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Socioeconomic and hygienic evaluations of certain actors of the fishing industry settled around certain waters of fishing in south of Benin Republic

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ABSTRACT: The halieutic products are very nourishing foods. However, their consumption poses severe problems of public health in Benin. What risks, deteriorating with the increase of the anthropological pressure on the aquatic environment. Indeed, Benin, fishermen live in communities in villages installed in the immediate neighborhoods of plans of water or in constructed compartments on piles in full water. Their domestic waste is directly dumped into water. Also, the mismanagement of solid waste and liquid put down along these rivers is responsible for the bad quality of rivers. The objective of this study is to appreciate the practices of hygiene implemented during the fishing and the sale of halieutic products at the level of Lake Ahémé, Nokoué and lagoon of Porto-Novo and among the actors of this sector. To do this, interviews were conducted with resource persons for the selection of villages. Two forms of questionnaires intended to fishermen and retailers were used. A total of 240 people were investigated, including 120 fishermen and 120 retailers of fish products. The collected data were analyzed using the SAS 9.2 and MINITAB 14 software. Thus 88% of fishermen and 94% of resellers do not wash their hands before fishing or sale. 7,14% and 3,44% of the fishermen on lake Nokoué respectively and Porto-Novo lagoon use ice for the conservation of their products against 0% in the level of lake Ahémé. 46% of all respondents defecate directly into the waters.

KEYWORDS: halieutic products, fishermen, resellers, inquest, hygiene.

1 INTRODUCTION

Water is the source of life in the broadest sense of the term and an essential factor in economic and social development. Especially as it is housing, food, means of production, transportation and indirectly very trade, the tireless efforts of man towards the development of industry, intensive farming and household activity introduce in the water cycle of pollutants that reach the rivers, lakes and ground-water [1]. Thus, although it is the first substance of the planet and one of the most abundant resources on earth, water is becoming a rare natural property. The freshwater resources of the planet available in rivers, lakes and reservoirs are threatened by impurities of all kinds exacerbating its shortage ([2]; [3]).

Benin in spite of its important water resources, also encountered enormous difficulties of water supply [1]. Numerous works has been realized on various rivers showing their pollution. Also, the explosive dynamism of the human population affected and gradually imposed changes on the environment and blows the degradation of aquatic environments. This is a real problem of public health especially when the aquatic environment is polluted, the organisms that live are exposed to different pollutants which they bio accumulate ([4]; [5]). So, their consumption represents a potential danger to the human health.

One of the main activities of the waterside population is the fishing. In spite of its socio-economic importance, it's confronted with many numerous difficulties in particular the lack of the good hygienic practices of the actors (fishermen, wholesalers and resellers) for this sector. It appears then necessary to control the action of these populations in these rivers one hand and on the product of fishing on the other hand.

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The objective of this study is to estimate the control of hygiene regulations by the actors of the fishing industry living around these rivers and the impact of these watersides populations on the latter.

2 MATERIALS AND METHODS

2.1 MATERIALS

Survey sheets containing questionnaires integrating questions of orders socio cultural, economic and hygienic developed for this study were used.

2.2 METHOD

The adopted methodology was centered on a survey of field. This survey took place in the form of conversations semi-structured based on a questionnaire and observation of the actors at work. It contained three main phases namely:

- an exploratory phase;
- a sampling phase and data collection;
- a data analysis phase.

2.2.1 EXPLORATORY PHASE

The exploratory phase allow to identify various villages along the three (3) plans of water constituting the study area namely Lake Nokoué, the lagoon of Porto Novo and the lake Ahémé. The choice of survey areas is based on a pre-inquiry in the OFFICE OF FISHERIES AND THE COMMUNITY CENTERS FOR AGRICULTURAL PROMOTION (CeCPA). Once the ended pre-investigation, is complete, the selected villages are: Ganvié and Ekpé at lake level Nokoué; Bopa-Dado and Ghézin for Lake Ahémé and Djassin and Goho to the lagoon of Porto Novo.

