Socio-economic Baseline Study of Kayangel State

PICRC Technical Report No. 16-11

[1]Shirley Koshiba, [2]Karen E. McNamara, [1]Marine Gouezo, [1]Evelyn Otto, [1]Randa Jonathan

[1]Palau International Coral Reef Center 1 M-Dock Road P.O. Box 7086 Koror, Palau 96940
[2] The University Of Queensland, St Lucia QLD 4072, Australia

July 2016

Executive Summary

In 2015, Palau International Coral Reef Center, in collaboration with the University of Queensland, conducted a baseline socio-economic study within six PAN States of Palau. The results presented in this report are based on one of six PAN states: Kayangel State. The study utilized household questionnaires and key informant interviews incorporating key socio-economic indicators at the regional level (Micronesia Challenge), National level (Palau Indicators) and site level (local management plan).

Based on the results of this study, most respondents in Kayangel were knowledgeable about their state conservation areas, state bul[1], as well as the PAN. In terms of the Micronesia Challenge, only less than 40% of respondents indicated having knowledge of the MC. Majority of households in Kayangel participated in fishing activities mainly for food consumption, customary practices and less for income generating purposes. Most households did not attribute any changes to locally-sourced marine food availability to the protected areas. In addition, key informants and more than half of survey respondents indicated that they often hear about or see illegal entry or taking of resources from the conservation areas. According to key informants, stronger enforcement was needed to decrease the number of poaching in Kayangel's conservation areas. Additionally, key informants also reported the need for more surveillance officers including relevant training for capacity building of Kayangel's conservation officers.

[1]Bul refers to a Palauan traditional form of conservation where certain restrictions are placed to regulate the harvesting of plants or fishing. The bul would only be lifted if the village chiefs or men's clubs observed that the reefs and/or plants were ready to be harvested again.

Introduction and Context

Socio-economic information provides resource managers and relevant stakeholders important information to effectively manage protected areas. Within the Micronesia region, the MC serves as an initiative to effectively conserve 30% of near shore and 20% of terrestrial resources across Micronesia by 2020. In Palau a system of protected areas known as the Palau PAN was created with the goal of conserving and sustaining Palau's pristine resources. It is Palau's mechanism to achieve the goals of the MC. This study aims to assess the effectiveness of PAN sites in improving the livelihood outcomes of Palau's communities. It does so by conducting a socio-economic study within six PAN States of Palau. The results presented in this report are based on just one of those six states: Kayangel State.

Veitayaki (1997: 124) noted that 'nearly all of the marine management systems now being tried in contemporary societies were used in some form in traditional Pacific Island management systems'. These have included actions such as closed seasons and/or areas, size and catch limitations, equipment control and prohibitions. The PAN, being implemented across Palau, in many ways pays close tribute to the traditional marine management system – Bul – that was in place for many, many decades.

In a broad brush manner, the literature on implementing protected areas, particularly marine areas, points to their lack of success, especially in developing countries (e.g. Cinner, 2007; Johannes, 2002). While these studies promote a rather grim prognosis for

protected areas, ambitious calls to establish more conservations areas globally continue (Mora et al., 2006).

Often, studies on the impact, effectiveness and sustainability of protected areas focus heavily on biological and ecological indicators. While understanding the progress being made in these areas to conserving resources, equally important is understanding the views and perceptions of surrounding local communities – as Johannes (1978) puts it, understanding the viewpoint of the 'conserver'. This is the core impetus for undertaking this study. Making this study novel is that it builds on a limited knowledge base of empirical data on local people's behaviours, support for, and perceptions of the protected areas, not only in Palau, but globally (see Bartlett et al., 2009).

Methods and Study Site

Methods

This study utilized a structured household questionnaire administered across six States of Palau: Kayangel, Ngaraard, Ngchesar, Ngiwal, Airai and Peleliu. Within each state is a registered marine and/or terrestrial PAN site. While the aim of this study was to determine a variety of social factors related to marine protected areas, equivalent terrestrial questions were conducted where applicable. This study focused on surveying individuals over 18 years old who could speak on behalf of their household and were considered to be the head of household, being mindful too of the need to try and ensure

a gender balance across the sample size. To do so, the local data collectors asked if either the male or female head of household was available to be surveyed.

This data collection method was deemed most appropriate and efficient in collecting a large sample size across a broad geographical area. The main objectives of the household questionnaire were to ascertain:

- Socio-demographic data on the respondent and their household;
- Livelihood activities and household income levels;
- Food and water security at the household level; and
- Individual views on the Conservation Areas in their State.

Each question attempted to align with some of the indicators set by the Micronesia Challenge, Palau Indicators and PICRCs own indicators. The questionnaire is provided in Appendix 1 and each question also shows which indicator it is attempting to align with. The questionnaire also more broadly aligns with the Marine Protected Areas Management Effectiveness Initiative set up by the World Conservation Union's World Commission on Protected Areas (Marine) and the World Wide Fund for Nature, which has developed 16 indicators related to the socio-economic dimensions of marine protected areas.

Accompanying the household questionnaires were key informant interviews with two individuals from Kayangel State. These were conducted by PICRC staff and were held with Kayangel State Government officials who were also village chiefs as well as Kayangel State PAN staff. An interview schedule with a list of semi-structured questions

was used to guide the interview to help clarify some of the questionnaire findings and also ascertain the views of these interviewees in relation to the success and challenges of the conservation areas. Their views have been integrated into the discussion section.

A sample size for the socio-economic household questionnaire was determined for each of the six sites based on their population size (at a household level), as well as the desired confidence interval (or, margin of error– set at 5%) and confidence level (95%). A sample size calculator (http://www.surveysystem.com/sscalc.htm) was used to calculate the sample size for each of the sites – the results of which are illustrated below in Table 1.

Table 1. Determining the sample size for the six study sites

State and Study Site	**Number of households**	**Number of household questionnaires (based on the sample size calculator)**	**Total number of questionnaires actually collected**
Ngaraard	111	86	88
Ngchesar	78	65	65
Ngiwal	78	65	64
Peleliu	146	106	106
Airai	650	242	242
Kayangel	*27*	*27*	*25*
Total	**1,162**	**591 (51% of all households)**	**590**

In total, the sample size was determined as 591 household questionnaires. For Kayangel State, the focus of this report, 27 questionnaires were required and 25 were collected for the study in total.

The questionnaires were administered in each of the six sites by local data collectors who were trained on how to collect data ethically and systematically. The data were then inputted into the Statistical Package of the Social Sciences (v22.0), and analysed. The purpose of this report is to show baseline data. Therefore the main analysis includes basic frequencies, percentages, means and sums and findings are displayed as charts and tables.

Provided below is a summary of the various indicators that were used and integrated into the household questionnaire.

Micronesia Challenge Indicators:

- MC1: Perception of change in food availability
- MC2: Household participation in MC management planning or decision making
- MC4: Change in violations and illegal activities related to fishing, harvesting and use of natural resources
- MC8: Community awareness of MC
- MC9: Community support for MC

Palau Indicators:

- PI1: Household food availability and sources
- PI2: Household dependence on local food resources
- PI3: Level of harvesting from local resources and their conditions-fishers and farmers
- PI4: Household income, expenses and subsistence distribution by source
- PI5: Perception of quality and quantity of water

The people of Kayangel and the Kayangel Protected Areas Network Five Year Management Plan 2013-2018 Indicators:

- Goal 4: The Kayangel Protected Areas Network is effectively managed and providing a learning and enjoyment platform for the people, visitors, researchers, and academic community and further offer new sustainable livelihood opportunities for the local community.
- Goal 4-2: By May 2013, a feasibility study for a bird-watching industry is commissioned and next steps are determined.

Study Site

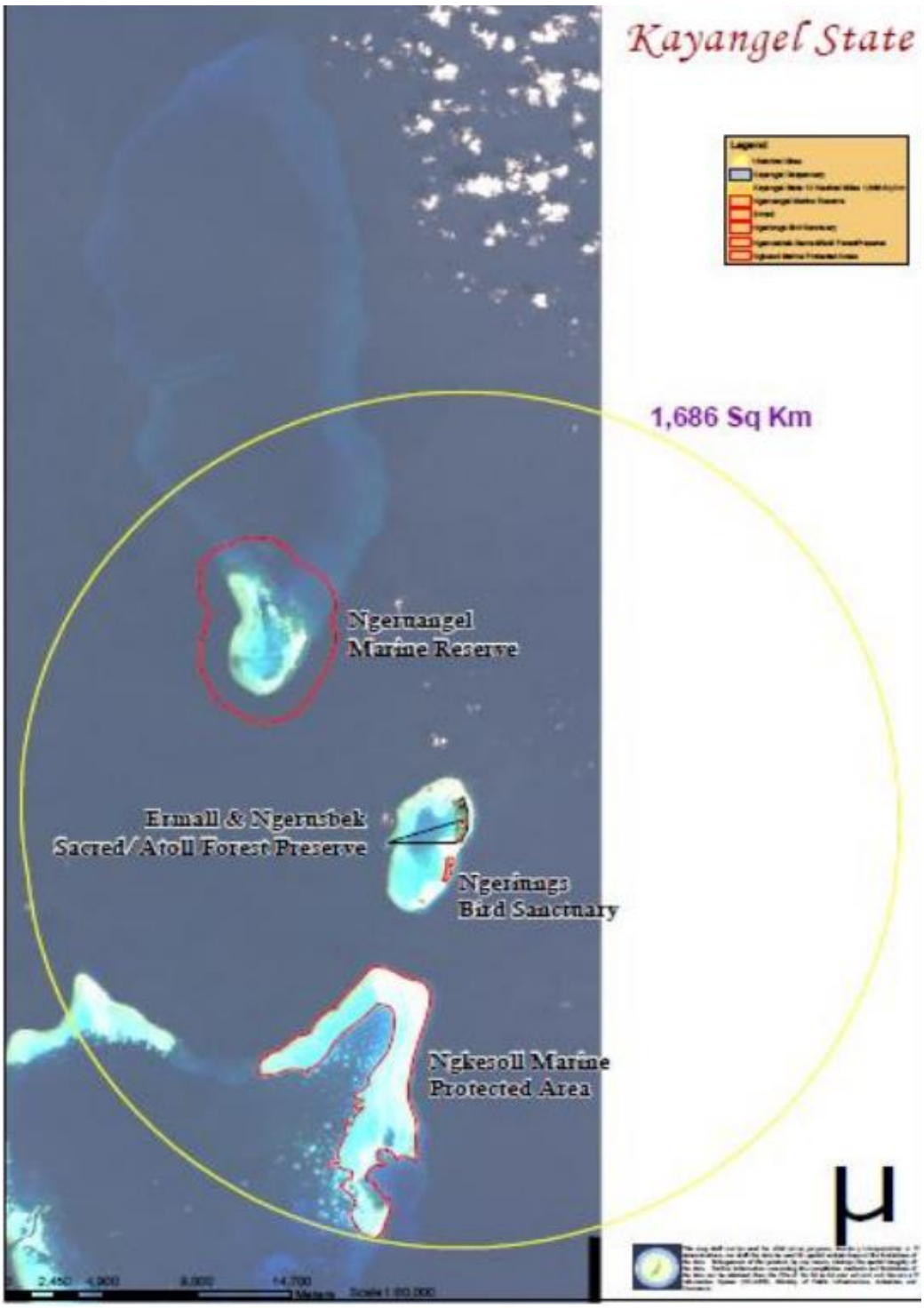

Figure 1. Display of Ngeruangel Marine Reserve, Ngerusebek atoll forest preserve, Ngkesol Marine Protected Area. Source: Kayangel Protected Areas Network Five Year Management Plan 2013-2018.

