

**Long-Net Fishing**

**in**

**Kosrae**

**A**

**Term Paper**

**submitted to:**

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**and**

**Project: MACIMISE**

**by**

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## Introduction



Fishing is an everyday cultural activity common throughout the Pacific Islands, with slight differences in techniques. In this paper I will suggest how fishing can be broken down into parts, to form an algorithm for not only how to fish, but also how to preserve the original techniques for generations to come. As seen in the photo above, here in Kosrae, like all other Pacific islands, most traits are passed down through the generations by word of mouth, thus, if we are talking about fishing, the best place to talk is at sea, and most likely, it is less talk and more action. As stated by Benjamin Franklin, "Tell me and I forget. Teach me and I remember. Involve me and I learn."

By exposure, this little kid could be the next best fisherman on the island, but there are tests he will have to pass, and this is one of the many to come. According to the father, he is learning how to tell the different tides, and how to behave at sea. The father has brought a throwing net, but they stand silently for about two hours before going to the next spot. At times the kid will be yelled at, to stop playing and just stare into the sea and

look for movements and to tell the father what he sees. It is hoped that the child will complement the practical by learning of the Lunar Calendar from school.

For too long it has been assumed that poverty has been the major factor in student failures in their academic endeavors. As researchers, however, we should explore other views and/or causes, and how utilizing local cultural activities within the existing curriculum would better allow a society with collectivist learners to adapt educational practices and compete with societies of individualist learners, and thus prove worthy of continuing financial support. I believe that a student will participate and learn more at school if better efforts are taken to link the learning process with the local environment. As researchers, (local experts with “emic” perspectives), we have been given the task of improving the learning process by living and teaching within the students’ cultural systems of understanding, thus the attempt to consider the individual’s culture and beliefs and to see things from the students’ perspectives. Most students in a society of collectivist learning will be better understood if the teacher is properly acquainted with the local culture. Because fishing is such an important cultural activity in Kosrae, I hope to contribute to the attempt to improve culturally appropriate education by developing an algorithm to allow outsiders to view Kosraeans through this particular activity in Kosrae. Hopefully, this could also be utilized for expert academic instructors from the individualist society to acknowledge the collectivist style of learning and thus adapt their teaching practices to suit.

Fisheries development is one of the mandates of the Federated States of Micronesia, of which Kosrae is part, but at the national level, Kosrae State has failed to respond to previous opportunities to develop a fish cannery operation. However,

fishermen in Kosrae are successful in catching fish either by trolling and/or other methods of beyond-the-break fishing as well as within the breaks, as could be witnessed by the selling of fish at the local markets. Maybe by getting the stake-holders to seriously participate in fishing ventures as other means of generating revenue, the local traits could combine with the latest technology for a more successful venture than they have in the past.

Kosrae along with the other Small Islands States have continued to take a stance against bigger countries depleting its sea resources, especially within the 200-mile zone. Given better training, Kosrae State can again develop fishing from being only a local enterprise to becoming an international export, at the same time plan and implement fishing strategies to ascertain local requirements as well as international are met, and with more in reserve. I hope that the Kosrae lunar calendar will be introduced back into the elementary school curriculum as in previous years, with little to no modification. Reciting the lunar calendar will hopefully help restore local knowledge of the moon phases synchronizing with the tides and currents, and which species of fish can be found at what times. I hope thereby to raise further interest among the students, who could follow up their local knowledge with high school science and college-level study of the physical science of how the moon affects the sea and its resources.

Understanding the success and challenges of a collectivist community offers the best hope for competing with the learners of an individualist society, and to lose that understanding is like taking a step backward. In order to do this, each individual must contribute and have the desire to eat and live with each catch, rather than thinking of

commercializing each catch in exchange for imported goods, which is happening among societies today.

As one of the four states that make up the Federated States of Micronesia, Kosrae has little in the way of a local style fishing. Micronesian fishing practices are shared in common not only among the four states but among other Micronesian islands like the Marshall Islands and Palau etc. Most of the information are obtained from the elders which is sad, since it means that the young generation of today are not using these cultural activities, meaning that it will die out with the elders. Fishing is an ideal activity for someone who is dedicated to living with nature, learning how his or her world revolves around the changing environment, living off the resources of nature, and learning how to give and take in this world in order to survive. Most Pacific Islands including Kosrae have the sea and its resources at their disposal, and sustaining it for future generation depends entirely on the present generation, which can reflect on the errors and achievements made by previous generations.

