Local Ecological Knowledge on Mangroves in Mayotte Island (Indian Ocean) and Influencing Factors

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Supplementary Figure S1. Extract of the interview guide that dealt with LEK

LEK on Ecosystem Services

We tried different questions to help people mentioning ecosystem services:

- Do you think that the mangrove is useful for something ? If yes, in what is it useful?
- If there is no mangrove, what would be the changes?
- What are the advantages and disadvantages of the mangrove? The positive and negative aspects?

LEK on Ecology and Geomorphology

- Do you think that the mangrove is marine, terrestrial or both?
- The interviewer asked questions on the following subthemes:
  - animals (name in local languages or in French), stock evolution (amount and quality)
  - mangrove trees: number of species, name in local languages or in French, localisation of mangrove trees depending on the sea or the land, particularity of mangrove trees compared to terrestrial trees, surface evolution
- back mangrove trees: name in local languages or in French
- origin of knowledge

Supplementary Table S1. Characteristics of analysis variables on LEK of the survey questionnaire.

Variable [1]	Type of Answers	Number of Respondents	Analysis of Differences
Type of ecosystem (sea, land, intertidal) [2]	categorical variable, one answer	437	Chi square
Differences between mangrove trees and other trees [2]	categorical variable, one answer	437	Chi square
Criteria used to recognize mangrove trees	categorical variable, several answers	341 (if yes) [3]	-
Number of mangrove tree species [2]	categorical variable, one answer	437	Chi square
Name of mangrove tree species	open answer	251 (if a number was given) [3]	-
Knows whether mangroves provides ecosystem services [2]	categorical variable, one answer	437	Chi square
Type of service	categorical variable, several answers	390 (if yes) [3]	-
Mangrove state today [2]	categorical variable, one answer	437	Chi square
Mangrove state 10–20 years ago	categorical variable, one answer	257 (if lived in the village for at least 10 years) [3]	Chi square
Reason explaining mangrove state today	categorical variable, several answers	437	-
Reason explaining mangrove state 10–20 years ago	categorical variable, several answers	257 (if lived in the village for at least 10 years) [3]	-
Surface area evolution of mangrove	categorical variable, one answer	257 (if lived in the village for at least 10 years) [3]	Chi square
Reason for increase or decrease	open answer	30 (if increase) [3] 146 (if decrease) [3]	-
Origin of knowledge on mangrove	categorical variable, several answers	437	-

[1] Follow the order in the questionnaire. [2] Variables used for the multiple component analysis. [3] Question asked depending on previous answer.

Supplementary Figure S2. Additional description of the choice of influencing factors on LEK

The influencing factors on LEK were chosen based on previous studies on mangroves showing their influence on answers, but also on other considerations because of the scarcity of mangrove studies using this type of analysis. Most studies on LEK on mangroves analyzed the influence of the various selected mangroves or villages on answers, but only few of them applied a test of independence [18,21,22]. The few studies examining the influence of factors on LEK answers took into consideration age, education, occupation, duration of living period, distance to the mangrove, visiting the mangrove, and having harvesting practices [18,19,23,33]. We selected these variables for our studies except the one regarding occupation.

In Mayotte, similar to what had been observed in the field, harvesting practices were few compared to recreational activities. Surveyed people were only questioned on legal harvesting practices: salt production (mainly in Bandrélé), medicinal use and fishing activities for consumption or bait. Because very few of them had at least one of these practices when questioned or in the past, we produced a new variable combining the answer for these four questions. In this variable, people having at least one of these four harvesting practices during the survey or in the past were considered as harvesters. We also selected a variable informing whether people went inside the mangrove: they could be harvesters, people with recreational activities, or crossing the mangrove to go to their field. Among the diversity of recreational activities identified, we selected one of them, nature walks. Indeed, we find similar significant influences than for variables such as walks, canoe practice, friendly moments, and rest. Other recreational variables—collecting shellfish, love date—were not practiced enough to perform the Chi square test. The influence of the attachment to the mangrove on LEK was also tested based on previous findings [83,84].

Supplementary Table S2. Some characteristics highlighting the profiles of surveyed people.

| Variables	Answers	%
Gender [1]	Woman	52.4%
	Man	47.6%
Age class [1]	15–29	44.6%
	30–49	37.5%
	over 50	17.8%
Main activity [1]	Employed [2]	27.2%
	Homemaker	20.6%
	Pupil or student	16.5%
	Unemployed [2]	17.4%
	No occupation	16.0%
	Retired [2]	2.3%
Education level	No education	24.7%
	Primary school	13.7
	Secondary school	44.9%
	University	16.7%
Resident time	Less than 10 years	16.1%
	More than 10 years	83.9%
Childhood location	Surveyed villages	43.7%
	Another village in Mayotte	15.1%
	Comoros	30.7%
	France outside Mayotte	6.6%
	Other countries	3.9%
Grew up in a village adjacent to a mangrove	Yes	58.8%
	No	41.2%
At least one harvesting practice (today or in the past)	Yes	25.2%
	No	74.8%
Nature walks	Yes, today	27.2%
	Yes, in the past	25.6%
	No, never	47.2%
Penetrates in mangrove	Yes, today	30.2%
	Yes, in the past	44.6%
	No, never	25.2%
Attachment	Yes, very attached	51.0%
	Yes, attached	24.3%
	No, not really attached	7.3%
	No, not attached	13.0%
	No opinion	4.3%