2.2.2 SAMPLING PHASE OF THE RESPONDENTS AND DATA COLLECTION

The number of fishermen and product retailers investigation is determined by the formula [6]. So, the size of the sample obtained is 120 fishermen and 120 retailers. This survey aims at obtaining information concerning the practices of hygiene of the actors of the fishing so much as regards the general hygiene as the handling of fish products. The practice of hygiene or not by respondents was assessed using criteria established by us. It is about :

- Washing of gears and fishing equipment or of sale of halieutic products;
- washing of hands before fishing or sale of halieutic products;
- toilette use;
- washing of hands after the needs etc ...

This survey was to interview one hundred and twenty fishermen and one hundred and twenty resellers of fish products in the villages.

2.2.3 STATISTICAL DATA ANALYSIS PHASE

The collected data were entered and processed through Excel. This software is allowed to perform calculations, to determine the proportions and drawing graphs. The collected data were analyzed using the SAS 9.2 software and MINITAB14. The MINITAB14 software was used to verify the conditions of application of statistical tests. These were performed with the SAS software 9.2.Le chosen significance level is 5% ($p < 0.05$).

3 RESULTS

The figures 1,2,3,4,5,6,7,8,9 and 10 present the socio-economic characteristics of fishermen and surveyed of retailers.

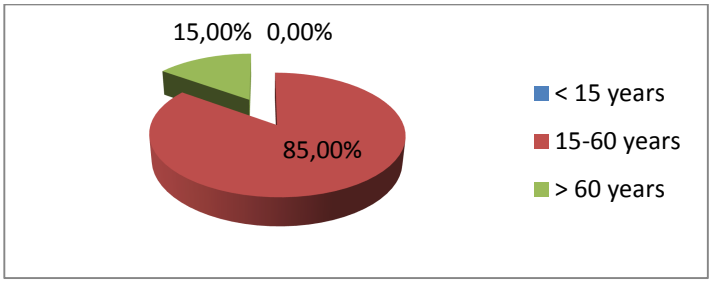


Fig. 1. Diagram of distribution of the set investigated according to age

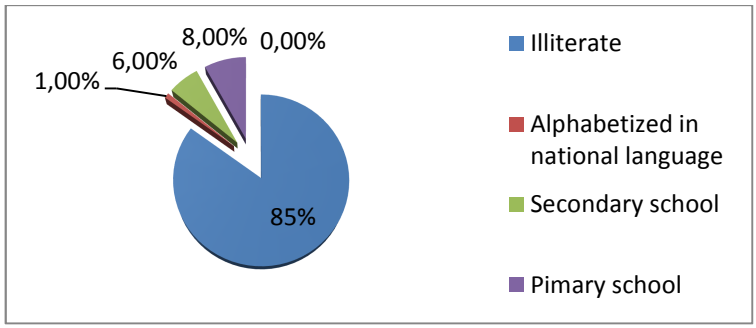
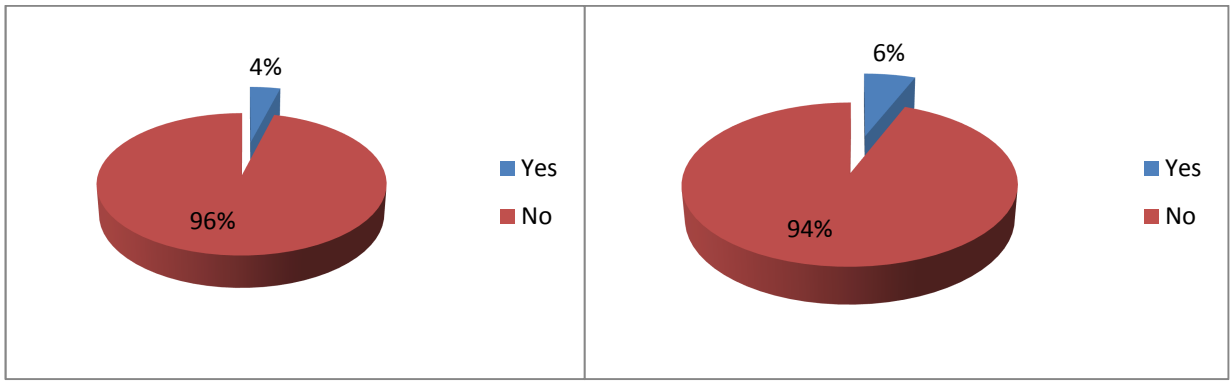


