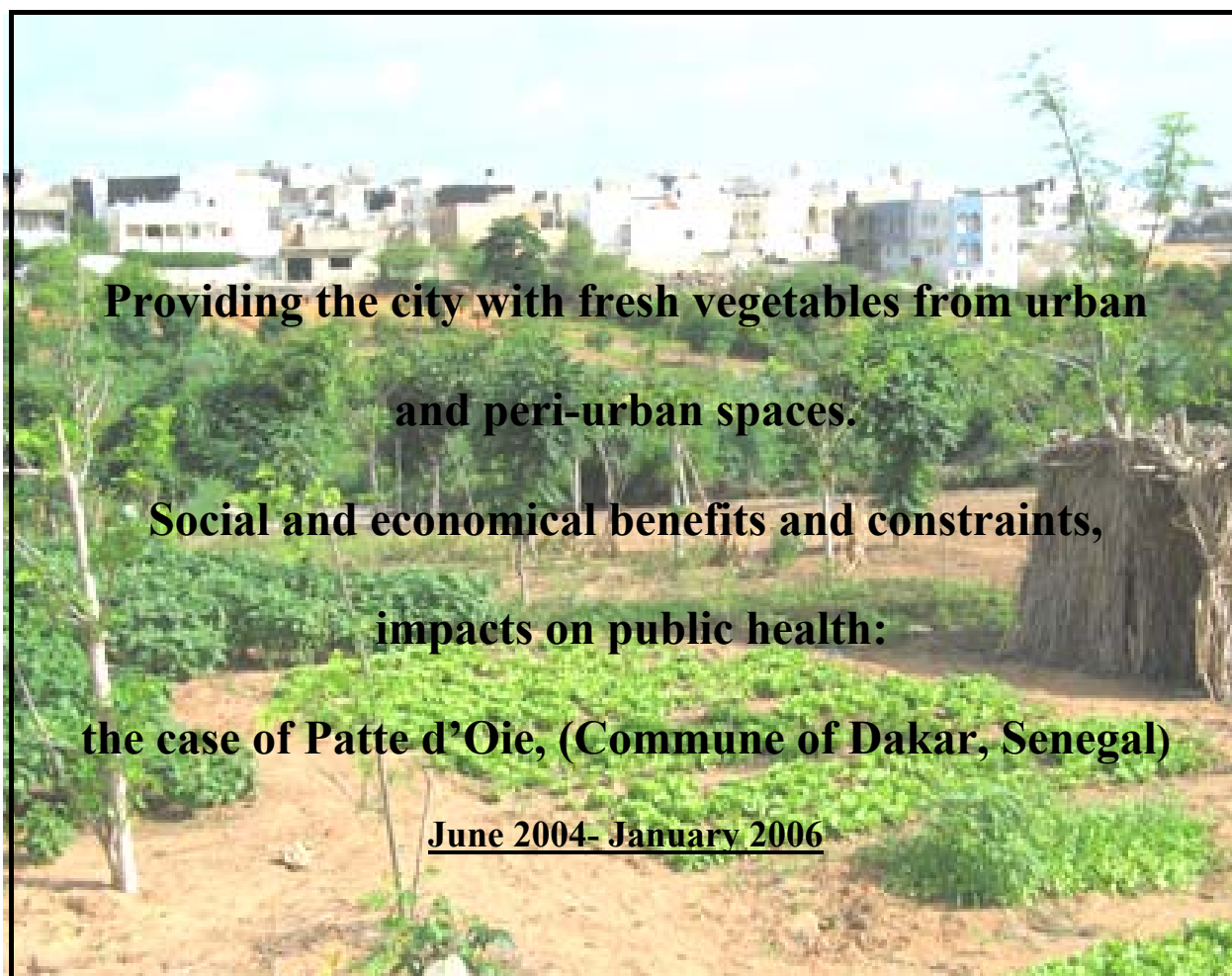


**MINISTRY OF HEALTH
AND MEDICAL PREVENTION
DEPARTMENT OF PUBLIC HYGIENE**

**INTERNATIONAL
DEVELOPMENT RESEARCH
CENTRE (IDRC)**



**Providing the city with fresh vegetables from urban
and peri-urban spaces.**

**Social and economical benefits and constraints,
impacts on public health:**

the case of Patte d'Oie, (Commune of Dakar, Senegal)

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Providing the city with fresh vegetables from urban and peri-urban spaces; social and economical benefits and constraints; impacts on public health: the case of Patte d'Oie, (Commune of Dakar, Senegal)

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SUMMARY

The practice of urban agriculture in the Niayes Valley of Patte d'Oie (a neighbourhood on the periphery of Dakar) developed before 1937 during the period when vegetable farming was introduced to Senegal by the Colonizer. Today with urban expansion and the pressure of real estate speculation, this luxurious green zone has been reduced to a surface of about 12 ha where approximately 161 farmers including 10 women farm to provide fresh vegetables under the constant threat of expropriation in favour of real estate promoters. This study is pluridisciplinary, coordinated by National Service of Hygiene thanks to funding from the Canadian International Development Research Centre's program Cities Feeding People Programme. Its goal is to highlight some of the strengths and weaknesses of urban agriculture in the area.

A profile of the farmers show that more than half (54%) are owners of their plots. The rest are renters, borrowers and sharecroppers. For those who are owners, a small percentage acquires their land by purchase or inheritance. The others do not have clear land titles. Among the non-owners one finds 76% renters, 12% borrowers and 12% sharecroppers.