### **Methodology**

#### 1. How did you conduct your research?

Information was gathered mainly from my many informants throughout the four municipalities of Kosrae, the Museum, Visitor Bureau, Fisheries, and KCSO.

#### 2. Who did you consult?

Most of the research is based on interviews with elderly Kosraeans, which unfortunately and sadly proves that the cultural activity in question is slowly but surely dying out with the elderly, as the young people of Kosrae are now heavily dependant on

imported foods. That is one reason why Kosraeans have joined the world-wide epidemic increase in the prevalence of diabetes.

3. If you used a set of interview questions, what were they?

Questions:

1. State your full name
  2. What kind/type of a fisherman you classify yourself as.
  3. What are the most important aspect of fishing
  4. How do you fish
  5. Do you have fishing spots
  6. Do you know the sea-beds of Kosrae
  7. How do you regard preparation to fishing
  8. What is your preferred fishing method
  9. Do you fish according to the moon-phase, explain
  10. Are you aware of the Kosrae Lunar Calendar
  11. Do you know the spawning season
  12. If you were given the opportunity to guide other fishermen into conserving areas, where would you implement them and how and why
  13. Any other comments you would like to add to your statements
  14. Is it true that sex before fishing is bad, can you further elaborate
4. What were the difficulties that you encountered in conducting the research?

I found at first poor communications between myself and the informants, especially since I am from a family here in Kosrae that knows little about fishing, and they didn't want to fully share their family or community knowledge with me. With time,

slowly but surely I started to earn their trust, but unfortunately, time ticked by too quickly, as I am still in the stage of accompanying them fishing, meaning just a helping hand with little gain but information. When fishing with the groups, I don't get any share of the catch, as according to my informants, my share within the family is the secret knowledge gained from the venture. As it is dark and rainy most times, with nothing to see but shadows as shown in the photo shots below, I really learned nothing except the common locations for the specific kind of fish locally known as "ac" (pronounced "E"), or better known as mullet.



The first shot is from the bank side with the net laid out in a "C" shape with the tide just above the ankle on most parts. The second shot is still at the bank side, with the shot upwards towards the sky to show that it was supposed to be bright as it is full moon, just that it is raining. I don't know why the poor first photo shot is so dark??

Other problems included actually keeping to schedule, since I was waiting for my informants to have some free time, and most of the arranged times got delayed due to family commitments. My main informant, Papa Manasa Charley, lost two sons a month apart within the duration of our program, so I was lucky for him to accept me during his mourning periods. Other informants, as they are mostly elderly, were called to meetings

at short notice within their respective municipality and this forced them to cancel or postpone our meeting, and sometimes if it rained too much they opted not to meet. Last but not the least is in regards to my last question, where during the group meet with the Research Collaborators of the Eastern Group, this question (14), popped up ?? Since it is rude and unacceptable for young people (reporters included) to go deeply into the private life of an elderly, it was hard for me to ask the question, and when I did, it was brushed aside very quickly.

5. Do you feel that your research on this topic is as complete as possible for the purposes of developing math curricula, or would you recommend further research?

I would recommend further research on this topic, since here in the Pacific, fishing should be the topic of the century, and in order to merge such an important cultural activity with classroom curricula, more time should be spent to ascertain whether it succeeds. Unfortunately, with teething problems (when we first started, we had to learn about the application programs like “Laulima”, and how to sign/register for the course etc. Since I was a late starter, I had extra problems obtaining my student ID and number) with technology and application softwares to delivering the course, and not to mention the competition between colleagues for the spot to study, and the sudden death in my family and that of my main informants (by suicide), time became the enemy.

6. What aspects of your research do you feel were successful or unsuccessful?

The successful aspect of my research is the connection and trust that has been built between myself and my informants. Another would be the fact that I have become well acquainted with my fellow research collaborators from the other eight Pacific Islands including here on Kosrae. I have learned about their character during the good



and bad times and sort of learned whom to trust and whom not to trust, whom I can rely on and whom I should not rely on. Even though I have not commented on any of their blogs, I sort of know which of my colleagues know what they are doing and which ones are just filling in time.

