

# **Global Leadership Training Programme in Africa**

## **Title of Research**

Current status and continuous factors of Sack Gardening in Nairobi, Kenya

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## **English Summary**

Currently, urban agriculture has gotten a great attention as an effective prescription to solve serious urban problems such as “food desert” in inner city. Food self-sufficiency by urban agriculture is primary of importance in developing countries, since they consistently suffer from unstable market affected by rapid inflation and riots. This study identified the current status and continuous factors of the vegetable growing activity using hemp sack, called “Sack Gardening”, practiced in inner cities of Nairobi, Kenya. Sack Gardening was spread widely by financial support of NGO, but it has been shrunk rapidly after NGO left. We conducted an interview to two groups: current gardeners (40 people) and former gardeners (17 people), and compared their living standard and individual attributions. The result showed that there is hardly difference in economical level in the two groups, while participation ratio in mutual financing association and educational standard are significantly different. We concluded that continuous factors of Sack Gardening are not always financial one, but it may include self-subsistence of individuals and problem-solving abilities developed by better education.

Keywords: Food self-sufficiency in household, Food security, Urban agriculture, Inner city slum

## Main Text

### 1. Background

#### 1-1. Introduction

The world population reached 70 billion in 2011, and it is estimated world population will reach 90 billion by 2050. The remarkable population increasing has occurred mainly in developing country. In especially, Sub-Saharan Africa has 5.1 total fertility rate <sup>[1]</sup>; the number is 3 times more than developed countries. It is supposed that one of general characteristics of Sub-Saharan African cities is high informal population ratio. Therefore, informal settlement is supposed to act as receptacle in rapid urbanization. Nairobi, the capital of Kenya, has more serious problem in such case. The reason why the area ratio of the informal settlement is extremely low since Nairobi built by UK in the colonial period, and registration of land and development of the suburbs progressed early compared with other African cities <sup>[2]</sup>.

Table 1: Information of Sub-Saharan African cities

	Nairobi	Lusaka	Dakar
Area size	696 km <sup>2</sup>	360 km <sup>2</sup>	547 km <sup>2</sup>
Informal settlement size	5.20%	35.40%	33.00%
Population (year)	313.8M(2009)	174.2M(2010)	226.7M(2002)
Informal population ratio	55-60%	60-70%	30-40%
Informal population density	52096 p/km <sup>2</sup>	9574 p/km <sup>2</sup>	4997 p/km <sup>2</sup>

Thus, the immediate improvement is indicated since the slums in Nairobi are overpopulation area compared with other African cities and living condition is also inferior. On the other hand, if urbanization progresses with population increasing, the slum of other African cities will also be considered that becoming the same congested area being predicted and making the subject in the slum in Nairobi and its solution public leads also to improvement in the living environment of other cities.

#### 1-2. Sack Gardening

In such an overpopulation area, various problems, such as inferior health environment by lack of infrastructure maintenance, shortage of the goods by no road, shortage of drinking water and inflation, are pointed out. In Nairobi, the price of corn doubled in these five years. Moreover, although 80 percent of the resident lives in the rented house on the slum in Nairobi, the house rent increased 3 times in ten years, and also introduction of electricity and gas is pressing the household economy.

With the decrease of the amount of money, which can be cleft for food expenses, the hood security in a slum has been severe problem.

For reasons of such situation, "Sack Gardening" has progressed on the slum in Nairobi. Sack Gardening is to grow kale and spinach etc. in a sack, which put stones, soil and manure in. The point that Sack gardening differs from the usual vegetable garden is as follows (Fig. 1 and 2).

- (1) Cultivation is possible also in an overpopulation area as it is not to need big space.
- (2) Since it can grow with 5 liters per day of water, cultivation is comparatively easy also on the slum where reservation of safe water is difficult.
- (3) Since it grows from the upper surface and the side, there are many crop yields.

According to Gallaher et al. (2013), for the Sack gardening enforcer, the improvement was found about food security, and when the largest, it was carried out by 5000 houses. However, while there is such an advantage, development of Sack Gardening is not seen in other areas.