Fig. 2. Diagram of the level of instruction of the set investigated



a- Practice of hygiene at the fishers *b- Practice of hygiene at the sellers*

Fig. 3. Diagram of the assessment of the hygiene practice

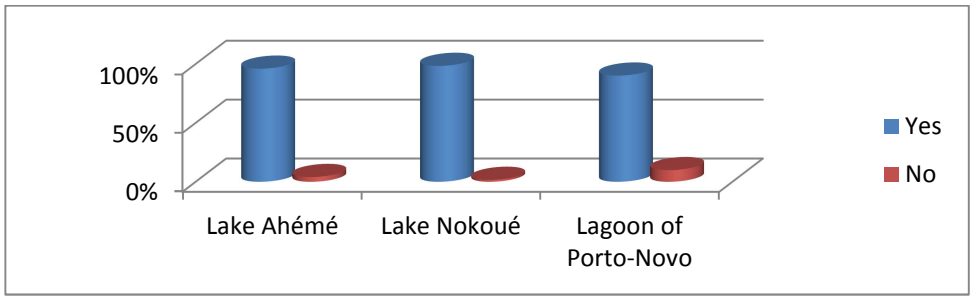


Fig. 4. Washing of the material of fishing and sale

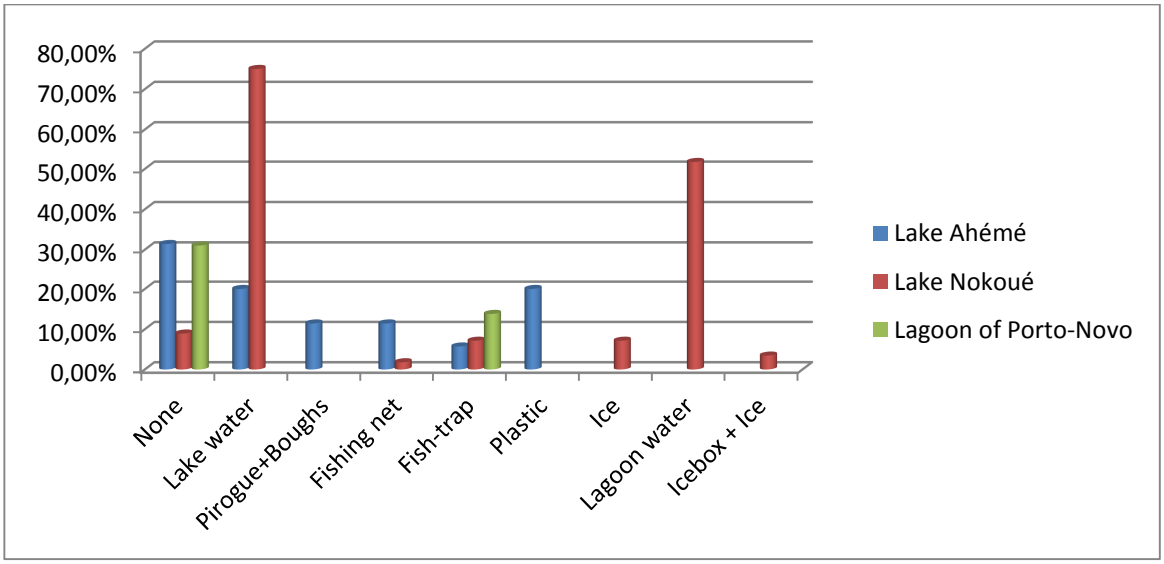


Fig. 5. Fashions of conservation of the products by the fishers

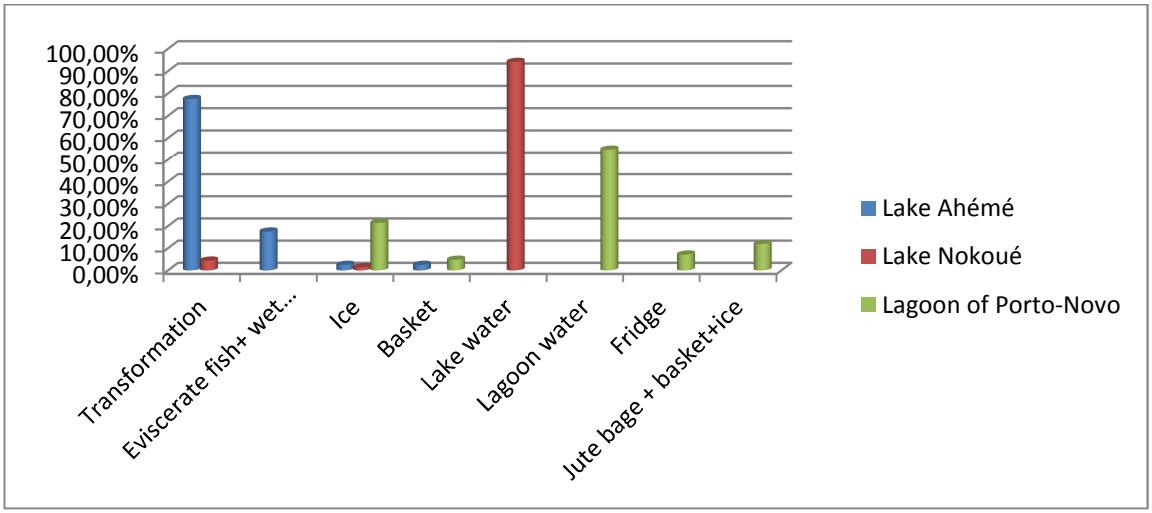


Fig. 6. Fashions of conservation of the products by the sellers

