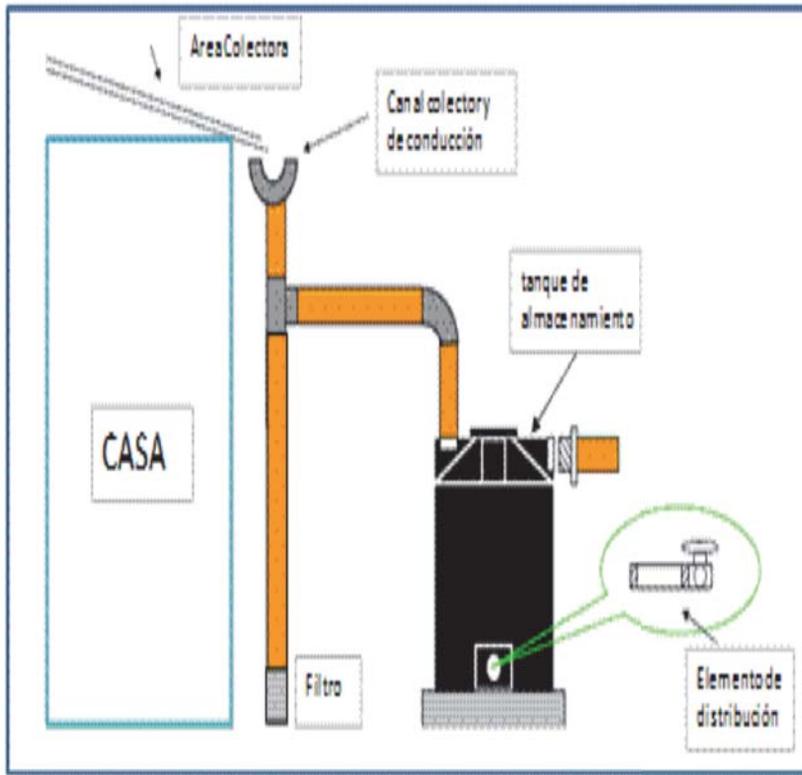
### Intervenciones en el Proyecto

- 1 • Captación y almacenamiento de agua de lluvia
- 2 • Mejora de la captación de fuentes de manantiales municipales
- 3 • Almacenamiento de agua en lotes municipales