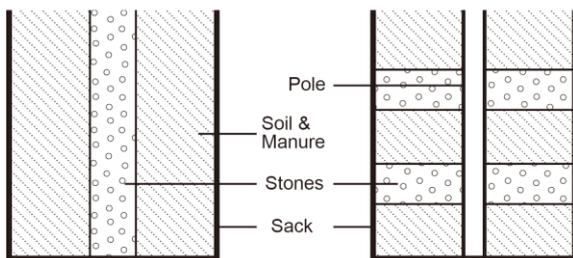


Fig.1: Patterns of Sack gardening



Photo 1: Sack gardening

Development of Sack Gardening in Nairobi is largely based on support of NGO "Solidarites International" of France. This measure has been taken by Solidarites from 2008, it aims at the improvement of food security, and the increase in an income since distributing materials required for enforcement of Sack gardening free. However, it is thought that a certain factor has influenced in enforcement of Sack gardening, since the variation of the enforcement number of houses is found depending on the region in the same slum.

## 2. Purpose

Based on the these backgrounds, the purpose of this study is to investigate the development factor of Sack gardening in an overpopulation slum, and to aim at becoming the knowledge for the improvement in living environment in other overpopulation slums besides future.

### 3. Study area

The largest slum “Kibera” in Nairobi, Kenya (Fig.3)

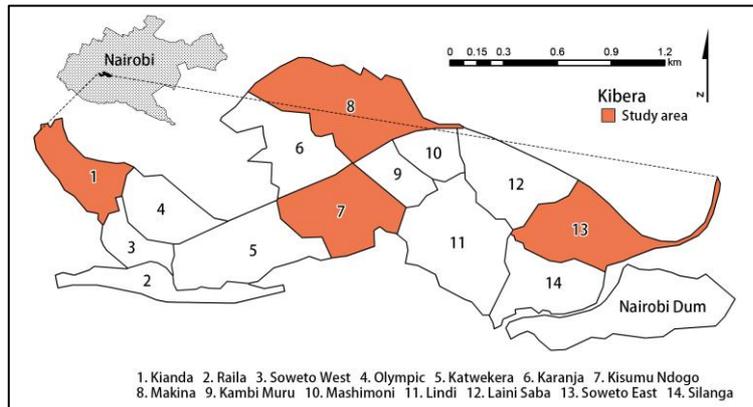


Fig.2: Study area (made by Nairobi Land Use 2010)

### 4. Methods and Materials

#### 4-1. Outline

It is shown clearly by literature review the formation of Nairobi and Kibera, and why Sack gardening has progressed in Nairobi. Second, in field survey, to interview and get location information as used by GPS. Next, to analyze by the human factor what kind of person has carried out Sack gardening by what kind of method, and geographic factors, such as soil, a head, and geographical feature. Finally, discuss from two directions using the analysis result (Fig.4).

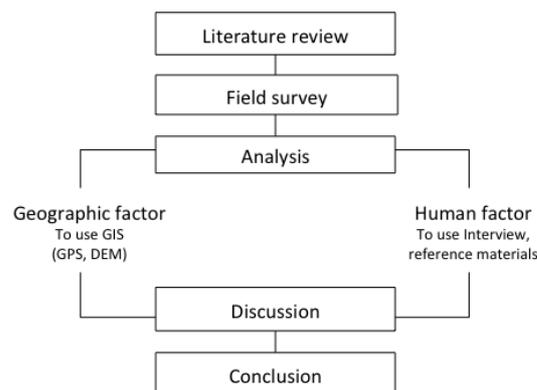


Fig.3: Flowchart of method

#### 4-2. Materials

##### (1) Interview result

UN-Habitat : the person in charge of KENSUP

Ministry of Housing

NGO(Maisha ya Raha, Solidarites International, Umande Trust, Undogo Organization)

Youth group members

Sack gardeners (57 peoples living in Soweto East, Makina, Kianda, Kisumu Ndogo)

- (2) Research report by UN-Habitat
- (3) Research report by Solidarites International
- (4) Nairobi Land Use 2010
- (5) Kenya's digital elevation model at 90-meter resolution

#### 4-3. Methods of Interview

(1) For Sack gardeners:

\* Methods

It is face-to-face interview using interview sheet. In Soweto East, it interviewed all Sack gardeners for the whole region by visual observation, and sorted out the person who ended Sack gardening by snowball sampling, and in other three area, it interviewed sorting out 10 Sack gardeners each areas by snowball sampling.