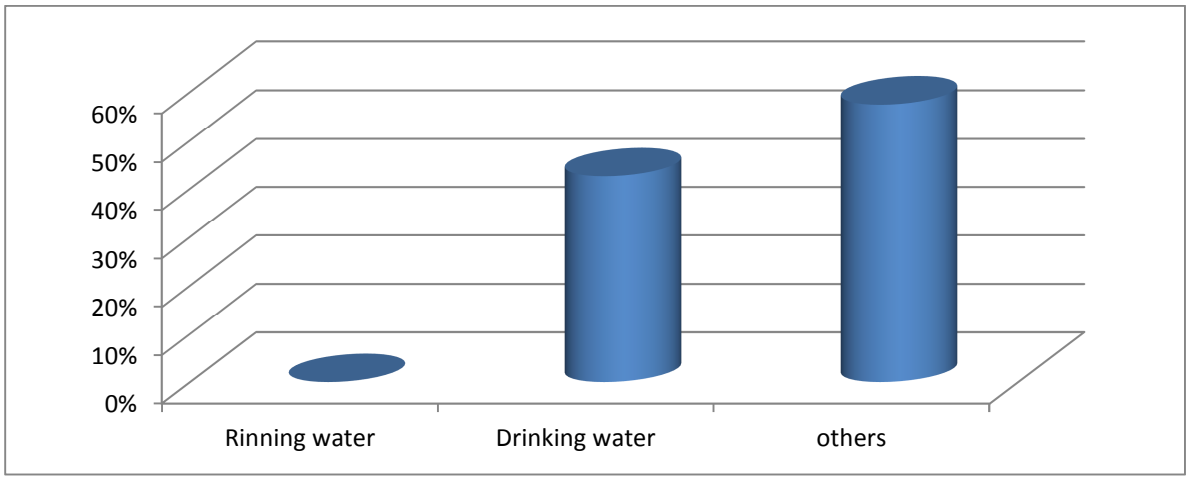


Fig. 7. Accessibility to the drinking water

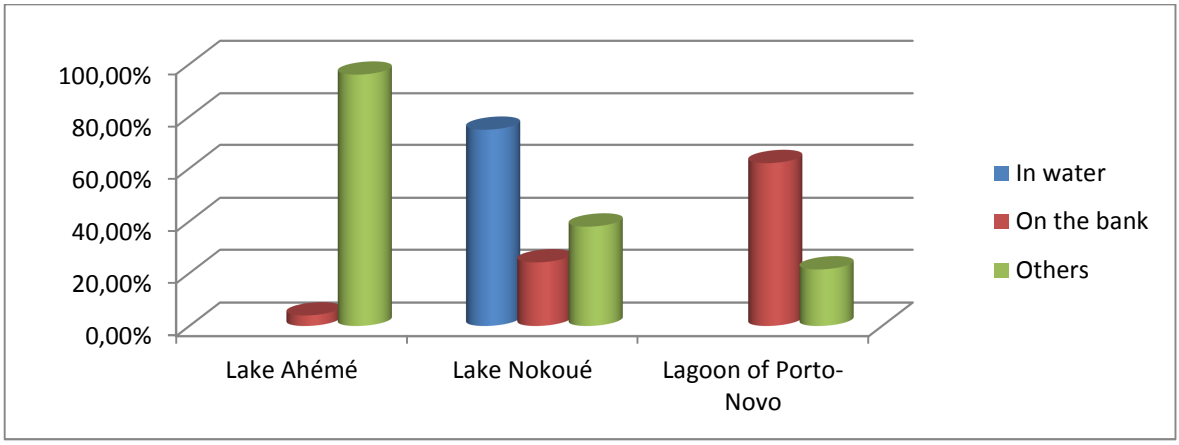
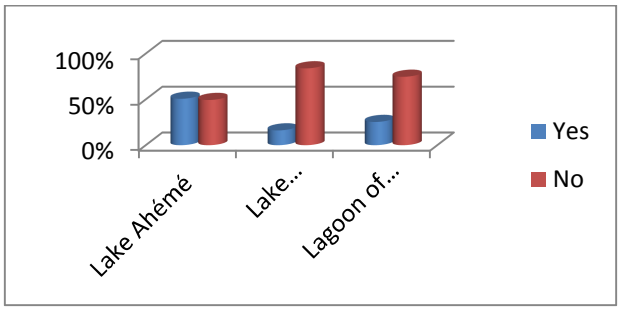
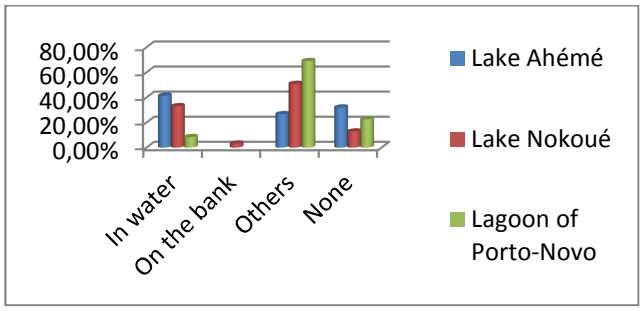