[1] The three variables used to establish the quota sample. [2] Regarding the main activity, like investigators of the National Census, we wrote down what surveyed people declared. They could declare to be employed, unemployed or retired without being officially registered as such in regards to the French administration. Unemployed people proved difficult to meet. These national categories of activities used by the French office of census are not well suited to Mayotte. We have reason to believe that the predominance of the unemployed category is an important bias induced by investigators helping people to fill in the National Census forms and to answer this study. Future surveys in Mayotte using the quota sample technique, should instead use the more reliable level of education.

**Supplementary Table S3.** LEK on type of ecosystem, mangroves trees and knowledge of ecosystem services (n = 437).

| Variables	Answers	%
Type of ecosystem	Marine	29.%
	Terrestrial	11.2%
	Between sea and land	59.5%
Differences between mangrove trees and other trees	Yes	78.0%
	No	18.8%
	I do not know	3.2%
Number of mangrove tree species	1–3	35.9%
	4–6	10.5%
	7–9	2.7%
	More than 10	8.2%
	I do not know	42.6%
Knows whether mangroves give services or benefits	Yes	89.2%
	No	2.7%
	I do not know	8.0%
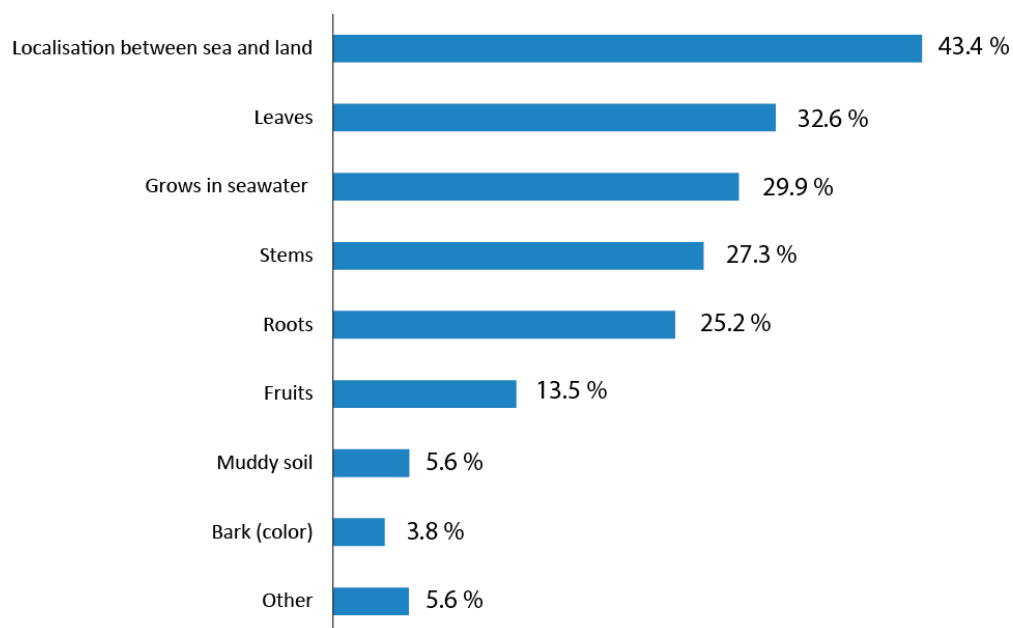
Supplementary Figure S3. Criteria used to differentiate between mangrove trees and other trees by surveyed people (*n* = 341).
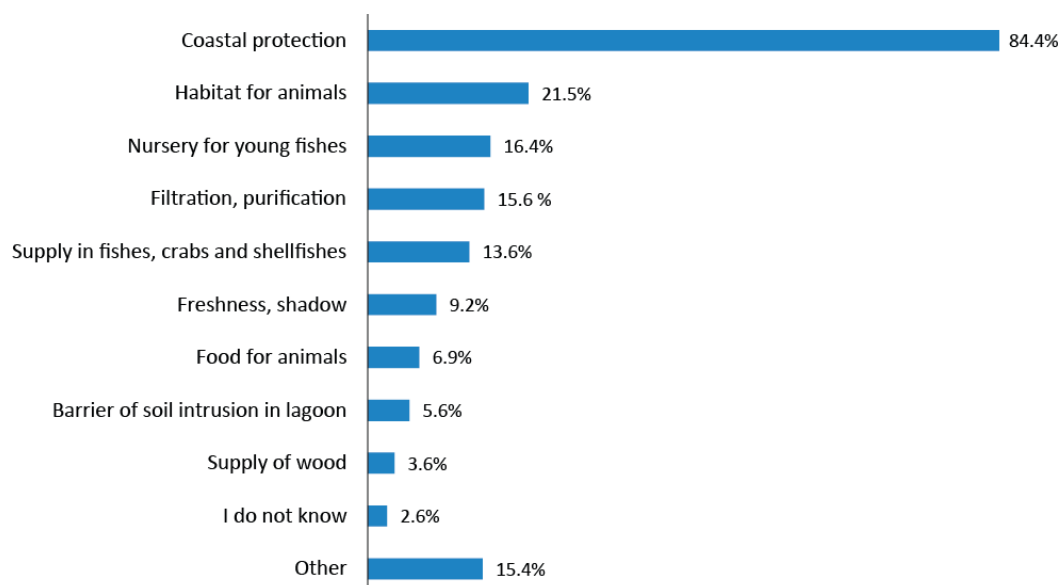