\* Contents

- i. Basic information (family size, education, occupation, etc.)
- ii. Information of Sack gardening (motivation, how to get materials, challenges, etc.)
- iii. Information of social network (relation with neighbors and NGO)



Photo 2: The situation of interview

(2) For others

Used interview sheet and IC recorder.

## **5. Result and progress**

Now, field survey is completed and analysis of the result is conducted. Analysis classifies Sack Gardeners every four areas, performs a cross tabulation and extracts the difference by an area.

### **5-1. Conclusion from literature review**

From Matsuda(1999), Katsumata(2011)

#### **5-1-1. Formation of Nairobi**

There is the origin of Nairobi in transit camp having set to Nairobi in 1899, while building the Uganda railroad, which connects Uganda to Mombasa. The reason this place was chosen is that it is in the middle of main port towns called Mombasa and Kisumu, to have the comfortable climate and abundant water supplied from the Aberdare mountain systems, and to be located on the center of an agricultural zone. In this way, the migrant of Nairobi in which Europeans were formed by becoming a subject increased from the reasons of that it is an important place of traffic, rich environment, etc., and it became a capital of British territory East Africa 1907. For this reason, in Nairobi, the private development sector and housing loan organization for the home for Europeans and Asians or a real estate investment have developed early. After independence, the governmental land reform program performed rapid development of Nairobi, the remarkable increase in population of 7% of an annual rate was seen, and development of the suburbs progressed early. Furthermore, since the landowner was clarified, room for low-income residents to do unapproved occupation was restricted to only 5% of land to gross areas, such as an unused land along a river or a track and in a trading estate.

#### **5-1-2. Political background of Nairobi**

Since it became independent in 1963, Kenya has been called "the honors country in Africa." Therefore, the riot called the Post-election violence, which took out over 1000 dead persons and over 300,000 domestic evacuees from the end of 2007 to February, 2008 surprised the world very much. However, such a riot was seen in Nairobi former repeatedly. Since one of the reasons which accomplished the development with Kenya so far has followed the pro-American & pro-British unlike other neighboring countries getting socialism, it is that the assistance from the west side was continued. Therefore, citizens have had distrust to the government by governmental state power politics. The conflict between Luo and Kikuyu, which leads to the Post-election violence behind, has been born by this process. The earliest riot is 1969. Since the guess that assassination of Luo politician, Tom Mboya was what is depended on directions of President Jomo Kenyatta of a Kikuyu person spread, the anti-President demonstration by a university students were carried out. Although a

conflict between Luo and Kikuyu was seen also in the town, the police clamped down on the Luo side in both cases. Although such a riot was seen several times, the government repeated to clamp down at every time and the slot of the government and a citizen deepened. The structural adjustment program began from the further 1980s, and city residents' life further became destitute. Liberalization of exchange control and containing farm export, privatization of a public corporation, government officials' reduction, etc. were carried out, so rapid inflation and the increase in unemployment grew worth dramatically in the process. In Nairobi where the distrust to the government was increasing, four techniques have progressed as self-help for surviving the bottom of such severe environment. (1) Participation of informal sector, (2) City farming, (3) Mutual assistance association, (4) Participation of development organization, there are four, among these similarity is regarded as (2) and (3). (2) City farming was the technique of increasing rapidly in the big city in Africa, and to grow vegetables without legal permission at the vacant lot near a place of residence. In Kenya and Tanzania, the number of cultivation household increased from 10-25% in early 1980s to 60% in 1987. Although the technique of (3) tries to aim at self-help by carrying rural cooperation nature into city life, it is considered that the point common to these two of making an agricultural life and city life making compatible has African urbanism.

## 5-2. Support organizations

It turned out that the project of Sack Gardening by Solidarites International was started in March, 2008, and it has ended in July, 2012. It is the purpose to educate the person for supporting hood security continuously, and this project is because it was judged with the support for four years and four months that it was enough. In July, 2012 and afterwards, local residents succeed activity and it is working by limiting a place. The two differences were summarized in the table (Table. 2).