AGUA A NIVEL FAMILIAR

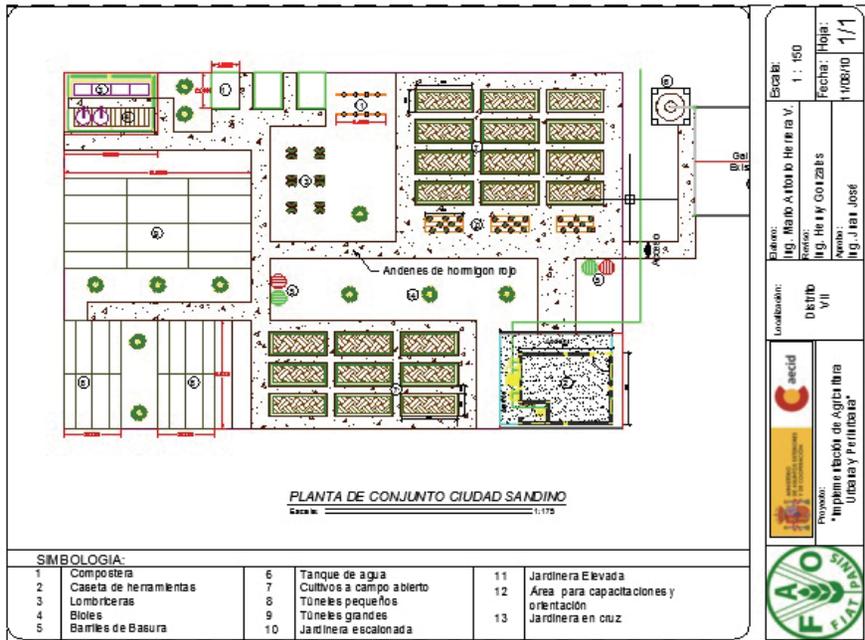
AGUA A NIVEL MUNICIPAL





Proyecto AUP-FAO  
Palencia Guatemala Esc. 1/50

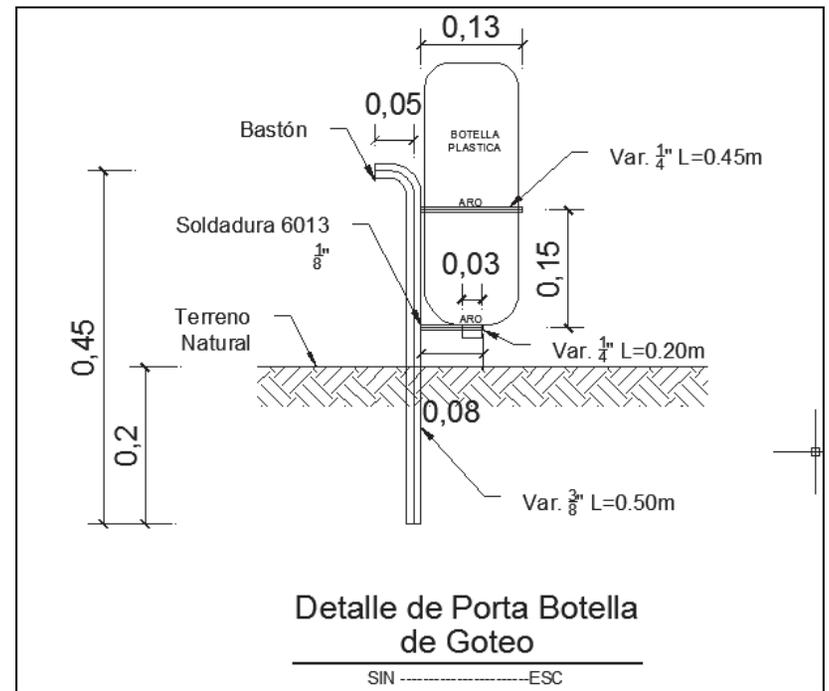
1. Altura de tubo para descargar primeras aguas es variable. Depende de altura de techos y topografía del lugar.
2. Base de tinaco hecha de concreto y piedra del lugar.
3. Colocada con pescantes y cargadores longitud máxima 5.00 mts.



PLANTA DE CONJUNTO CIUDAD SANDINO  
Escala: 1:175

Escala: 1:150  
 Fecha: 1/1/11  
 Autor: Ing. Mario A. Abalo Herrera V.  
 Proyectista: Ing. Herly Gotzals  
 Asesor: Ing. J. Esteban José  
 Localización: Distrito VII  
 Proyecto: "Implementación de Agricultura Urbana y Periurbana"  
 Logos: FAO, SIDA, UNICEF

Capacidad (L)	Riego Litros/m <sup>2</sup>	Área de huerto (m <sup>2</sup> )			
		5 m <sup>2</sup>	10 m <sup>2</sup>	15 m <sup>2</sup>	20 m <sup>2</sup>
		Días de riego			
4,100	4.0	205	103	68	51
6,000	4.0	300	150	100	75



## Methodology to harvest water, and efficient irrigations systems



# Recycling gray waters



Grey water filter US\$ 24.00

Water well

Recycled tires US\$ 17.00

Plastic 6000L US\$ 682.48



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# Recycling and sustainability: Creativity



# Recycling and sustainability: Composting & trash removal



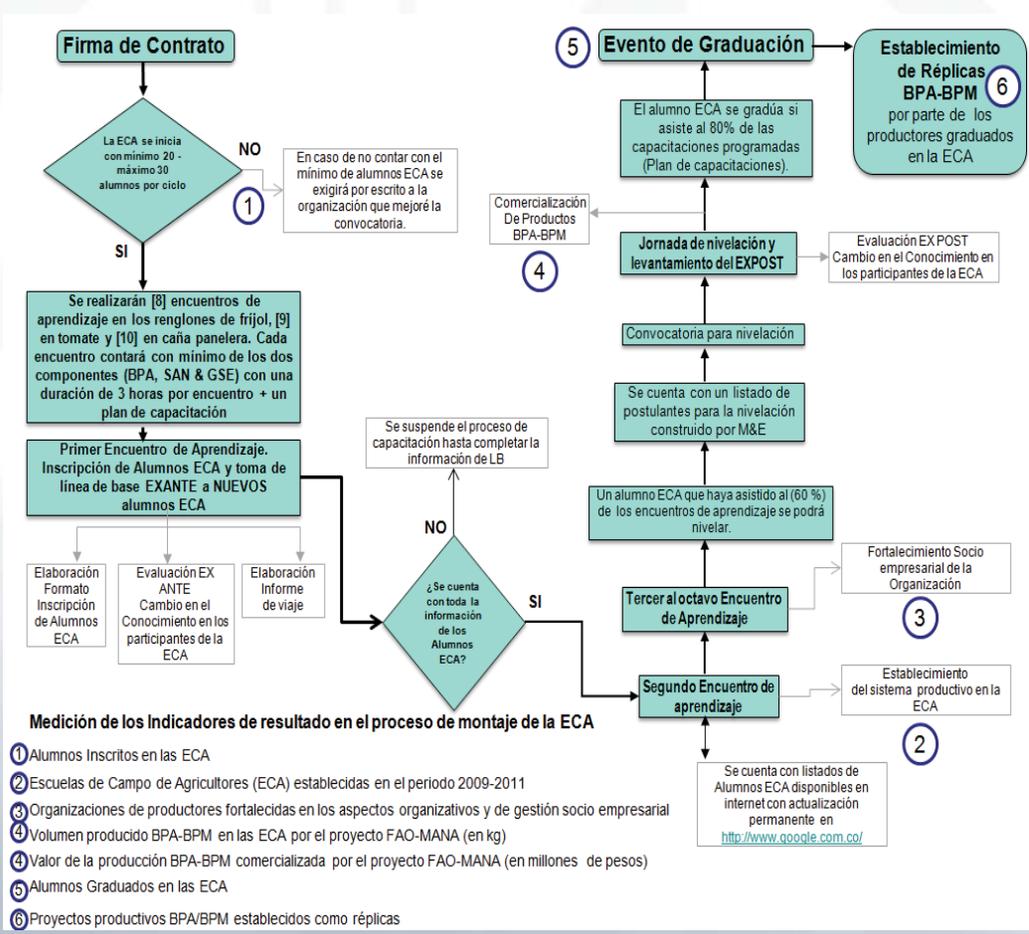
# Farmers Market, Fairs, and Commercialization