The vegetables most cultivated include lettuce, tomatoes, bitter eggplant (jaxatu), chiles, okra, onion, carrots, turnip and cabbage. Most of the farmers cultivate the same species.

- 68% of the producers say that lettuce is their first crop
- 10% for "jaxatu" and 5% for tomatoes
- Associated cultivars include fruit trees, *Moringa* and mint

The number of rows varies between 30 and 500 as a function of the size of the plot, source of water most used. This includes the "ceane" (shallow wells) (used by 73% of farmers). Eight percent of the farmers use deep wells while 5% use wastewater. The water table, although it is shallow, dries up during the month of May which poses a problem with water availability for farmers. In addition, there is a progressive salinisation of the water table related to a rise in activity.

The estimated surface cultivated in Patte d'Oie is around **67 000 m²**. The estimated production from this area on lettuce is around **560 tonnes** per year. Since the mean value of lettuce is estimated for **187,5 f CFA per kg**, This allow us to declare that this area gains only on lettuce per year (6 campaigns) around **105 000 000 f CFA**. This corresponds to annual profit margin of

1 276 000 F CFA for a farmer with **0,1 ha** that uses water from "ceanes". This profit margin increases to **1 414 000 F CFA** for those who use wastewater and to **1 336 000 F CFA** for those who use well water.

Urban agriculture, however, faces many constraints which include: the cost of the public water distribution, the progressive salinity of the water table used for watering vegetables, the use of wastewater, insect infestations, encroaching construction which constitutes one of the greatest menaces.

To improve the quality of the soil four types of amendments are used. These include cow manure, horse-dung, poultry droppings, and groundnut shells.

Upon analysis of the constraints linked to irrigation water, the results show that

- The level of salinity of irrigation water whether water from canals or wells represent alarming concentrations. It is necessary to consider in the short term an alternative to decrease the salinity level. Wastewater could be used as an alternative.
- The concentration of nutritive matter in the irrigation water even if their concentrations are weak should be taken into consideration in the policy of enrichment of crops by chemical or organic fertilisers. This could be economical as well as protective of the environment where excess fertilisers could contaminate the water table.
- The concentration of suspended and organic matter in irrigation water is acceptable given the number of users. On the other hand if this water should be used as an alternative to dilute the salinity of water, it would then be necessary to plan a simple treatment to reduce the load.
- As was expected, the level of fecal coliform in wastewater conforms on what we find in general. On the other hand, the other sources of water have concentrations of fecal coliform that do not respect WHO norms of unrestricted use, despite the fact that this water is used for bathing, drinking and rinsing vegetables.
- The parasites *Ascaris lumbricoides* was found in wastewater and canal water with high concentrations found in wastewater. No parasites were found in well water.

In addition, the study revealed vegetables contaminated with fecal coliform and parasites including *Ascaris lumbricoides*, *Furcocercaires*, *Trichomonas* and *Strongyloides* with all types of irrigation. The level of contamination of vegetables is elevated in markets where they are constantly sprayed with water to maintain their freshness.

The study also showed that disinfection of vegetables before consumption is not a systematic practice. The survey showed that only 66% of households state that they use a disinfectant to wash their vegetables. The rest simply rinse their vegetables with tap water (which contains chlorine). The products used for disinfection include chlorine bleach (65.6%), vinegar (1.6%), le permanganate (1.3%) and table salt (0.6%). Even if the vegetables that have been disinfected are ready for consumption, they still contain fecal coliform although have fewer parasites.

With regards to epidemiological risks linked to the activity, we have noticed a prevalence of 66% (on a total 56 people) of parasitic infections. The intestinal parasites identified are linked to protozoa and helminths. The protozoans include *Entamoeba histolytica*, *Entamoeba coli*, *Endolimax nana* and *Giardia intestinalis*. The helminths include *Ascaris lumbricoides*, *Trichuris trichura* (Trichocéphale), Ankylostomes, *Strongyloides stercoralis*, *Dicrocoelium dendriticum*. Five among them constitute urinary parasite with an overall prevalence of 8.9%. This includes *Trichomonas vaginalis* and *Schistosoma haematobium*. Comparison of global prevalence as a function of irrigation water shows that those farmers that use well water are not infected by parasites. However, the prevalence between those that use wastewater and canals is comparable.

For sellers all 7 people sampled carried intestinal parasites. This is 100% prevalence. One carried *Trichomonas vaginalis* a prevalence of 14.2%. Types of parasites found are less varied than those of the farmers. These include *Entamoeba coli*, *Endolimax nana*, *Ascaris lumbricoides* and *Trichuris trichura*.

The women represent a minority among the farmers only 6%. With regards to the distribution chain women play a major role in the marketing of vegetables. They also play

a role in the cycle of contamination of vegetables. It has been shown that washing vegetables in the fields and at markets are critical points of contamination for vegetables. This is principally done by women. It is also women who are also responsible for disinfecting vegetables before consumption.

One should note the launching of a programme to protect the zone (PASDUNE) initiated by high level authorities in the country. This programme assures secures land tenure acknowledging the importance of urban agriculture ensuring sustainability for the zone.

In light of the importance of urban agriculture financially and nutritionally in Dakar, this study recommends the continuation of research. Presently, a legal framework is being put in place to protect the Niayes region. It is important to convince authorities the importance of this. The study should, therefore, focus on the following areas: the provisioning of water and its good management, questions related to land tenure, reinforcement of capacity of farmers and sellers and access to credit.