Table 2: The difference in support organizations

	Solidarites	Youth group
FUND	EU,UN,CIAA(€1.6M)	Donation & Lecture expense
MEMBER	39 members	17 members
AREA	Whole Kibera & Mathare	Makina, Kianda, Kisumu Ndogo
GOV	Participation	Partial participation
INCOME	15~30K (ksh)	None
ACTIVITY	22 days/month	8 days/month
PERIOD	2008/3-2012/7	2012-

The biggest difference among both is a fund. In the project of Solidarites, the first 21 months had

1,600,000-euro financial support in all from UN, CIAA, etc. about the remaining second half from EU. On the other hand, the youth group doesn't have such financial support and it is managed by the income from the member itself contribution and a 1000 Ksh per 6 hours gardening short course.

Next, a big difference is the scale. In the project of Solidarites, there were 39 core members and 25000ksh was paid to these all. Furthermore, since the whole region of vast Kibera was covered, seeds and manure were distributed to the organization of each area, and structure for cooperation had been taken. It is assumed that 45000 houses were finally carrying out Sack gardening. On the other hand, in the youth group, there are ten prime members, and in Kibera, the sphere of activity is also limited by three areas, while in 14 areas. In the organization of each area whose provision of a seed or manure was lost, support of Sack gardening was also ended and more than the half of Gardener who interviewed had already ended Sackgardening in the Soweto yeast which is outside the sphere of activity of a youth group.

However, in Kianda, Kisumu Ndogo, and Makina which are continuing activity, many Sack Gardening enforcers are still continuing activity. By Makina, it is especially carried out actively and the meeting of one week is also carried out among Gardener.

### 5-3. Current states of gardeners

#### 5-3-1. Purpose of carrying out

To get gardeners(N=40) to choose from 4 choices; (1)for food security, (2)for their household economy, (3)for neighbors, (4)as community activity, 33 persons chose "for Food security", 8 persons chose "for their household economy", 5 persons chose "for neighbors", and 4 persons chose "as community activity"(Fig.6).

It is revealed that Sack Gardeners ongoing have carried out Sack Gardening for food security as main purpose.

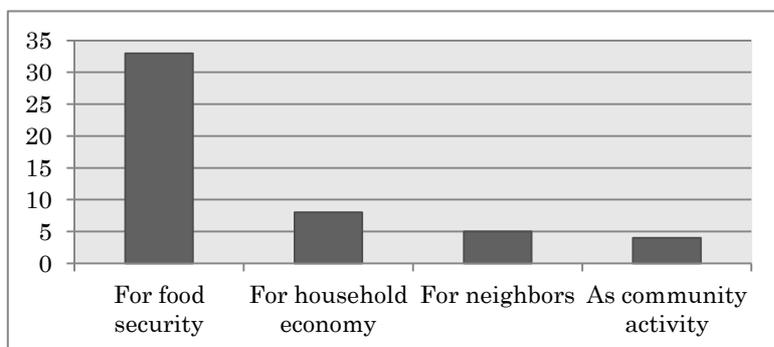


Fig.4: Purpose of carrying out

### 5-3-2. Cultivated crops

Many gardeners were seen in order of Kale, Swisschard, Tomato, Onion, Terere, and Coriander (Fig. 7). Since kale and spinach are often eaten daily in Kenya, nutritive value's being high and cultivation are comparatively easy for them and growth is early, it is thought that growers have increased in number.

