



Distribution and dynamics of *An. arabiensis* breeding sites in three health districts with high malaria incidence (Diourbel, Touba and Kaolack (Senegal))

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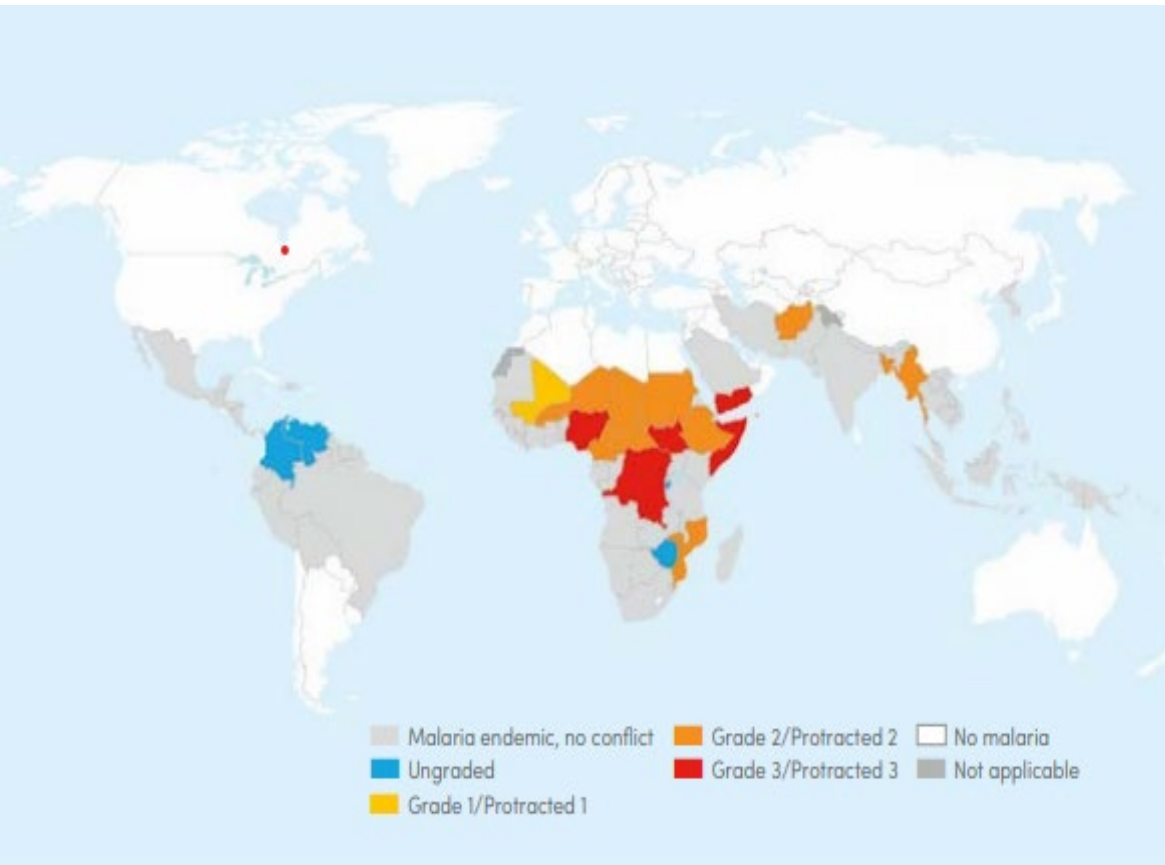
FATOU NDIAYE

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INTRODUCTION

Malaria, the most deadly infectious diseases

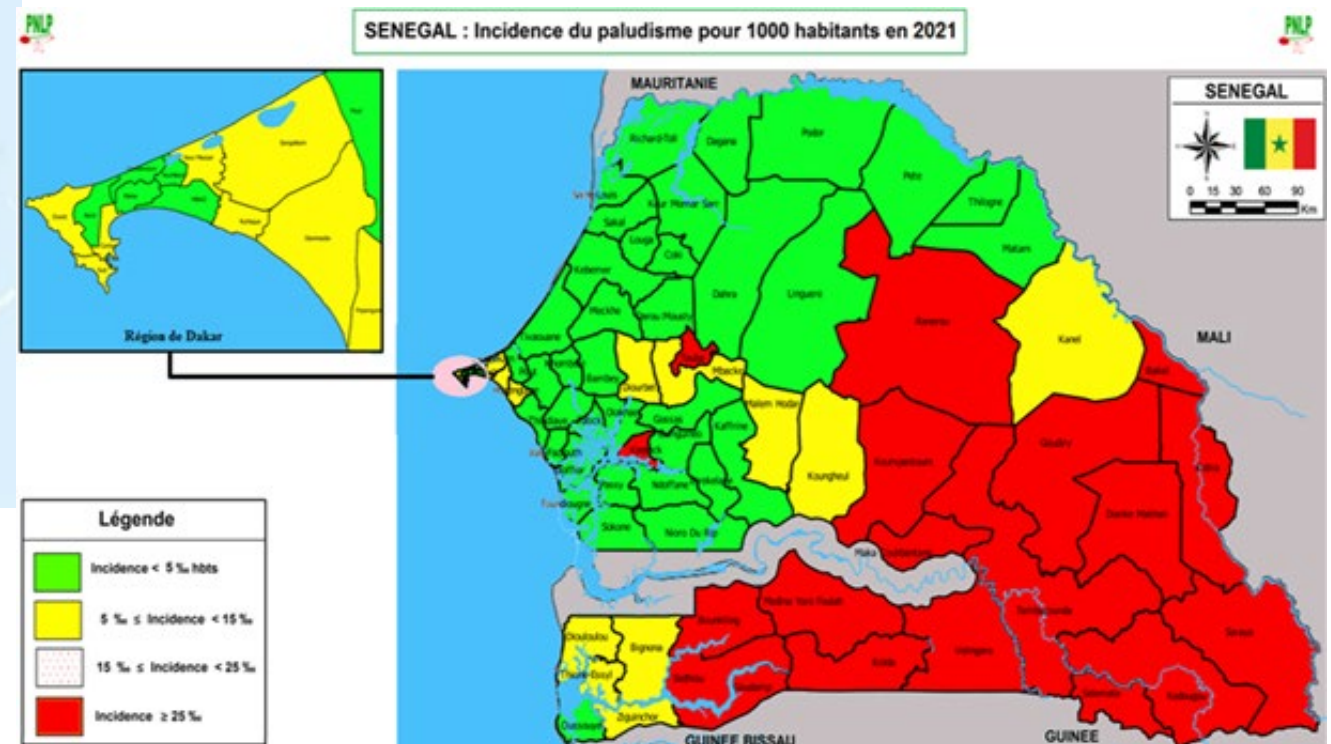
Malaria incidence in Senegal in 2021
(NMCP,2021)



Distribution of malaria in the World
(WHO 2021)

WHO African Region: **228 million** estimated cases

Red Zone covers 58% of deaths in Senegal



BACKGROUND 1/2

Senegal remains a leader in piloting and scaling up new recommendations and innovative strategies in the fight against malaria.