The state of Kayangel is located on the northernmost part of Palau and is one of only two sandy atoll islands in Palau. The atoll is surrounded by important habitats of coral reef systems, barrier reef, patch reefs, seagrass, nesting beaches and unique atoll forests, all of which comprise the Kayangel Protected Areas Network. (Kayangel Protected Areas Network Management Plan 2013-2018). The island has a total household population of 27 households.

The Kayangel Protected Areas Network consists of a mixture of managed area and full protected areas: Ngeruangel Marine Reserve (no-take zone), Ngkesol Barrier Reef MPA (managed area), Ngeriungs Bird Sanctuary, and Chermall and Ngerusebek Natural Sacred Site Preserves (Kayangel Protected Areas Network Management Plan 2013-2018). While Chermall, Ngerusebek and Ngeriungs represent terrestrial protected areas in Kayangel, Ngeruangel Marine reserve was originally created in 1996 through a traditional closure. The reserve represents Palau's northernmost atoll reef including a small islet. It is also a nesting site for mainly the Green Turtle and Hawksbill Turtle. Ngkesol Barrier Reef MPA is a managed area and was established in 2012 within the Kayangel Protected Areas Network. It is part of Palau's extensive barrier reef system and includes important spawning grounds, aggregation sites for fish as well as habitat for Giant clams (Kayangel Protected Areas Network Management Plan 2013-2018).

Results

Socio-demographics

Most of Kayangel respondents were male (68%) with 32% female respondents. The mean age of respondents was 53, with an age range of 25 to 85 years old. In terms of the length of time lived in this state, most respondents reported having lived in Kayangel all their lives. The majority of respondents were married (64%), followed by being single (32%) and widowed (4%). All respondents held Palauan citizenship. Table 2 provides some further socio-demographic characteristics of the respondents and their households.

Table 2. Socio-demographic information on respondents and their household

Education (%)		**Traditional knowledge (%)**		**Income (%)**		**Land tenure (%)**		**Participate in resource management (%)**	
Up to elementary school	12	None	0	Government work	44	Traditional agreement	8	Never	8
Up to high school	68	Some	16	Pension/social security	48	Owns land	92	Seldom	36
Up to college	20	Extensive	84	Private Business	4	Leases from State Government	0	Sometimes	56
Up to university	0			No income	4	Private rental	0	Often	8
						Informal agreement	0	Always	0

68% of respondents reported having obtained an education level of up to high school, while 20% of respondents reported attaining some college education (Table 2). Almost half of respondents (44%) indicated that their predominant source of income was

through Government work, while 48% of respondents earned their income through pension and social security (Table 2). 92% of all respondents own the land they live on, and 84% reported having extensive level of traditional knowledge. 56% of respondents stated that they sometimes participated in the management planning and decision making process for protected areas, while 36% of respondents indicated rarely participating in such activities (Table 2).

Households ranged in size from 1 to 10 individuals, with a mean of 3 individuals per household. Figure 2 shows the total number of people in each age group living in each surveyed household, and Figure 3 shows the average size of each household.

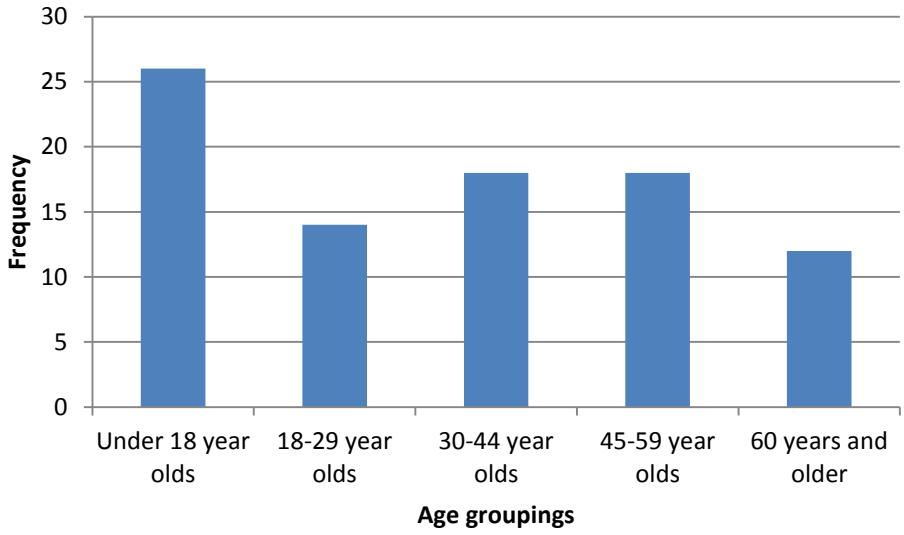

Figure 2. Number of people in each age group living in the surveyed households.

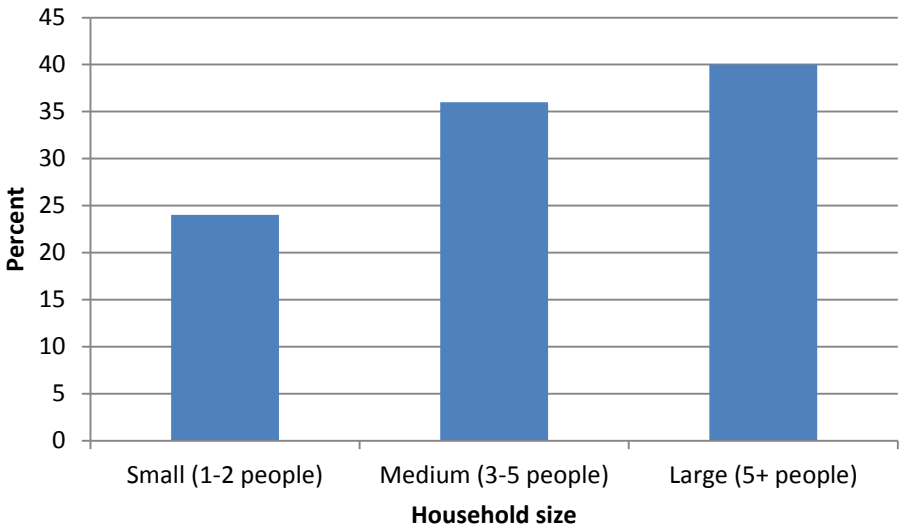

Figure 3. The average size of each surveyed household.

Income and Livelihood activities

The questionnaire sought to identify the key income and subsistent livelihood activities of each surveyed household. 56% of all surveyed households reported a monthly income level between $500-1000, followed by less than $500 (Figure 4). In terms of the perceived effect of the conservation areas on household income and expenses, most respondents reported no change, although two-fifths (40%) of respondents indicated that the conservation areas have greatly increased household expenses (Table 3).

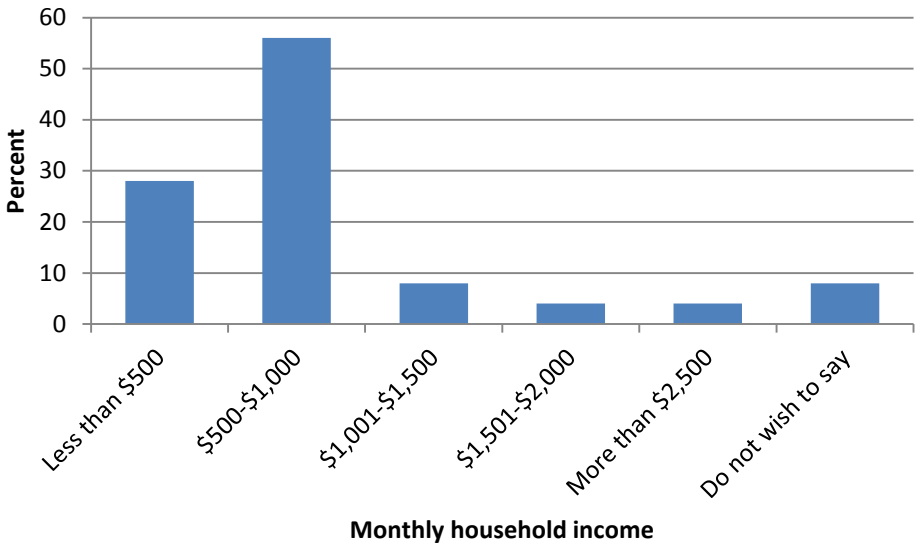

Figure 4. Monthly household income according to respondents.

Table 3. The reported effect of the conservation areas on household income and expenses.

	Greatly increased	Somewhat increased	Not Changed	Somewhat decreased	Greatly decreased	Don't know
Household income	4%	8%	**72%**	12%	4%	0%
Household expenses	40%	0%	**60%**	0%	0%	0%

Respondents also reported on their household's key subsistence livelihood activities which included fishing, harvesting invertebrates, farming crops and rearing livestock.

