

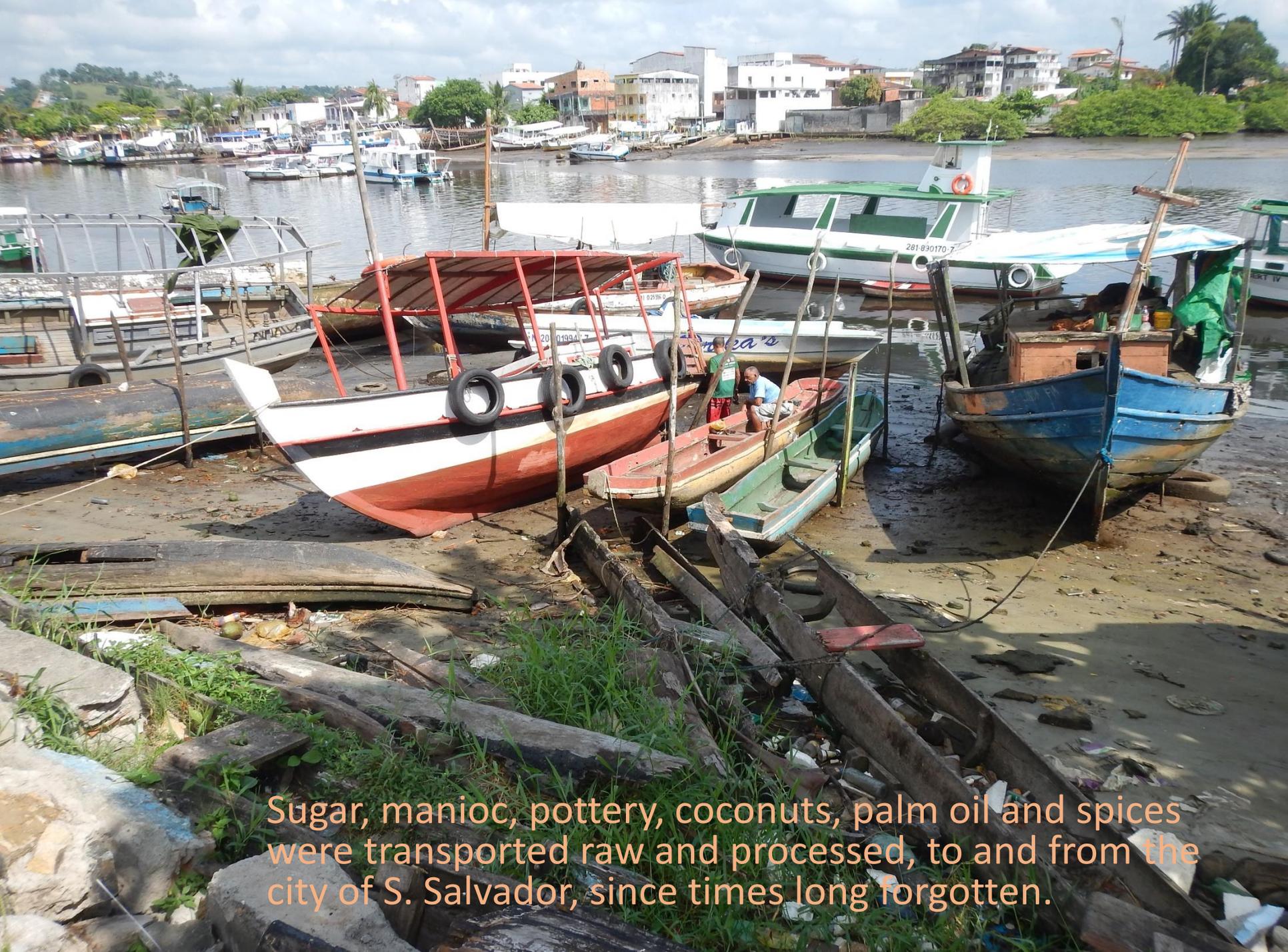
Saveiros da Bahia



Thursday, May 14, 2015, 11:30 to 12:00



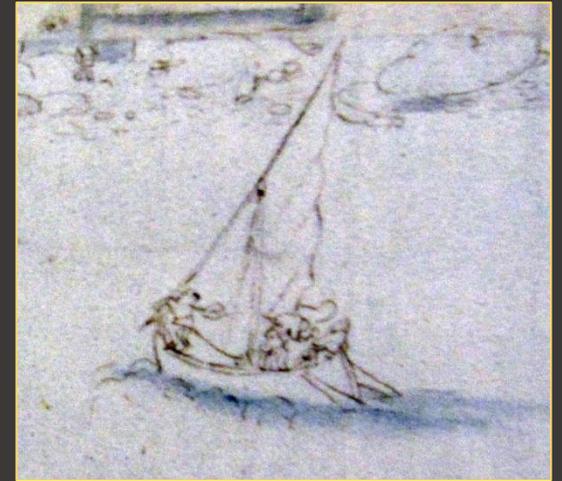
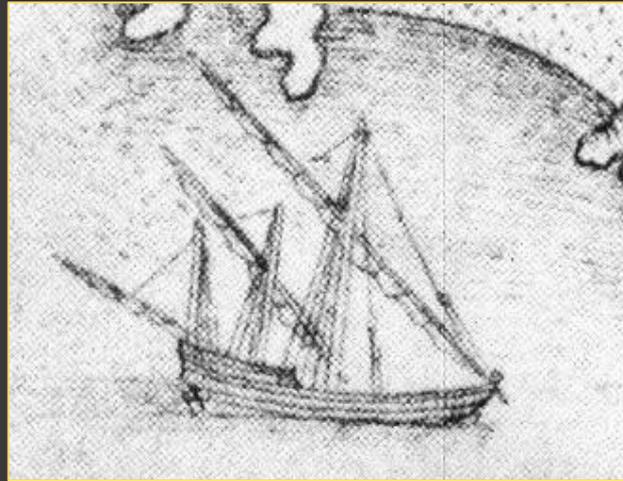
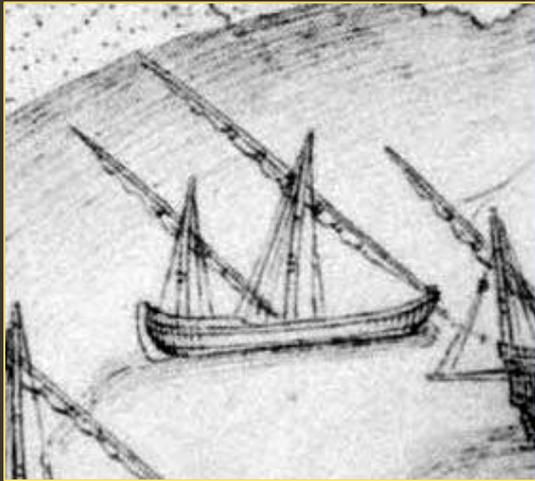
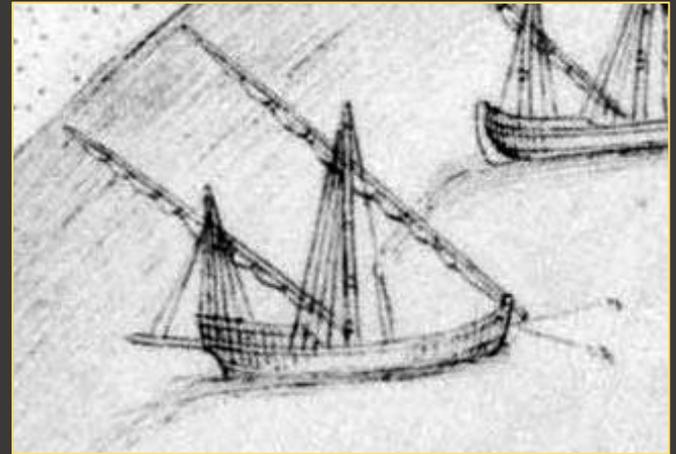
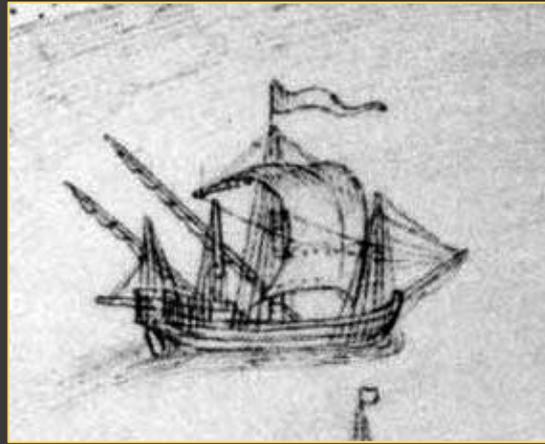
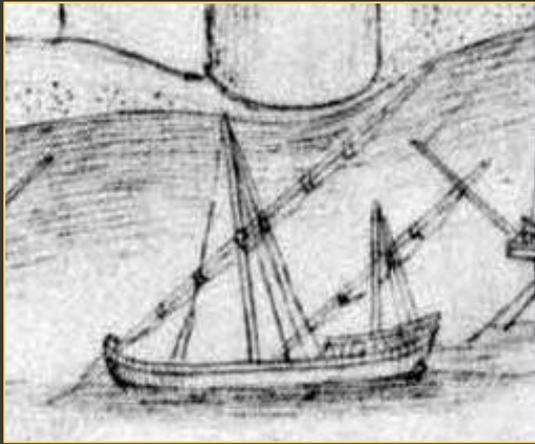
Saveiros were the working horses that supplied Baía de Todos os Santos and distributed its manufactured goods throughout the cities and villages that surrounded that industrial center.



Sugar, manioc, pottery, coconuts, palm oil and spices were transported raw and processed, to and from the city of S. Salvador, since times long forgotten.



Anthropologist Pedro Agostinho (1973) made the case for its evolution from the colonial caravels through “the slower rhythm of cultural change, [which] may have preserved until today many archaic structures, forms and techniques.”



John Patrick Sarsfield, who in the 1980s traced a hypothetical developmental line, which explained the introduction of the present gaff sails through Dutch influence [17th century] and the change of name from caravela (or caravelão) to saveiro.

Sarsfield documented and published the construction method used by one of these Brazilian shipwright *mestre* (master shipwright) Walter Assis de Santana and eventually raised funds to build a “caravel” in Valença.