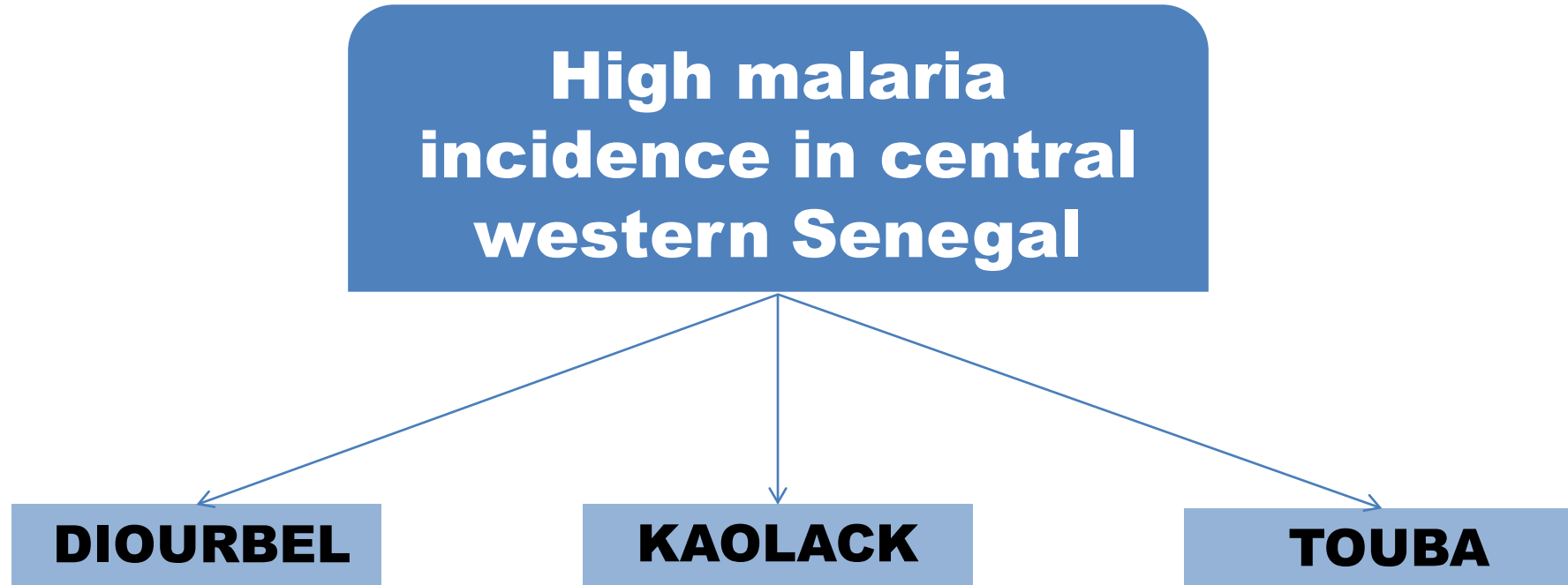


The NMCP has adopted a national strategic plan (NSP) since 2016

Massive and systematic distributions of ITNs

Indoor residual spraying (IRS), in some districts

BACKGROUND 2/2



- ❑ The Three most populated cities after capital Dakar
- ❑ Urban malaria with high incidence

OBJECTIFS 1/2

OBJECTIVES GENERAL

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graph TD; A[OBJECTIVES GENERAL] --> B[Suggest alternative/Complementary approaches to LLINs/IRS]; A --> C[Reduce malaria burden in the urban settings];
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**Suggest
alternative/Complementary
approaches to LLINs/IRS**

**Reduce malaria burden in
the urban settings**

OBJECTIFS 2/2

SPECIFIC OBJECTIVES

- ✓ Identify, Locate and Characterize larval habitats of malaria vectors



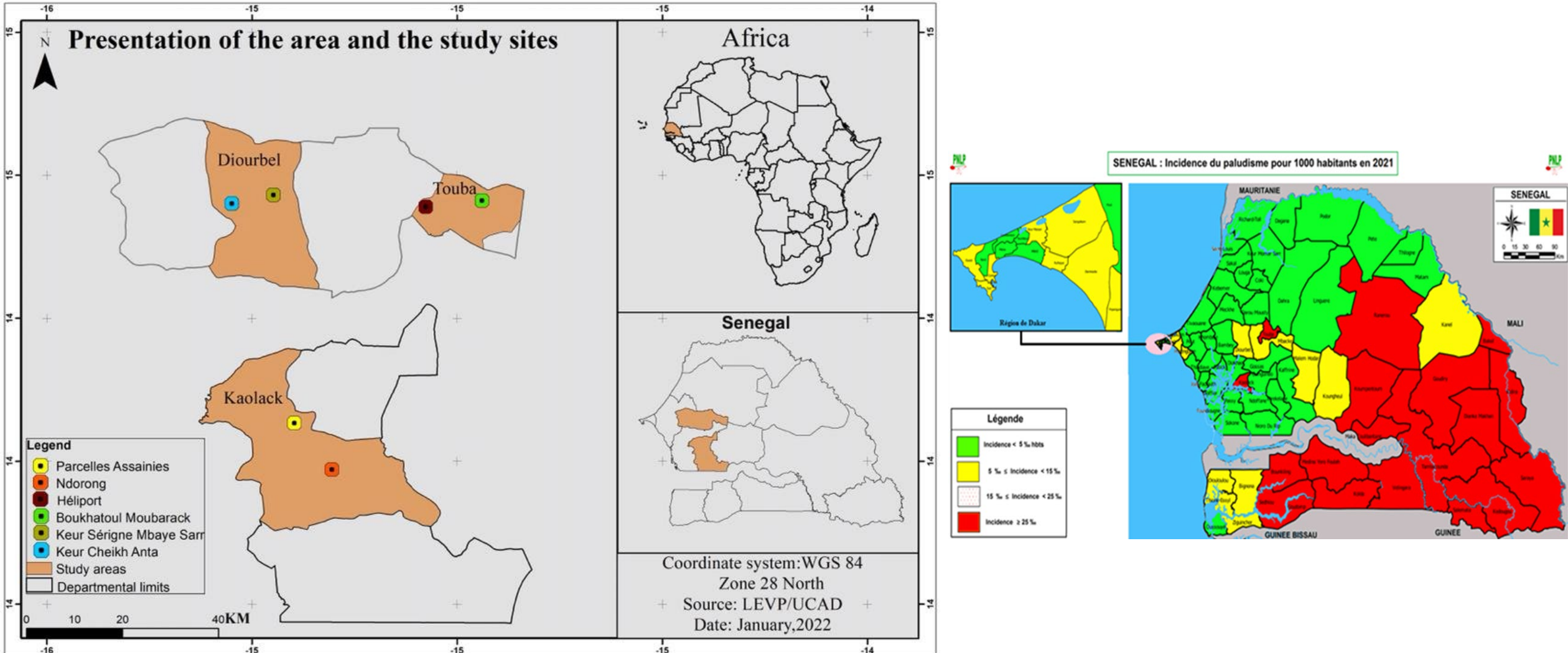
- ✓ Better guide the NMCP in the implementation of targeted interventions with higher impact