76% of the surveyed households reported participating in fishing activities mainly for food consumption and less for both income and food consumption (4%) (Figure 5). Half of surveyed households indicated harvesting invertebrates for food consumption only, while 80% of households reported farming crops for food consumption as well (Figure 5). The majority of all surveyed households participated in fishing and farming activities

mainly for food consumption and less for income generating activities. The majority of all surveyed households in Kayangel participated in fishing fish and harvesting invertebrates on a weekly basis and/or every 6 months.

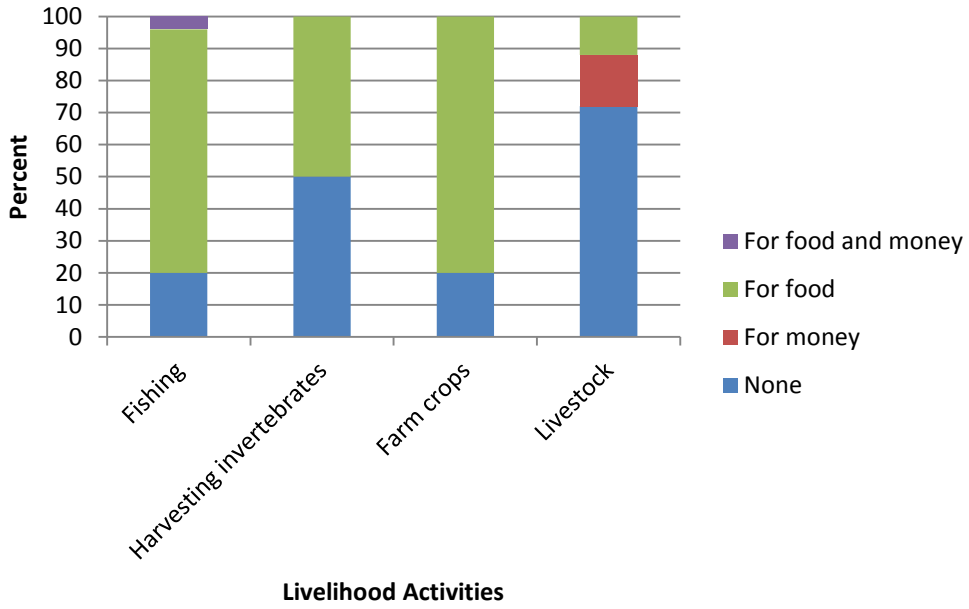

Figure 5. Household level of resource use for livelihood activities in Kayangel State.

Households reported that on average 41% of their fish catch was for food consumption, followed by giving away (26%) and family customs (5.2%) (Figure 6). Households that indicated harvesting invertebrates, reported that 31.5% of their invertebrate harvest was for food consumption, followed by giving away (20.8%) and family customs (1.9%) (Figure 6). Households also reported that half (50.2%) of their farm crops was for food consumption, while the remaining 27% was for giving away and family customs (2.8%) (Figure 6).

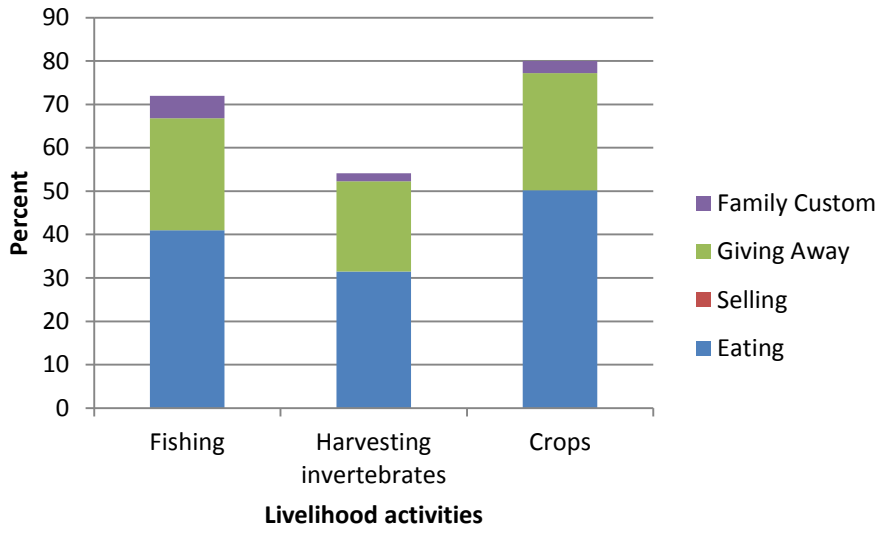

Figure 6. Household resource use for various livelihood activities in Kayangel state.

Of the households that participated in fishing and invertebrate harvesting activities, 58.3% fish by handline and spear diving (46%), followed by gleaning (37.5%) or harvesting invertebrates and cast net (37.5%) (Figure 7). Figure 7 further summarizes all key methods used as a means for fishing fish or harvesting invertebrates.

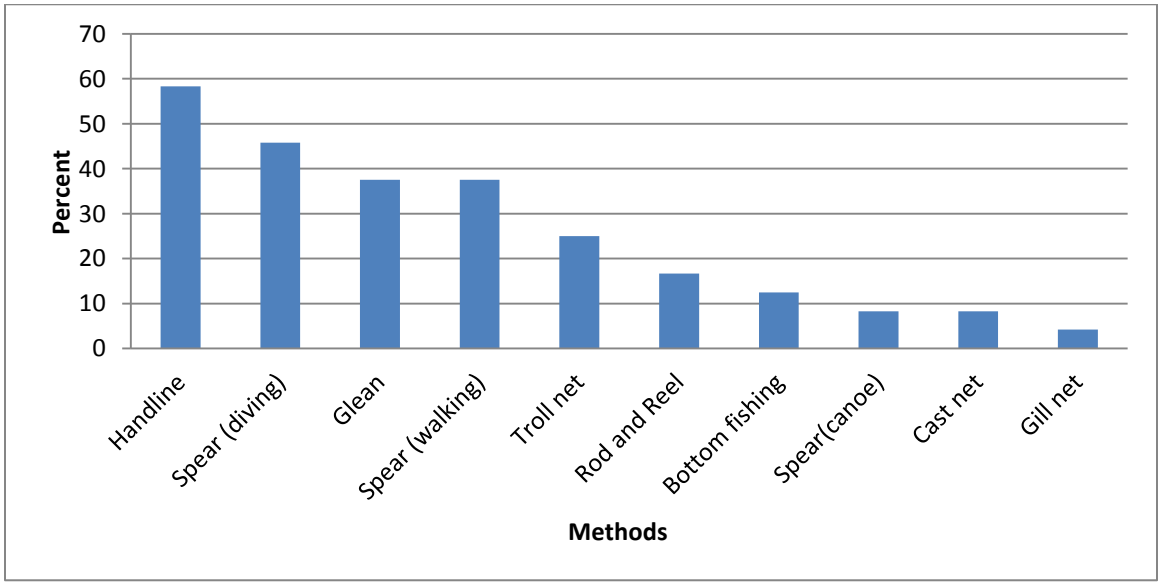

Figure 7. Methods used by households for fishing related activities.

The majority of respondents reported that the top two threats to Kayangel's marine resources were overharvesting and climate change. When asked what solutions would be best for such threats, most respondents stated setting size limits for fisheries and having stronger law enforcement.

Food and Water Security

Respondents were asked where their household food supply came from, how often it was sourced and if this was different compared to five years ago. The results of this are in Table 4.

Most households relied on household grown crops as well as local market crops and/or vegetables (Table 4). Households also relied moderately on self-caught marine resources, and heavily on imported processed or canned foods from shops (Table 4). Most households relied less on imported marine resources (24%). Almost all household food sources were not different compared to five years ago.

Table 4. Household's food supply in comparison to five years ago (**bold** denotes highest percent in each food category).

	Now - how often (%)				**Compared to five years ago (%)**		
	A lot	*Moderate*	*Little*	*None*	*More*	*Same*	*Less*
Household grown crops and/or vegetables	0	**44**	52	4	4.2	**87.5**	8.3
Local market crops and/or vegetables	0	**32**	36	32	0	**75**	25
Imported crops and/or vegetables	44	28	**20**	8	12.5	**70.8**	16.7
Self-caught marine resources	8	**52**	28	12	4	**83.3**	12.5
Local market marine resources	0	40	**20**	40	0	**83.3**	16.7
Imported marine resources	24	4	28	**44**	8.3	**83.3**	8.3
Local freshwater resources	**0**	0	0	0	0	**0**	0
Local land animals (pigs, birds, fruit bats)	0	36	24	**40**	4.2	**79.2**	16.7
Locally produced livestock	0	28	20	**52**	0	**91.7**	8.3
Imported livestock (meat)	12	28	40	**20**	4.2	**83.3**	12.5
Imported processed or canned foods from shop	**32**	40	28	0	4.0	**80**	8.7
Other	0	0	0	0	0	0	0

84% of surveyed respondents indicated that at least one member of their household participates in farming related activities. More than half of surveyed households (68%) reported farming betel nut, followed by garden vegetables (60%), sweet potato (56%) and taro (48%) (Figure 8).

Respondents who participated in farming activities mainly used seagrass (42%) and green manure or compost for fertilizing their farm crops (Figure 9). In terms of pesticide use (including insecticides, herbicides and fungicides), 29.2% of respondents used pesticides on household crops.