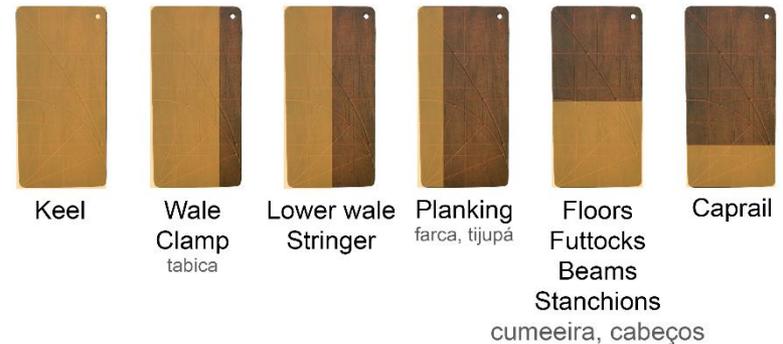
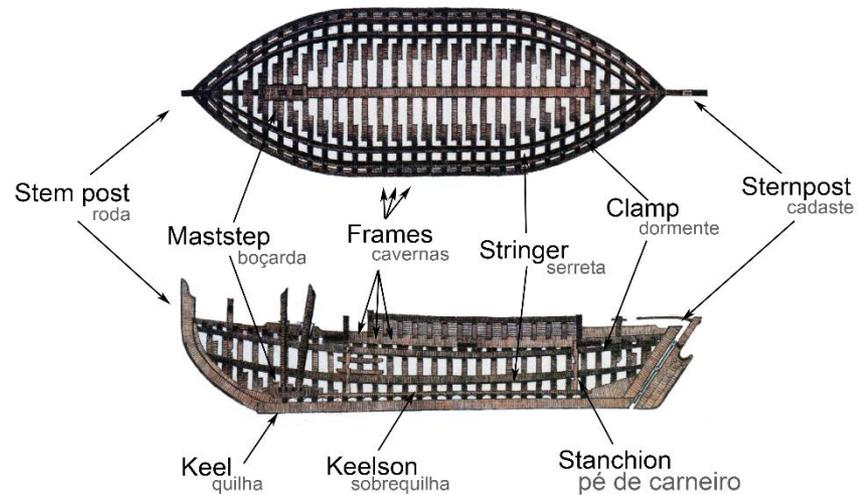
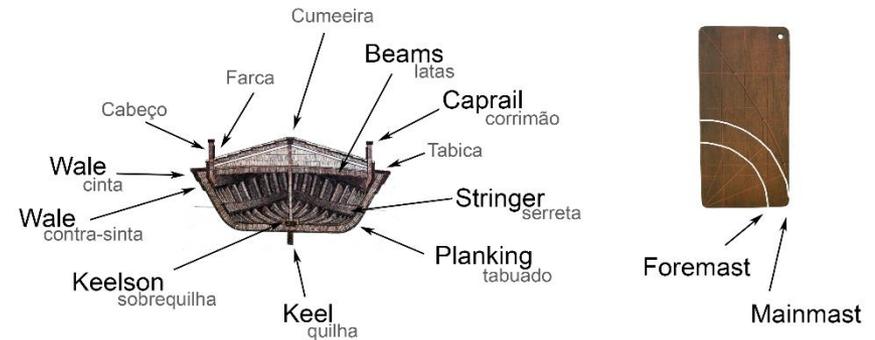
Saveiros were built following an old Mediterranean non-graphic conception method that uses molds, gauges (*graminhos*), and ribbands, and is known in the Anglo-Saxon world as whole-molding.





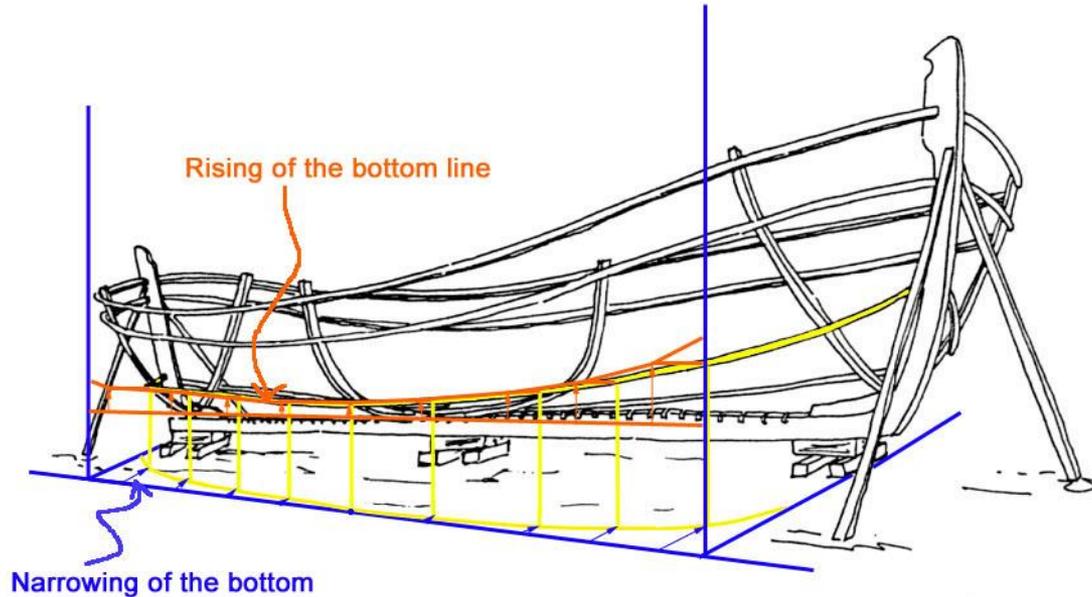
A small number of molds, gauges (*graminhos*), and ribbands are used to obtain – or repeat – a particular hull shape with reasonable accuracy.

In 1996, a book by Lev Smarcevski presented a recipe for building a 20 m long saveiro used by local shipwright, *mestre* João Bezerra, and based on a *graminho* that also contains the boat's main scantlings.





Building with master frames, gauges, and ribbands requires a certain period of apprenticeship to understand the use of geometric aids, which can be used without a full understanding of the geometric steps needed to design the molds, calculate the gauges, or determine the number of pre-designed frames.



This method defines the shape of a hull from three basic longitudinal lines: the first outlines the shape of the **keel and posts**, the second is referred to as the **turn-of-the-bilge line** and defines the boundary between the vessel's bottom and its sides, and the third is the **main wale line** or, in smaller vessels, the caprail line.



In December 2013 we visited Valença and interviewed a number of shipwrights in order to assess the situation and design a strategy to study this shipbuilding tradition.



Tracing a *graminho*.

Interestingly, in this visit we observed one case in which the shipwrights used the molds and the gauges correctly, together with a number of rules of thumb passed onto them through oral tradition, sometimes without a full understanding of the entire whole-molding process.



