Hodi, a traditional craft of Nicobari tribe

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The Nicobari tribe is one among the six native tribes of Andaman and Nicobar Islands (ANI), who lives in Nicobar group of Islands. This tribe follows traditional fishing methods for the exploitation of marine fishery resources from time immemorial. The traditional crafts employed for exploitation of fish in Car Nicobar, the capital of Nicobar district where a significant proportion of this tribe inhabit, is commonly called as Hodi and “ap” in Nicobari language. Hodi is constructed either using trees locally available in the island or from nearby islands. The technical skill for the construction of Hodi is based on the traditional indigenous knowledge acquired by the Nicobarese from their forefathers. It takes few weeks to few months for the construction of a Hodi. Selection of tree for the construction requires specific experience and few selective elderly persons among Nicobari tribe is considered to be the experts for the construction of Hodi. During earlier days axe and sword sickle (Fel) have been used as construction tools. However, presently modern electrical and mechanical instruments are also used for the construction of this craft. This craft is used for many fishing practices such as spearing, harpooning, light fishing, hand lining, cast netting, shore seining and gill netting to catch seer fishes, carangids, sardines, parrot fishes, tuna, sail fish, barracuda, mullet, octopuses, crabs and turtles.

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The Nicobar group of islands includes 22 islands of varying sizes of which only 11 islands have been inhabited. Nicobarese and Shompens belonging to Mongoloid race inhabit these islands who differ from Andaman tribes belonging to Negritoid race¹. The major population of Nicobari tribe is living in Car Nicobar Island which is one among the 11 inhabited islands of the Nicobar district under the Union territory of Andaman and Nicobar Islands. This island is flat with some cliffs and surrounded by white sandy beach with bluish unpolluted water. The economy of Nicobari tribe is intricately linked with forest through coconut plantation² and sea through fishing.

The traditional craft of Nicobari tribe is the Hodi, which is an outrigger canoe, very commonly operated in Nicobar group of Islands. The design of Hodi slightly varies from island to island. In Andaman and Nicobar Islands, except Jarawa tribe other tribes are using different kinds of outrigger canoes. The design of the Shompen tribe’s canoe closely resembles as that of Nicobarese, but is smaller than the canoes of other tribes in the islands³. From the time immemorial Nicobarese show their excellent craftsmanship in constructing their canoe from a single log by hollowing the trunk of the tree. These canoes have proper buoyancy and stability for racing. Outriggers and buoy are used on port or starboard side of the craft which make the operation of this craft easy at all weather conditions and prevents toppling in mid sea. Since Car Nicobar Island is situated in open sea, Hodi has been used as an important means of marine transport from time immemorial. Apart from fishing, they have been used for transporting people, racing and exchange of goods from island to island. The size of this traditional craft varies according to the purpose for which it is built. Smaller to medium size Hodis with the overall length ranging from 3 - 9 m are used for fishing in coastal waters. The bigger size Hodis with the overall length exceeding from 10 m are used exclusively for racing purpose. It is believed that Hodi race, which is celebrated in a grand manner every year, preserves the traditional culture of Nicobarese and paves way for the cultural interaction and promoting brotherhood among the Nicobari tribe.

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Car Nicobarese are known for team playing and spread into 15 villages, covering an area of 129 sq km. They always prefer to reside and work together for any common assignments starting from the preparation of vegetable gardens to the construction and maintenance of community structures like Churches, community halls, etc. They join together to build Hodi and houses too. Mostly Hodis are considered as an asset of tuhet. The term tuhet refers to a group of families, controlled by a leader called Headman. Presently this Island possesses 299 tuhets and no restriction is imposed for using a Hodi belonging to one tuhet by persons belonging to other tuhets, with prior permission. Hodi is generally operated by 1-4 persons. In case of fishing, each and every crew member carries his own fishing lines, hooks and food along with him. At the end of the fishing cruise, sometimes the total catch is shared among the crew equally otherwise they carry their individual caught fish along with them. However, the fisher who directed the craft to the fishing ground and helped in maintaining the stability of the craft would get his share from each of the crew. Usually food items such as jack fruit, tender coconut, coconut, salt, green chillies, beedi, pan, boiled kewdi (Pandanus pendans), boiled Nicobari Aloo (a common tuber in Nicobar) carried as food materials during fishing cruise. Nicobarese believe that eating jack fruit before venturing into sea favours more fish catch but eating papaya, banana may lower the catch. Nicobarese are considered as reservoir of traditional knowledge hence, this study is aimed to bringing out the Indigenous traditional knowledge pertaining to the construction of the traditional craft, ‘Hodi’.

Methodology
An exploratory research study was undertaken at Car Nicobar of Nicobar district during July to December 2011 to study the traditional craft of Nicobari tribe, Hodi. Nine out of fifteen villages at Car Nicobar, viz. Perka, Mus, Kinmai, Small Lapathy, Arong, Tapoiming, Teetop and Big Lapathy villages were selected purposively, where the Hodi is made by the tribal carpenters/fishers. In the selected villages, 40 respondents comprising of tribal master carpenters and fishers were selected purposively to get precise information on variables like technical specifications of the outrigger canoe, wood selection procedure, construction method and utility of the craft. Besides, information was also collected by from key informants like Tribal secretary, Captains of the selected villages. The data were collected through a well structured interview schedule, personal observation, some specific data like scientific names of trees used for making different parts of Hodi were collected from published literature.

Results
Hodi is used by Nicobari tribe for fishing and sporting. Nicobari tribe was found to be one of the tribes well known for their craftsmanship; they build Hodi with 3 - 9 m length, 0.3 - 1.0 m breadth and 0.4 - 1.0 m depth. The various parts of Hodi include hull, cross boom, deck, deck boards, hatch covers, mast, sail, outrigger poles, buoy, stanchion, steering oar, projections at stem and stern ornamental, which not only serve the ornamental purpose but also help in finding the direction and balancing apart from outrigger poles.

Carpentry tools used in the construction of Hodi
The carpenters of Car Nicobar Islands handle both ancient and modern carpentry tools in the construction of Hodi. The most commonly used carpentry tools were axe without handle (Fig. 1a), axe with handle (Haniong) (Fig. 1b), chisel (Subile), saw (Ranatchon), sword sickle (Fel) and wooden hammer (Tanok) (Fig. 1c). Charcoal paint (Pintep) and simple thread are used for marking the Hodis (Fig.1d).

Measuring tools used in Hodi construction
The Nicobari tribe employs various measuring tools for the construction of Hodi. Apart from hand (Kel) and foot (Kunroon), bamboo (Kinlah roon ap), coconut leaves, bamboo scale (Laneiny), single pointed bamboo arrow (Kinlahpano) (Fig.1e), double pointed bamboo arrow (Harah laneiny) and thin bamboo scale (Kunan) were used as measuring tools.

Identification and selection of trees
The trees such as Ufak (Atrocarpus gomeziana Wall.), Kinya (Amoora wallichi King), Kinyav (Barringtonia asiatica (L.) Kurz.), Pep (Buchanania splendens Miq.) Ipoh [Syzygium samarangense (Bl.) Merr. & Perry]3, Toka-voka (Atrocarpus heterophyllus Lam. ), Lava (Terminalia sp.) are generally utilized for construction of the canoe.

A well experienced tribal carpenter along with his team used to visit dense forests of the Island to identify the tree suitable for the construction of Hodi based on the purpose and specifications. In the present days, the availability of trees suitable for
making Hodi are getting reduced and hence a tribal team with expertise used to make continuous visits to the forest till the identification of suitable tree. The sound received from the root of the tree when knocked by foot and an axe is used to determine the quality, with the good quality tree producing strong and sharp sound while the poor quality tree expressing hollowness.

They traditionally measure the width of the tree based on the index finger masking the tree while standing at a distance of seven feet. While seeing the tree by closing one eye, if the stretched hand index finger hides the tree, the thickness of the tree is considered insufficient and unfit for Hodi construction. If the finger does not hide the tree fully, the thickness of the tree is considered to be ideal for Hodi construction.

The identified tree was cut using axe and hand saw. They tie the rope made of Beth (Rehenthamne) bark firmly over the tree, one meter above the cutting edge to avoid breaking or splitting of the log. For safely leaning the tree at the preferred side, they cut the tree using axes and to some extent hand saw at the base to about three-fourth of its girth and then cut 15–20 cm above that, on the opposite side (Fig. 2a).

Generally trees of about 20-50 yrs old with desirable characters, viz. (i) straight with small curvature for easy and fast construction; (ii) sufficient length which decides the size and purpose of the craft; (iii) sufficient girth for facilitating more draught; (iv) sufficient moisture content for avoiding breaking of trunk; (v) sufficient strength for more shelf life; (vi) good floating capacity; (vii) free from nodes and (viii) without much branches up to the required length of trunk were selected for the construction of Hodi (Fig. 2b).

### Hull construction

The work used to start with the removal of branches and bark of the trunk (Fig. 2c). The cut trunks are positioned above the ground level with the help of wooden logs and a line is drawn at the centre from fore and aft by using cotton thread dipped in the charcoal paint to enable scooping (Fig. 2d) continuously from centre to the fore and aft (rear) ends to get the shape of the canoe (Fig. 2e). Care is taken by the carpenters in keeping uniform thickness of canoe. Hand axe was used for scooping out the wood. The thickness of the Hodi varied depending on the design and size of the craft and also varied slightly among the carpenters of different islands. The thickness of gunwale (top edge of the side of a boat) was less than that at the bottom of Hodi. In case of fishing canoes, the bottom thickness ranged from 5-10 cm and the gunwale thickness from 3.5 - 6.5 cm. However in case of Hodi meant for race, the bottom thickness was about 10 cm while the gunwale thickness was about 7.5 cm. To maintain the uniform thickness, holes with the diameter of 0.5 cm were made all along the length of Hodi, at regular intervals in the sides and bottom using hand drills (Lanong). In a medium size hodi 4-5 holes were drilled along its length and 3 holes were made along its depth. These holes help the carpenters to measure the thickness of the hull and to maintain uniform thickness all along the hull. Later holes were filled with caulking wood (kinlah-pamo), made from locally available tree such as Tauku (Hibiscus tiliaceus L.) and Lava. Wooden pieces derived from these soft woods could arrest the leakage of water into the hull. Besides, using holes to determine and ensure uniform wall, measuring aids such as foot (kunroon), hand (kel), bamboo (Kinlahroon ap), bamboo scale (Lanainy), single
pointed bamboo arrow (kinlapamo), double pointed bamboo arrow (haralanainy) and thin bamboo scale (kunan) were found used.

Making of mid-dorsal ridge

Hodi is a keel less craft as it belongs to the category of dugout canoe. However, it has a mid-dorsal ridge (Fig. 2f), which reduces the friction and improves the hydrodynamic efficiency of the hull. Though hand spokes were initially used for achieving pointed mid dorsal edge at the bottom, nowadays, electrical spoke machines are used for the purpose. Cotton thread wound on the wooden stick is immersed in water mixed with charcoal powder and used for marking or lining the mid dorsal ridge.

Fore and aft end designing of Hodi

Nicobari tribe shapes the fore and aft ends of Hodi very carefully. The lower portion of the tree trunk with greater girth is selected for aft side and the upper portion with relatively smaller girth is shaped as fore end of the Hodi, which were always made narrow (Fig. 2g) and lengthy for fast moving. The stern side was relatively wider (Fig. 2h) to enable the crew members to sit and oar. While the width of stem and stern portion of the Hodi was measured using foot, the gunwale thickness was felt and measured with the help of palm of both hands keeping firmly opposite to each other on both sides of gunwale and using Kinlapoma (Fig. 2i).

Flow chart showing the construction procedure of Hodi

Description of certain important processes and parts of the crafts

Firing

The wooden logs were scooped out; both inside and outside of the scooped log were rubbed with grated coconut pulp; then fired (Fig. 2j) and charred evenly with the help of dried and firmly tied coconut leaves. Firing of hull at controlled heat was to make the hull dry, hard, strong with light weight. Firing also helped to kill wood worms and protect the hull from fouling organisms. The hull was fired once or twice during the construction and was repeated during annual maintenance. The hull was secured above the ground level on poles for easy firing. Immediately following the first firing on both sides of the hull, wooden poles were fixed inside the hull as cross woods (Tanam) made from Tauku, Lava, Kindrut, Kinrul or from branch of any tree by giving slight pressure on the gunwale to widen it. Occasionally second firing was also done both inside and outside of the hull on the same day and the cross woods are adjusted and re-fixed by giving pressure to make the gunwale further wider. To avoid over charring of hull, a branch of Pandanus (kewdi) tree was made like a brush (Pintep kuo tamenyo) at one side and dipped in the water and rubbed against the hull. Usually the inner side of fishing Hodi is not painted but the outer periphery of the charred gunwale is decorated with two or more colour paints.

Fixing of cross bars

After two days of firing, permanent cross bars (Sinkivo), cut from Tachei, Hanom misoko, Lava, Tauku, Channotkomat and Kinrul tree, with both end grooved were fixed on the gunwale to retain the wider opening of the hull (Fig. 2k). The spacing between the cross bars was usually maintained as one foot. The gaps between the cross bars were filled with the wooden planks which served as deck for the crew and lengthy booms (Tinyiel) were secured tightly along each side of the gunwale above the cross bars (Fig. 2 l&m). These lengthy booms facilitate not only keeping the cross bars firmly secured and also fixing the outriggers (Fig. 2n).
Decoration piece

The projecting ornamental pieces of canoe were fixed on both stem and stern sides and painted to make the craft elegant (Fig. 2o). The fore piece (Karuo) was attached on the forward end of the canoe and in continuation of this a fork like projection (Sinrinki) was attached. The upper portion of this fork was tied with a flag. These forward projecting set was also used for directing the vessel (Fig. 2p). Aft side of the canoe was attached with a projecting piece (Ritlo). One side of the Ritlo was attached with the canoe while the other end was designed as a solid circle. These ornamental pieces were made from Minhut, Charry, Bambukuo wood which was then attached with canoe by rope and pegs (Fig. 2q). (Ritlo), Ritlo, Sinrinki and Karuo were usually decorated with black, red and white paints respectively.

Outrigger boom (Payang)

The outrigger booms were slender and lashed along with the cross bar and lengthy boom fixed on the gunwale. The boom length varied with the overall length (OAL) of canoe and in general its length was kept as half of the OAL of the craft. The fore and aft outrigger boom was not fixed on the same distance from both extreme edges of the hull. The fore outrigger boom was fixed far away in the stem side than the aft outrigger in the stern side. It was mainly to facilitate fast movement and avoid toppling of Hodi in the sea. While the fore outrigger boom was thinner than its aft counterpart, the lengths of both booms were same. Sometimes the outrigger was also found positioned in such a way that the distance of outrigger from the stem and stern were equal. Tree such as Tumlei, Topiyom, Topile, Tafooto and Urang (bamboo for hodi race) used for this purpose.

Buoy (Nara)

The soft wood like Fuk, Tamreh, Mingungo, Channotko-mat, Pig and Minhut were commonly used for making of bouy/float which was tied along with outrigger booms through 18 connecting pegs or stanchions (Tumnoka) (Fig.2r), 9 stanchions each connecting an outrigger with buoy. Tissa (Supari) tree, Payuoh, Tanek, Tumleh woods are employed for making of stanchions. Floats were used to keep the boat lifted in water and to avoid toppling. The lower ends of the stanchions were found pointed and plugged into the slit made on the top of the float mostly without lashing. The upper end of the stanchion was round and lashed along with the outrigger boom. The float was fixed either at port (Latave) or starboard (Lahamo) side of the craft based on the shape or inclination of the hull for providing balance to the craft. The buoy at the centre was round in shape and tapers more in the bow than in the aft. The length of the buoy was three fourth of the length of Hodi.

Mast (Kanama)

Sails were rarely used for manoeuvring the Hodi. In case of using sail, masts of varying sizes were used for hoisting the sail based on the size of the canoe and the number of masts varied between one and four. The masts were fixed firmly on the cross bars with the help of pegs (Fig. 2s). The commonly used tree for this purpose is Tumlah, Payuoh and Topigyom.

Steering Oars

Steering oars are about 1.5 m in length and are used for seafaring the outrigger canoes from one place to another (Fig. 2t).These oars were very long, thin and light weighted, elegantly shaped made from the hard red-brown wood locally called as Payuoh (Garcinia speciosa Wall.,) and Tanek. The upper end of this oar was long handled while the lower end was broad bladed with sharp edge. The oar, Kane ritlo was used as rudder for changing the direction and to slow down the speed of the craft. The man who sits at last and directs the vessel is called Chuok-mi-iritlo.

Rituals/Pooja

Rituals have been the part of the life of Nicobarese. They seek the blessing of the Father of the Church before every crucial step in Hodi construction, viz. cutting the selected trees, transporting the tree, staring of making Hodi, and before introducing the Hodi into the water. During all the blessing ceremonies, done invariably on Wednesdays as it is the holiday for the Church Father, refreshments/food is served according to the status of the owner of the boat.

Fishing nets operated from Hodies

Basically Hodi is a small traditional dugout canoe with very narrow beam fitted with outrigger booms and buoys (Fig. 2u). Availability of space and accessories for the operation of fishing gears was found to curtail the operation of any modern fishing gears, however fishing gears such as gill net (Inhal) (Fig. 2v), cast net (Kinval), shore seine (Harah kinval-kak), encircling net, hand line (Kelthakua-kak), Troll
Fig. (2a)—Tree cutting; (2b) Cut trunk; (2c) Removing of bark; (2d) Hollowing of hull; (2e) Shaping of hull; (2f) Fore end of canoe; (2g) Aft end of canoe; (2h) Hodi bottom shaping; (2i) Measuring of hull thickness; (2j) Firing of hull; (2k) Fixing of cross bar; (2l) Shaping of boom; (2m) Measuring of boom; (2n) Making of ornamental projection; (2o) Final shape of stem and stern projection piece; (2p) Fixing of projecting piece; (2q) Painting on the canoe; (2r) Hodi with mast; (2s) Fishing canoe; (2t) Fisher with oar; (2u) Venturing into sea fishing; (2v) Operation of gillnet; (2w&x) Major fishes caught in Hodis.
line (*Inruon thakuakak*) and Harpoons are used in *Hodi*, and hand lines, gill nets and harpoons being the most common ones.