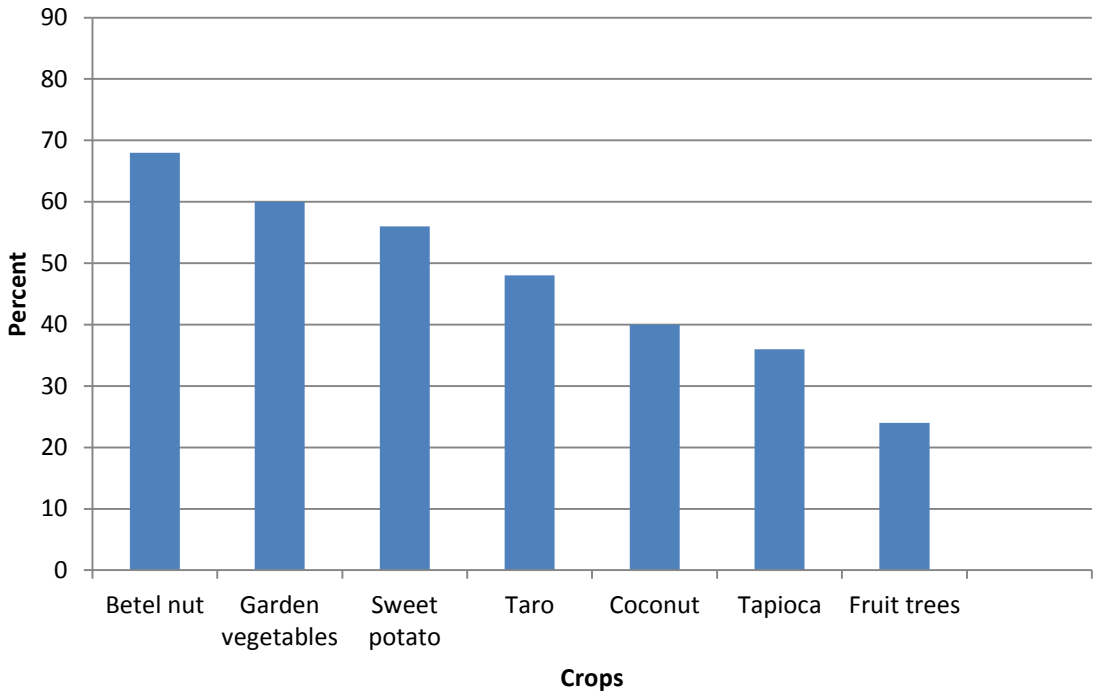

Figure 8. Crops grown by households in Kayangel state.

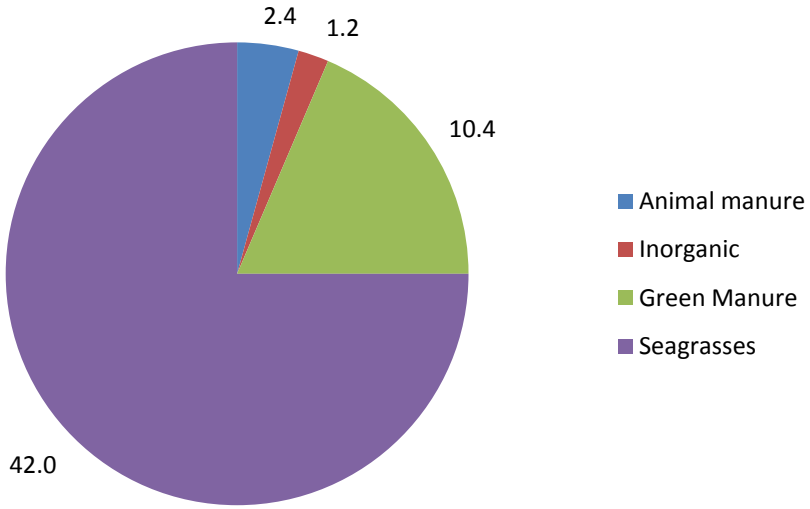

Figure 9. Main fertilizers used on household grown crops.

Respondents were also queried regarding their perceptions on the quality of their household drinking water and general use water. Almost all households relied on household rainwater tanks with less than 10% of households relying on village wells or taps for sources of drinking water. Most respondents indicated that their household had access to safe drinking water with 4.2% stating not having safe drinking water. This was similar for general use water.

Views on the Conservation Areas

With the overall focus of this study, it was crucial to identify if respondents had heard of different conservation initiatives such as the MC, PAN, State Bul and state conservation areas. More than 85% of respondents were aware of the PAN and state conservation areas, while only 37% of respondents reported being aware of the MC (Figure 10). Most respondents reported having medium to extensive level of knowledge regarding the PAN and state conservation areas, with more than half of respondents indicating having no knowledge of the MC (Figure 11).

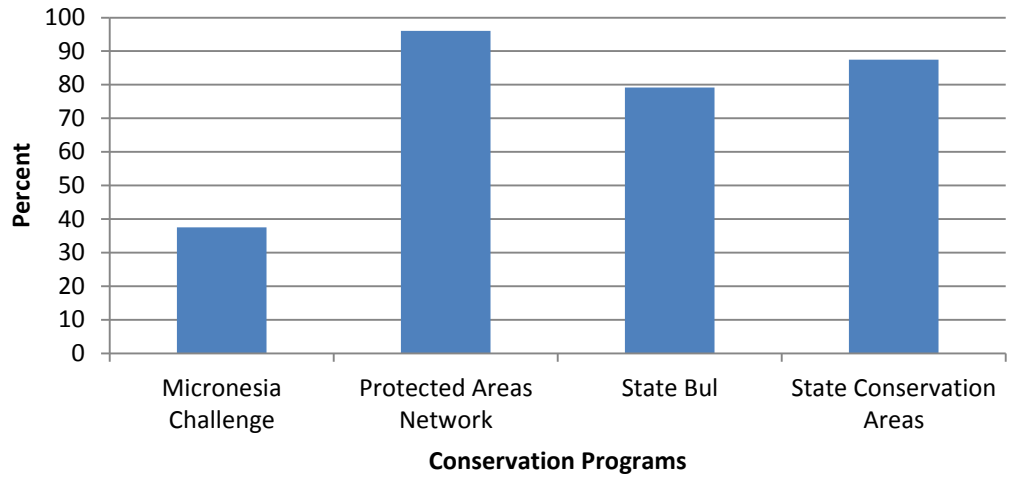

Figure 10. Level of awareness of different conservation initiatives.

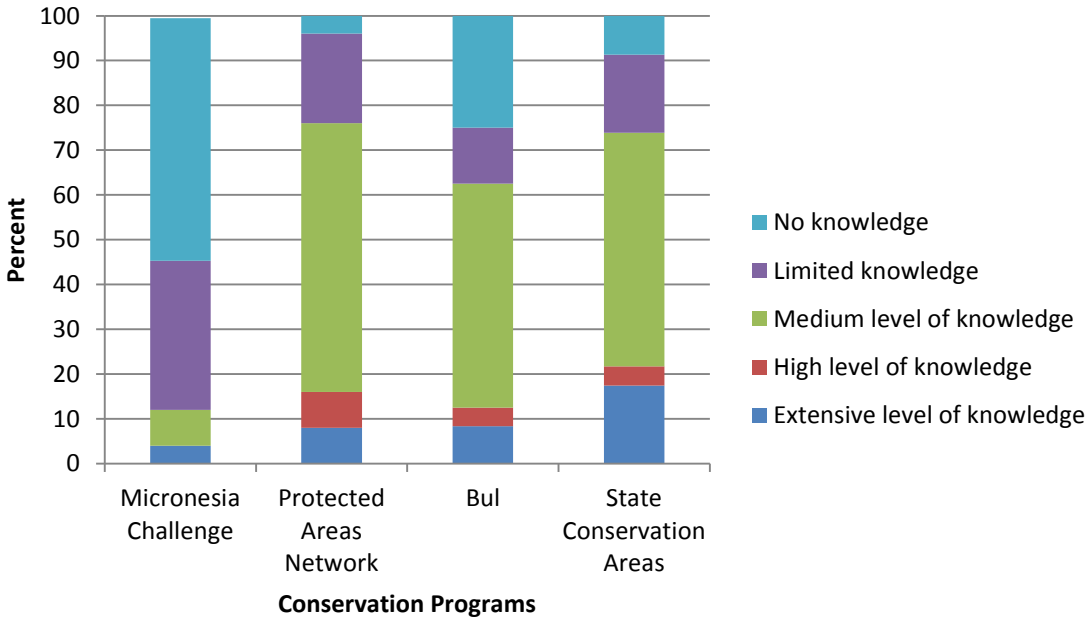

Figure 10. Level of knowledge of different conservation initiatives.

Most respondents were supportive of the PAN and state conservation areas; however, 25% of respondents had limited or no support for the MC (Figure 12). This could be attributed to respondents having no knowledge of the MC.

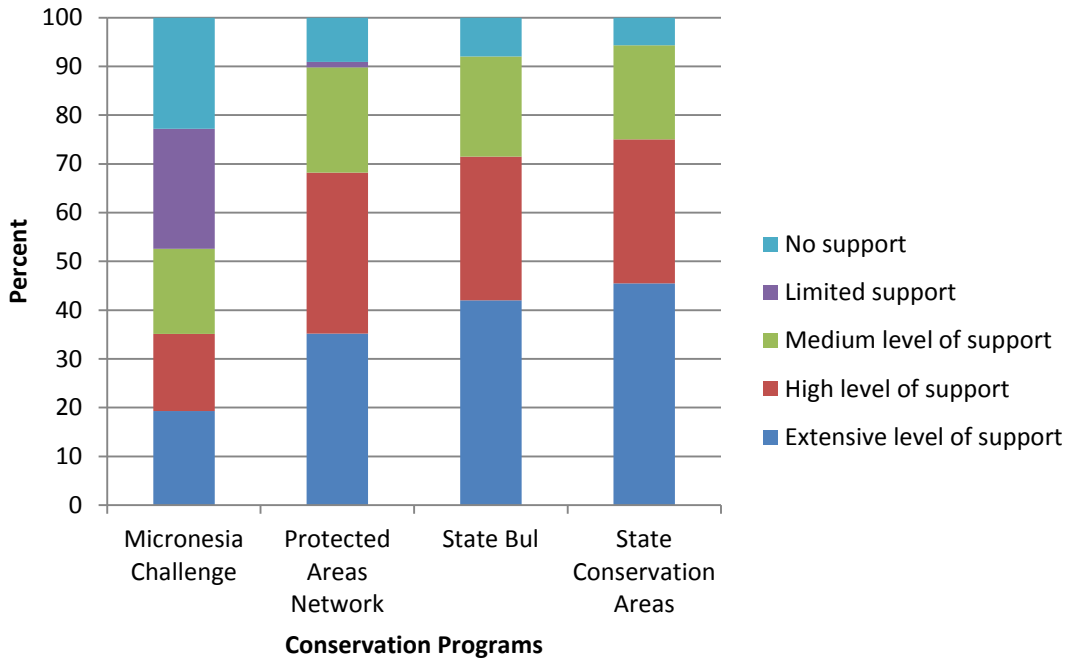

Figure 12. Level of support for different conservation initiatives.