Supplementary Figure S4. Mangrove ecological services and benefits known by surveyed people (n = 390, on average, 1.9 ± 1.3 answer).
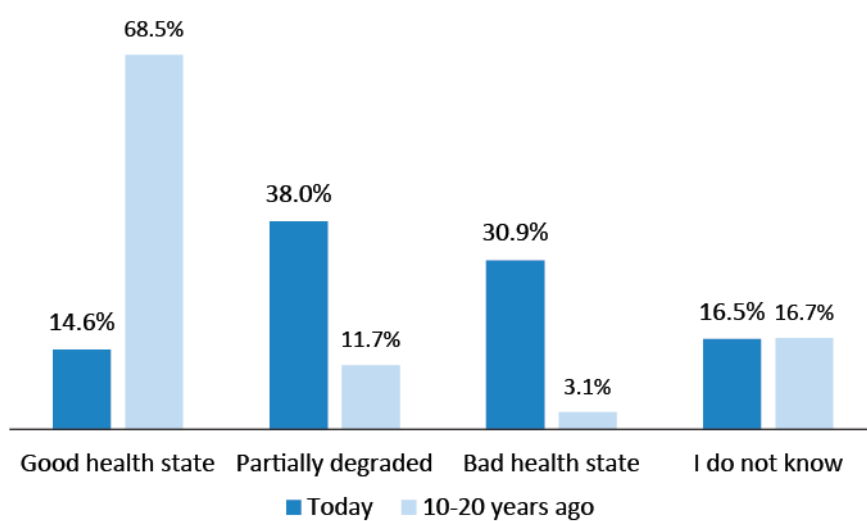
Supplementary Figure S5. Assessment of mangrove health today (n = 437) and 10 to 20 years ago (n = 257) by surveyed people.
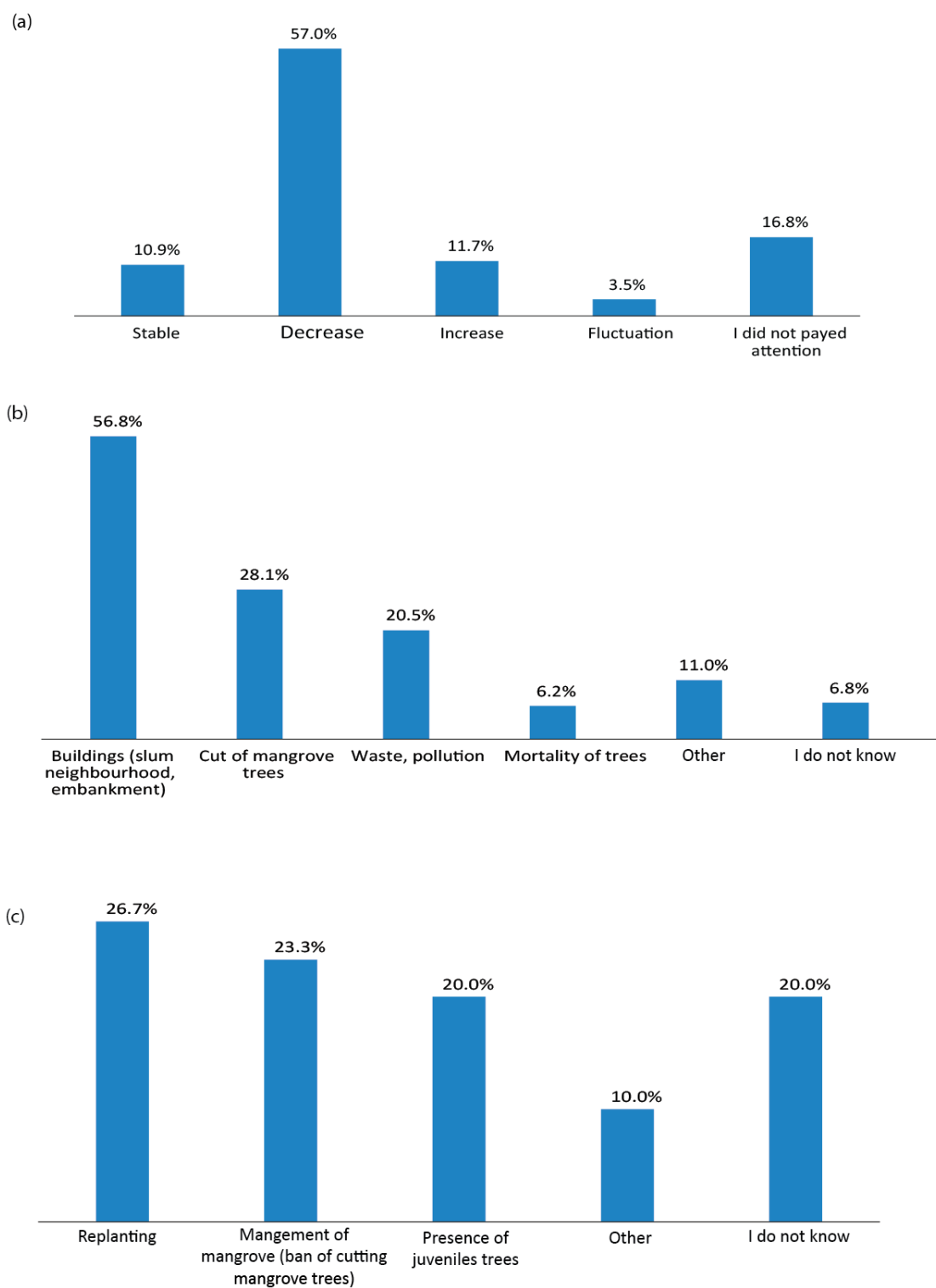