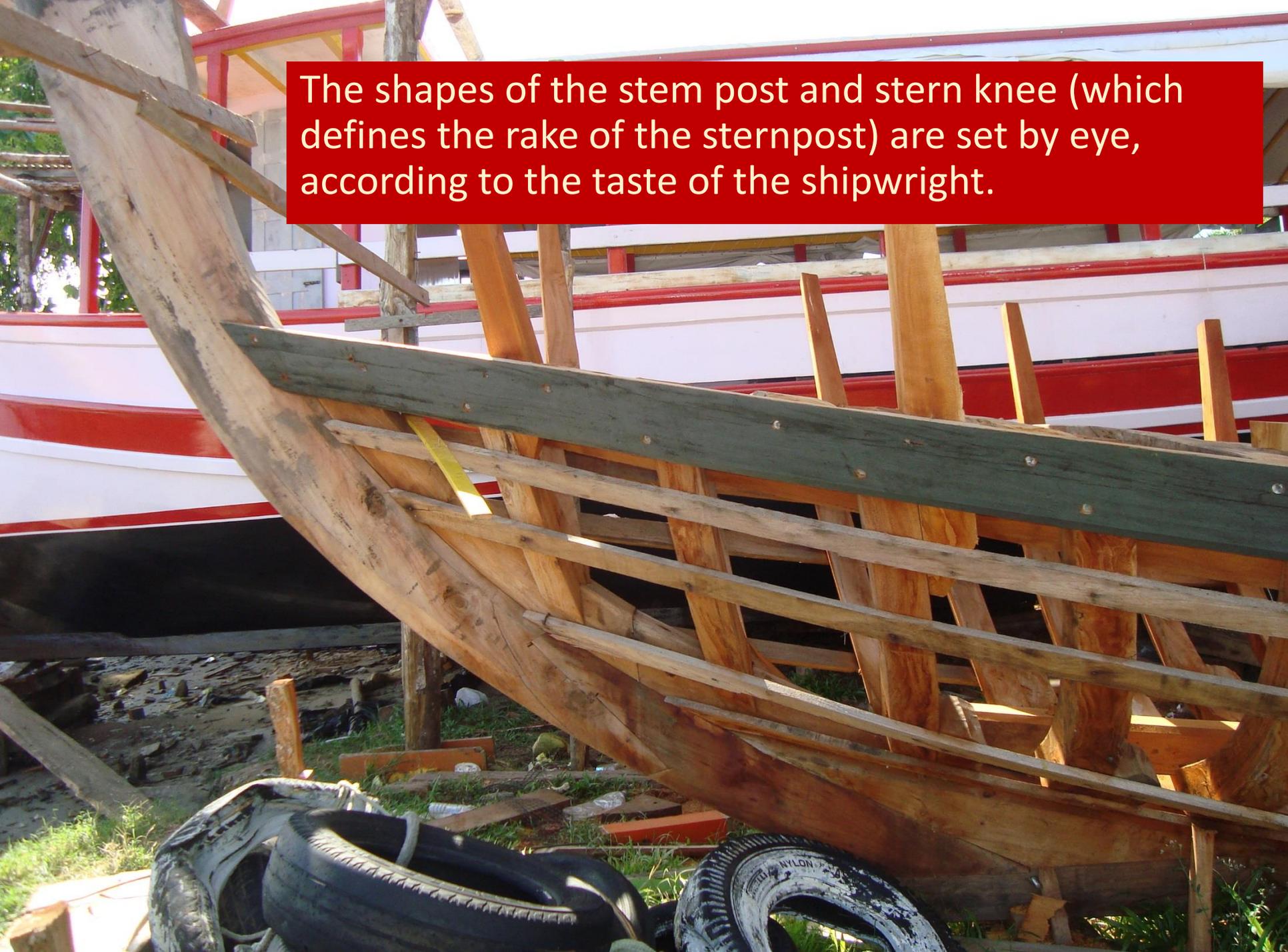
Boats (saveiros, lanchas, and escunas) are defined by their length overall. The beam and the number of pre-designed frames depend on the boat's length.





According to *mestre Zé Crente*, “a 9 m long saveiro takes eight predesigned frames (*casas de armação*), one of 10 m requires 10 predesigned frames.”

The shapes of the stem post and stern knee (which defines the rake of the sternpost) are set by eye, according to the taste of the shipwright.





The turn of the bilge and futtock arcs are also shaped by eye and are never circular arcs.



The stern panel, assembled with thick planks, is normally half as wide as the maximum beam and shaped with the futtock arcs inversed (with the turn of the bilge up).



Lower face of frame No.4

Total rising

Keel center

Total narrowing

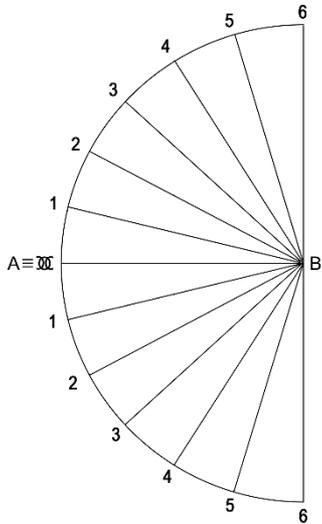
Master frame
Frame No.1

Frame No.4

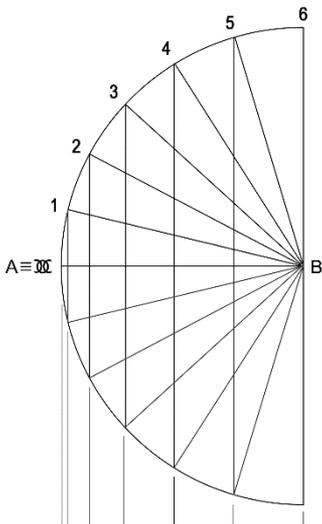
Once the floor timber and futtock molds are ready, the shipwrights define the total rising and narrowing of the turn of the bilge and trace the respective *graminhos*.