In regard to my informants, I have learned a lot of fishing techniques. I have learned how to read the moon phases, the tides and the best times for catching most kinds of fish species. I have learned the importance of preparation for fishing, customs of dividing the catch, and the different techniques of mending the fishing net, especially how to start from scratch.

Anyway, for what it is worth, I take off my hat to Rhoda and Latika for successfully researching most local topics that I as a national don't even know of in all my years in Kosrae, and for their use of local terms in their blogs without knowing how to speak the language.

The unsuccessful aspect of my research is my failure to come up with the goods within the given time period, and wasting the devoted time of my informants, and my inability to take good snapshot photos of the venture that was given to me for my learning. The worst would be the wasted opportunity to use the most sought-after activity in the Pacific to be used as a basis for developing and implementing curriculum units for the grades 1, 4, and 7.

## Description:



First Name : Manasa  
Last Name : Charley  
Municipality : Malem  
Age : 71  
Birth date : 02-03-39  
Profession : Retired Government  
employee (Laborer)  
Local Knowledge : Reef fishing and beyond  
the break fishing

My fishing story will be based on knowledge from Papa Manasa Charley's livelihood in fishing. At 71, he has retired from government work and fishing, but still upholds the practice by mending old nets and weaving news ones, both throwing nets and long nets, for other fishermen and women from all over Kosrae. In the photo above, Manasa Charley has interrupted his daily routine of mending the net, upon my intrusion to seek guidance from his local knowledge of fishing. In the photo, he poses with his wife, daughter and son in their modernized *inum* (local cooking house).

He is an all-around fisherman, but prefers catching tuna by vertical long-line deep-sea fishing. Like all Kosraeans, he is aware of the lunar calendar but has a version

of his own, which he says will not only share with me sometime, but will also show me practically by taking me fishing.



My main informant, Papa Manasa Charley, is shown above with a completed throwing net awaiting the insertion of the weights. He insisted on showing me how vertical long-line fishing was done in the past, since nowadays fishermen use a new technique. Because Papa Manasa uses crutches to walk, most fishermen when asked to take us out to sea in their boat refused to, saying they didn't want to take responsibility should an accident happen. At a grand age of 71, Papa Manasa should retire to the house, but he still goes for his daily walk at times, but most of the time he just sits and mends nets. Inside his house, we talked about which fishing spots are good for specific species and the times that various fish can be seen. His wife and daughters fish with long net for the family consumption, while he admits that now, more frequently than before, he eats canned food, which he knows is bad for his health. He shared the fact that, depending on the occasion, he spends time preparing for whatever type of fish he is going to catch,

while we help him decide what size mesh is required, judging from the tide times to decide on the height and length of the net to use. He emphasized the importance of preparation, deciding on the size of the fishing mesh, considering how many participants there were and the moon phase (tide), and the length and height of the fishing net. After awhile, I asked him whether having sex before fishing has any effects and after a grin, he stated that each person has different beliefs and that he sees nothing wrong with it, stating that if anything it relieves you of worries.



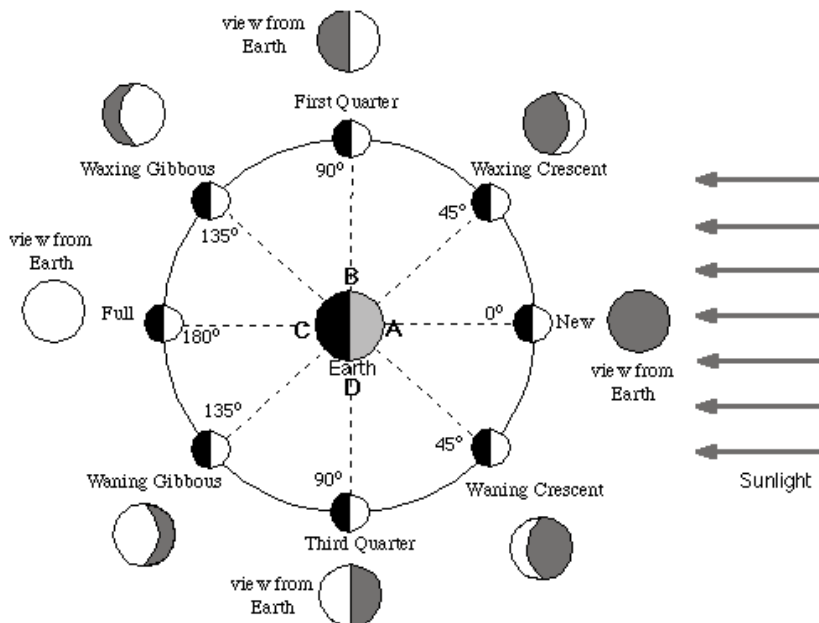
Above is another fisherman from the Municipality of Malem. This is Director Kalwin Kephas from the College of Micronesia, Kosrae Campus. When not at work, he fishes either within the breaks (*turong* – spear fishing) or beyond the breaks (trolling). Kalwin Kephas prefers *turong* to long-net fishing because it does not involve the complex mathematics of dividing the catch, since what you catch is your own, and even better, he says, depending on your ability, you can get almost any kind of fish you desire, such as parrot fish (*ohlohl*), surgeon fish (*kwi*), unicorn, grouper (*kalisrihk*), *malap* and so

forth, which are just a few of those he has caught. He added that if you are not scared of ghosts and sharks, then it is best to fish alone at night time, especially during dark nights, or even during nights with a half-moon, when you will have to wait until the moon has gone down. If you can go 15 – 20 feet deep, you will come across big fish such as *kuhsruhl* and *komokut*, of a size that requires the assistance of a second person. Note that these big fish sleep in caves where sharks cannot reach them, so, doing it on your own could prove fatal at times.

However, Director Kephas commented that in regards to long-net fishing, Kosraeans in earlier days used the local long nets constructed from coconut fiber, called “*neklahp*.” Twenty women in line would hold a net out straight in both hands and the line slowly marched forward as if it were a 100-to-200-foot-long fishing net. As they guided the fish towards the shoreline or where the sea-bed is shallow, each would pick up the fish and put it into their basket. At times, a woman would select a fish from her catch to give to the next woman in line if she were not getting any, otherwise, after the fishing, the whole catch would be divided according to the houses of those who participated. During those times, women took pride in fishing, accompanied by one man who would act as their leader, giving orders on where the lines should form, the direction of the marching, etc. The purpose of the male was to safeguard the fisherwomen. In some cases, each village used landmarks as their boundaries, and they would not let anyone else fish within that boundary. Some even went to the extent of using rocks (*weirs*) to surround the fish, trapping them from swimming back to the breaks at low tide. The most common fish to catch is *ac* and the best time is during the full moon. Octopus, on the other hand, is best

caught after a thunderstorm; Kosraeans believe that it is scared by the vibrations and comes out of its hide-out.

The mathematics in fishing is firstly implemented with the determining of sea tides according to the moon phase. As observed and noted by local fishermen and compared with the knowledge using science, this synchronises quite well as shown below. Unlike the sun (24 hours in a day), the rotation period of the earth in respect to the moon is 24 hours 50 minutes, thus there are two daily high tides 12 hours 25 minutes apart.



The Sun-Moon angle is the angle defined by Sun->Earth->Moon with Earth (where *square*) as the angle vertex. As the Sun-Moon angle increases we see more of the sunlit part of the Moon. Note that if this drawing were to scale, then the Moon would be half this size and its orbit would be about 22 times larger in diameter and the Sun would be about 389 times farther away than the Moon!

<http://campuslady.files.wordpress.com/2008/01/moon-phases-diagram.gif>

The bright full moon reflects the sun's light back to our eyes. The moon is used to measure time, with the length of a month being related to the motion and phases of the moon. For 7.375 days it is seen as a 'waxing crescent' (the illuminated portion of the moon is getting larger), then 1<sup>st</sup> quarter, and in another 7.375 days it reaches full-moon

stage. After another 7.375 days it reaches third quarter, then another 7.375 days and it reaches new moon again, and so forth it goes. (An Introduction to Physical Science Pg.469 Shipman/Wilson/Todd).

The Kosraean Lunar Calendar correlates with fishing and agricultural activities.