Supplementary Figure S6. (**a**) Assessment of surface evolution of the mangrove for 10 to 20 years by surveyed people (*n* = 257), (**b**) Reported reasons for mangrove decrease (*n* = 146), (**c**) Reported reasons for mangrove increase (*n* = 30).
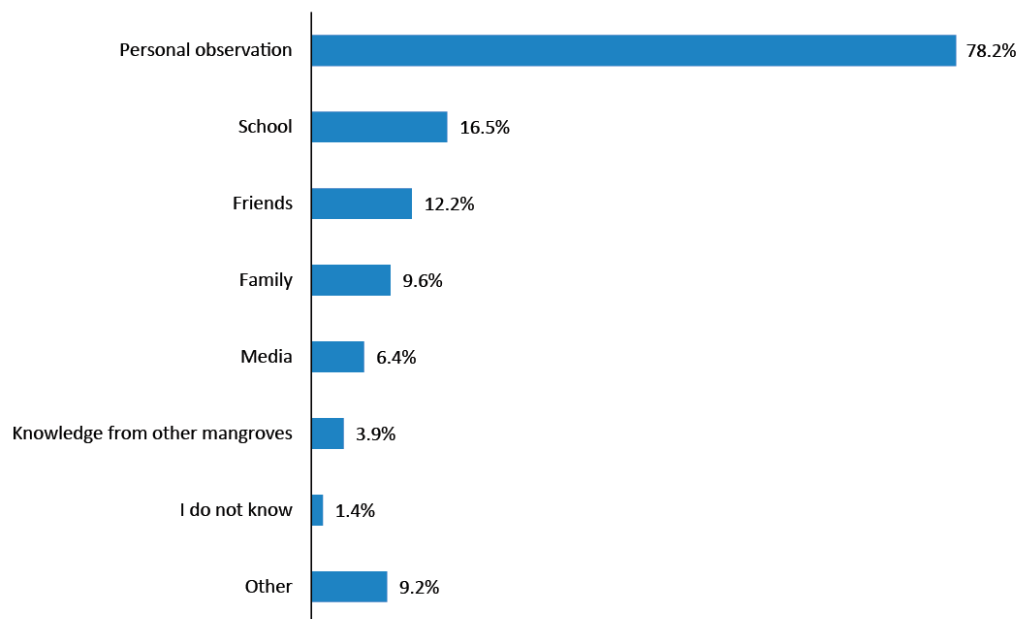
Supplementary Figure S7. Sources of LEK of surveyed people (n = 437, on average, 1.4 ± 0.7 answer).

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