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# UPA contributions:

1. Complementary work
2. Extra income
3. Differentiated brands
4. Insertion into existing markets
5. Commercialization and access to new distribution chains and markets: Carrefour



# School Gardens and UPA

## School gardens

- ❖ Promote horticulture
- ❖ Improve quality of meals
- ❖ Practical nutrition education
- ❖ Increase household consumption



<http://www.rlc.fao.org/es/publicaciones/mapeo-implementacion-proyecto-educ-huerto-escolar/>

# Handicapped children: nutrition and skills development



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Відомості про організацію

# Chef and nutritionists

## Adoption of new fruits and vegetables



# Community gardens



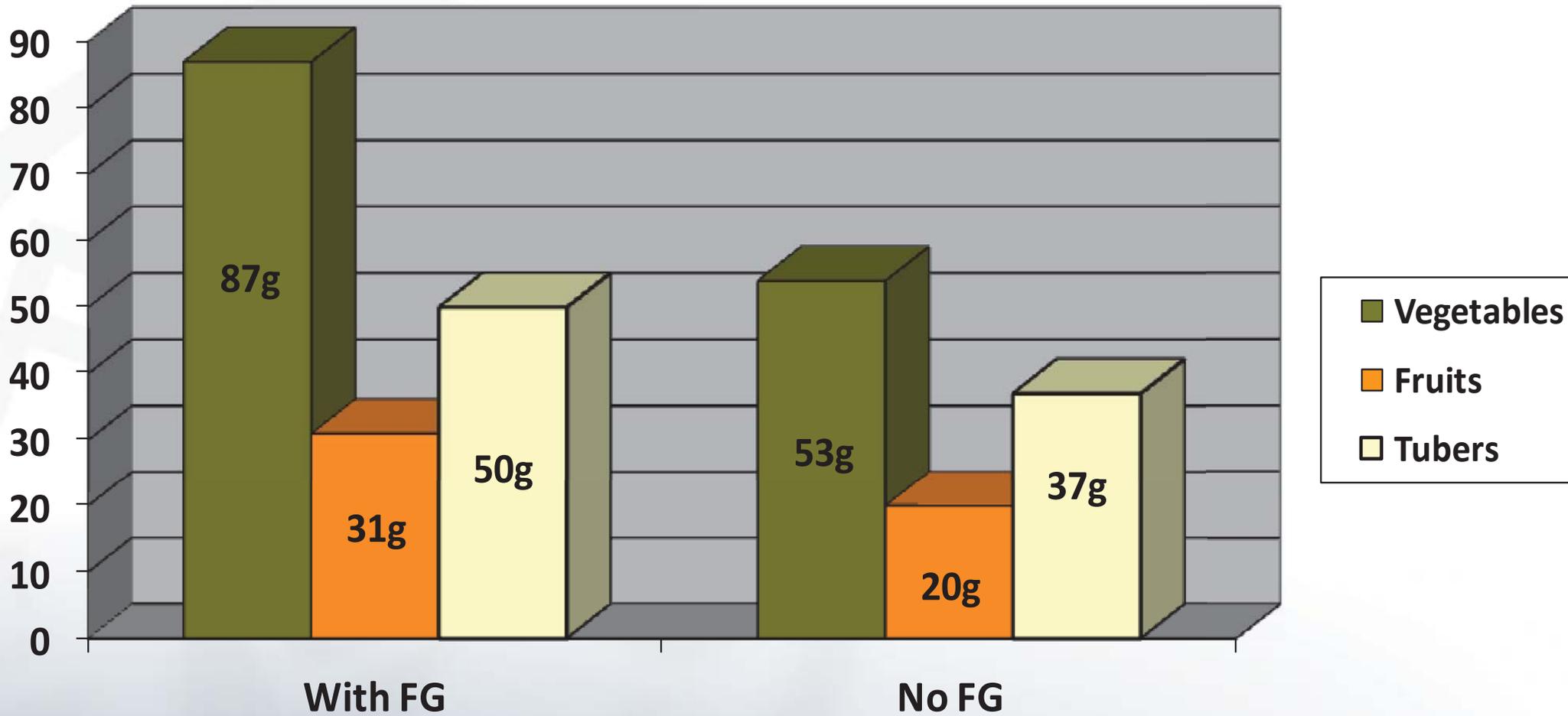
# UPA under emergency situations: Early establishments subsistence crops