1 <sup>st</sup>	Maspang	new moon
2 <sup>nd</sup>	Musalum	new moon
3 <sup>rd</sup>	Musaan	new moon
4 <sup>th</sup>	Museit	good fishing
5 <sup>th</sup>	Musaoal	poor fishing
6 <sup>th</sup>	Lotloto	poor fishing
7 <sup>th</sup>	Mutaoal	good for turtle catching
8 <sup>th</sup>	Sriafong	phosphorescence, poor fishing
9 <sup>th</sup>	Arfoko	fish gathering by species
10 <sup>th</sup>	Sukanpur	good for gathering house timber
11 <sup>th</sup>	Lofsan	good crab catching
12 <sup>th</sup>	Olwen	good crab catching
13 <sup>th</sup>	Fakfong	good fishing
14 <sup>th</sup>	Mesr	planting day
15 <sup>th</sup>	Eel	planting day
16 <sup>th</sup>	Lulti	good fishing
17 <sup>th</sup>	Kuwulah Sie	good fishing
18 <sup>th</sup>	Kuwulah Luo	good fishing
19 <sup>th</sup>	Sopasr	fish producing eggs
20 <sup>th</sup>	Apnuk	fish in separate schools
21 <sup>st</sup>	Sopasr	fish full of eggs
22 <sup>nd</sup>	Oslun	all fish now in species groups
23 <sup>rd</sup>	Kusaf	fish in species groups
24 <sup>th</sup>	Sunak	fish hiding
25 <sup>th</sup>	Sroanpur	fish hiding beneath hanging branches
26 <sup>th</sup>	Arpi	fish releasing eggs
27 <sup>th</sup>	Lil	fish returning to the sea
28 <sup>th</sup>	Srupup	regrouping of species
29 <sup>th</sup>	Lunguni	dark of the moon
30 <sup>th</sup>	Lungalan	dark of the moon

(Island of Angels, Pg.17)

Other mathematics in fishing begins with the preparations for going fishing, and involves decisions about what kind of fish to go after, and the best time to go, according to the type of fish and the tide times. Other decisions involve the number of people to bring as assistants, and selecting the two best net-bearers from among those people. The size of the fishing mesh is another important decision. The height and length of the fishing net will be decided last. The organizer must also tell all the participants what time to meet, and travel arrangements to and from the fishing place must be arranged.

The fishing location will be determined according to the sea currents and weather. After a few trials and errors in choosing the location, the shape of the net when laid out will be determined, and the exact spot will be told to the two net-bearers; otherwise, the wiser of the two bearers will decide where to start laying out the net and what shape to use. The most common shape is the letter “C” as it gives the guides an opening to guide the fish into before closing the gap. If the tide is getting too low, then the tide will help trap the fish, so the net shape will be the letter I, or straight in parallel with the break. The mathematics here involves the timing of the bearers, when the guides can start splashing towards the net, and how fast they should travel. With the local knowledge of the area, the bearers and the guides can pinpoint spots where the sea-bed will be to their advantage, the spots with many fish etc, so the fishermen should have a rough idea of the features of that particular location, or at least take note of the success rate for future reference. Since during fishing decisions are really made on the spur of the moment, the leader should mathematically calculate how far if anything between the laying of the nets from that of the last, and to what shape should it form this time around putting into consideration the location (i.e. the sea-bed). Usually when catching fish, or in the process,



everyone must be quiet and use sign language or body gesture to describe the event of fish size and this also involves math.

After the fishing venture, the mathematical aspects left to discuss would involve the weighing of the fish for sale, and/or the distribution of the fish by size and weight according to the importance of the participants and the role each played in the team fishing. Of course the owner of the nets must get most of the fish, depending also on their family ranking and/or importance in the community. Like in my case, since I was actually an outsider to the family with no importance in regards to the fishing priority, I got nothing in return for my efforts in the ventures. Of course every now and then they would offer a fish or two out of kindness, but, when dividing up the fish, other criteria outrank kindness.

A meeting with ex-Marine Resources—now Lelu Elementary School—Security Guard Rooston Abraham never occurred, as with the two expert fisherwomen from the Municipality of Tefunsak and Utwe, due to the fact that here in Kosrae time is not of the essence. A scheduled meeting-time can be broken at all times. Anyway, the meeting with Rooston Abraham was to discuss the spawning season and what Kosrae State has done to ascertain sustainability of each species of fish, but, like other meetings, this will be made a priority for me should the assignment deadline be extended or if I'm approved to join this project as one of the selected Program participants.

Throughout the Pacific, the most plentiful natural resources available are the sea and the sun, so in order to become one with nature, one must adapt to a livelihood using these two resources to survive. A fisherman or woman is a person who is well versed in his or her environment, having taken note throughout his lifetime of the changes in

weather patterns and how that affects the sea and its resources. Through practical exposure he learns about what needs to be learned, including the sea-bed, and how currents and tides vary with different phases of the moon. The fishing method I have emphasized here is “long-net fishing”, a technique common throughout the Pacific for community fishing where each island differs slightly in the ways they implement it to suit their local environment. This activity is intertwined with most other cultural activities such as navigation using the stars, reading moon phases for information on tide cycles and fish behavior, constructing canoes for fishing beyond the breaks, constructing earth ovens for cooking the catches, and of course weaving, in order to repair and reuse an existing net. One must understand that in the old days before nylon was available, Kosraeans had to make do with coconut leaves and fibers for the construction of the long fishing net. At that time, fishing was considered a way to survive and it was taken so seriously that clans often clashed in battle, and communities marked their boundaries on the ground. These days however, fishing is taken more lightly, such that fishing has become a leisure sport or pastime for some, while others have even commercialized it as a means to earn money by selling fish at local markets. In Kosrae, it is common to see women long-net fishing, and as a matter of fact, any kind of reef fishing is usually done by the women, while the men prefer to fish beyond the break. According to my many informants, this is not a restriction but rather a practice from earlier days as mentioned above, and which seems to have continued until today. My main informant mentioned that it might have something to do with the fact that men from other municipalities other than Lelu prefer to go out fishing beyond the breaks, to avoid clashing with fishermen from Lelu as a sign of respect. Most individuals, regardless of gender, over time will be

involved with long-net fishing, and will learn, by word of mouth or through exposure, their specific family or community fishing practices. This activity, especially the ability to spot schools of fish and prepare the plan of attack through local knowledge of the seabed, is passed through generations mainly by word of mouth, as explained in the introduction section of this paper, and only to a chosen few. The moon phase plays a primary role in the decision as it matters whether the fishing is to be during the day or night, and also if the tide is going in (high tide) or out (low tide), so timing is very crucial.

Reading the moon phases is a cultural technique perfected over time through observation, while learning the Kosrae lunar calendar. This has been passed by word of mouth through generations and in some cases only to a chosen few. Fortunately for those expert fishermen willing to share their knowledge, their lunar calendar has been taught in the elementary schools to ensure their work is remembered from one generation to the next. Reading the moon phase gives us the ability to predict the tidal information, having in mind the tide changes every six hours from high to low, and vice versa. As stated by the lunar calendar, this also predicts good or bad fishing times among many other things.

These in itself involve a lot of mathematics if you want to catch fish and sustain the fishing grounds for future generation, which to some commercialised fishermen no longer holds true. Most fishermen nowadays go into the territory of others due to the need to supply the requirements of foreign companies. Some will start using canoes to access fishing areas beyond the reef, thus practicing their navigational skills using the stars, which in itself is a complex method of fishing. Today most fishermen use the compass

and map, but during the ancient times, our ancestors used clouds, and sometimes the stars to pinpoint places of good fishing and how to travel to and from islands.

#### References Cited, Persons Interviewed

- Journal of Micronesian Fishing (www.micronesianfishing.com)
- SPC Fisheries Newsletter (ISSN 0248-076X, Number 124 [Jan – Mar 2008] )  
Secretariat of the Pacific Community (SPC)
- An Introduction to Physical Science Shipman/Wilson/Todd
- Kusaian-English Dictionary Kee-dong Lee (1976, University of Hawaii Press, Honolulu).
- Papa Manasa Charley, male, age 71, Malem Municipality, retired Government worker
- Director Kalwin Kephas, male, age 67, Malem Municipality, Director COM-FSM
- <http://campuslady.files.wordpress.com/2008/01/moon-phases-diagram.gif>
- “All photos were taken by me unless otherwise attributed”

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