Larval Source Management

METHODS 1/2

Geographical Location of the selected health districts and study sites



The study was conducted in the town of Diourbel, Touba and Kaolack, in the central western of the Senegal. The area includes the most populated regions of Senegal, after the capital city of Dakar.

METHODS 2/2

LARVAL HABITAT SURVEYS

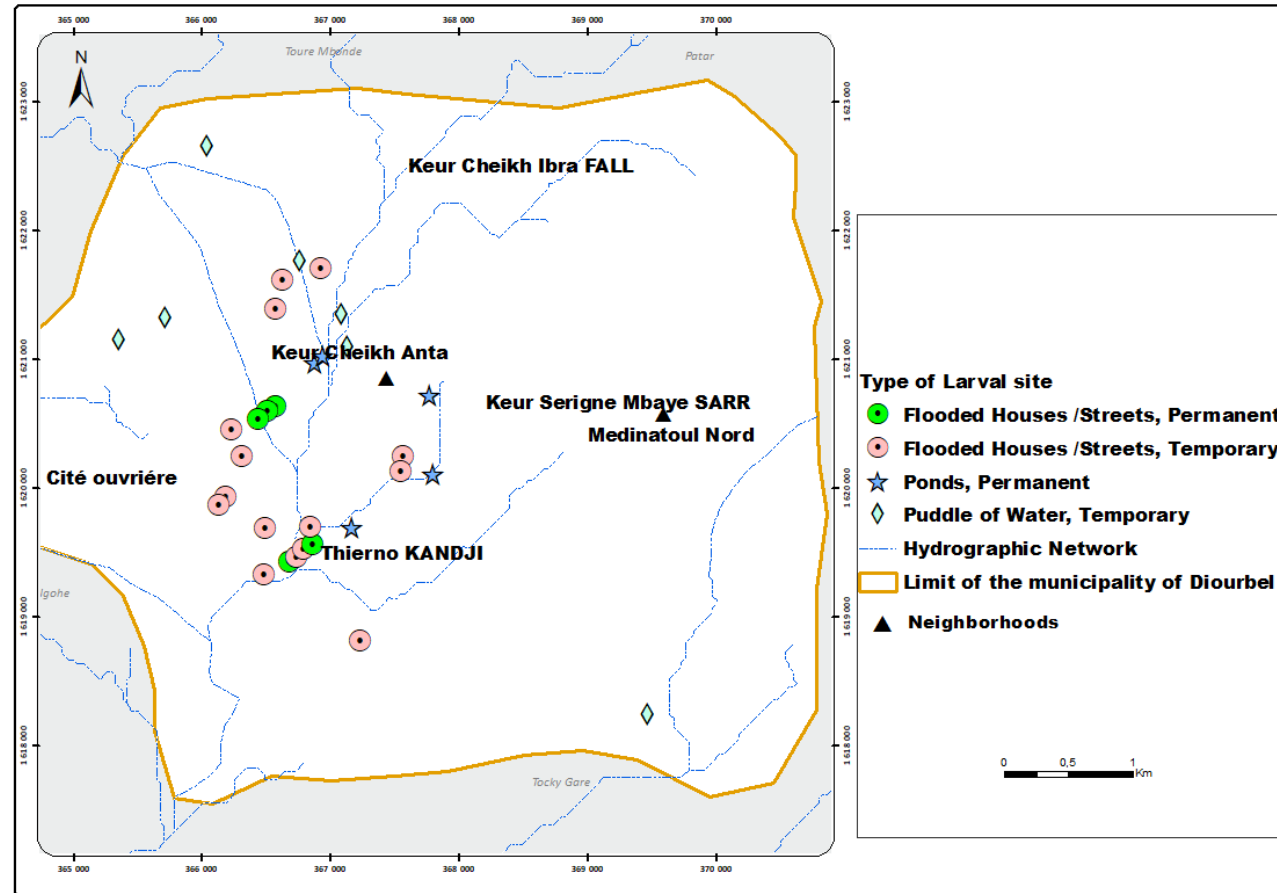
- ✓ Identification and geolocation of all potential larval habitats
- ✓ Classification according to the nature and typology of breeding sites
- ✓ Characterization of the larval habitats monitored
- ✓ Monitoring of the positivity and productivity of breeding sites

RESULTS

Spatial distribution and typology of *An. arabiensis* larval habitats

RESULTS 1/6

Spatial distribution and typology of *An. arabiensis* larval habitats in Diourbel



The majority of breeding sites in Diourbel were located in Keur Cheikh Anta (43.75%) and Thierno Kandji (34.37%), while few larval habitats (10%) were recorded in Keur Serigne Mbaye Sarr and its outskirts (Figure).

RESULTS 2/6

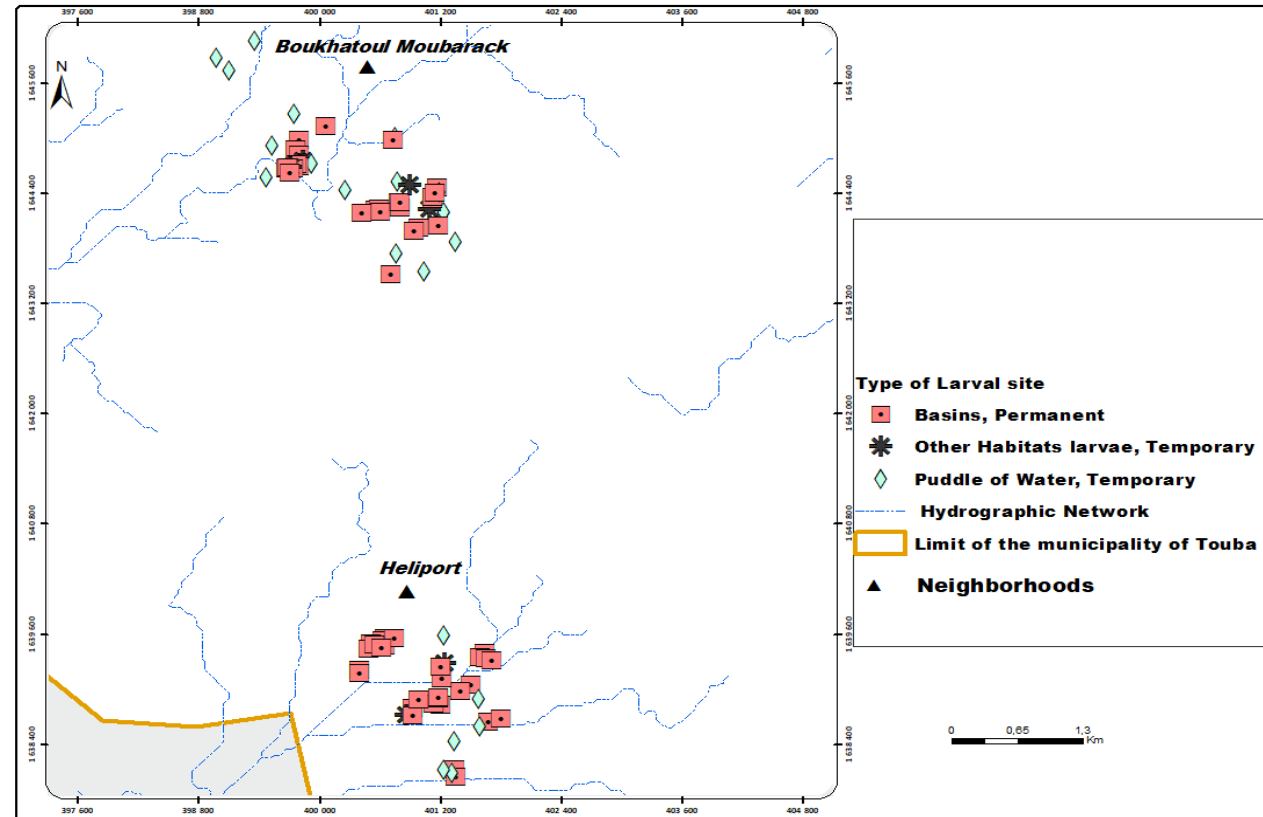
Diourbel



In Diourbel, the larval habitats consisted mainly of natural water bodies (Flooded houses and streets).

RESULTS 3/6

Spatial distribution and typology of *An. arabiensis* larval habitats in Touba



A total of 83 breeding sites were found in Boukhatoul Moubarak and Heliport either inside or in the immediate surrounding areas of houses. The surveyed larval habitats were man-made water basins, followed by ponds and puddles and temporary larval habitats (flooded buildings under construction, human and animal footprints, and open septic tanks).

RESULTS 4/6

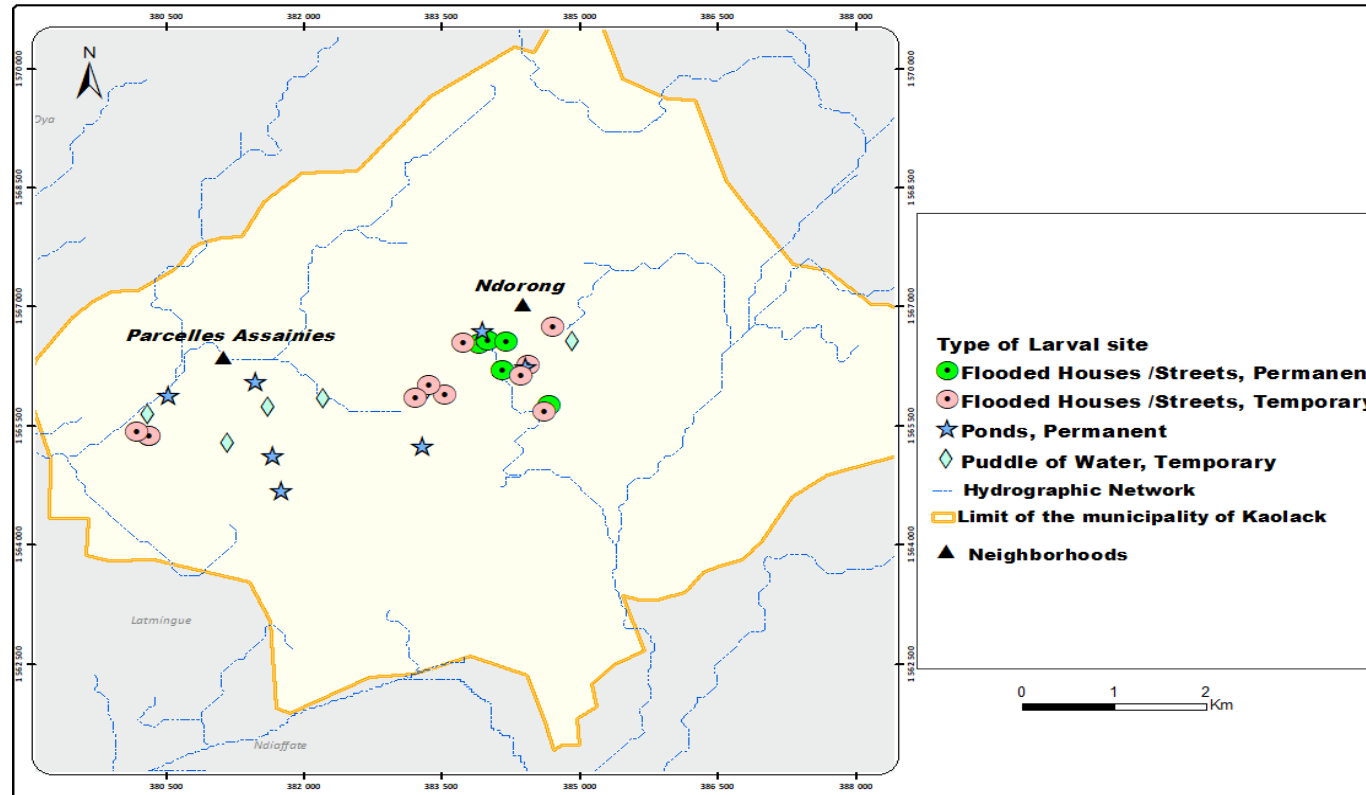
Touba



In Touba, atypical larval habitats were found and were mostly represented by man-made water storage basins, built inside the house compounds to store drinking water or water used for domestic activities such as laundry, bath or for the livestock, due to the scarcity of water in the city, especially during the dry season (Figures).

RESULTS 5/6

Spatial distribution and typology of *An. arabiensis* larval habitats in Kaolack



In Kaolack, a total of 30 larval habitats, including 12 natural surface water bodies, 2 anthropogenic, and 16 flooded areas and / or houses were found. The breeding sites were mainly anthropogenic and in general constituted by flooded areas and/or houses and were located in Ndorong. While natural breeding sites made of surface water bodies were more frequent in the Parcelles Assainies. ¹²

RESULTS 6/6

Kaolack



In Kaolack, larval habitats consisted by natural water bodies or anthropogenic habitats. The natural surface water bodies consisted mainly of flooded houses and streets (Figures).

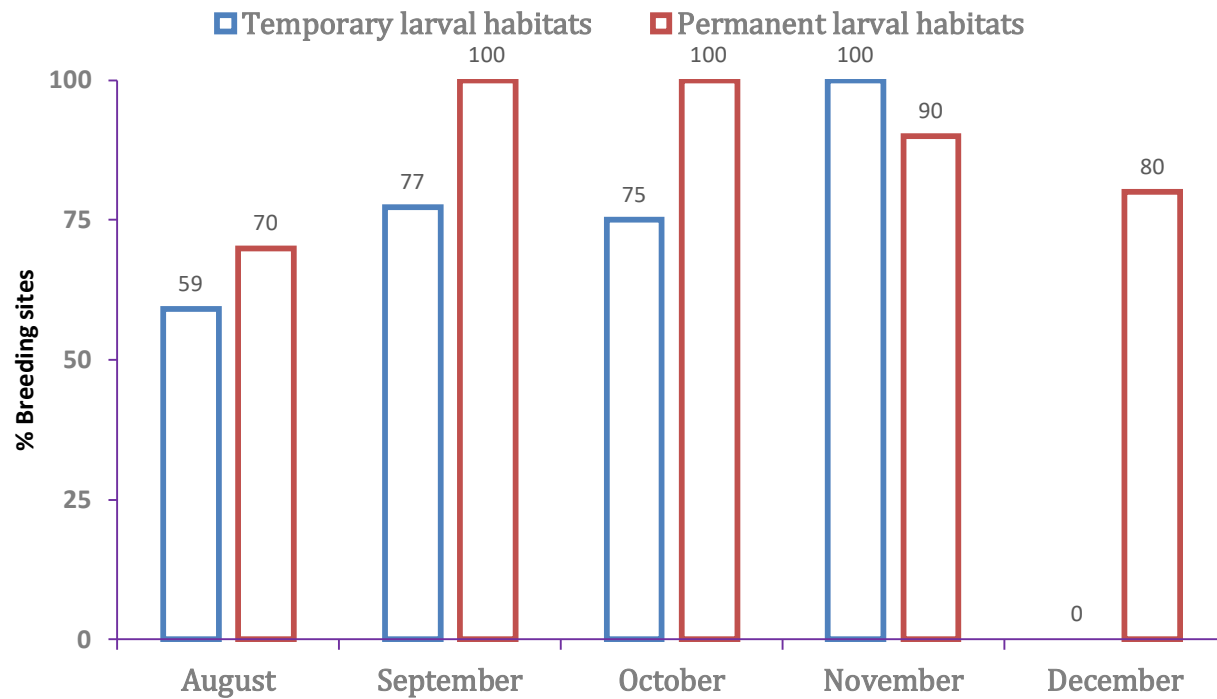
RESULTS

**Positivity and productivity rates of anophelines
breeding sites**

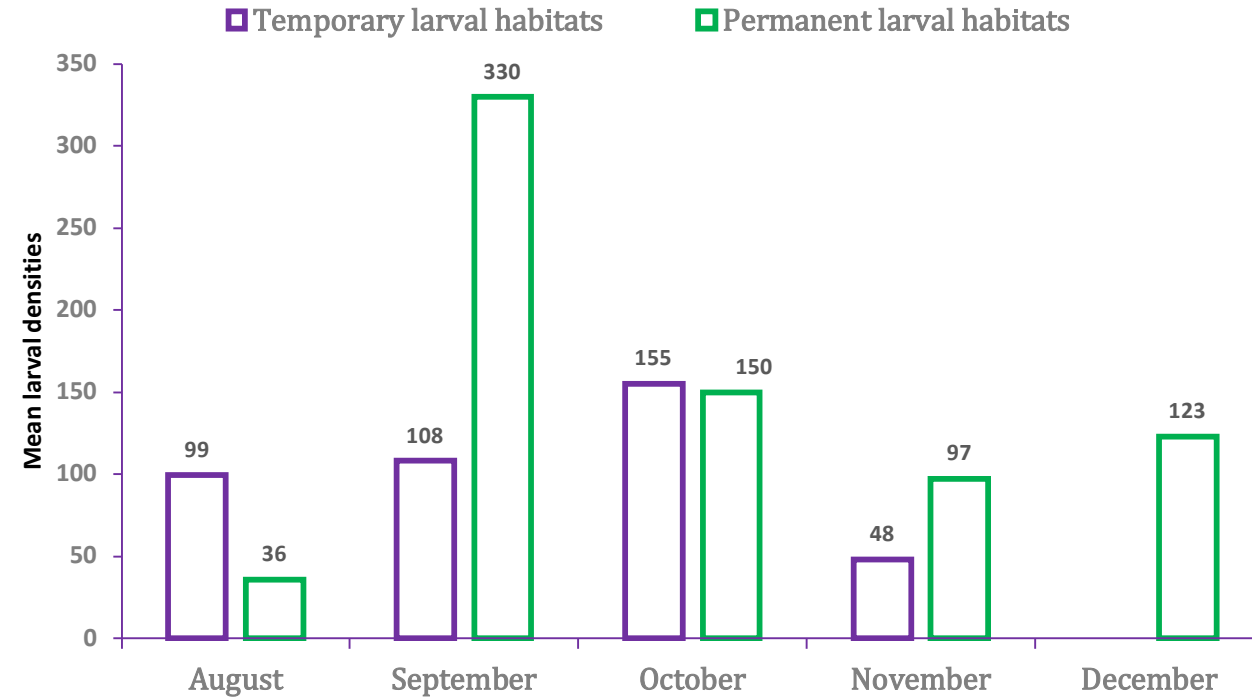
RESULTS 1/5

MONTHLY POSITIVITY AND MEAN LARVAL DENSITIES IN DIOURBEL

Monthly positivity rate in Diourbel



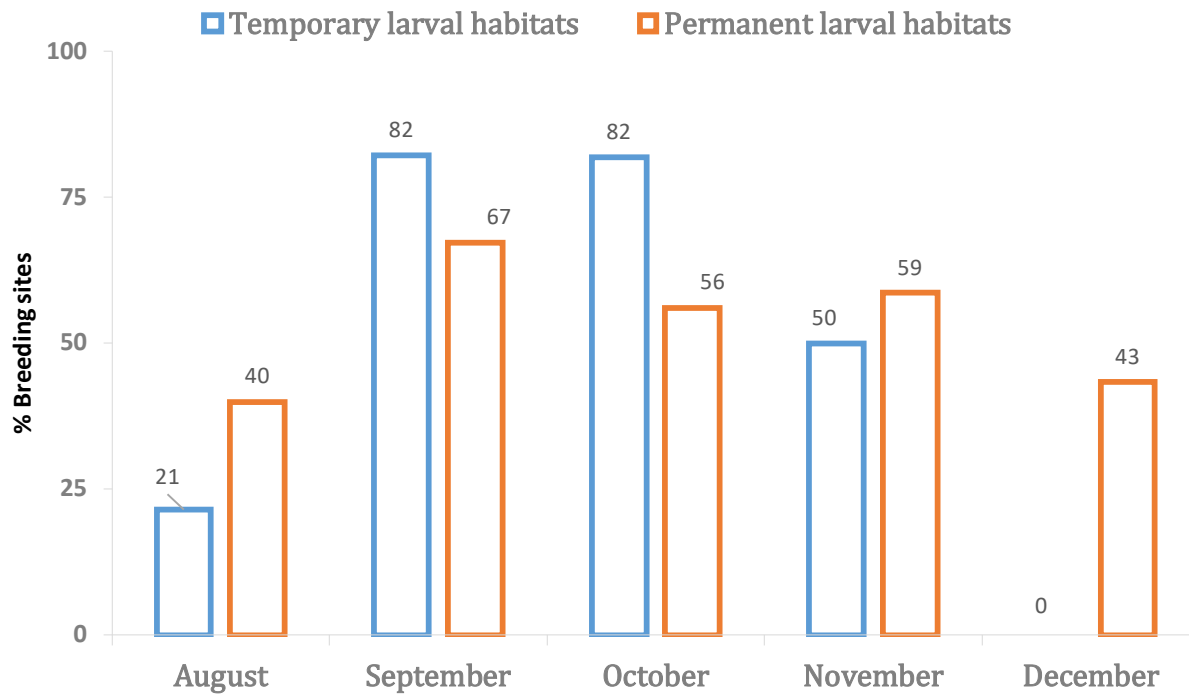
Monthly larval densities in Diourbel



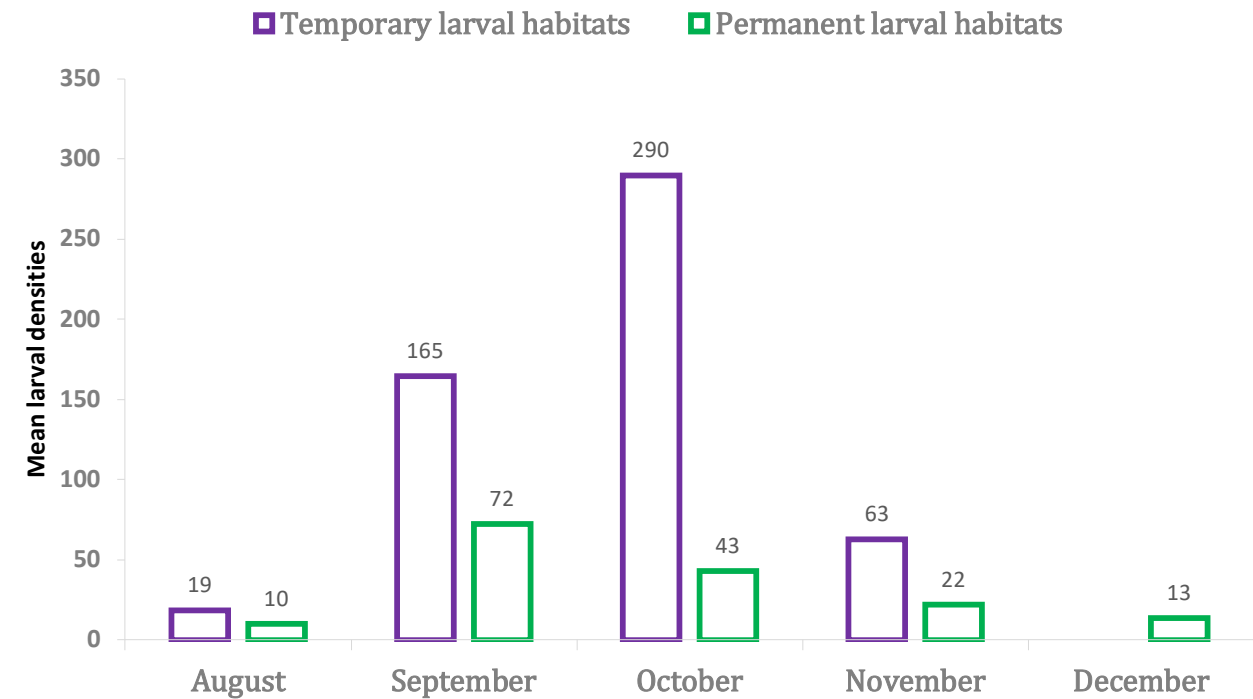
RESULTS 2/5

MONTHLY POSITIVITY AND MEAN LARVAL DENSITIES IN TOUBA

Monthly positivity rate in Touba



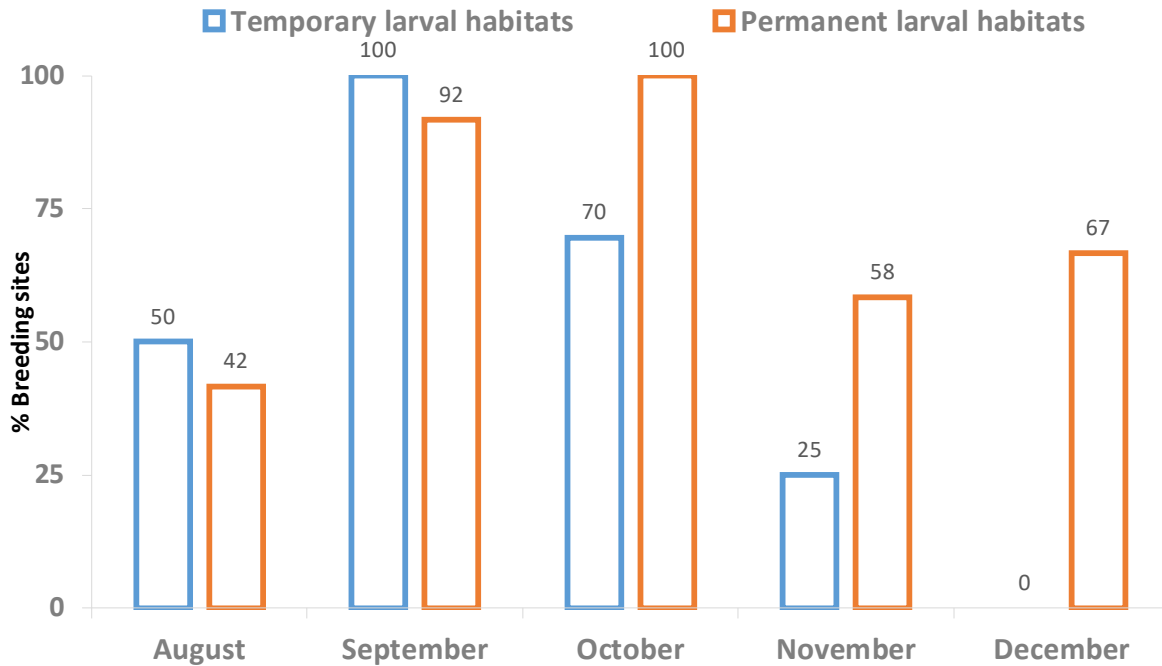
Monthly larval densities in Touba



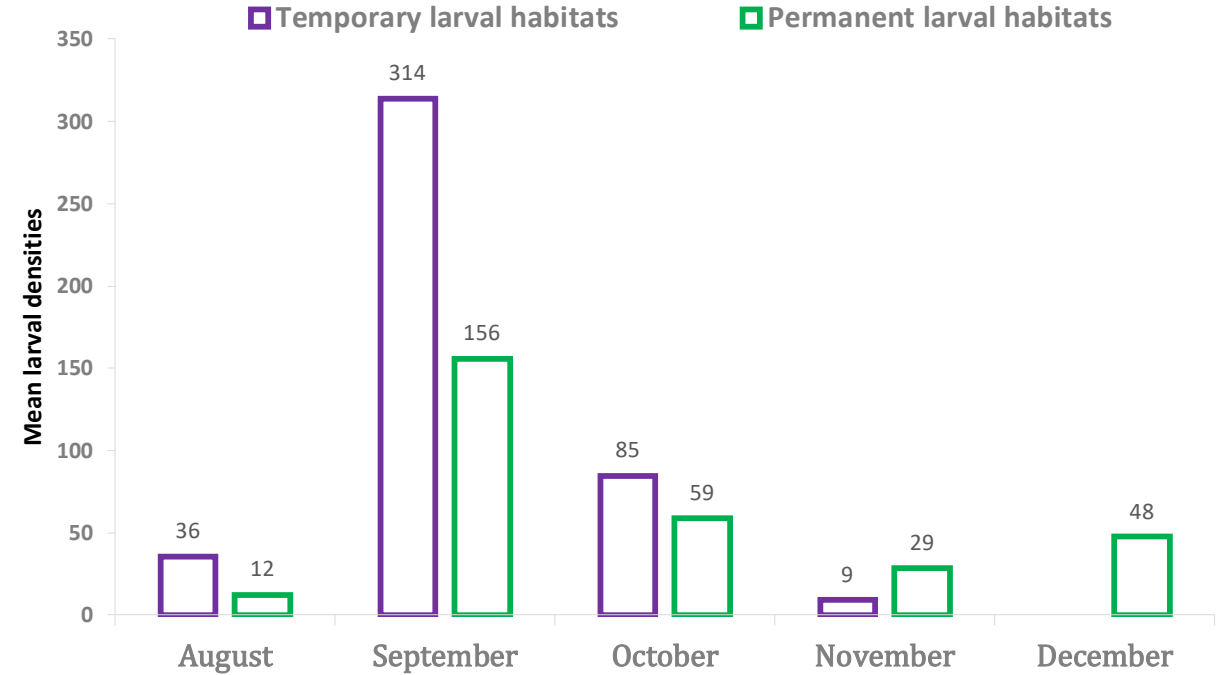
RESULTS 3/5

MONTHLY POSITIVITY AND MEAN LARVAL DENSITIES IN KAOLACK

Monthly positivity rate in Kaolack

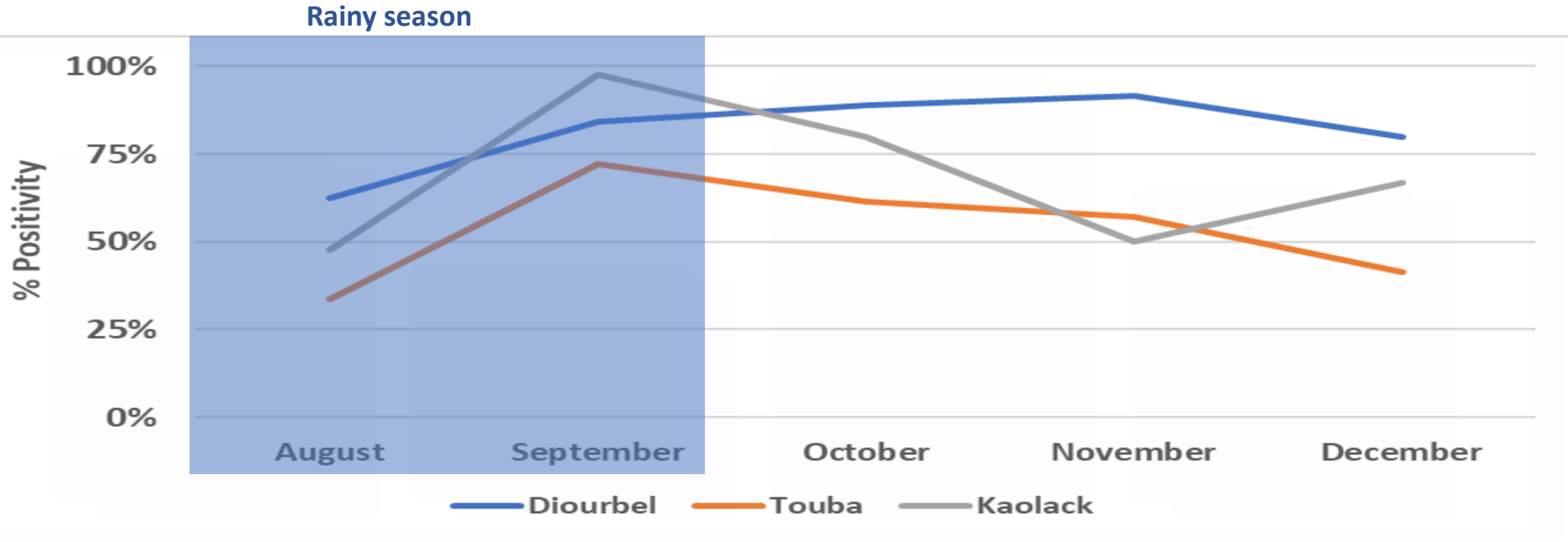


Monthly larval densities in Kaolack



RESULTS 4/5

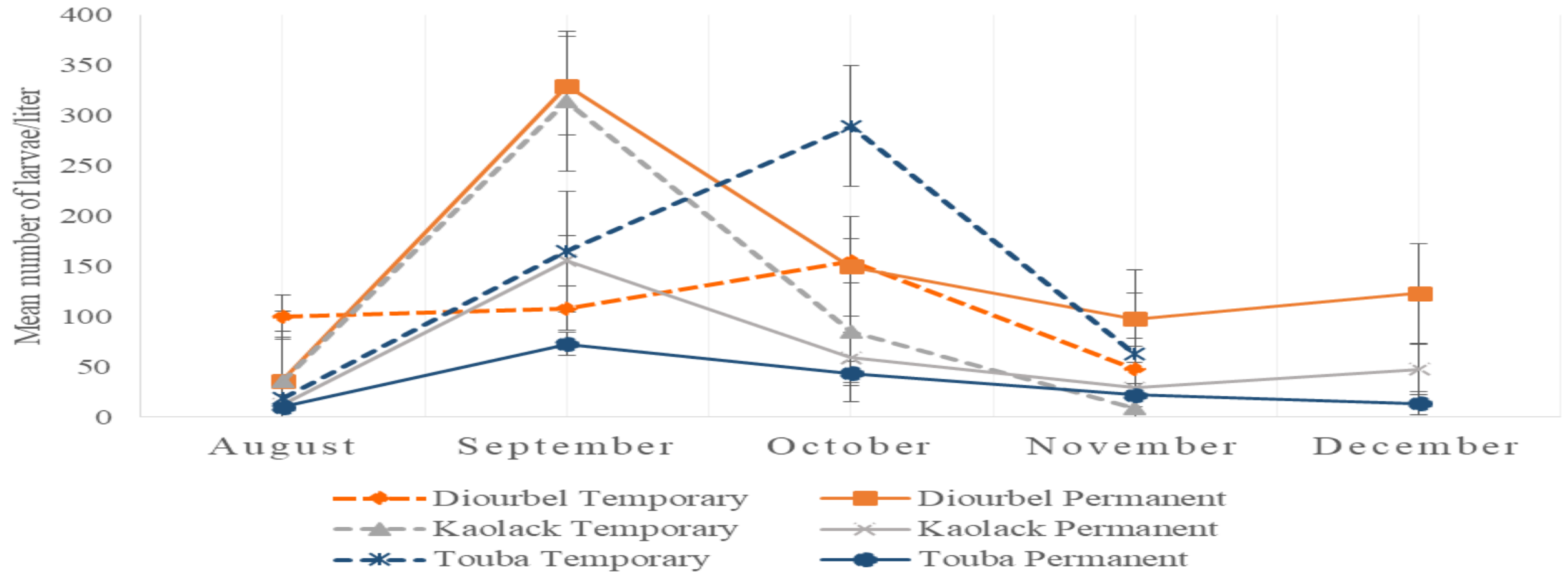
LONGITUDINAL *An. arabiensis* POSITIVE LARVAL HABITATS SURVEY



The highest proportion of positive larval habitats was recorded during the rainy season. The lowest proportion of positive larval habitats was noted in August and November.

RESULTS 5/5

MEAN NUMBER OF *An. arabiensis* LARVAE PER SITE



The lowest average larval densities were recorded in August (29 larvae / liter) and November (23 larvae / liter). The peak mean larval density was observed in September.

Conclusion

- ❖ Larval habitats in the three cities studied were fixed, findable (georeferenced) and few toward the end of the rainy season,
- ❖ Temporary larval habitats displayed peak productivity during the rainy season due to the importance of anthropogenic activities,
- ❖ Permanent larval habitats likely plays the maintenance of anopheline larvae productivity in the absence of rainfall,
- ❖ In Touba, atypical *An. arabiensis* larval habitats (**Water Storage Basins**) were found and likely maintain the production of anopheline larvae after the rainy season,

RECOMMENDATIONS

**Conduct larviciding in
permanent and temporary
larval habitats**

**Regular application of a
biological or chemical
insecticide**

**Bacillus thuringiensis . Israelensis
(Bti) and Bacillus sphaericus (Bs)**



**THANK YOU FOR YOUR
ATTENTION**