**Major fishes harvested**
Seer fishes sail fishes, tuna, carangids, sardines, mullets, mackerels, terepon, barracudas parrot fishes, sharks and Octopus are mainly caught from the sea using *Hodi* (Fig.2w) and it primary depends on the type for the fishing gear deployed from the *Hodi*.

**Maintenance of the craft**
Generally repair and maintenance of *Hodi* is done once in a year when all the accessories from the canoes are removed and hulls are reshaped and shaved (Fig.3a) upto half an inch from all sides of the hull. During the entire life span of the fishing *Hodi*, the thickness of the hull is reduced only twice, whereas for race *Hodis*, shaving is carried out more than two times so as to achieve the required speed (Fig.3b). Important parts such as cross bars, buoys, and outrigger booms were changed once in a year. The canoes were always kept in shade in a shed (Fig.3c) or under a tree, as prolonged direct exposure to sun might lead to shrinkage and stagnation of water inside the craft was also prevented to prevent decay of the canoe.

**Discussion**
The construction of *hodi* involves both science and art, the carpenters involved in construction of *Hodi* needed to have artistic outlook, patience, adequate carpentry skills, and coordinated effort apart from basic scientific knowledge. The details depicted in this paper clearly show their superior knowledge in selecting suitable trees, designing and constructing the craft, fishing and in navigation. The design of canoe’s hull, float, ornamental projections at stem and stern side and usage of various tree parts for construction of different parts of canoe are the true testimony to their craftsmanship and indigenous technical knowledge. Even though the *Nicobari* tribe make *Hodies*, *Chowrites* are well recognized and reported to be experts in making *Hodi*.

Hull construction is a time consuming job. The *Nicobari* tribe never uses standard drawings or models for constructing *Hodies*. The construction was based only on the experience of the master carpenter, called as “Vami-ap”, who is entrusted with the full responsibility of designing and construction of the craft with the assistance of other carpenters. The master carpenter would have basic knowledge on the sea conditions and stability requirements of the craft. The co-workers were found to have adequate skills in shaping craft with artistic manner as per the directions of the master carpenter. Unskilled labourers were also involved for assisting in the construction, particularly for physical works which varied with the size of the craft. Even though plenty of mango trees are present at Car Nicobar, it is not commonly used for *Hodi* construction because of its low life span, except in for making small *Hodi* suitable for operation by single person.

The indigenous knowledge of *Hodi* making is diminishing over time. Lack of raw material has lead tribes to import constructed *Hodi* from Chowra and Hut bay. The diffusion of knowledge in recent times changed the aboriginals to adapt new technologies which resulted in shrinkage of tribal territory and misuse of nature’s wealth. Though it is widely accepted that the new technologies introduced in the various parts of the world in the field of fish harvesting had caused reduction of fishery wealth and poverty of indigenous fishermen, it is not true in case of *Nicobari tribe* who use conventional fishing methods and indigenous devices, thus aiding in ecologically sustainable exploitation of fish without causing damage to the corals, mangroves, wetlands, seagrass.
Conclusion

The present study indicated that the Nicobari tribe in Car Nicobar had great skills in making Hodi, the design of which differed from those constructed at different islands. Different kinds of trees were found to be used in different Islands for the construction of this craft based on local availability and the most commonly used wood in Car Nicobar was the trunk of Jack fruit tree (Toka-voka). Importing Hodis from other islands and use of other types of boats for fishing has an inherent threat for preserving the traditional knowledge. The art of Hodi construction deserves to be preserved among the tribal community through (i) dissemination of knowledge on Hodi construction among young tribal fishers; (ii) establishing hodi making yards in different parts of Islands (iii) undertaking a study using architects for improving the stability of Hodi since it has claimed few lives in sea accidents (iv) checking indiscriminate usage of trees suitable for Hodi construction for other purposes. Expansion of Hodi-based fishery would lead to establishment of backward and forward linkages, thus enhancing the socio-economic status of the fishers of this island. Hence, the indigenous knowledge in design and construction of Hodi, acquired and passed over generations by their ancestors need to be preserved for sustainable harvest of the island fishery resources.

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