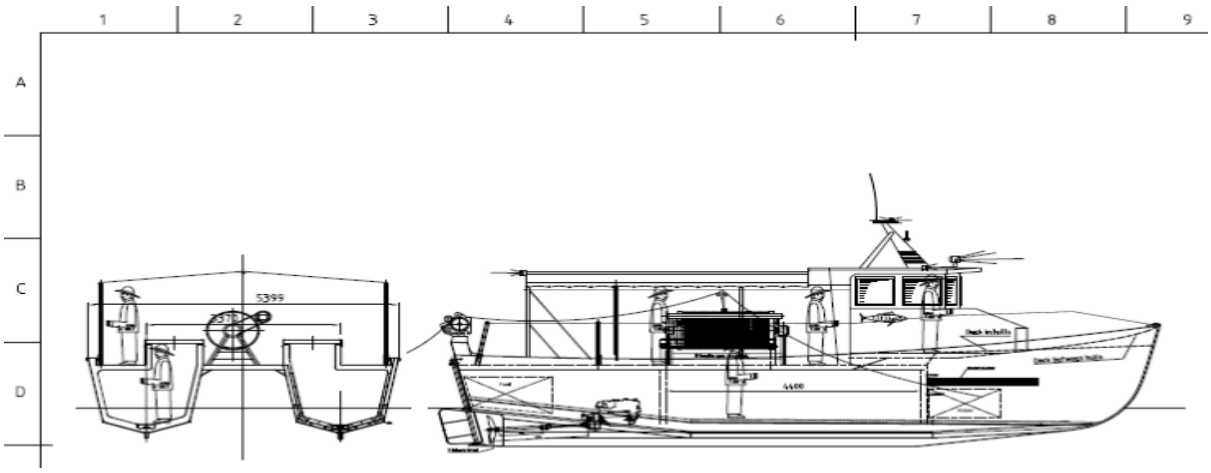
Development of a Multiplatform Fishing Boat for American Samoa Fishermen



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Western Pacific Regional Fishery Management Council
1164 Bishop Street, Suite 1400, Honolulu, HI 96813

A report of the Western Pacific Regional Fishery Management Council
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ABSTRACT

The most commonly used fishing boat by local fishermen in American Samoa at artisanal level is the 28-foot alia (catamaran) fishing boat. While the alia is preferred by most local artisanal fishermen, there is a need to modify the alia design to provide an improved and more efficient boat for American Samoa fishermen. Consequently, the American Samoa Marine Conservation Plan includes a priority project, to be initiated under the Development of Multiplatform Fishing Vessel for American Samoa project, aimed at developing a new prototype fishing boat to replace the present alia. The project is further supported through the "Review Draft of American Samoa Comprehensive Economic Development Strategy 2012," which calls for the revival of the local alia fleet with modern conditions. Modern conditions are necessary as essential components of the new alia fishing boat in order to enhance the ability of the boat to perform efficiently and to increase and provide good quality catches. This report is prepared to advise the American Samoa government and Western Pacific Regional Fishery Management Council on the type of fishing boat that best meets the needs of American Samoa fishermen and to identify financing options for the American Samoa government to execute the development of a prototype fishing boat for American Samoa.

Keywords: American Samoa fishing vessel, alia, modernizing fishing boats

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1 INTRODUCTION

The most commonly used fishing boat by local fishermen at artisanal level is the 28ft *alia* (catamaran) fishing boat. Most of these boats were sourced from Samoa either as brand-new or secondhand. While the alia is preferred by most local artisanal fishermen, there is a need to modify the *alia* design to provide an improved and more efficient boat for American Samoa fishermen. Consequently, the American Samoa Marine Conservation Plan (ASMCP) has included a priority project to be initiated under the Development of Multiplatform Fishing Vessel for American Samoa project (principal project) aimed at developing a new prototype fishing boat to replace the present *alia*. The project is further supported through the "Review Draft of American Samoa Comprehensive Economic Development Strategy 2012", which calls for the revival of the local *alia* fleet with modern conditions. Modern conditions as essential components of the new *alia* fishing boat are necessary to enhance the ability of the boat to perform efficiently and to increase and provide good quality catches. In preparation for the development of the new fishing boat, all local fishermen consulted expressed interest in a fishing boat that has the following features: 1) be the larger version of the present *alia*; 2) enhance safety at sea; 3) facilitate fishing operations; 4) cater for longer fishing trips; 5) increase carrying capacity; 6) provide better quality of fish; 7) provide easy maintenance; 8) provide cheap operation; and 9) be affordable by local fishermen. These essential features are absent from most, if not all, *alia* fishing boat, and those around 30 feet in length presently used by fishermen.

Under the ASMCP other related projects are being promoted such as 1) Increasing Local Boat Building Capacity for Fishing Vessel Construction; 2) Fishermen Training Program; and 3) Fishermen Lending Scheme. The creation of the prototype fishing boat is seen as the principal project to promote the development of small-scale fisheries in the territory. The development of the prototype will introduce a new generation of fishing boats for American Samoa. However, the successful development of the prototype and the continuous production of new fishing boats requires input and collaboration with other ASMCP related projects. The ASMCP principal project and related projects need to work cooperatively and be implemented concurrently to successfully achieve better small-scale fisheries for American Samoa. It must be noted that production of new fishing boats would be of little value if fishermen cannot afford them due to financial constraints hence the need for the Fishermen Lending Scheme project to be well established and properly supported. There would also be an issue with having the most suitable fishing boat if fishermen do not know how to operate it effectively thus the need for the extensive Fishermen Training Program project. Likewise, the continuous development of the new generation of fishing boats would not be sustainable without the Increasing of Local Boat Building Capacity for Fishing Vessel Construction, a project which has been afforded priority by the ASMCP. Success, therefore, in the development of a prototype fishing boat for American Samoa would depend on the principal project and related projects working collaboratively.