Respondents were also queried on their level of knowledge regarding the allowable activities within the conservation areas in Kayangel State. 68% of respondents indicated having knowledge of some of the allowable activities within the conservation areas, while 24% of respondents indicated having no knowledge at all (Figure 13).

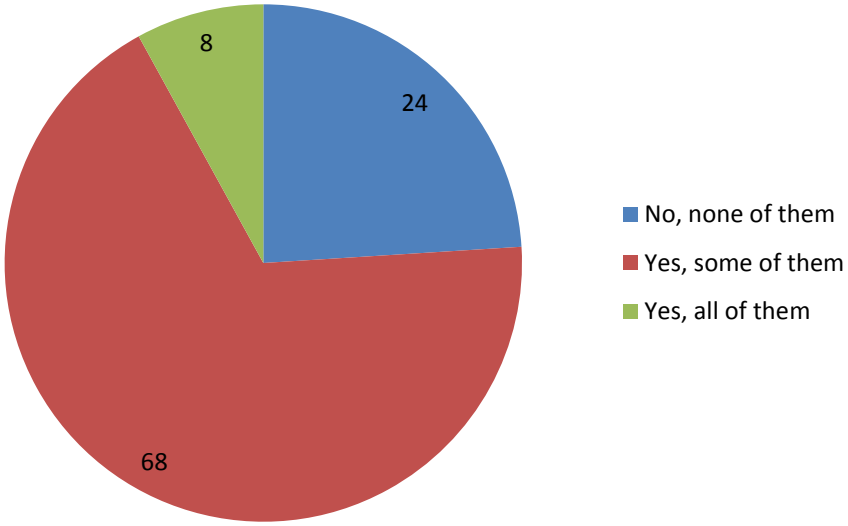

Figure 13. Respondents' knowledge of allowable activities of the conservation areas within the Kayangel Protected Areas Network.

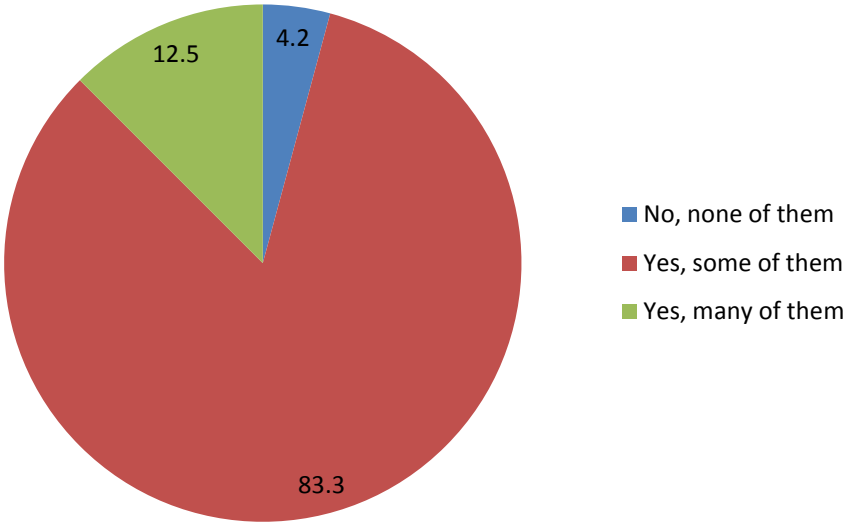

Figure 14. Involvement with activities related to the conservation areas within Kayangel Protected Areas Network.

83% of respondents indicated that at least one member of their household has seen, read and/or participated in outreach activities related to the conservation areas (Figure 14). The main source of outreach material/activity that participants had witnessed was

fact sheets (62.5%), followed by awareness print materials (50%), education and/or awareness plans (37.5%), student field education programs (20.8%) and community meetings (12.5%) (Figure 15).

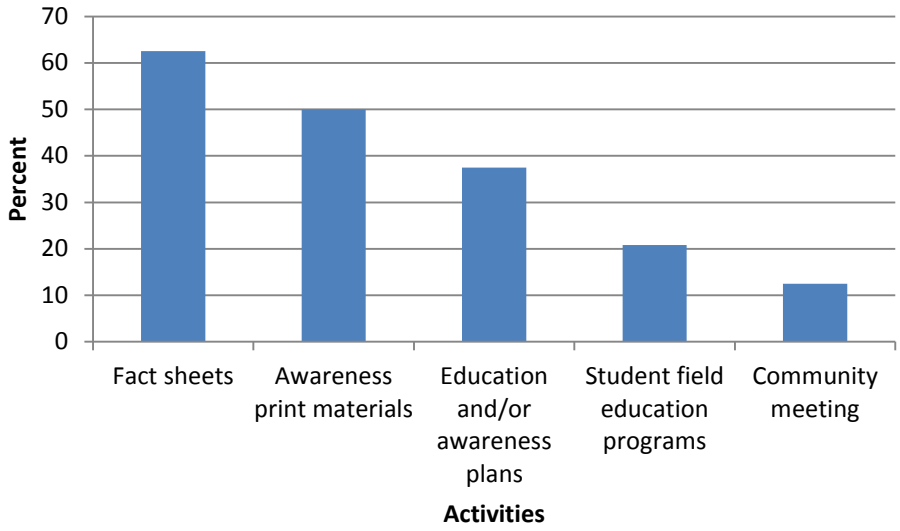

Figure 15. Activities that respondent's and their household members have participated in

More than half of survey respondents did not attribute any changes to locally-sourced marine and terrestrial food availability to the protected areas (Table 5). This was similar to changes to the overall quality of the marine and terrestrial environment (Table 5 & 6).

Table 5. The perceived impact of the Marine Protected Areas on livelihood factors (**bold** denotes highest percent for each variable listed in the first column).

	Greatly increased	Somewhat increased	Not changed	Somewhat decreased	Greatly decreased	Don't know
Overall quality of the marine environment	4.2	4.2	**66.7**	20.8	4.2	0
Abundance of fish	4.2	4.2	**58.3**	20.8	8.3	4.2
Abundance of invertebrates	0	8.3	**54.2**	25	8.3	4.2
Size of fish	4.2	8.3	**50**	25	4.2	8.3
Size of invertebrates	4.2	8.3	**50**	25	8.3	4.2
Availability of food from fish	4.2	4.2	**54.2**	25	4.2	8.3
Availability of food from invertebrates	4.2	8.3	**50**	25	8.3	4.2
Spiritual and cultural amenity	0	0	**62.5**	8.3	4.2	25

Table 6. The perceived impact of the Terrestrial Protected Areas on livelihood factors (**bold** denotes highest percent for each variable listed in the first column).

	Greatly increased	Somewhat increased	Not changed	Somewhat decreased	Greatly decreased	Don't know
Overall quality of the terrestrial environment	8	12	**60**	12	0	4
Abundance of fruit bats	8	4	**52**	20	0	12
Abundance of medicinal plants	8	8	**44**	24	0	12
Abundance of building materials	4	8	**48**	24	4	8
Size of fruits bats	4	4	**56**	16	4	12
Size of building materials	0	8	**56**	16	8	8
Availability of farm food (crops)	0	8	**56**	24	4	4
Quality of public freshwater	0	0	0	0	0	0
Quantity of public freshwater	0	0	0	0	0	0
Spiritual and cultural amenity	4	4	**52**	12	0	0

Finally, respondents were asked to reflect on a series of statements related to the overall impact and progress of the Conservation Areas in improving livelihood outcomes. These attitudinal statements were placed on a scale of 0 (do not agree) to 4 (very strongly agree). Respondents could also select 'don't know'. The results (both means and percentages) are illustrated below in Table 7.

Although most respondents did not attribute any household level changes to the protected areas, more than half of survey respondents believe that the conservation areas have been beneficial to their community (Table 7). Most respondents also believe that everyone benefits equally from the conservation areas, however more than half of survey respondents also indicated that they still hear about or see illegal entry or taking of resources from the conservation areas (Table 7).

Table 7. Attitudinal statements related to the Conservation Areas (**bold** denotes highest percent for each variable listed in the first column).

Statements	Mean Value	Very strongly agree	Strongly agree	Moderately agree	Agree a little	Do not agree	Don't know
Overall, the Conservation Area(s) has been beneficial to our community	6.88	28	**52**	12	0	4	0
I often see or hear about illegal entry or taking of resources from the Conservation Area(s)	10.88	**44**	32	8	8	0	8
There is adequate enforcement of the rules of the Conservation Area(s)	2.20	12	**40**	20	12	16	0

There is adequate monitoring of the natural resources in our community	2.24	16	**32**	24	16	12	0
There have been positive livelihood benefits due to the Conservation Area(s)	6.92	4	32	**48**	12	4	4
There have been positive economic benefits due to the Conservation Area(s)	6.68	20	**56**	8	8	4	4
There have been positive cultural and spiritual benefits due to the Conservation Area(s)	14.16	16	**40**	20	4	8	12
There have been positive environmental benefits due to the Conservation Area(s)	7.04	36	**44**	16	0	0	4
Everyone benefits equally from the Conservation Area(s)	6.36	20	**36**	24	4	12	4
If we want to preserve our natural resources then ‘closing off’ certain areas is necessary	3.00	**40**	32	16	12	0	0

Local Management Plan

All respondents were aware of Ngeruangel Marine Reserve, while 83.3% of respondents knew of the official boundaries of the reserve (Figure 16). 78.3% of respondents were aware of Ngkesol Marine Protected Area, with 64% having knowledge of its boundaries. Lastly, 60% of survey respondents were knowledgeable of the Kayangel Territorial Waters, with fewer having knowledge of its boundaries (Figure 16). Most respondents also indicated high level of support for having a bird watching industry in Kayangel State.