Fig. 8. Management of the garbage by the populations



a- Access to the latrines



b- Necessity

Fig. 9. The use of the latrines

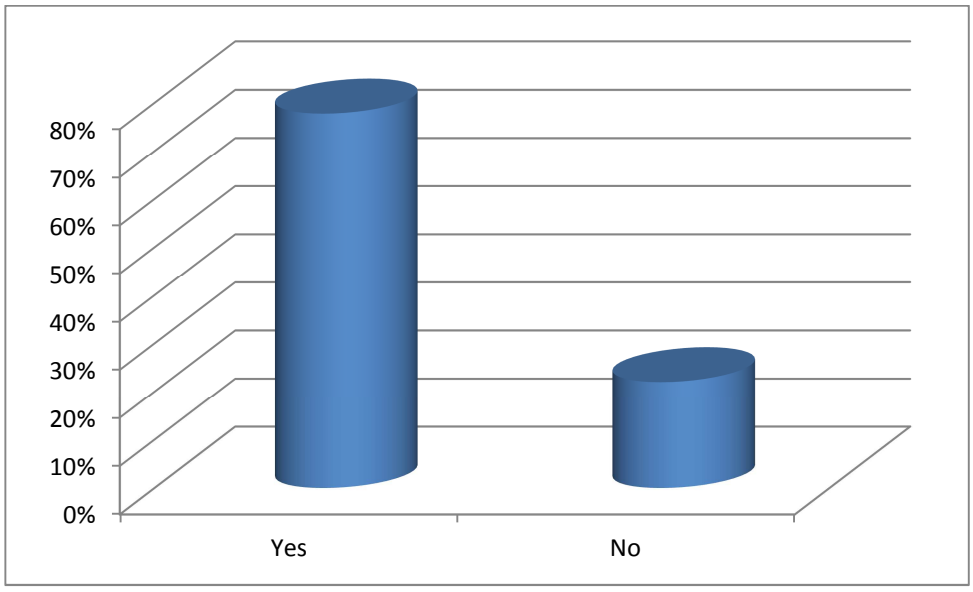


Fig. 10. Washing of the hands after the Necessity

4 DISCUSSION

SOCIOECONOMIC CHARACTERISTICS OF THE FISHERMEN AND THE RETAILERS

The study of the socioeconomic characteristics of the fishermen and the retailers of fish products allowed to classify the population investigated according to several criteria. The results of the inquiries of the fishermen and the retailers of fish products show that at the level of six studied villages, all the fishermen are male and the female retailers. These results make observe that in the whole of the investigated populations, 85 % are one age old between fifteen (15) and sixty (60) years. The analysis of these results indicates a significant variation of the age according to rivers at the threshold of 5 %. As a consequence, there are no individuals of less than fifteen years in the fishing activities of and sale of the fishing products in villages investigated during the period of the survey. The fishing and the sale of the fishing products are the main activities of the studied populations. However, some investigated have secondary activities for example the breeding or the agriculture. These results are similar to those obtained by [7].

When we had studied the academic level of the investigated people, the majority of the schooled people is male and come for the most part of the lake Ahémé. This low rate of the academic level could be explained by the fact that the majority of the investigated are grown-up people who were not schooled, but who practice these fishing activities and sale of the fishing products since their childhood. The fishing and the sale of the fishing products are the main revenue of the studied populations. The average daily earnings by the fishermen vary between 800 francs and 2500 CFA francs. Concerning the retailers, it is situated between 1225 and 1600 CFA francs.

EVALUATION OF THE PRACTICE OF HYGIENE

The evaluation of the practice of hygiene includes as well the evaluation of the practice of the hygiene in the fishing and the sale as that of the practice of the general hygiene. The level of practice of hygiene was determined as well at the fisherman's as at the retailers by questionnaires.

The results of survey on the best practice of the hygiene show that, only 6 % of the retailers and 4 % of the fishermen practice all the established hygiene regulations. This shows that the majority of the targeted populations respect only some hygiene regulations and not all the rules. 92.5 % of the fishermen and 98% of retailers investigated wash their material (machines, nets and basins) every day with some water of river. At the level of three considered rivers, the water of fishing is differently used by the fishermen to stock their products of fishing. More than half fishermen of the lake Nokoué (75 %) and of the lagoon of Porto-Novo (51,72 %) use the water of fishing to stock their products against only 20 %de those of the lake Ahémé. Only 7, 14 % and 3, 44 % of the fishermen respectively of the lake Nokoué and the lagoon of Porto-Novo use freeze (ices, mirrors, ice creams) 77, 5 % of the retailers of the lake Ahémé 94, 11 % respectively of the lagoon of Porto-Novo and the lake Nokoué clean their products before the sale against 54, 76 % and use the water of fishing to keep their products. It is however necessary to notice that retailers of the lagoon of Porto-Novo use strongly (33, 32 %) of ice (mirror, ice cream) to stock their products.

As regards the hygiene generally, 88 % of fishermen and 94 % of retailers do not wash to themselves hands before the fishing or the sale. The accessibility to the drinking water is also a problem for all these populations, because only 42 % has access to the water of the pump. The remaining 58 % which have no access to the drinking water, drink the well water, realized during the drillings of water; among them, 89 % do not handle the water before drinking it. Only 28 % of all the investigated have access to latrines, 2 % make them needs on the bank, 46 % in rivers and 52 % somewhere else. After their needs for saddle or for urine, 78 % of the investigated wash themselves hands, among them, only 22 % use the soap. These results are similar to those obtained by [8] on the lake Nokoué.

5 CONCLUSION

The present study allowed us to evaluate the practice of hygiene by the actors of the fishing industry of Lake Nokoué and Ahémé and those of the Porto-Novo lagoon on one hand and the impact of local populations on these courses for water. The results of our investigations show a bad application of good hygienic practices as well at the fishermen as at the retailers. We also notice a pollution of these rivers by the waterside population due to their different activities. It is therefore necessary to sensitize actors of the fishing industry, lake and riverside populations on good hygienic practices. The destruction of all garbage dumps located along the banks is needed, the prohibition to throw garbage into the water too. It should also

encourage the promotion and popularization of ecological latrines to reduce the pollution by feces and developing garbage collection strategies.

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