2 PURPOSE

This report is prepared to advise the American Samoa Government (ASG) and Western Pacific Regional Fishery Management Council (Council) on the type of fishing boat that best meets the needs of American Samoa fishermen and to identify financing options so the ASG could proceed to execute the development of a prototype fishing boat for American Samoa.

3 SIMILAR ONGOING DEVELOPMENTS

When the Council was attempting to develop the prototype fishing boat, it was realized that three similar projects were ongoing. These include 1) the super alia project by Seppsamoa Steffany; 2) the 30-foot *alia* currently built by the Tool Shop of American Samoa; and 3) the super alia project by the Fisheries Department of the neighboring Samoa. All three projects were designed to accommodate features identified by American Samoa fishermen.

3.1 Steffany's *Alia* Project

Steffany is a businessman and fisherman. He is currently working on a 40-foot *alia* project that would be a multipurpose fishing boat. The basic plan for his *alia* boat was prepared by a New Zealand company (NZ Kingfisher) and includes some adjustments advised by the Council's American Samoa Fisheries Development Coordiniator (ASFDC). Steffany is still determining various details and specifications of his boat. He intends to have his boat built in New Zealand. The general layout of Steffany's alia is shown in Figure 1. Concurrently, Steffany's *alia* boat was designed with most of the features deemed important by American Samoa fishermen.

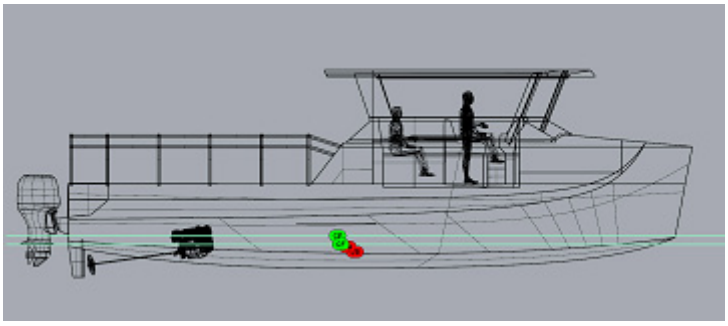

Figure 1 Steffany's 40-foot *alia* basic plan side view.

3.2 *Alia* Project by the Tool Shop

The Tool Shop is currently building a 30 ft alia which was designed by a New Zealand Naval Architect, presumably the same architect that designed the alia for Steffany. The alia has been precut from New Zealand and is assembled by the Tool Shop. The boat is being designed as a calculated guess to meet local conditions. Fishermen may need to use boat for commercial fishing or recreational use. Figures 2 (a) and (b) show the basic layout for the Tool Shop's boat. The Tool Shop's alia although designed to cater for multipurpose use, its size being small may not accommodate all feathers needed by American Samoa fishermen.

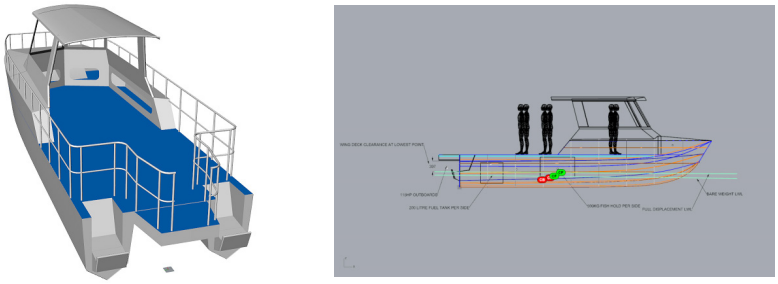

Figure 2 Basic layouts of Tool Shop's 30-foot *alia*.

3.3 Samoa's Super *Alia* Project

The Samoa Fisheries Department has contracted a naval architect through the Food and Agriculture Organization of the United Nations (FAO) sponsorship to prepare a report on the design, construction and cost estimates for a new *alia* fishing boat with features and needs similar to those identified by American Samoa fishermen. The naval architect selected for Samoa's project was the same architect who developed the original design for the *alia* fishing boat for Samoa back in the late 1970s. The Samoa Fisheries Department has released (with conditions) a copy of its FAO report, "TCP/SAM/3302 Report on travel to Samoa to deliver design for *Alia* and assist with builder selection porcess" by Arild Overa, to the Council's ASFDC. The report contains important information needed for the development of the prototype *alia* fishing boat for American Samoa. The Samoa super *alia* is 40-foot long and is largely in agreement with the features needed by American Samoa fishermen except for the use of sail as reserve propulsion. Documentation for the development of Samoa's super *alia* is well in advance compared to that of American Samoa's prototype *alia*. The production of the boat, however, is being halted due to lack of funds. The layout of Samoa's super *alia* is shown in Figure 3.