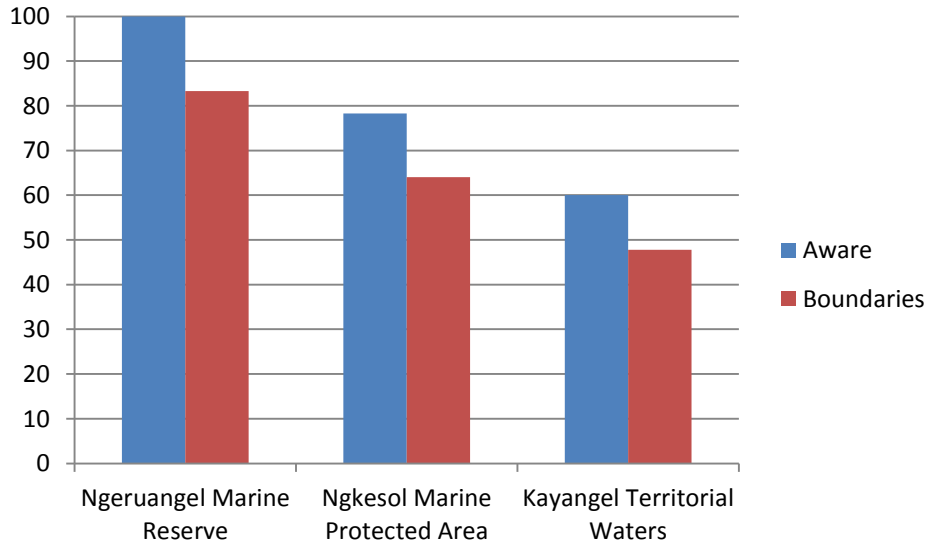

Figure 16. Respondents level of awareness and knowledge of boundaries of the Marine Conservation areas in Kayangel State.

Discussion

The majority of Kayangel respondents were male, with a mean age of 53 and have lived in Kayangel all their lives. The most predominant source of income for respondents was through government work or pension and social security. Over half of respondents indicated that they sometimes participated in the management planning and decision making process for protected areas. Majority of Kayangel respondents did not attribute any changes to locally-sourced marine food availability to the protected areas in Kayangel. Respondents indicated participating in fishing and farming related activities mainly for food consumption and giving away and less for income purposes. Household's most used fishing methods were fishing by handline and spear diving.

In terms of respondent's views on the conservation areas, the majority of respondents were aware and knowledgeable of the PAN and Kayangel State conservation areas. However, only less than half of all respondents indicated having knowledge of the MC. Almost all respondents were supportive of the PAN and State conservation areas, although more than half of respondents could not indicate their level of support for the MC due to having no knowledge regarding the MC.

Although respondents indicated having support for the Kayangel State protected areas as well as the PAN, most respondents as well as key informants still see or hear about illegal entry and fishing in Kayangel's protected areas. During key informant interviews, both key informants stated the strong need for additional enforcement officers, improved surveillance (proper citation materials, enforcement training for officers) citation

equipment, training for conservation officers/rangers, and more funding for conservation related activities.

Most respondents in Kayangel believed that overall the conservation areas are beneficial at the community level, and strongly believed that there was equitable distribution of benefits of the protected areas. During key informant interviews, both key informants stated that Kayangel's protected areas network can have more successful outcomes for the people of Kayangel, however there needs to be more educational awareness, involvement, and enforcement.

Conclusion

The results illustrated in this study served as baseline socio-economic information for Kayangel's protected areas. As baseline socio-economic information, these results can also be used to make a preliminary assessment on the effectiveness of PAN sites in improving livelihood outcomes. In the long-term, continuous socio-economic monitoring is necessary to capture trends and changes in order adaptively manage the conservation areas in Kayangel State.

Acknowledgements

We wish to acknowledge and thank the Kayangel state Government and the people of Kayangel as well as the data collectors, Melanie Tiobech and Shirley Blodak for their assistance and support throughout this study. We would also like to thank the Palau Socio-economic working group, Dr. Supin Wongbusarakum, and King Sam for their feedback and assistance with the questionnaires and performance rubric for this project. Lastly we would like to thank PICRC researchers, research assistants and numerous interns for assistance with data entry and analysis for this project. Funding for this study was made possible through funding from the GEF Small Grants Program, NOAA Coral Reef Conservation Program and the Micronesia Conservation Trust.

References

Bartlett, C.Y., Pakoa, K. and Manua, C. (1999) 'Marine reserve phenomenon in the Pacific Islands', *Marine Policy*, 33, 673-678.

Cinner, J.E. and Aswani, S. (2007) 'Integrating customary management into marine conservation', *Biological Conservation*, 140: 201-216.

Kayangel Protected Areas Network Five Year Management Plan 2013-2018.

Johannes, R.E. (1978) 'Traditional marine conservation methods in Oceania and their demise', *Annual Review of Ecology and Systematics*, 9: 349-364.

Johannes, R.E. (2002) 'The renaissance of community-based marine resource management in Oceania', *Annual Review of Ecological Systems*, 33: 317-340.

Mora, C., Andrefouet, S., Costello, M.J., Kranenburg, C., Rollo, A., Veron, J., et al. (2006) 'Ecology: Enhanced coral reefs and the global network of marine protected areas', *Science*, 312: 1750-1751.

Veitayaki, J. (1997) 'Traditional marine resource management practices used in the Pacific Islands: An agenda for change', *Ocean and Coastal Management*, 37: 123-136.

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

School of Geography, Planning and Environmental Management

Project Title: Socio-economic Study of Palau's Protected Areas Network

PARTICIPANT INFORMATION SHEET FOR SURVEY PARTICIPANTS

I, Karen McNamara, kindly seek your assistance with a research project exploring the effectiveness of the Protected Areas Network on livelihood outcomes across six sites in Palau. This research project is being conducted by The University of Queensland in close partnership with the Palau International Coral Reef Center (based in Koror). This research seeks to draw on the views and experiences of locals to better understand the overall livelihood benefits, or not, of the protected areas network.

This research will involve the collection of information about your household socio-demographics, livelihood activities and income, food and water security, and views on the conservation areas.The results from which will be written up in reports and peer-reviewed literature to illustrate progress towards the socio-economic outcomes of the Protected Areas Network.

Your participation is voluntary. At all stages of the research, participant feedback is warmly welcomed. If you would like more information on this research project, please don't hesitate to contact me.

This study adheres to the Guidelines of the ethical review process of The University of Queensland and the National Statement on Ethical Conduct in Human Research. Whilst you are free to discuss your participation in this study with project staff (contactable on +61 (7) 3365 6069 or karen.mcnamara@uq.edu.au), if you would like to speak to an officer of the University not involved in the study, you may contact the Ethics Coordinator on +61 (7) 3365 3924.

I would like to thank you very much in participating in this research.

Dr Karen McNamara
Lecturer
School of Geography, Planning and Environmental Management
The University of Queensland
E: karen.mcnamara@uq.edu.au

HOUSEHOLD QUESTIONNAIRE: PALAU INTERNATIONAL CORAL REEF CENTER

Surveyed by:_____ Date:_____Survey No: _____

State:_____Hamlet:_____

SECTION ONE: Socio-demographics. Telengtengil a delengchokl

1. Obtain the following information for the 'interviewee' - who is the 'head of household' (remember to aim for a gender balance, where possible). (PICRC1, MC2)

A. Who **Ng techa oungerachel er a delengchokl?**	B. Age (in years) **Ng tela rekim?**	C. Have you always lived in this State? **Ke meketeketang el kiei er tia el beluu?**	D. Marital Status **Ke bechiil?**	E. Highest level of formal education **Kot el ngar bab el skuul el mtilobed er ngii**	**F**. Highest level of practice of traditional knowledge **Klemdengei er a siukang, klebelau me a klechibelau**	**G**. How do you predominately earn an income? **Uchul a klekerngem**	H. Citizenship **Chad er ker**	**I**. Does your family own the land you live on? **Tia el om kiei er ngii ng chetemem**	**J**. Participate in resource management planning and decision making **Mla nga er a omesodel me a omelchesel a llechul me a omengermelel a ngikel, cheled, blul el basio.**
(Interviewee)									
1='Male' head of household 2='Female head of household'		**0** =Yes **1**=No, less than 1 year **2** =No, between 1-5 years **3** =No, more than 5 years	1=Single 2=Married 3=Widow 4=Divorced 5=Other (specify)	1=Up to elementary 2=Up to high school 3=Up to college or similar 4=Up to university or similar 5=None 6=Other (specify)	1=Extensive **Dmolech el klemedengei** 2=Some **Medengei a bebil** 3=None **Diak**	1=No income 2=Handicraft 3=Fishing (catch and/or harvest) 4=Farmer (crops, livestock) 5=Private business 6=Remittances 7=Land or house lease 8=Government work 9=Family custom 10=Pension/social security 11=Other (specify)	1=Palau 2=Other (specify)	1=Yes 2=No, lease from State Gov't 3=No, private rental 4=No, informal agreement 5=No, traditional arrangement	0= Never **Diak** 1= Seldom **Derstang** 2= Sometimes **Bebil ra taem** 3= Often **Oumesind ra taem** 4= Always **Bek el taem**

2. Indicate how many people (adults and children), including yourself, live in your household, including their age group: **Te tela el chad el uldimukl er kau a kiei er a delengcheklem e dertela rekrir?** (PICRC1, MC2)

	Under 18 years old	18-29 years old	30-44 years old	45-59 years old	60 years old and higher
Number					

SECTION TWO: Livelihood Activities and Income. Omenged, Omelngot me a Omengerker

3. What income and subsistent livelihood activities does your household do? **Ngera el omenged me a omelngot a omoruul er a delengcheklem? (PI1, PI3, PI4)**

E.g.: Do you or anyone else in your household go out to catch or harvest? If No, select 'None'. If Yes, is this for money or food or both **(select all that apply).** And how often (on average over a year) ? **Ng ngar ngii a ngar er a delengcheklem el oumenged el melngot el di kall, ng makit a lechub e ngii el teblong? E a le ngar er ngii e ng locha tela el taem er a ta el rak?**

Complete this for all the other livelihood activities (harvest, farm crops and livestock).