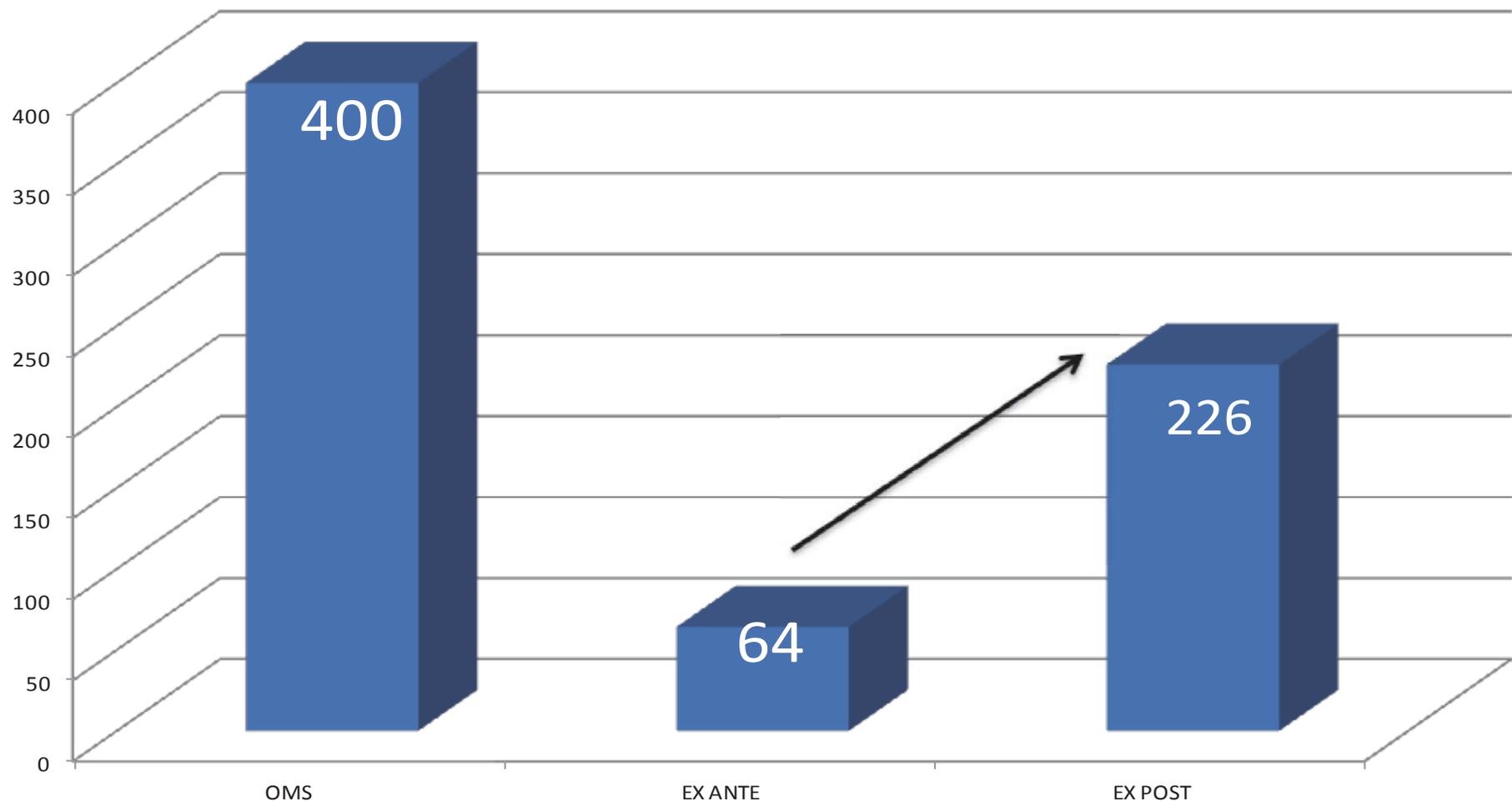
# Consumption of fruits and vegetables by families with and without family garden.