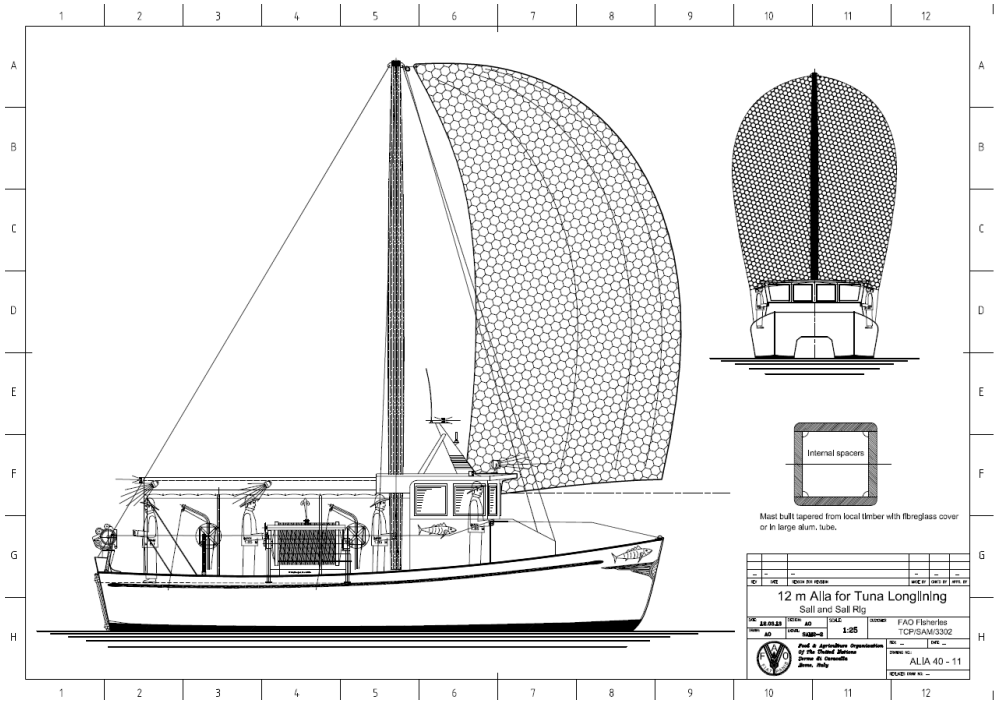

Figure 3 Layout of Samoa's super *alia* with sail.

4 AMERICAN SAMOA'S PROTOTYPE ALIA FISHING BOAT

4.1 General Specifications

The general layout and basic design for the future alia fishing boat of American Samoa to meet features needed by fishermen were based mainly on the information contained in the FAO report by Overa and outcomes of consultations with various stakeholders. People consulted for this project are listed in Appendix 1.

After consultations with American Samoa fishermen, fisheries technical personnel from regional organizations and the naval architect who originally designed the Samoa *alia*, the following particulars were established for the prototype.

Length over all:	12.30 m	40.4 ft
Length designed waterline:	11.38 m	37.2 ft
Beam moulded complete *alia*:	5.40 m	17.8 ft
Beam moulded one hull:	2.20 m	6.6 ft
Depth moulded to deck:	1.60 m	5.3 ft
Draught to DWL:	.78 m	2.5 ft
Displacement to DWL:	7.6 tons	
Engine power recommended:	2 x 40 hp inboard	
Service speed:	9 knots	
Fish hold volume:	16 cu. M	
Water tank capacity:	300 litr.	
Fuel tank capacity:	1500 litr.	
Fuel range at full speed:	800 n. miles/90 hours	
Suitable for the following fishing methods:	Pelagic longlining, Dermersal longlining, Bottom fishing, Trap fishing, Net fishing, Trolling	

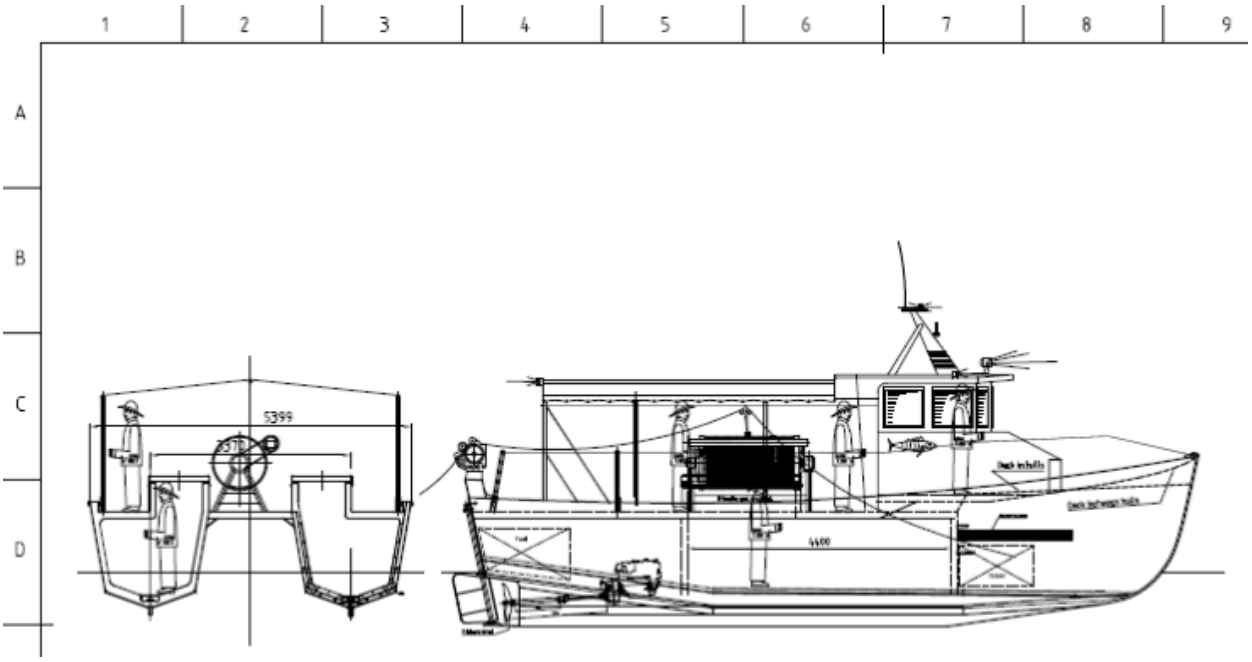

Figure 4 General arrangements of American Samoa's new *alia* fishing boat.