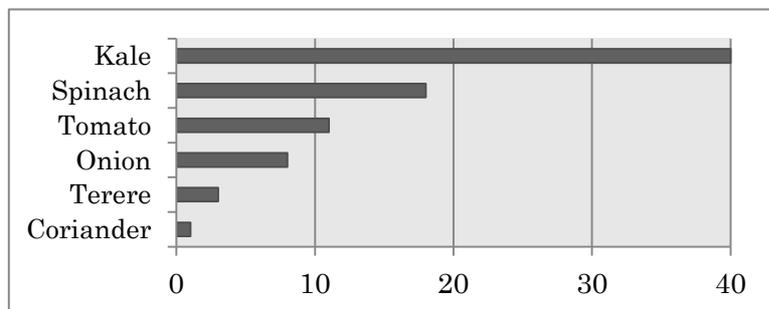


Fig.5: Cultivated crops

### 5-3-3. Number of sacks

It was 37 persons that the present condition could be checked among 40 Gardeners. Furthermore, 8 gardeners directly planted into soil from a hemp sack. If it restricts to 29 persons who are not transplanting, an average of 5.3 sacks (the maximum 20, the minimum 1, standard deviation 4.3) per person are possessed. If there are about 5 sacks, it can be said that it is possible to compensate a part for almost all the vegetables of a meal, and there is sufficient meaning from the point of domestic food self-sufficiency.

### 5-3-4. Problems of Sack gardening

I had the point which thinks is a subject when carrying out Sack Gardening to an enforcer raised to two or more freedom, and it also united and asked the reason. Having been mostly raised as a subject point are "pesticide is expensive" 31 peoples, "water shortage" 14 peoples, "a sack is expensive, and easy to deteriorate over time" 6 peoples, "animals" 6 peoples, "weathers" 6 peoples, "It is difficult to get a seedling" 5 peoples, etc. (1.98 per person and all the 15 sorts)

### 5-4. Compare current gardeners and former gardeners

Compared current gardeners and former gardeners about the family size, the academic level, the number of domestic workers, the monthly income, the house rent, and participating rate of mutual-help organization, using Mann-Whitney U test (a two-sided test, 5% of a significance level). The difference significant about an academic level ( $p= 0.035$ ) and the participating rate ( $p= 0.015$ ) to a mutual-aid organization was accepted. Therefore, the present enforcer found that an academic level was high compared with a former enforcer, and the participating rate to a mutual-aid organization was

low. A significant difference is not accepted, although the present enforcer has many domestic workers compared with a former enforcer and a monthly income is also in a slightly high tendency about a monthly income and the number of domestic workers.

About a family size and a house rent, a difference was hardly accepted (Fig. 8).

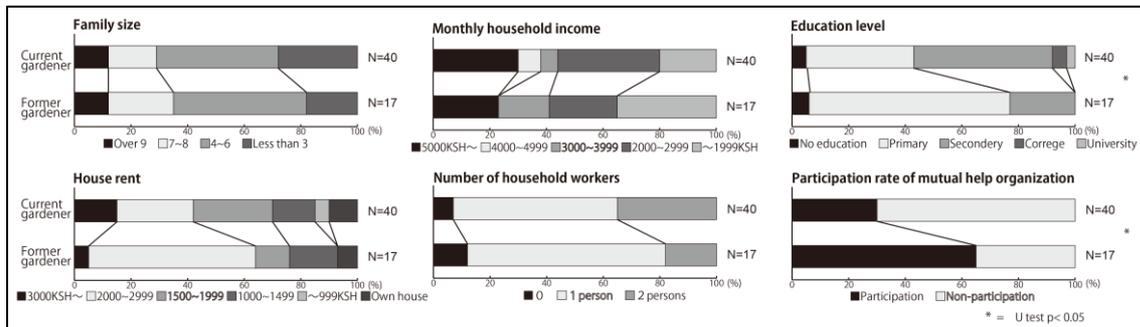


Fig.6: Compare current gardeners and former gardeners using Mann-Whitney U-test

## 6. Results

Results of this research are following 3.

- (1) Sack Gardening in Nairobi is developed as one of activities of Solidarites. Activity of Solidarites ends in 2012, and local residents develop it as an independent activity at present.
- (2) Mainly purpose of carrying out Sack Gardening of current gardeners is improvement of Food security and also Sack Gardening contribute enough to food self-sufficiency in household.
- (3) It is suggested that current gardeners have a ability of recognizing problems, and is strong in the ambition which tries to plan for living independence in the slum influence of the unstable social situation is easy to undergo where compare with former gardeners, and this it is related to continuation of Sack Gardening.

After the support organization evacuates a activity like SG as the plan theory-like viewpoint obtained from this research, when I continue and develop it as an independent campaign by a resident the point that to emphasize economical support may not always be effective can be pointed out.

## Acknowledgement

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