## Honduras, 2012



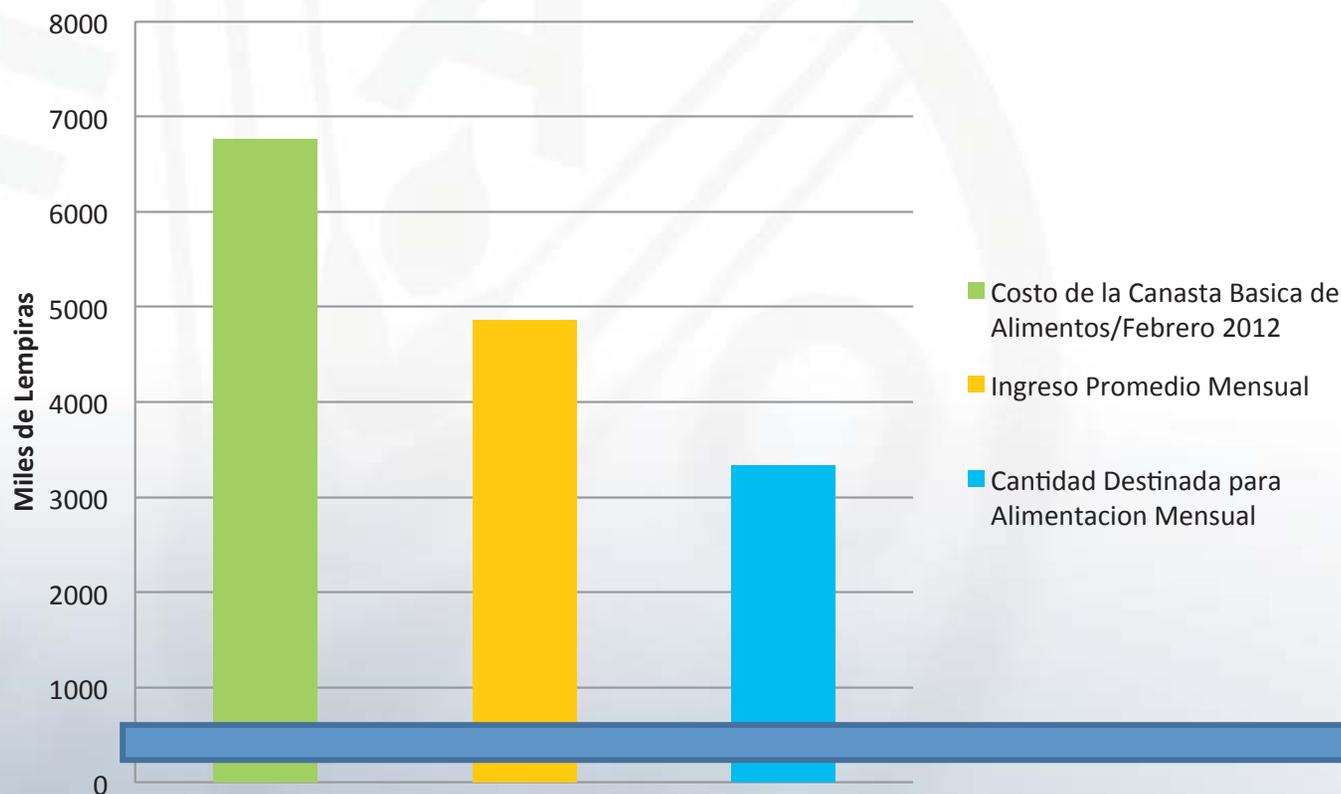
# Consumption of Fruits and Vegetables in Popayán, Colombia, 2012

Consumption of Fruits and vegetables



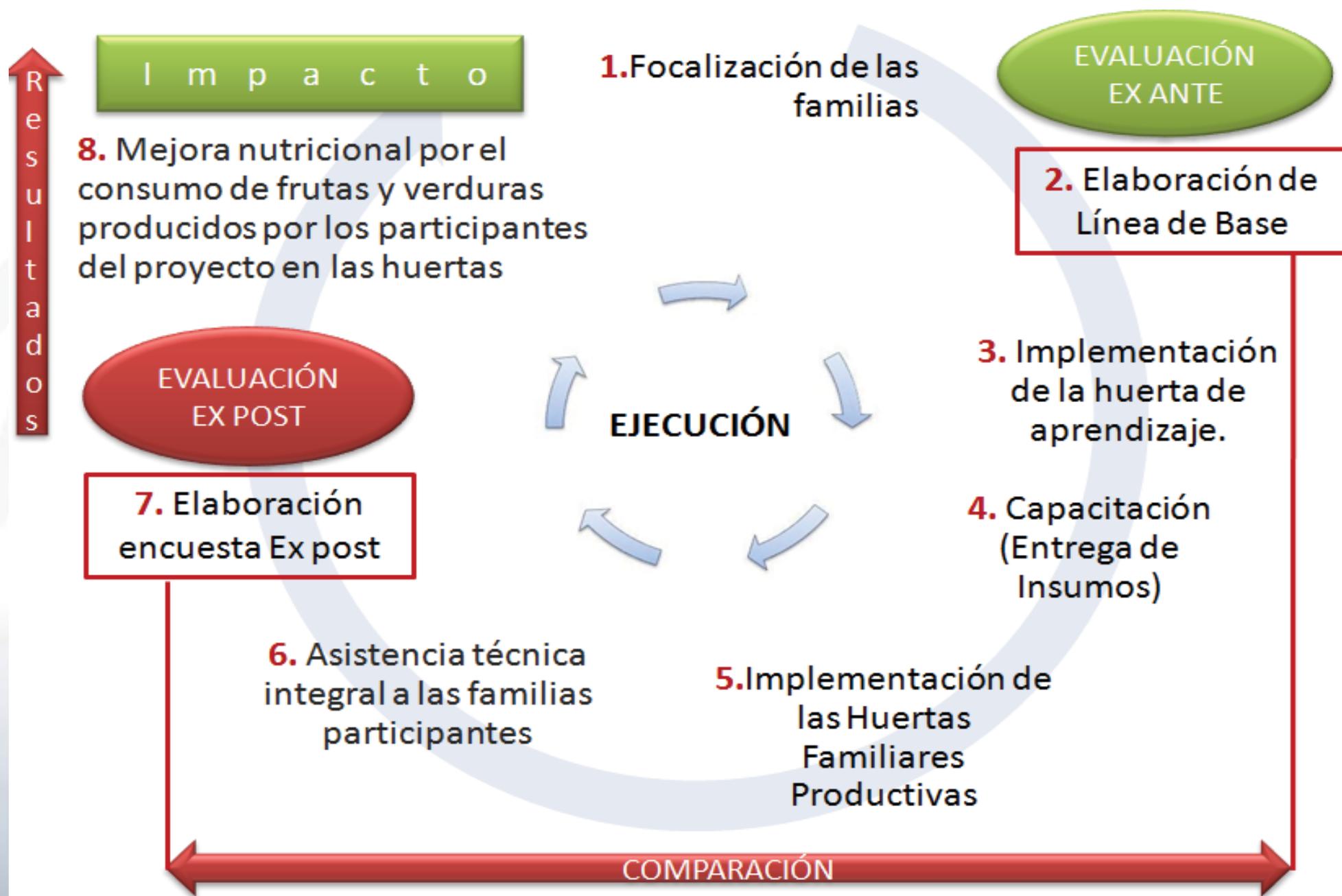
# Contribution of family garden to food basket Honduras, 2012

Descripción	Lempiras	Porcentaje (Aporte Económico del Huerto Familiar)
Costo de la Canasta Básica de Alimentos/Febrero 2012	6766.19	
Ingreso Promedio Mensual	4858.58	
Cantidad Destinada para Alimentación Mensual	3332.58	
Aporte Económico del Huerto Familiar Mensual	420	<b>13%</b>

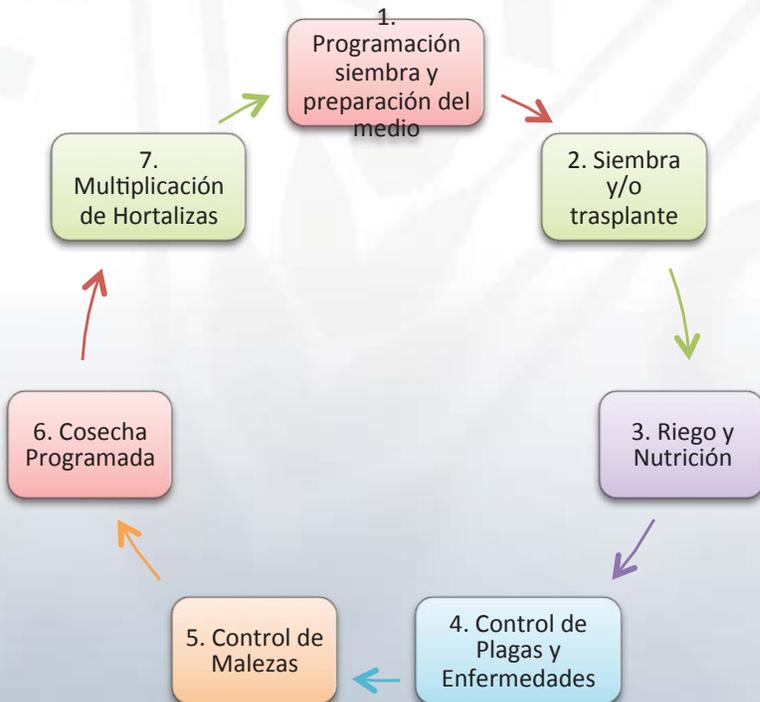
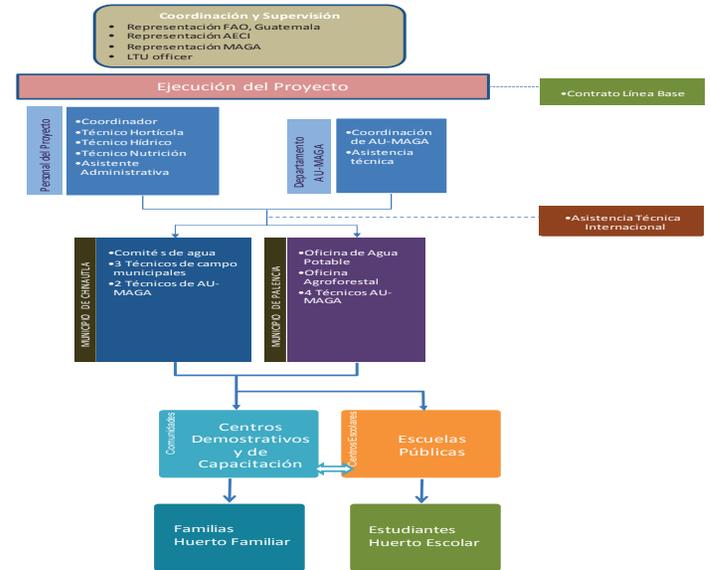
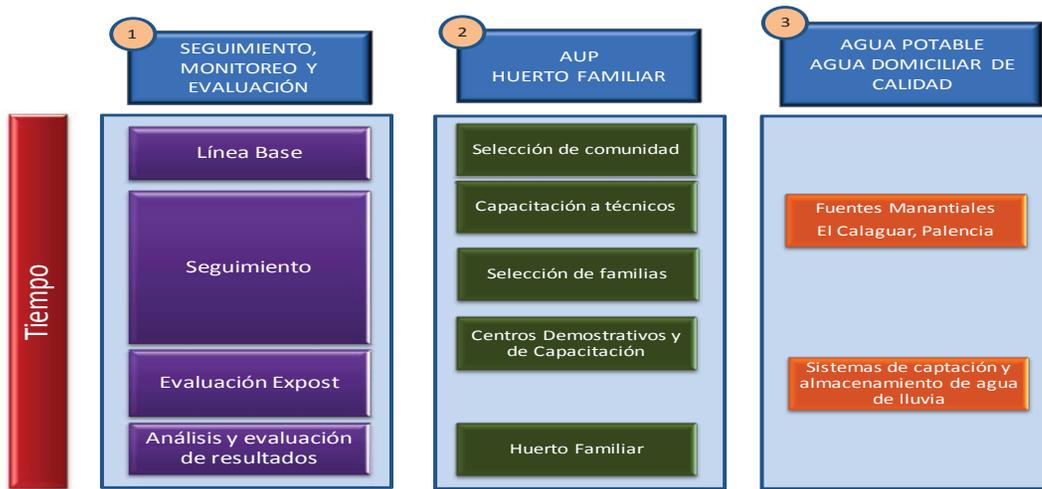


**Family garden  
represents 13% of the  
income destined for  
food**

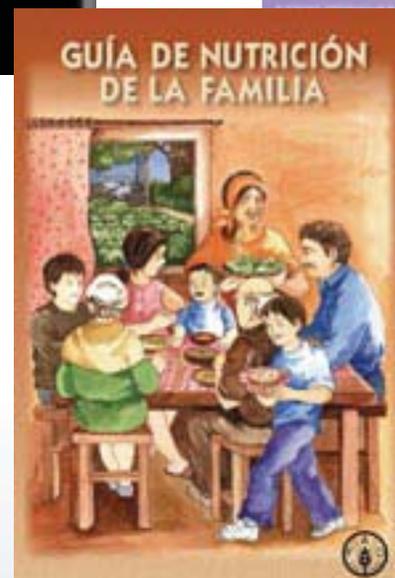
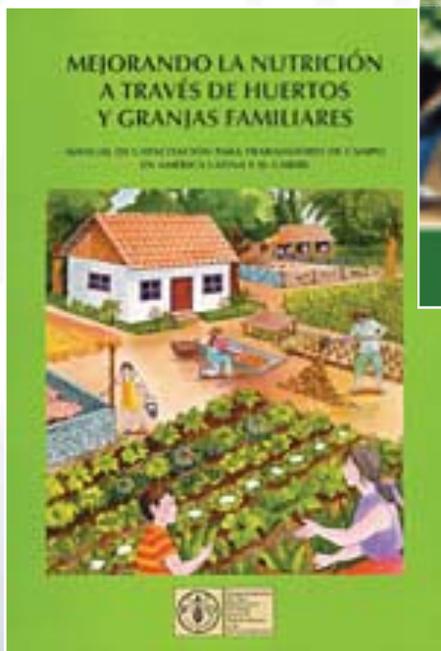
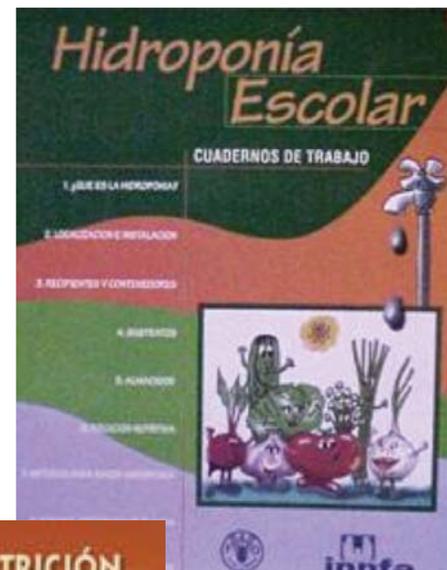
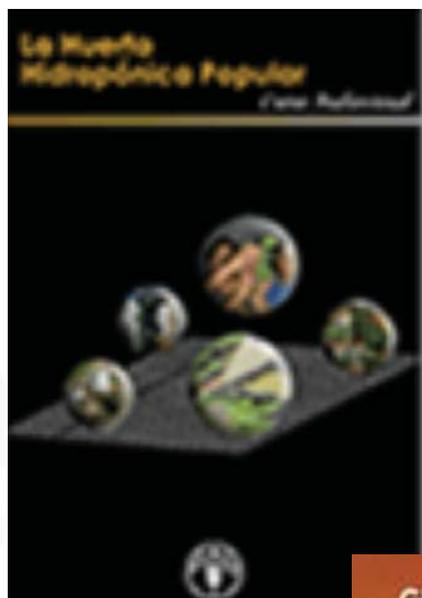
# Basic intervention Model



# Models



# Publications and on line videos



<http://www.rlc.fao.org/es/conozca-fao/prioridades/agricultura-familiar/>

[http://www.rlc.fao.org/es/publicaciones/lista/?tp=list\\_group\\_familiar&or=0&submit=Enviar](http://www.rlc.fao.org/es/publicaciones/lista/?tp=list_group_familiar&or=0&submit=Enviar)



# FAO contribution to UPA: Challenges

- Development transfer of sustainable techniques for UPA/FF
- Development of simple methodologies for technology-transfer.
- Capacity building and strengthening local institutions
- Promotion of public policy on family farming
- Building knowledge
- Publish/disseminate experiences
- Inexpensive methodologies to the UP grower (access to information, use of internet, mobile phones)



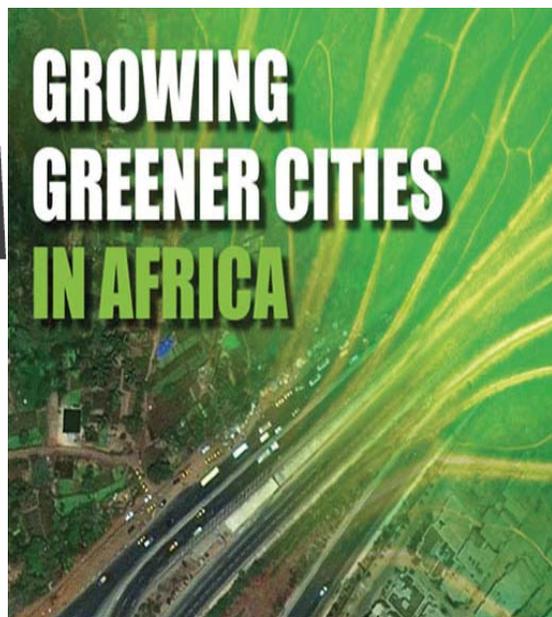
# **Good governance: Integrate UPA into national & urban planning Design or adapt cities to be greener cities**

- ❖ **Argentina: national policy to promote UPH**
- ❖ **Brazil: Ministry for Combating Hunger sets urban agriculture guidelines**
- ❖ **Colombia: Departmental policies in Antioquia, Valle, Cundinamarca**
- ❖ **Egypt: “Green food from green roofs”**
- ❖ **DR Congo: municipal committees and local technical support**
- ❖ **Cape Town: “start-up kits” for gardeners**
- ❖ **Nairobi: Municipal agriculture department**
- ❖ **Hanoi: 100 plant protection staff**
- ❖ **Kigali: Urban master development plan**





# GROWING GREENER CITIES



## GROWING GREENER CITIES IN AFRICA

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<http://www.rlc.fao.org/en/about-fao/regional-priorities/family-farming/>



# Family Farming

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Великобритания и Ирландия