4.2 Estimated cost to produce the prototype

The estimates of cost to produce the fishing boat with general specifications discussed in section 4.1 are detailed in Table 1.

Table 1 Estimated cost for building the new *alia* for American Samoa fishermen

1.	Preparation of detailed plan and drawing		$22,000
2.	Contract with naval architect		$60,000
3.	Contract with Samoan builder		$65,000
4.	Materials		$52,000
	○ Aluminum materials: 3.2 tons combined sheets and profiles	$22,000	
	○ Other materials such as foam insulations, windows, tank fittings, sun shade, stainless, fastenings etc.	$30,000	
5.	Electrical installations, lights, batteries, cables, switches and fuse boxes		$11,000
6.	Propulsion engines, two complete sets, consisting of: 2 Nanni 50 hp marine engines, based on Kubota diesel, down-rated to 40 hp continuous duty; 2 high reduction ZF gearboxes, oversized for extra long trouble free service life; Stern gear with three bladed propellers, shafts, couplings, etc.; Manoeuvre handles and cables; including sea freight from NZ to Pago Pago		$59,600
7.	Set hydraulic steering gear for two rudders, single helm		$ 5,500
8.	Navigation instrument		$ 6,200
7.	Hydraulic longline system from Lindgren Pitman (NZ)		$25,000
	○ Super Mini Spool, 28-inch diameter inch and longest model, 48 inch long drum	$11,400	
	○ Operating valve	$ 660	
	○ Set of hoses, spare oil filters etc.	$ 1,150	
	○ Operating handle and high quality control cable	$ 370.	
	○ Shooter /setter	$ 8,700	
	○ Hydraulic tank unit with filters and cooling ribs	$ 275	
	○ Hydraulic pump with clutch. Recommend to be ordered and already fitted on main engine in NZ	$ 1,927	
	○ Leader spool	$ 550	
8.	Fishing gear		$17,900
	○ Monofilament, 3.2 mm diameter, 25 n. miles	$ 8,700	
	○ Hooks, swivels, ropes, floats, poles, etc.	$ 9,200	
Total Estimate			**$324,200**

Estimates were based on information from the FAO report and cost projected under the ASMCP with revisions (see page 6). The cost of $324,200 has been estimated to complete the new fishing boat. This estimate is based on assumptions that 1) the builder already has all necessary tools and the machinery required to build the boat except the hydraulic plate press and the production machinery; 2) most of the construction materials, equipment and fishing gear are sourced from New Zealand; 3) the cost of all carpentry work, electrician's wage and all other required professional inputs are included in the contract with the main builder; and 4) the cost of welding supplies, argon gas, welding wire and spares are part of the builder's responsibility and, therefore, are allowed for in the building contract.

4.3 Options to consider for financing the prototype

There are two options to be considered in sourcing finance to produce the *alia* prototype. The first option (Scenario A) is for the ASG to be responsible for the entire cost of producing the new fishing boat. The boat would eventually be owned by the Department of Marine and Wildlife Resources (DMWR). The second option (Scenario B) is for the ASG to share the cost of producing the prototype with a private fisherman. The fishing boat would eventually be owned by the private fisherman. The ASG would be responsible for costs of producing the boat design, cost of the naval architect and cost of boat construction. The fisherman would be responsible for the cost of building materials, equipment and fishing gear.

As seen in Table 2, the estimate of $311,200 was projected to produce the prototype fishing boat based on the report by FAO and estimates forecasted under the ASMCP. This estimate was revised to $324,200 after discussion with individuals who had concerns with the original estimate. The costs for the Samoa boat builder and navigation instruments were increased in the revision.

Under Scenario A, where the ASG is fully responsible for financing the prototype, the ASG contribution would be $324,200. Under Scenario B, where the cost of producing the prototype is shared between the ASG and the private fisherman, the contribution by ASG would be $147,000 and that of a private fisherman would be $177,200. The estimate of producing a future *alia* fishing boat is estimated at around $242,200.

Table 2 Cost estimates for building the prototype fishing boat under two different scenarios.

Required services, materials, equipment etc to produce the prototype		Estimates based on FAO report and ASMCP	Scenario A: ASG be responsible for all costs	Scenario B: Shared responsibilities between ASG & private fisherman		Estimate of building future *alia* boats
				ASG	Private fisherman	
1.	Contract with Samoa builder	$55,000	$65,000*	$65,000*		$65,000*
2.	Boat design	$22,000	$22,000	$22,000		
3.	Contract with Naval Architect (6 months)	$60,000	$60,000	$60,000		
4.	All building materials	$52,000	$52,000		$52,000	$52,000
5.	Electrical materials and installation	$11,000	$11,000		$11,000	$11,000
6.	Propulsion – 2 complete sets	$59,600	$59,600		$59,600	$59,600
7.	Set hydraulic steering gear	$ 5,500	$ 5,500		$ 5,500	$5,500
8.	Navigation instruments	$ 3,200	$ 6,200*		$ 6,200*	$6,200*
9.	Hydraulic longline system	$25,000	$25,000		$25,000	$25,000
10.	Fishing gear	$17,900	$17,900		$17,900	$17,900
Total		**$311,200**	**$324,200**	**$147,000**	**$177,200**	**$242,200**

(*) Revised estimate

4.4 Advantages and disadvantages of the two scenarios

As summarized in Table 3, there are advantages and disadvantages of the each scenario. The advantages for Scenario A include the boat being available at any time for use by the DMWr and no cost for hire, while the disadvantages include greater expenses to the ASG/DMWR and the boat being underutilized. The advantages for Scenario B include less overall expenses for the ASG/DMWR and more efficient use of the boat but less access to the boat and potential expenses to hire the boat.

Table 3 Advantages and disadvantages of Scenarios A and B

	Scenario A – Prototype fully funded by the ASG and owned by DMWR	Scenario B – Cost of producing Prototype shared by ASG and private fisherman and boat owned by private fisherman
1.	Expensive for ASG to produce.	Less cost to ASG to produce.
2.	Added cost to DMWR budget to man and to operate the boat.	No cost to DMWR to man and operate the boat.
3.	Added maintenance expenses in DMWR budget.	No maintenance expenses to DMWR
4.	Boat is subject to underutilized. No mortgage, so no obligation to work continuously.	Efficient use of boat– Boat needs to operate continuously to pay for mortgage
5	Boat available at any time for use of DMWR for training and research	Availability of the boat for training and research is only possible through agreement.
6	No cost involved for hire	Cost for hire of boat could be expensive.

4.5 Recommendation

Based on the above, it is recommended that the ASG consider Scenario B to produce the prototype fishing boat for American Samoa fishermen.

4.6 Fishing trials

The prototype fishing boat is expected to undergo fishing trials during the first month after construction to assess its performance. There is a need for the Secretariat of the Pacific Community (SPC) master fisherman and the naval architect to be a part of the fishing trials. The estimated cost of the fishing trials is $8,480 (see Table 4). The fishing trials may be treated as part of the Fishermen Training Program project as approved under the ASMCP with an estimated budget of $130,500.

Table 4 Estimated cost for fishing trials

i.	Fuel for four trips @ $1,200	$4,800
ii.	Ice for four trips @ $400	$1,600
iii.	Bait for four trips @ $220	$ 880
iv.	Crew ration for four trips @$300	$1,200
Total		**$8,480**

4.7 Key project personnel

Depending on the financing scenario chosen by the ASG, three or four project personnel are expected to play leading roles in various stages of the project. These include a naval architect/master boat builder, a local boat builder, a private fisherman as a co-sponsor of the project and a master fisherman from the SPC.

The naval architect would prepare the detailed boat design, manage the construction of the boat, train the local boat builder and his technicians and be one of the evaluators during fishing trials to assess the performance of the fishing boat. The naval architect must be a qualified boat builder with extensive experience in building boats in the Pacific Islands with special expertise in designing and building alia fishing boats.

The need for a private fisherman depends on the financing scenario chosen by the ASG. The private fisherman would not be needed if the ASG chooses to take full responsibility of funding the prototype. On the other hand, the private fisherman would be required if the ASG chooses the cost sharing scenario with the private fisherman.

The local boat builder would be responsible for building the prototype boat after acquiring the appropriate expertise through training conducted by the naval architect. Equipped with the new skill, the local boat builder is expected to build additional similar boats in the future.

A master fisherman is required to rig fishing gears, train the fishing crew and assess the performance of the new boat during the fishing trials. It is expected that an arrangement with the SPC can easily be reached to fulfill this part of the project.

4.8 Future preparations and processes

Assuming that recommendation made in this report is taken up by the ASG, the following process comprising steps (i) – (ix) need to be understood and closely followed. On the other hand, should the ASG chose to fully fund the prototype boat, then step (i) Solicitation of bids from interested fishermen, as outlined below, would not be required.

(i) *Solicitation of bids from interested fishermen*: The construction of the prototype fishing boat under Scenario B requires a private fisherman to co-fund the boat with the ASG. The fisherman with the successful bid would eventually own the prototype boat. The solicitation process is necessary when Federal funds are made available for a project.

(ii) *Solicitation of bids from interested local boat builders*: The local boat builder with the successful bid would be contracted to build the boat. As the new boat would have a unique design and fitted with modern equipment and instruments, the local boat builder and his support builders would undertake training under the leadership of the naval architect who should also be a master boat builder.

(iii) *Preparation of contract agreements*: Contract agreements for the selected fisherman and local boat builder need to be properly documented to spell out party's respective obligations in the partnership arrangement.

(iv) *Consultation with the recommended naval architect*: There is a need to place a naval architect on the project site to manage the construction of the boat and to conduct training for the local boat builders. The naval architect who was engaged by FAO to design the Samoa super alia fishing boat has been identified as the one best suited for the work. It is important that due consultation is held with the naval architect to address issues such as the costs involved, time availability and expected responsibilities and obligations of each party. It is suggested that the naval architect be invited to make a presentation on the most suitable fishing boat for American Samoa during one of the Council's future meetings.

(v) *Preparation of contract agreement with naval architect*: It is important to spell out the responsibilities and obligations of each party as agreed in the consultation process (step iv) in a legally binding contract agreement.

(vi) *Preparation of boat detailed design*: The naval architect after signing the contract agreement would prepare the detailed drawings and design for the new boat, which would guide the local boat builder during the construction phase. The design would need to be prepared in consultation with the US Coast Guard as certain features of the new boat would need to adhere to US Coast Guard regulations.

(vii) *Placement of overseas order*: Orders for boat building materials, equipment, instruments and fishing gear must be precisely specified and quantified in order to avoid overspending and delays. While these costs would be covered by the selected fishermen, the specific details of orders need to be prepared based on the advice of the naval architect.

(viii) *Boat construction*: Construction of the boat would be carried out by the selected local boat builder in accordance with the detailed design and drawings prepared by the naval architect. The naval architect would guide the construction process and monitor adherence to design. Additionally, the naval architect would train the local boat builder and his team of support builders during the construction phase. It is estimated that the construction of the boat may be completed within three to four months providing that all materials are on the project site.

(ix) *Fishing Trials*: Fishing trials would be undertaken immediately after the boat is built in order to test and assess the performance of the boat against the design's expectations. It is intended that the master fisherman from SPC would be engaged to undertake the fishing trials together with the naval architect.

A detailed activity plan for the production of the *alia* prototype and trial fishing is detailed in Appendix 2.

4.9 Benefits to private fisherman and local boat builder and opportunity to seek additional responsibilities

It is apparent that the ASG will expend less resource if it chose to work with a private fisherman to produce the prototype boat as the fisherman will bear the cost of building materials, equipment, instruments and fishing gear. At the same time the fisherman himself will benefit a great deal because the ASG will contribute a substantial amount towards the total cost of boat design and construction. This being the case, there is potential to negotiate with the fisherman for added responsibilities such as accommodation and transportation costs for the naval architect.

Similarly, the local boat builder will benefit a lot from the arrangement. The arrangement will not only support the sustainability of this line of business for the boat builder, but will also mean capacity building for the boat builder and his supporting technicians through training conducted by the naval architect. For these benefits, there is also a potential to negotiate added contributions from the boat builder similar to those suggested for the private fisherman.

4.10 Economic Analysis of the new fishing boat

The economic analysis to project the performance of the prototype fishing boat has been developed using King's formulation (used in determining the economic ability of Samoa's fishing boat, the *Ulimasao*) with adjustments to cater for new developments within the longline fishery. The economic analysis attempts to assess the ability of the prototype boat to operate sustainably. The information used for the analysis was obtained mainly from historical data collected by the Samoan Fisheries Department on tuna longline vessels with similar fishing capacities. Some data from the National Oceanic and Atmospheric Administration (NOAA) were also used.

The boat is designed to operate a number of fishing methods including trolling, bottom handling, vertical longling and pelagic longlining for tuna. Unfortunately, data was not available from other fisheries beside the pelagic longline fishery. For that reason, the ability of the prototype boat to earn revenue from other fisheries during the low tuna seasons has not being taken into account. The boat therefore needs to undertake well-designed fishing trials to include other fisheries in order to determine its full ability to perform sustainably. The economic analysis in this report nevertheless focuses on the expected performance of the boat in the tuna longline fishery. Table 4 lists various factors and forecasts which are taken into consideration during the economic analysis of the new fishing boat.

It was initially estimated that 60 fishing trips with an average of 3 sets of 1,000 hooks deployed in each trip can be completed by a properly managed boat of this design. However, local experience advised that the boat of this size is capable of setting 1,200 hooks per set (3,600 hooks per trip) or 216,000 hooks per year. The boat would then be fishing a total of 180 days a year. This is considered a conservative estimate as most of the similar tuna longline boats with the same fishing capacity fish an average of 220 days a year.

With new information received, the CPUE which was set at 114 lbs (52 kg) per 100 hooks is reduced to 101 lbs (46 kg) per 100 hooks for fishing vessels currently fishing in and outside the 50 nautical mile zone around the Samoan islands, including those of American Samoa and the Independent State of Samoa. The data indicated that the catch composition is 74 percent for albacore tuna, 16 percent for yellowfin and bigeye tuna and 10 percent for other species.

Local fish prices used for the analysis after revision were $2,970 per metric ton ($1.35/lb) for albacre tuna (StarKist Samoa price), $3.00 per lb for yellowfin and bigeye tuna, and $1.50 per lb for other fish species.

The estimate running cost for the boat, which include fuel, bait, ice, food, crew wages and fishing gear repair and replacement was estimated at $228,280 per year.

Fixed costs totalling $82,300 were calculated assuming that a boat operator would need to borrow $242,000 to purchase the boat and fishing gear. The annual fixed costs included 12 percent interest for the loan repayment, 10 percent depreciation on the value of the boat, 9 percent insurance fee, 5 percent for repairs and maintenance and $50 for registration fees.

The total annual cost for running the prototype fishing boat after 60 fishing trips is estimated at $315,400. The total value of catches earned by a boat of this design is estimated at $355,400. So the boat is capable of making an annual profit of $40,000 which is 13 percent of the annual cost. All factors considered during the analysis are detailed in Appendix 3.

Table 5 Economic analysis for the new *alia* based on 60 trips per year.

Value of the boat and fishing gear		**$ 242,000**
AVERAGE RUNNING COSTS PER TRIP		
Fuel		$ 1,200
Bait		$ 220
Ice		$ 400
Food for crew		$ 200
Fishing gear - replaced/repaired		$ 300
Crew wages (20% of catch)		$ 1,184
Total running costs per trip		**$ 3,804**
Total running costs per year		**$2280,270**
FIXED COSTS PER YEAR	%	
Loan repayment	12	$ 29,040
Depreciation of vessel	10	$ 24,200
Insurance of vessel	9	$ 21,780
Boat repairs and maintenance	5	$ 12,000
Registration fees		$ 50
Total fixed costs per year		**$ 87,170**
Total fixed costs per trip		**$ 1,450**
STATISTICS		
Estimated number of trips per year		60
Estimated number of sets per trip		3
Average number of hooks per set		1,200
Number of hooks set per year		216,000

Total costs per trip		**$ 5,260**
Total costs per year		**$ 315,400**
ESTIMATED RETURNS		
Average catch (lbs) per 100 hooks (CPUE)		101
Estimated catch per year (lbs)		218,160
Catch combination	%	
Value of Albacore catch per year ($1.35@ lb)	74	$ 217,940
Value of Yellowfin/Big-eye catch per year ($3.00 @ lb)	16	$ 104,720
Value of others species per year ($1.50 @ lb)	10	$ 32,720
Estimate value of catch per year		**$ 355,380**
Average catch ($) per 100 hooks		$ 163
Average catch ($) per trip		$ 5,923
ESTIMATE PROFIT PER YEAR		
Estimated annual returns minus costs		**$ 40,000**
Estimated profit as per cent of cost		**13%**

4.11 Suitability of the Alia fishing boat over the monohull

When the new fishing boat was initially brought to the attention of the fishermen, the first feature that American Samoa fishermen asked for was the boat to be the larger version of the present alia. The neighboring Samoa in mid 70s under the FAO/DANIDA fisheries development project, constructed two types of fishing boats – the alia type and the monolull. Samoa fishermen were buying alia boats instead of the monohulls. One might argue why such preference is set among the Samoan fishermen. The answers are laid with the fishermen themselves as they are not only ones that eventually use the boat, but also have more experience with boat behavior at small scale. Table 5 compares the behavior of the alia versus the monohull assuming that the two vessels are of the same length (40 ft).

Table 6 Advantages and disadvantages of the *alia* and the monohull of a similar size (40 ft)

Behavior / Characteristics	Monohull fishing boat	*Alia* fishing boat
Carrying capacity	Has much more carrying capacity than the *alia,* so fish holding capacity is much larger. The boat needs to stay out for longer fishing trips to fill fish holds. Ice may not hold good quality of fish for over 7 day trip.	Fish hold volume of 16 c.m (565 c.ft) is sufficient hold 5,900 lbs of fish with 11,800 lbs of ice. This caters enough ice to last for 3-5 day fishing trip and catch will remains in good quality.
Stability	Monohull rocks a lot especially in rough weather. The sway movement may not only trigger dizziness of the crew, but cause scratches on fish.	Alia tends to sit more steadily. According to the fishermen, it is one of the reasons that fishermen prefer the *alia* type.
Safety	A monohull of 40 ft long will require an inboard motor for propulsion. If the engine fails, communication will be terminated and safety as far as rescue is concerned will be difficult.	An *alia* of 40 ft long uses 2 inboard engines. If one fails, the other can safely bring the crew on shore.
Boat maintenance	The characteristic of a monohull having a steep keel will require the boat to be hauled off the water for hull maintenance. This will be additional maintenance cost.	Hull maintenance can be done at the beach as the *alia* can sit still on the beach when the tide goes out. No additional maintenance cost involved.
Capability to maneuver around shallow passages	Very hard maneuver around shallow passages due to steep keel.	Very easy to maneuver around shallow passages because there is no steep keel.

5 CONCLUSION

The development of a prototype fishing boat for American Samoa fishermen as a priority development is initiated under the ASMC project the Development of Multiplatform Fishing Vessel for American Samoa. The same development is supported as part of the "Review Draft of American Samoa Comprehensive Economic Development Strategy 2012", which calls for a new alia fishing boat with modern conditions to replace the present alia fleet. The project has been carefully examined from different approaches to see how best the development may be executed to provide an improved small scale fisheries development in American Samoa.

The prototype boat is designed to meet the needs of American Samoa fishermen. The needs include the boat that 1) is commonly preferred by fishermen; 2) enhances the sea safety of fishermen; 2) facilitates fishing operations; 3) caters for longer fishing trips; 4) increases carrying capacity; 5) provides better quality of fish; 6) provides easy maintenance; 7) provides economical operation; and 8) is affordable by local fishermen. To meet these needs, the boat is being designed based on the FAO report, consultations with local fishermen and regional fisheries experts, and advice from the original alia designer.

Two financing options were examined to facilitate the production of the prototype alia boat. The first option involves the ASG bearing full responsibility for costs with the boat to be eventually owned by the DMWR. This option is costly for the ASG as it contributes $324,200 for the production of the boat.

The second option involves a cost sharing arrangement between the ASG and a private fisherman with the boat to be eventually owned by the private fisherman. This option is cheaper for the ASG as it contributes $147,000 for production of the boat, while the private fisherman contributes $177,200 for construction materials, equipment and fishing gear. This is the option recommended by the report.

The creation of the new fishing boat project for American Samoa fishermen is seen as the principal project to promote sustainable fisheries development among small scale fishermen. The successful achievement of the principal project and its goals would not be possible without inputs from other ASMCP related projects such as Increasing Local Boat Building Capacity for Fishing Vessel Construction project; Fishermen Training Program project; and Fishermen Lending Scheme project. It is vitally important that the principal and related ASMCP projects are collaboratively organized and implemented supportively in order to improve small scale fisheries development in American Samoa. This can only be possible with Government support and availability of resources.

Appendix 1 – People consulted for the development of American Samoa's fishing boat

Government officials

1. Keniseli Lafaele	Director, Department of Commerce
2. Uili Leauanae	Deputy Director, Department of Commerce
3. J. Anthony Lankide	Fisheries Adviser, Department of Commerce
4. Dr. Ruth Matagi-Tofiga	Director, DMWR
5. Selaina Vaitautolu Tuimavave	Deputy Director, DMWR
6. Teejay Letalie	Manager, FAD program, DMWR
7. Dr. Claire Poumele	Director, Ports Authority
8. Jason Betham	Development Bank of American Samoa (DBAS), Acting President
9. Ruth Matagi-Faatili	DBAS, Loans Manager
10. Fainu'ulelei Alailima-Utu	DBAS, Legal Counsel

Private sector

11. Brett B. Butler	General Manager, Starkist Samoa
12. Alfonso P. Galea'i	Human Resources Manager, Samoa Tuna Processors (STP)
13. Craig Double	Cold Storage Expert, STP
14. Ian Boatwood	Expatriate staff, STP
15. Robert Gebauer	Relationship Manager, ANZ
16. Carlos Sanchez	Owner, Longline Services, Inc. (LSI)
17. Christinna Sanchez	Manager, LSI
18. Peter Crispin	Owner, Tool Shop

Local fishermen	**Island**
19. Fuega Moliga	Tutuila/Manu'a
20. Paepae Lava	Tutuila
21. Seppsamoa Steffany	Tutuila
22. Eo ElvinMokoma	Tutuila
23. Lea'ai Filoiali'i	President, Tai Samasama Fishermen CoOp (TSFC), Ta'u Manu'a
24. Lesi'i Salesa	Vice President, TSFC
25. Nua Mailo Saoluaga	Member, TSFC
26. Tamapele Tevaseu	Member, TSFC
27. Saena Moliga	Member, TSFC
28. Leau K. Nevile	President, Faleluaanu'u Fishermen CoOp (FFC), Manu'a
29. Pita Ili	Member, FFC
30. Fau T. Sai	Member, FFC
31. Taliga Vaiolo	Secretary/Treasurer, FFC
32. Vaena Sofeni	Member, FFC

Appendix 1 – People consulted for the development of American Samoa's fishing boat continued

Outside American Samoa

33. Joyce Samuelu Ah Leong	Assistant Chief Executive Officer, The Ministry of Agriculture and Fisheries of Samoa
34. Ueta Junior Faasili	Principal Fisheries Officer, The Ministry of Agriculture and Fisheries of Samoa
35. Savali Time	Retired Principal Fisheries Officer, Samoa
36. Masanami Izumi	Fishery Officer, FAO, Apia, Samoa
37. Dr. Michael King	Regional Fisheries Expert, Australia
38. William Sokimi	Fisheries Development Officer/Master fisherman, SPC
39. Arild Overa	Naval Architect, Norway

Appendix 2 – Activity plan to produce the *alia* prototype

	Projected time frame	Events	Estimated costs	Funding source	Responsible persons/authority
i.	1st-2nd month	Consultation with a recommended naval architect	Not Appro-priate (NA)	NA	ASFDC in consultation with Council
ii.	2nd -3rd month	Preparation of Contract Agreement with naval architect	NA	NA	ASFDC in consultation with Council
iii.	3rd – 4th month	Preparation of boat detailed design	$22,000	ASG/Council	Naval architect in consultation with ASFDC and private fisherman
iv.	4th – 5th month	Placement of naval architect at project site			
		Fare	$3,000	ASG/Council	Council
		Local transportation	$6,000	Private fisherman	Private fisherman (to agree)
		Accommodation	$6,000	Local boat builder	Local boat builder (to agree)
v.	3rd -5th month	Solicitation of bids from interested fishermen	$400	Council/DM WR	ASFDC in consultation with Council and DMWR
vi.	3rd -5th month	Solicitation from interested local boat builder	$400	Council/ DMWR	ASFDC in consultation with Council and DMWR
vii.	5th -6th month	Preparation and placement of overseas order for building material, equipment, fishing gear, etc	$177,200	Private fisherman	Private fisherman in consultation with naval architect
viii.	7th-10th month	Construction of boat			
		Payment of contract with local boat builder	$65,000	ASG/Council	DMWR/Council
		Payment of contract with naval architect	$60,000	ASG/Council	DMWR/Council
ix.	10th-11th month	Trial fishing			
		Fare for master fisherman	$3,000	SPC	ASFDC in consultation with SPC
		Accommodation and local transportation for master fisherman	$3,600	ASG/Council	DMWR/Council in consultation with ASFDC
		Fuel, baits, ices and crew ration	$8,480	ASG/Council	DMWR/Council in consultation with ASFDC

Appendix 3 – Revised Economic Analysis of American Samoa's New Fishing

LINE ITEMS	ORIGINAL ANALYSIS			REVISED ANALYSIS	
	%			%	
Value of boat and fishing gear		**$242,000**			
Average running costs (per trip)					
Cost of fuel used on trip		$1,200			$ 1,200
Bait		$ 220			$ 220
Ice		$ 400			$ 400
Food purchased for trip		$ 200			$ 300
Fishing gear repaired/replaced (1%)		$ 230			$ 500
Crew wages (20% of catch)		$ 2,000		20	$ 1,184
Total running costs per trip =		**$ 4,250**			**$ 3,804**
Total running costs per year =		**$ 255,000**			**$ 228,276**
Fixed costs (per year)					
Loan repayments/return to capital	12	$ 29,040		12	$ 29,040
Depreciation of vessel	10	$ 24,200		10	$ 24,200
Insurance of vessel	9	$ 21,780		9	$ 21,780
Boat repairs and maintenance	3	$ 7,260		5	$ 12,100
Registration/fees		$ 50			$ 50
Total fixed costs per year =		**$ 82,330**			**$ 87,170**
Total fixed costs per trip =		**$ 1,372**			**$ 1,452**
Statistics					
Estimated number of trips per year		60			60
Average number of sets per trip		3			3
Average number of hooks per set		1000			1200
Numbers of hooks set per year =		**180,000**			**216,000**
Total costs per trip =		**$ 5,622**			**$ 5,257**
Total cost per year =		**$ 337,330**			**$ 315,446**
Fishing costs per 100 hooks =		**$ 187**			**$ 146**
ESTIMATED RETURNS					
CPUE (lb) per 100 hooks		114			101
Average catch per year (lbs)		205,200			218,160
Albacore price per ib		$ 1.70			$ 1.35
Yellowfin/Bigeye price per lb		$ 3.00			$3.00
Other fish species price per ib		$ 2.00			$ 1.50
Average price per ib		$ 2.23			
Value of Abacore catch per year	74	$ 258,141		74	$ 217,941
Value of yellowfin and Bigeye catch/year	16	$ 98,496		16	$ 104,716
Value of other species per year	10	$ 41,040		10	$ 32,724
Estimated value of catch per year		$ 397,677			$ 355,382
Estimates value of catch per trip		$ 6,627			$ 5,923
ESTIMATED PROFIT					
Estimated annual returns minus costs =		**$ 60,347**			**$ 39,936**
Estimated profit as % of costs =		**18%**			**13%**