Catch (fish, turtles etc) ☐None			**Harvest (invertebrates)** ☐None			**Farm crops** ☐None			**Livestock** ☐None		
For $	For food	How often (on av./yr)	For $	For food	How often (on av./yr)	For $	For food	Area (acres)	For $	For food	How many (on av./yr)
☐	☐	_____	☐	☐	_____	☐	☐	_____	☐	☐	_____
		1=daily 2=weekly 3=monthly 4=6 months+			1=daily 2=weekly 3=monthly 4=6 months+			1=<0.25 2=0.25-1 3=>1			1=1-5 2=6-10 3=>10

4. What is the monthly income level of your household**? Ng locha telang a uldekial a kerrekerngem me a rebek el mengerker el kiei er a delengcheklem er a chelsel a ta el buil?** (PI4)

Less than 500$ Mekesai er a 500	**500-1,000$**	**1,001-1,500$**	**1,501-2,000$**	**2,001-2,500$**	**More than 2,500$ Betok er a 2,500**	**Do not wish to say Diak el soal el ouchais**
☐	☐	☐	☐	☐	☐	☐

5. Have the Conservation Area(s) changed your household income or household expenses? **A ika el blul el basio, ng ngar er ngii a blal ngedechii er a klungel a kerrekerngem me a omengitem er a udoud?** (PI4)
    - **If No, mark 'not changed' box**
    - If Yes, has it increased or decreased your household income/expenses? Greatly/Somewhat?

	Greatly Increased **Kmal klou**	Somewhat Increased **Ngar er ngii**	Not Changed **Diak a mla mengodech**	Somewhat Decreased **Mla ngmanget**	Greatly Decreased **Kmal mla ngmanget**	Don't Know **Ng ngaukai**
Household income. **Kerrekerngel a delengchokl**	☐	☐	☐	☐	☐	☐
Household expenses. **Omengitel a udoud er a delengchokl**	☐	☐	☐	☐	☐	☐

SECTION THREE: Food and Water Security. Ulekerreuil a Kall me a Ralm

6. Indicate where your household's food supply comes from, how often it is sourced, and if this is different compared to five years ago: **Ka mouchais el kmo a kall er a delengcheklem ng ngar ker el mei, e merames ng mekudem a ngeiul/skel , e ngodech a lechub e ng di osisiu me a eim el rak er a mla me mong?** (PI2)

	Now - how often **chelechang el taem - kudem**				Compared to five years ago **Eim el rak er a mla me mong**		
	A lot ***Mekudem***	*Moderate* ***Klebech***	*Little* ***Merames***	*None* ***Diak***	*More* ***Betok***	*Same* ***Osisiu***	*Less* ***Mekesai***
Household grown crops and/or vegetables **Sers er a ongraol me a yasai**	☐	☐	☐	☐	☐	☐	☐
Local market crops and/or vegetables **Ongraol me a yasai er a makit (delomel er Belau)**	☐	☐	☐	☐	☐	☐	☐
Imported crops and/or vegetables **Ongraol me a yasai el ngar er a ikrel Belau el mei**	☐	☐	☐	☐	☐	☐	☐
Self-caught marine resources **Oumenged**	☐	☐	☐	☐	☐	☐	☐
Local market marine resources **Ngikel me a cheled er a makit**	☐	☐	☐	☐	☐	☐	☐
Imported marine resources **Ngikel me a cheled el ngar er a ikrel Belau el mei**	☐	☐	☐	☐	☐	☐	☐
Local freshwater resources **Usbechel a ralm**	☐	☐	☐	☐	☐	☐	☐
Local land animals (pigs, birds, fruit bats) **Odoim el charm er a beluu (babii, charm el suebek, olik)**	☐	☐	☐	☐	☐	☐	☐

Locally produced livestock **Kerbou, kaming me a babii er a sers**	☐	☐	☐	☐	☐	☐	☐
Imported livestock (meat) **Tech er a kerbou, kaming el mla er a ikrel a Belau**	☐	☐	☐	☐	☐	☐	☐
Imported processed or canned foods from shop **Kansume er a stouang**	☐	☐	☐	☐	☐	☐	☐
Other _____ **Kuk bebil**	☐	☐	☐	☐	☐	☐	☐

The following questions are only applicable if the interviewee and/or members of their household go out to the ocean to catch or harvest (if not, move to the end of Question10)

☐	**Select this box if the following questions are not applicable**

7. Which methods do you and/or members of your household use to catch or harvest? **Ng ngera el teletael er a omenged a om ngar er ngii, kau me a rebek el chad er a delengcheklem? (select all that apply)** (PI3)

☐	Glean **Omelai el cheled**	☐	Spear (walking) **Omurch (di merael)**	☐	Spear (diving) **Melechelbakl**
☐	Spear (canoe) **Oltoir (a uel) Melkelikes (omurch a chemang me a ngikel)**	☐	Hand line **Mengereel Omedesakl**	☐	Rod and reel **Mengereel obang a sao**
☐	Trap **Omub (ngikel me a chemang)**	☐	Cast net **Omuked**	☐	Gill net **Mengesokes**
☐	Bottom fishing **Mengereel er a dmolech**	☐	Trolling **Mengetakl**	☐	Other _____

8. Over the past year, list up to three locations that you and/or members of your household most frequented for catch or harvest, and indicate if these sites are different to where you most frequented five years ago? Please try and keep these locations quite general and broad. **A chelsel tia el mlo merek el rak, e ngera a kldei el basio el kau me ar kiei er a delengcheklem a blechoel el mo er a chei er ngii. E a ika el basio ng ngodech a lechub ng osisiu er a basio el obla er a chei er ngii er a cheim el rak er a mla me mong?**(PI3)

Location	Compared to five years ago	
	Same ***Osisiu***	*Different* ***Ngodech***
	☐	☐
	☐	☐
	☐	☐

9. Over the past year, list the most popular marine animals your household collectively caught or harvested, how many, and indicate if these animals are different compared to five years ago? **Tia el mlo merek el rak, ng ngera el ngikel, cheled me a charm er a kereker (daob) a oblechoel el melai? E locha mle uangera ildisel? E betok ng mekesai er a cheim el rak er a mla me mong?**(PI3)

Catch		Compared to five years ago		Harvest		Compared to five years ago	
Name ***Ngakl***	*Number* ***Ildois***	*Same type* ***Osisiu el bedengel***	*Different type* ***Kakerous el bedengel***	*Name* ***Ngakl***	*Number* ***Ildois***	*Same type* ***Osisiu el bedengel***	*Different type* ***Kakerous el bedengel***
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐

10. Are there any threats to catch or harvest**? Ng ngar ngii a sebechel uchul e ng mo nguemed a ika el ngikel, cheled me a charm er a kereker (daob)?** (PI3, PI11)

☐ No

☐Yes → Can you list up to two top threats? _____

Ng sebechem el masech a teblong el uchul?

Can you list up to two top solutions? _____

Ng sebechem el masech a teblong el sebecheklel?

The following questions are only applicable if the interviewee and/or members of their household grow crops (if not, move to Question 15)

☐	**Select this box if the following questions are not applicable**

11. Over the past year, which crops did your household collectively grow? **(select all that apply) Tia el mlo merek el rak e ngera el dellomel a omullalem?** (PI3)

☐	Taro **Dait/Brak**	☐	Coconut **Lius**	☐	Garden vegetables **Yasai**
☐	Tapioca **Diokang**	☐	Sweet potato **Chemutii**	☐	Fruit trees **Rodech**
		☐	Betel nut **Buuch**	☐	Other _____

12. Over the past year, what percentage of each input did your household use on its crops? **(select all that apply to add up to 100% or if None then put 0%) Tia el mlo merek el rak e ngera el koeas e uangerang a klungel (tela el basent) a omuluusbech er a omelalem a dellomel?** (PI3)

Fertilisers	
Animal manure **Dechil a charm**	
Inorganic fertiliser (chemicals) **Koeas er a Ngebard**	
Green manure (weeds) or compost **Ramk**	
Seagrasses **Char**	
Other _____	
	100%

13. Over the past year, have any pesticides been used on your household crops? **Tia el mlo merek el rak, ng ngar er ngii a spray er a charm er a dellomel el bla mousbech er a dellemelem?** (PI3)

☐	No **Diak**	☐	Yes **Choi**

14. Are there any threats to farming crops? **Ng ngar er ngii a uchul e ng mo smecher a lechub e ng mad a dellemelem?** (PI3, PI11)

☐ No

☐Yes ⟶ Can you list up to two top threats? _____

Ng sebechem el masech a teblong?

Can you list up to two top solutions? _____

Ng sebechem el masech a teblong el kerul a lechub e ng sebecheklel?

15. Over the past year, what percentage of the total amount of catch and harvest, and crops grown by your household would be for the following **purposes (select all that apply to add up to 100% or if None then put 0%)**: (PI3) **Tia el mlo merek el rak, ng tela el basent er a cheldmiu me a dellemeliu a mo usbechall er a ika el teletael el beldukl er eou:**

Catch		**Harvest**		**Crops**	
Eating **Blengur**		Eating **Blengur**		Eating **Blengur**	
Selling **Makit**		Selling **Makit**		Selling **Makit**	
Giving Away **Omekang**		Giving Away **Omekang**		Giving Away **Omekang**	
Family Custom **Mechesang**		Family Custom **Mechesang**		Family Custom **Mechesang**	
	100%		**100%**		**100%**

16. Indicate where your household water comes from: **(select all that apply) (PI5) A imeliu el ralm ng ngar ker el mei?**

☐	Stream or river **Omoachel**	☐	Household rainwater tank **Tank er a blai**	☐	Village wells or taps **Chido er a beluu**
☐	Spring **Madedok**	☐	Village rainwater tanks **Tank er a buai**	☐	Other _____ **Kuk bebil**

17. Does your household have access to safe drinking water and/or access to water for general use? (PI5) **A delengcheklem ng ngar ngii a rolel a ungil el ralm el ilumel me a dousbech er a blai el me er ngii?**

Safe drinking water **Ungil ilumel el ralm**		General use water **Ralm el dousbech**	
Yes **Choi**	☐	Yes **Choi**	☐
Sometimes **Al Bebil**	☐	Sometimes **Al Bebil**	☐
No **Diak**	☐	No **Diak**	☐

SECTION FOUR: Views on the Conservation Area(s) Klemedengei me a Osengem er a Blul el Basio

18. Which of the following have you heard of? **(select all that apply)** (MC8) **Ke mla remenges a chisel a ika el beldukl er eou? Mlecha olangch er a ike el rokui el modengei.**

☐	Micronesia Challenge	☐	Protected Areas Network	☐	Bul	☐	State Conservation Area(s)

19. Can you list the allowable activities in the Conservation Area(s)? (MC8) **Ng sebechem el masech a sebeched el meruul er a chelsel a blul el basio er a beluam.**