A ————— B

Trace a line AB with the length of the *compartida*.



Trace a semicircle with centre in B and radius equal to AB and divide each quarter in as many parts as the number of pre-designed frames required.



Trace vertical lines 11, 22, 33, etc.



Pass the points obtained to the gauge (*graminho*).

The division of the arc of circle used in the construction of the *graminho* is done by trial and error, as described in sixteenth century texts:

“and if the divisions are not right, one must make them again, longer or shorter, (...) until they divide the graminho [here meaning the half circle] exactly into the right number [of pre-designed frames]”
(Oliveira 1991, *folio* 95).



Bevels (*sotamentos*) are cut with the help of a scale marked in the *graminho*.



The floor timbers are fashioned a little bit thicker than the mold to allow the beveling, which is taken from the molded dimension (*de cheio*), and the futtocks are cut from the original design thickness (*de solinho*).



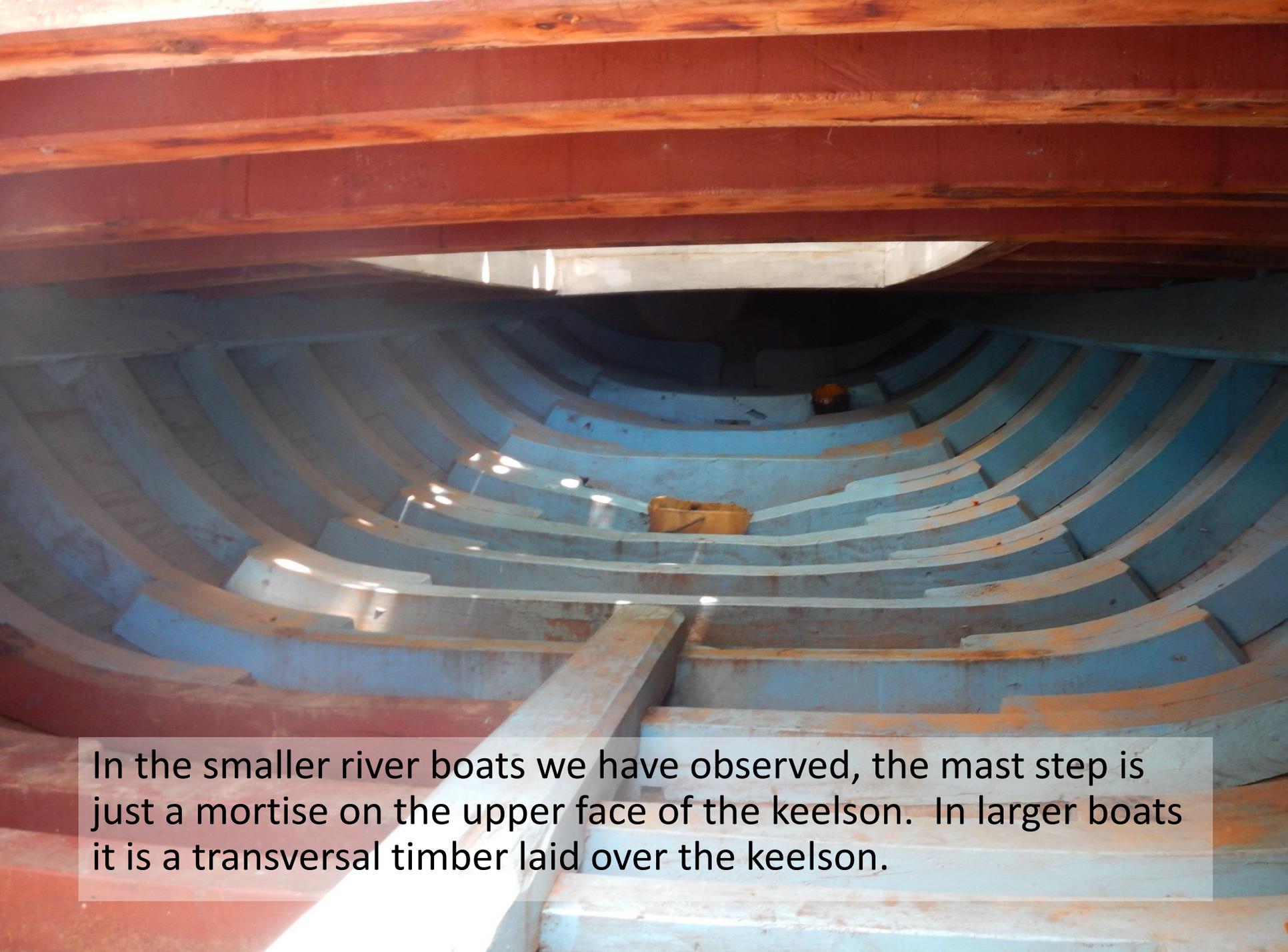
All bevels are marked with the help of a bevel gage (*suta*) at certain points along the length of the timbers and adzed out. The bevels seem to be measured directly from the *graminho* on the floor timber, but they are increased along the extension of the futtocks, being more pronounced on the top than the bottom sections.



After laying the stem post, the bow and stern knees, and the stern panel, the pre-designed frames are mounted over the keel.

The alignment of the frames is extremely important because once it is done, the keelson is fastened to the keel and the ribbands (*armaduras*) are nailed to the frames in a way that ensures a perfectly symmetrical berth from which the bow and stern frames (*enchimentos*) are shaped.





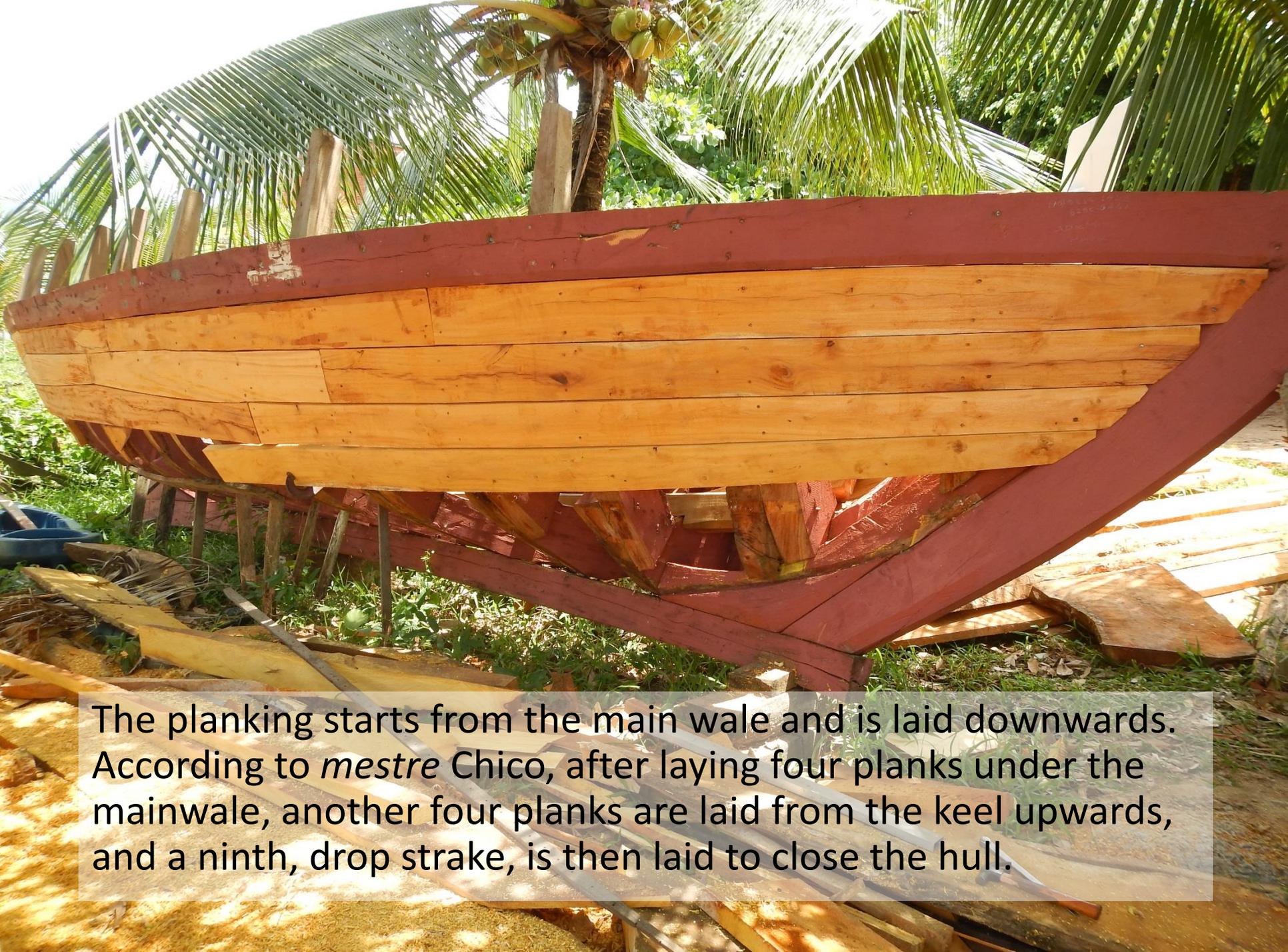
In the smaller river boats we have observed, the mast step is just a mortise on the upper face of the keelson. In larger boats it is a transversal timber laid over the keelson.



The main wale (*cinta*) is fastened to the complete framing, bent with the help of ropes and clamps, augured and fastened with screws – bolts in the past.

When timbers need to be bent, shipwrights use fire (*quentura*), oil, and weights, keeping the portion of the timber over the fire permanently wet.





The planking starts from the main wale and is laid downwards. According to *mestre* Chico, after laying four planks under the mainwale, another four planks are laid from the keel upwards, and a ninth, drop strake, is then laid to close the hull.



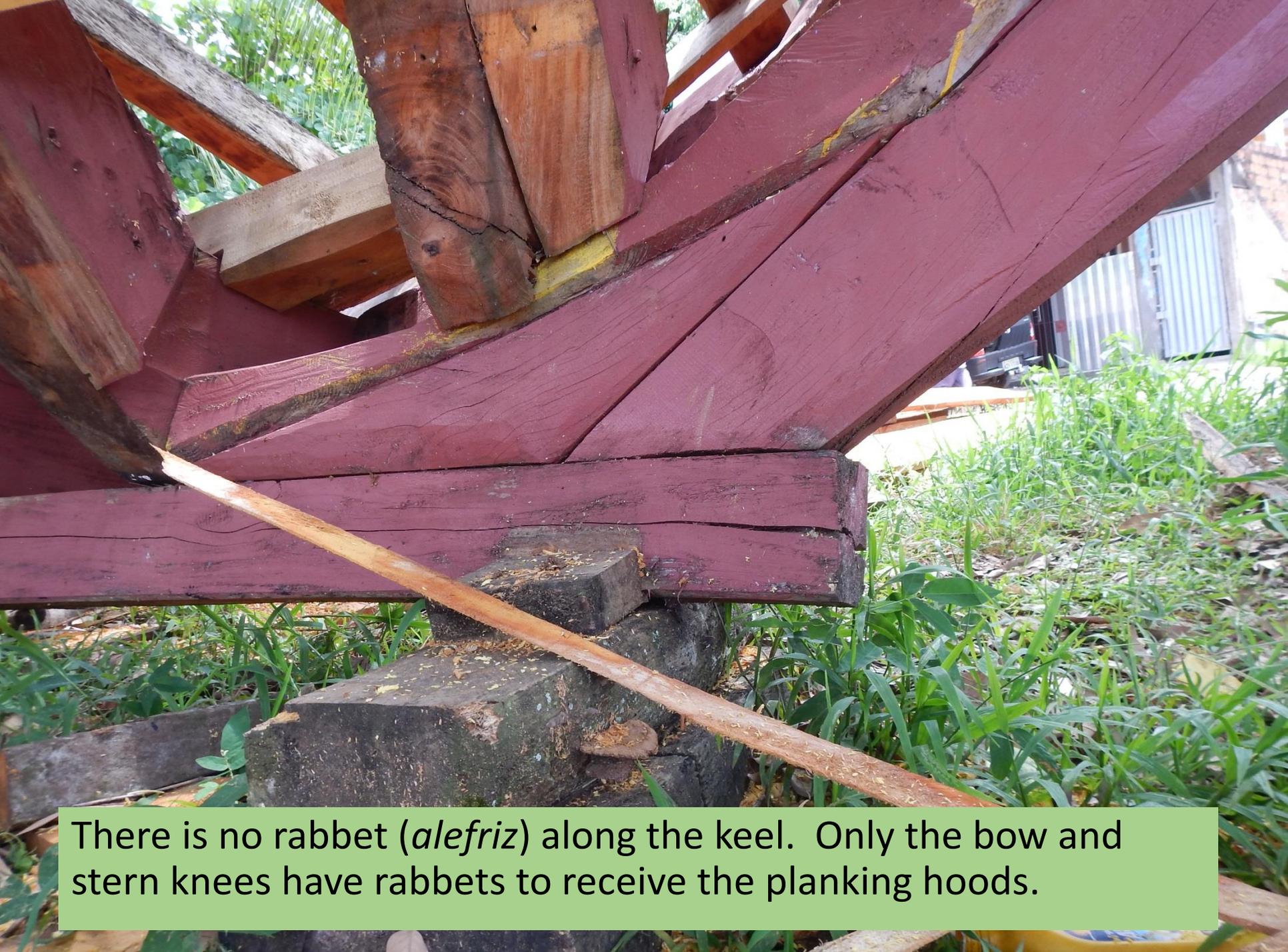
Spiling (*fasquilhar*) is done with a thin ribband (*fasquilha*), from which offsets are measured at each frame. The measurements are transferred to the inner face of the plank being shaped.



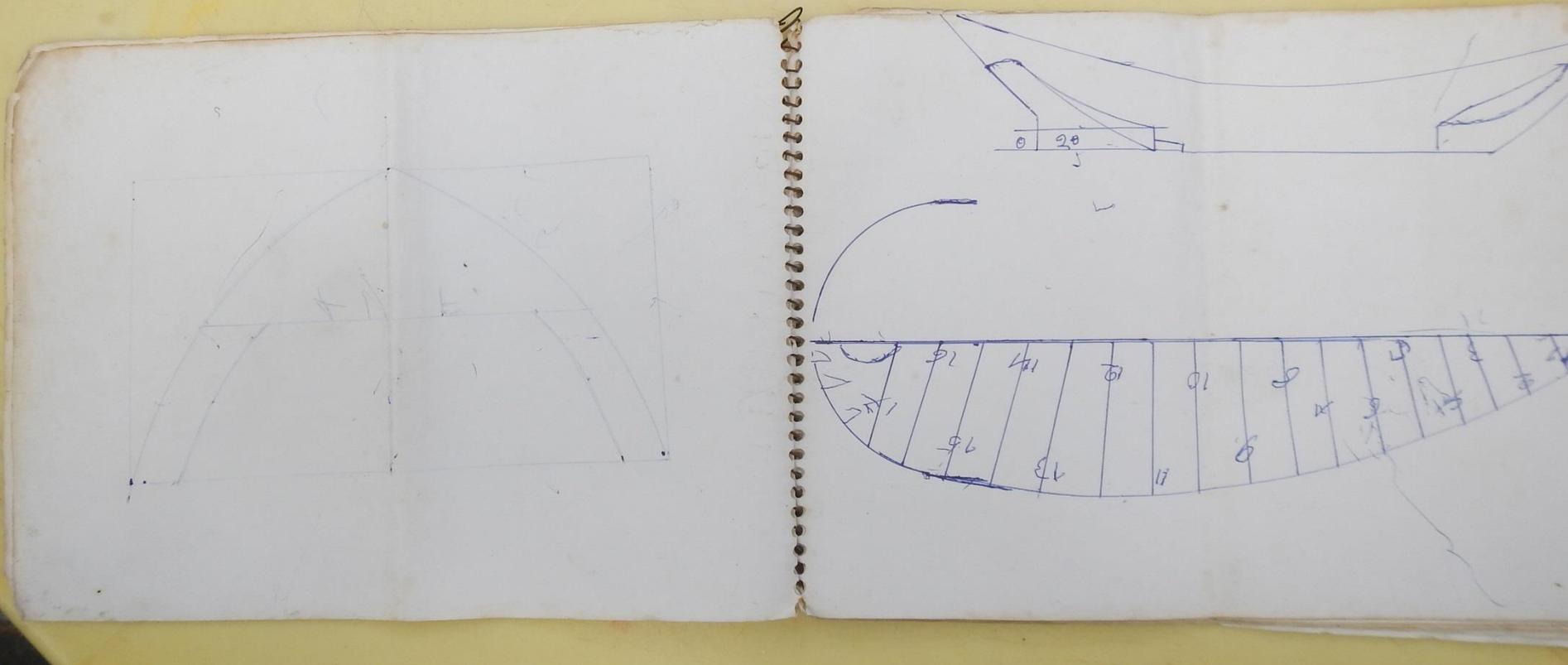
Room and space on a 10 m long *saveiro* was 25 cm in the predesigned frames and 35 cm in the bow and stern *enchimentos*.



The garboards (*tábuas de resbordo*) are sometimes laid last, with a characteristic sharp angle on the forward hood.



There is no rabbet (*alefriz*) along the keel. Only the bow and stern knees have rabbets to receive the planking hoods.



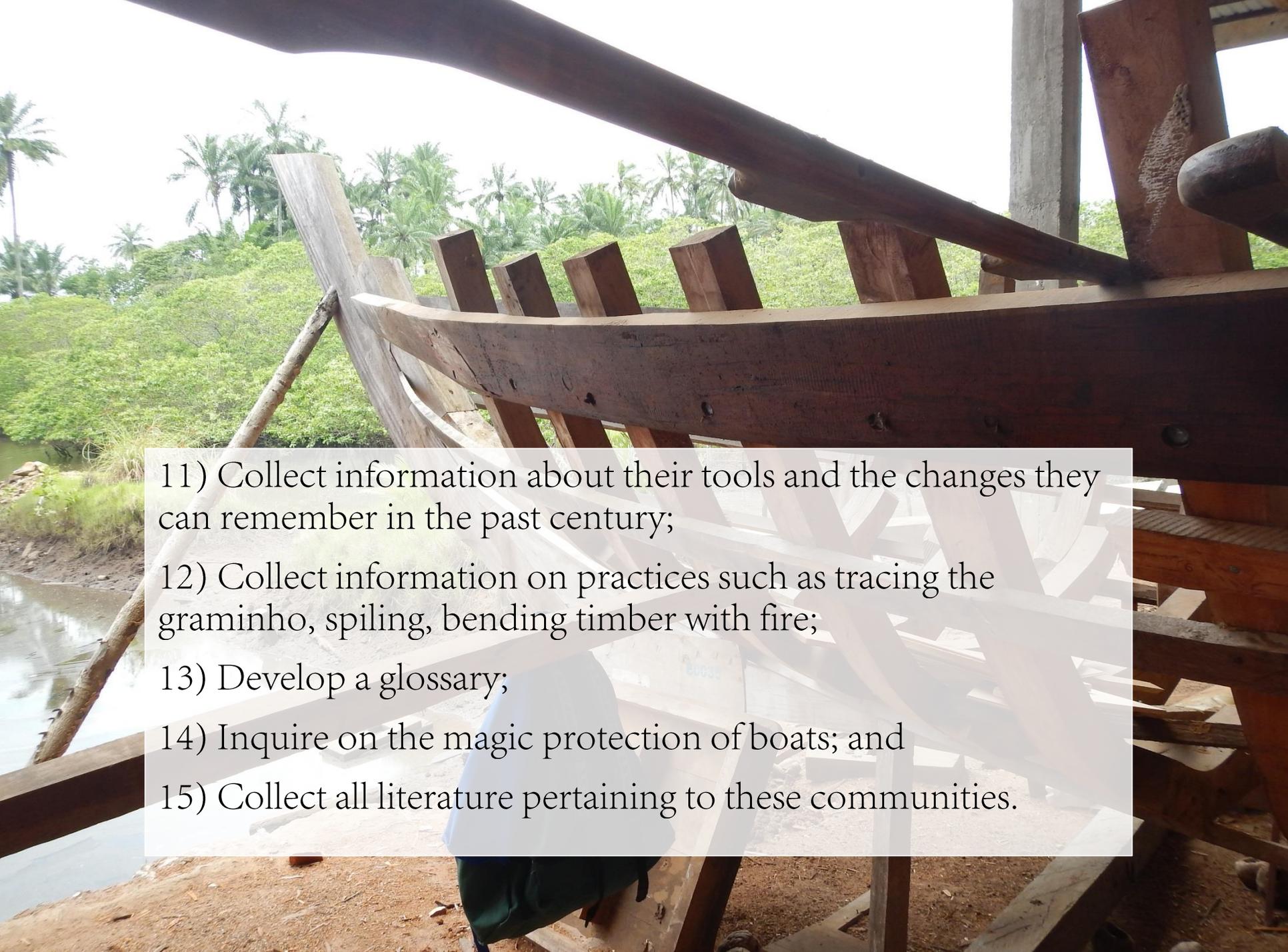
Our visit to Valença was an enormous success: all shipwrights opened their houses and showed us their notes, their molds and their *graminhos*.

Future Work

Our future plans include, among other things:

- 1) Recording of all existing variations of this type (saveiros, lanchas, and escunas);
- 2) Recording of all recipes we can collect;
- 3) Recording all variations in the construction sequence;
- 4) Recording of dimensions on as many existing boats as possible;
- 5) Recording of the scantlings and timber species on as many existing boats as possible;

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- 6) Visit the forest and watch them marking and cutting a tree;
 - 7) Interview timber suppliers;
 - 8) Record the different modalities of building contracts;
 - 9) Collect information about the relations of the shipwrights and the communities where they live;
 - 10) Collect information about the lineages of shipwrights in as many communities as possible;

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- A photograph showing the construction of a wooden boat on a riverbank. The boat's hull is made of large, curved wooden planks, and several vertical wooden posts are visible. A person wearing a blue shirt is partially visible in the background, working on the boat. The background features a lush green landscape with many palm trees and a body of water.
- 11) Collect information about their tools and the changes they can remember in the past century;
 - 12) Collect information on practices such as tracing the graminho, spiling, bending timber with fire;
 - 13) Develop a glossary;
 - 14) Inquire on the magic protection of boats; and
 - 15) Collect all literature pertaining to these communities.



Thank you!