☐	No, none of them **Diak**	☐	Yes, some of them **Choi, medengei a bebil**	☐	Yes, all of them **Choi, medengei el rokui**

20. Do you know why the Conservation Area(s) in your State were established? (MC8) **Ke medengei el kmo ng ngera uchul e ng mlekedmokl a blul el basio er a beluam?**

☐	No **Diak**	☐	Yes **Choi**

21. Indicate your level of knowledge about the purpose of each of the following: (MC8) **Mleliang a olangch el olechotel a delechel a klemedengei er kau er a ika el beldukl er eou:**

	Extensive level of knowledge **Dmolech el klemedengei**	High level of knowledge **Medengei a betok**	Medium level of knowledge **Medengei a bebil**	Limited knowledge **Oumededenger**	No knowledge **Diak kudengei**
Micronesia Challenge	☐	☐	☐	☐	☐
Protected Areas Network	☐	☐	☐	☐	☐

Bul	☐	☐	☐	☐	☐
State Conservation Area(s)	☐	☐	☐	☐	☐

22. Have you and/or any members of your household seen, read and/or participated in any outreach or awareness activities related to the Conservation Area(s)? (MC8) **Ng mla ta el om mesang ke oiuii, ke ngar er a miting me a lechub a cheldecheduch el olisechakl a teletelel a blul el basio er a beluam?**

☐	No, none of them **Dirkak**	☐	Yes, some of them **Mla ngar er a bebil**	☐	Yes, many of them **Kmal betok**

If Yes, select which ones **(select all that apply): A le ngar er ngii, e mlecha olangch er a ngii er a ika el beldukl er eou.**

☐	Fact sheets **Babier er a sodel a charm, dellomel, basio, me abebil el tekoi er a science el kirel a blul el basio**	☐	Student field education programs **Omesarch me a omesuub er a skuul**	☐	Other _____
☐	Awareness print materials **Babier el mesaod, omeklatk e omeketakl a teletelel me a llechul a blul el basio**	☐	Education and/or Awareness Plans **Plan me a lechub e ng babier el smaod a telbiil, ureor, okedmeklel, omengkerengel, me a osisecheklel a blul el basio.**	☐	Other _____

23. Indicate your level of support for each of the following: (MC9) **Kau mleliang a olangch er a kmo koumerang e oldubech a ika el beldukl er eou:**

	Extensive level of support **Dmolech el klaumerang e oldubech**	High level of support **Kmal oumerang e oldubech**	Medium level of support **Kuumerang e oldubech**	Limited support **Diak sa el oumerang e oldubech**	Do not support **Diak kuumerang me a ka kuldubech**
Micronesia Challenge	☐	☐	☐	☐	☐
Protected Areas Network	☐	☐	☐	☐	☐
Bul	☐	☐	☐	☐	☐
State ConservationArea (s)	☐	☐	☐	☐	☐

24. Do you think the Marine Protected Area (s) have changed the following for your household? (PI4) **A blul el basio er a kerker, ngar ngii a blal ngedechii er a delengcheklem?**

- **If No, mark 'not changed' box. A lak e mleliang a olangch er a "dirkak a mengodech"**
- If Yes, has it increased or decreased the items listed? Greatly/Somewhat? **A le ngar er ngii e mleliang a olangch er a klungel a mla mengodech er a ika el beldukl er eou.**

	Greatly Increased **Kmal klou**	Somewhat Increased **Telkib el klou**	Not Changed **Dirkak a mengodech**	Somewhat Decreased **Telkib mla ongesngesii**	Greatly Dereased **Kmal klou a bla losengesii**	Don't Know **Ngaukai**
Overall quality of the marine environment **Klungiolel a kerker**	☐	☐	☐	☐	☐	☐
Abundance of fish **Ildisel a ngikel**	☐	☐	☐	☐	☐	☐
Abundance of invertebrates **Ildisel a cheled**	☐	☐	☐	☐	☐	☐
Size of fish **Meklungel a ngikel**	☐	☐	☐	☐	☐	☐
Size of invertebrates **Meklungel a cheled**	☐	☐	☐	☐	☐	☐
Availability of food from fish **Ildisel a odoim el ngikel**	☐	☐	☐	☐	☐	☐
Availability of food from invertebrates **Ildisel a kall el cheled**	☐	☐	☐	☐	☐	☐
Spiritual and cultural amenity **Nglsecheklel a klebelau me a tekoi el chelid**	☐	☐	☐	☐	☐	☐

25. ***If applicable,*** do you think that the Terrestrial Conservation Area (s) have changed the following for your household? (MC1, PI1, PI2, PI7) **A omomdasu e a blul el basio er a beluu ng ngar ngii a bla el ngedechii er a delengcheklem?**

- **If No, mark 'not changed' box. A lak e mlelia olangch er a "Dirkak a mengodech"**
- If Yes, has it increased or decreased the items listed for your household?Greatly/Somewhat**? A le ngar er ngii e mlecha olangch er a klungel a mla mengodech er a ika el beldukl er eou:**

	Greatly Increased **Kmal klou**	Somewhat Increased **Telkib el klou**	Not Changed **Dirkak a mengodech**	Somewhat Decreased **Telkib mla ongesngesii**	Greatly Dereased **Kmal klou a bla losengesii**	Don't Know **Ngaukai**	**Not applicable**
Overall quality of the terrestrial environment **Klungiolel a beluu**	☐	☐	☐	☐	☐	☐	☐
Abundance of fruit bats **Ildisel a olik**	☐	☐	☐	☐	☐	☐	☐
Abundance of medicinal plants **Ildisel a dellomel el kar**	☐	☐	☐	☐	☐	☐	☐
Abundance of building materials **Ildisel a klalo el kerrekar**	☐	☐	☐	☐	☐	☐	☐

Size of fruit bats **Meklungel a olik**	☐	☐	☐	☐	☐	☐	☐
Size of building materials **Meklungel a klalo el kerrekar**	☐	☐	☐	☐	☐	☐	☐
Availability of farm food (crops) **Ildisel a delomel el kall (ongraol me a yasai)**	☐	☐	☐	☐	☐	☐	☐
Quality of public freshwater **Klungiolel a ralm er a beluu**	☐	☐	☐	☐	☐	☐	☐
Quantity of public freshwater **Ildisel a ralm er a beluu**	☐	☐	☐	☐	☐	☐	☐
Spiritual and cultural amenity **Nglsecheklel a klebelau me a tekoi el chelid**	☐	☐	☐	☐	☐	☐	☐

26. Indicate if you agree (and the level to which you do) with the below statements: (PI3, PI11,MC4)
Mleliang a olangch el kmo ke kongei a lechub e ng diak er a ika el beldukl er eou:

Statements Tekoi	**Very strongly agree Ak mal mui el kongei**	**Strongly agree Choi ak kongei**	**Moderately agree Ou ralm sils**	**Agree a little Oumededengei**	**Do not agree Diak moldubech**	**Don't know Diak Kudengei**
Overall, the Conservation Area(s) has been beneficial to our community **A ika el blul el basio a ngar er ngii al relii er a beluad**	☐	☐	☐	☐	☐	☐
I often see or hear about illegal entry or taking of resources from the Conservation Area(s) **Ak blechoel mesterir e remenges a chisir a re mo soiseb me a re melemall a llechul a blul el basio**	☐	☐	☐	☐	☐	☐
There is adequate enforcement of the rules of the Conservation Area(s) **Ng ungil a otutel a llechul a blul el basio**	☐	☐	☐	☐	☐	☐
There is adequate monitoring of the natural resources in our community **Ng ungil a klekerngel (monitoring) a dikesel a beluu (natural resources)**	☐	☐	☐	☐	☐	☐
There have been positive livelihood benefits due to the Conservation Area(s) **A ika el blul el basio a uchul a ungil omenged, omelngot, omengerker me a ungil el klengar.**	☐	☐	☐	☐	☐	☐
There have been positive economic benefits due to the Conservation Area(s) **A ika el blul el basio a dirrek el**	☐	☐	☐	☐	☐	☐

uchul a ungil kerruul el me er a beluu						
There have been positive cultural and spiritual benefits due to the Conservation Area(s) **A blul el basio a uchul a ngesecheklel a klebelau me a tekoi el chelid**	☐	☐	☐	☐	☐	☐
There have been positive environmental benefits due to the Conservation Area (s) **A ika el blul el basio a msa klungiolel a beluu me a kerker**	☐	☐	☐	☐	☐	☐
Everyone benefits equally from the Conservation Area(s) **A klungiaol el mengai er a ika el blul el basio a tabesul e oberk el mo er a dertang el chad er a beluu**	☐	☐	☐	☐	☐	☐
If we want to preserve our natural resources then 'closing off' certain areas is necessary **Al sekum e ng soad el mengeluoluo a dikesed e ng kired el osimer/omul a bebil er a basio**	☐	☐	☐	☐	☐	☐

SECTION FIVE: Views on the Local Management Plan

For Kayangel State

1. Can you tell us the name of the State Conservation Areas? **Ke medengei a ngklel a conservation area me a lechub e ng blul el basio er kemiu?** (only select 'Yes' if they correctly state it) (Goal 4)

	Yes Choi	**No Diak**
Ngeruangel Marine Reserve	☐	☐
Ngkesol Marine Protected Area	☐	☐
Chermall	☐	☐
Ngerusebek	☐	☐
Kayangel Territorial Waters	☐	☐

2. Do you know the official boundaries for these Local Conservation Areas? **Ke medengelii a kerrengsel tia el blul el basio el kmo ng nga er ker el mo er ker?** (Goal 4)

	Yes **Choi**	**No** **Diak**
Ngeruangel Marine Reserve	☐	☐
Ngkesol Marine Protected Area	☐	☐
Kayangel Territorial Waters	☐	☐

3. Indicate your level of support for the following new sustainable livelihood opportunity for the local community. **Ke oldubech a ika beches el uldasu er a uchul a kerruul el me er a beluu**?: (Goals 4-2, 4-3)

	Extensive level of support **Dmolech el klaumerang e oldubech**	High level of support **Kmal oumerang e oldubech**	Medium level of support **Kuumerang e oldubech**	Limited support **Diak sa el oumerang e oldubech**	Do not support **Diak kuumerang me a ka kuldubech**
Bird-watching industry	☐	☐	☐	☐	☐

If there are any other comments, please write them here: