

SUSTAINABLE SEAFOOD PROJECT PART 2:

Good Manufacturing Practices (GMPs) and Operational Pre-Requisite Programmes (OPRPs) Inspections of the Naduri Ice Plant.



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December 2015

1.0 Executive Summary

Through the “Sustainable Seafood Project” of the World Wide Fund for Nature (WWF), Fiji, the Naduri Ice Plant was inspected based on the Good Manufacturing Practices (GMPs) and Operational Pre-Requisite Programmes (OPRPs) of the Food Safety Regulation 2009.

The inspection outcomes revealed a lot of major non-compliance that need to be addressed in order to improve the quality of ice produced at the plant.

There is great opportunity to expand the sale of ice into supermarkets and as well as the improvement of Macuata Holding Fish Market at the Labasa fish market as the major fish outlet for the Macuata fishermen which could then export fish to hotels in Viti Levu. For this to be achieved, the ice plant and the Macuata Holding Fish Market have to first be GMPs and OPRPs compliant.

2.0 Introduction:

This project is part of the “Sustainable Seafood Project” organized and funded by World Wide Fund for Nature (WWF), Fiji. It is the follow up from the “Post-Harvest Fisheries” workshop conducted in February this year (2015) for fishermen and middlemen of the Macuata and Sasa communities to ensure high quality of fish is caught, processed and sold at higher value and that contribute to improving livelihood and development of individuals and communities.

The Naduri Ice Plant was identified as one of the major resource in the province of Macuata that appears to be under-utilized and that could be well utilized to maximize and increase the quality and safety of fish through cold supply chain with the use of ice which in turn will increase the value and sale of fish to hotels and resorts. Hence inspection of the ice plant was recommended to ensure high quality ice with reasonable cost was produced at the plant in order to attract and encourage fishermen and middlemen to use ice along the supply chain from harvest to retail.

The ice plant at Naduri, Macuata in Vanua Levu was inspected on the 24th October 2015 based on the hygienic conditions of the premises, the processing protocol of ice and the handling practices of the employee. This inspection was based on the minimum legislative requirement of the “Fiji Food Safety Regulation 2009” (Fiji Islands Government Gazette Supplement, 2009) in which the Good Manufacturing Practices (GMPs) and Operational Pre-Requisite Programmes (OPRP’s) were used. The use of the GMP and OPRP’s and not HACCP audit was selected based on the minimum requirement in order to provide a good starting point for how the ice plant could be improved to meet the proposed HCCP Certification the Tui Macuata is aiming to achieve in the future, especially for a rural based community in Fiji.

The Naduri Ice Plant is constructed at the beach front of the Naduri village facing the village beside the Women’s Community Shop as shown in Figure 1 below.

Figure 1: The Naduri Ice Plant



The ice produced at the Naduri ice plant are mainly used as the cooling medium for fish caught by fishermen during the fishing trip or for home storage prior to transportation of seafood to the middlemen at the Labasa Fish Market. Ice is also transported to the Macuata Holdings fish shop at the Labasa Fish Market for cooling fish and other seafoods for the display counter. Sometimes the ice are also used in the juice making and cold drinking water especially during warm and hot weather at household level in nearby villages and schools.

3.0 Scope of Work

Site Visit and Assessment

- A. Visit the Naduri Ice Plant and carry out the following-
 - a. Determine the quality of the water source utilized for ice making
 - b. Assess the current process utilized for ice making
 - c. Assess the cleaning procedures for the premises (procedure, frequency and cleaning agents and sanitizers)
 - d. Status on the Maintenance of the ice making machine - logbook
 - e. Review the Frequency of making ice and volume
 - f. Determine the frequency of use and purchase of ice by fishermen
 - g. Assess the handling and storage of seafood within the ice plant facility
 - h. Capture any related information that will improve the management and maintenance of the ice plant to achieve quality control certification.

Assessment Report and Recommendations

- B. Provide a Summary Report on the current status of the ice plant outlining recommendations for Sustainable Seafood Project Team to enhance project objectives in improving seafood supply chain from the project site.

Key Deliverables

The consultant will:

- A. Accomplish the tasks specified in the Scope of Work above.
- B. Provide copies of any relevant site information gathered
- C. Provide a short verbal and written report upon the completion of the site visit.
- D. Provide a final assessment report detailing recommendations and required actions for Naduri Ice Plant to achieve quality certification to meet market standards.

4.0 The Ice Plant and Ice Production:

The ice plant’s regular customers are usually the fishermen that use the Macuata Holding’s 4 fishing fleets, the Macuata Holding Fish Shop, Naduri villages and other nearby villages. On average about 10 bags of 40kg bag size ice are used per day and for 2 days a week. This is calculated as 4 bags of 40kg size bag of ice purchased by the 4 boats (1 bag per boat per fishing trip), 3 bags for the Macuata Holding Fish Shop and 2-3 bags purchased by villages. This means that the ice plant only produces about 18-20 bags of 40kg size bag twice a week (9-10 bags per 12hours/evening); usually on Mondays and Tuesdays from 6pm-6am in order to meet its regular customers demand.

The ice is sold at \$10/40kg size bag which gives a total of only \$100/night of ice production and that is equivalent to \$200 for 2 nights or in a week.

It is clear from the frequency of ice production and the amount of ice produced that there is low demand in the use of ice in Macuata. Hence it needs to be well promoted and to encourage all fishermen to use ice in order to retain high quality and safe fish.

5.0 Good Manufacturing Practices (GMPs) Inspection Outcomes and Recommendations

Personnel Hygiene and Practices	OK	Needs Work
Vili, the only employee at the Naduri Ice Plant:		
1. Never been trained on basic food standards or any forms of GMP or food handling practices. Hence, there is high likelihood of incidence of cross-contamination due to ignorance. This is evident in the sanitary conditions, operations and process control and in the plant design with no training records available.		√

<p><u>Recommendation:</u> <i>The employee needs to attend a basic food standard or food safety training in order to understand food standard and food safety and hence improve the handling practices, cleaning and record keeping at the ice plant.</i></p>		
<p>2. Never been medically examined or tested for illness, injuries or infections due to open lesion including boils, sores that may pose possible ice contamination or cross-contamination of contact surfaces, etc.</p> <p><u>Recommendation:</u> <i>The employee needs to have annual medical examination with records to prove that he does not pose any risk to the production of ice at the plant.</i></p>		√
<p>3. Did not see the employee wash or sanitize hands before touching ice. The improper hand washing facility as shown in Appendix H, is outside the work station without hand wash signs posted.</p> <p><u>Recommendation:</u> <i>The hand washing facility needs to be upgraded with a proper wash basin and tap operated by elbow or leg and to be furnished with paper towel or air-hand dryer and soap. Wash hand signs to be posted at the hand wash stations.</i></p>		√
<p>4. No protective clothing; uniform, hairnet, gloves, boots, etc worn by the employee.</p> <p><u>Recommendation:</u> <i>Proper protective clothing to be worn when producing ice such as uniforms, hairnets, gloves and impermeable boots by the employee.</i></p>		√
<p>5. No marked traffic control or instructions within the plant to prevent contamination of the product area.</p> <p><u>Recommendation:</u> <i>Clear instructions to be on the wall for restricted places.</i></p>		√
Plant and Grounds		
<p>6. The compound is well fenced as shown in Figure 1 away from animals and domesticated pets, clean without litter, grass cut and cleaned. Location not prone to flooding.</p>	√	
<p>7. The rest room is available, however with hand operated handwashing facility and not well cleaned.</p> <p><u>Recommendation:</u> <i>Needs to have proper handwashing facility with leg or elbow operated tap</i></p>		√

<i>and to be furnished with paper towel or air-hand dryer and soap and to be cleaned regularly.</i>		
8. Ice production and storage is in an enclosed room as shown in Appendices A and B. However ice contact surfaces to be food grade. <u>Recommendation:</u> <i>Ice contact surfaces to be non-absorbent, impervious food grade material.</i>		√
9. Proper construction of floors, walls and ceiling, however there is an absorbent material (sponge) at the opening where the ice drops down from the ceiling to the floor as shown in Appendices E and F. <u>Recommendation:</u> <i>Ice contact surfaces to be non-absorbent and impervious food grade material.</i>		√
10. The table material is made of absorbent and non-durable ply-timber and corrugated iron on the sites that are rotting, corroding and rusting away as shown in Appendices B, C and D. These are difficult to clean and sanitize. <u>Recommendation:</u> <i>Ice contact surfaces to resist corrosion and impervious food grade material and that inert to cleaning and sanitizing chemicals. Stainless steel food grade material would be preferred.</i>		√
11. Adequate storage space for placement of equipment and other materials available, however these are all placed on the floor accumulating dusts as shown in Appendix I. <u>Recommendation:</u> <i>Shelves to be constructed to raise the storage space for materials away from the floor for easy cleaning and to avoid harborage of pests and insects.</i>		√
12. Adequate lighting in the work station and fully covered.	√	
Sanitation Operations		
13. No pest control observed and neither pest control plan available <u>Recommendation:</u> <i>A pest control plan to be developed and executed.</i>		√
14. No cleaning records available. However servicing and cleaning of the plant is carried out by Lincon Refrigeration Company in Labasa once a month without any record available. Hence cleaning agents and sanitizers used are not known.		√

<p><u>Recommendation:</u> Cleaning records to be made available with all the standard operation procedures (SOPs) in place.</p>		
<p>15. No ice packaging are stored at the plant as fishermen provide their own 40kg-size bags as shown in Appendix G for packing ice. Hence, the hygienic status of the ice packaging will be the responsibility of the fishermen themselves.</p> <p><u>Recommendation:</u> Packaging to be provided by the Ice Plant to ensure cleanliness and safe ice to clients.</p>		√
<p>Sanitary Facilities and Control</p>		
<p>16. Water supply is sourced from the same Naduri community's drinking water supply that is not treated. No record of microbial and chemical tests results available.</p> <p><u>Recommendation:</u> Water to be tested for safety; Coliform and E.coli and to be chlorinated.</p>		√
<p>17. No hand washing observed when the employee touched the contact surfaces as the hand washing facility is not within the production facility but only available outside the building as discussed in 3 above.</p> <p><u>Recommendation:</u> The hand washing facility to be located inside and close or within the production area for easy access and needs to be upgraded with a proper wash basin and tap operated by elbow or leg and to be furnished with paper towel or air-hand dryer and soap. Wash hand signs to be posted at the hand wash stations.</p>		√
<p>18. Operation water is filtered, however the filter has never been changed since installation.</p> <p><u>Recommendation:</u> The ice or stored water in the tank need to be tested for Coliform and E.coli to provide evidence of safety in the use of filter before changing the filter.</p>		√
<p>19. Plumbing adequately installed and maintained and protected against backflow.</p>	√	
<p>20. Floor drainage needs further improvements to allow flow of discharge out into the drainage system. No water bath at the entrance of the ice production room.</p>		√

<p><u>Recommendation:</u> Chlorinated water bath is required for employees at the entrance of the ice production room and drainage to be done and cleaned regularly. Boots also need to be worn when entered the room.</p>		
<p>21. Toilet facility does not have self-closing doors and without proper hand washing facilities including soap and sanitizer.</p> <p><u>Recommendation:</u> Self-closing door to the toilet to be made with proper washing facility operated by elbow or leg and to be furnished with paper towel or air-hand dryer and soap. Wash hand signs to be posted at the hand wash stations.</p>		√
<p>22. Rubbish disposal adequately receptacles with cover.</p>	√	
Equipment and Utensils		
<p>23. The ice holding, conveying and manufacturing equipment for intended use, designed and of stainless steel is cleanable and properly maintained. Seams smoothly bonded and adequately maintained.</p>	√	
<p>24. Ice product holding/storage area refrigerated however no temperature indicating devise available.</p> <p><u>Recommendation:</u> A temperature indicating devise to be installed at the ice production and storage room and be made of food grade material.</p>		√
Processes and Controls		
<p>25. There is no analytical procedure in place that identifies possible ice contamination.</p> <p><u>Recommendation:</u> Analytical procedures to be developed, put in place and recorded to identify possible ice contamination. This includes sampling frequencies and testing results to meet the Fiji Drinking Water Legislation.</p>		√
<p>26. No sanitary standard operating procedures (SSOPs) in place for cleaning and sanitation plan for all areas of the plant. Hence no documentation and records available.</p> <p><u>Recommendation:</u> Sanitary Standard Operating Procedures to be developed, implemented, recorded and documented. This should indicate exact methods, tools,</p>		√

<i>detergent and sanitizer concentrations, etc. for all cleaning and sanitizing processes. Documentation on the performance of all cleaning and sanitizing activities to be made available.</i>		
<p>27. No record of all water contact surfaces and finished ice contact surfaces installed to verify that they are food grade compliance.</p> <p><u>Recommendation:</u> <i>Certification to be on file from manufacturer to verify food grade compliance of water and ice contact surfaces.</i></p>		v
<p>28. No written procedures and performance records for flushing and cleaning the ice making equipment and or product water storage tanks that have been idle for 5 days when ice is not produced; Wednesday-Sunday.</p> <p><u>Recommendation:</u> <i>Written records of servicing the ice making equipment by Lincon Refrigeration to be on file and testing for the performance of servicing on water and ice quality to be made and on record.</i></p>		v
<p>29. No record of water treatment methods.</p> <p><u>Recommendation:</u> <i>Water to be tested for treatments and if not treated should be treated and well recorded.</i></p>		v
<p>30. No record of master maintenance plan for facilities and equipment.</p> <p><u>Recommendation:</u> <i>A master maintenance plan for the facilities and equipment to be developed.</i></p>		v
<p>31. Processing equipment, utensils kept adequately clean, but no detergent and sanitizer seen.</p> <p><u>Recommendation:</u> <i>Standard Operating Procedures for cleaning and processing equipment to be developed, implemented, recorded and documented including frequencies of cleaning and concentrations of cleaning agents and sanitizers.</i></p>		v
Warehousing and Distribution		
<p>32. Ice is potentially exposed to microbiological, physical and chemical contamination during storage, transportation and distribution.</p>		v

<p><u>Recommendation:</u> Hand washing facility needs to be addressed, water and ice contact surfaces contamination due to no GMP and SSOPs, etc to be put in place as discussed above.</p>		
<p>Security</p>		
<p>33. Access to plant premises is limited because it is fenced and locked. However no record of time cards and signs in and out of visitors.</p> <p><u>Recommendation:</u> A logbook for the employee to be made available and a separate logbook for visitors indicating time in and out.</p>		<p>√</p>
<p>34. No record of access to the plant's production areas i.e. the use of uniforms and escort visitors.</p> <p><u>Recommendation:</u> Extra protecting clothes; uniforms, hairnets and gloves to be made available to visitors and recorded in the logbook.</p>		<p>√</p>

6.0 The way Forward:

Based on the GMP and OPRPs inspection outcomes above there are a lot of major non-compliances observed with recommendations that need to be executed, monitored and verified in order to confirm the safety of ice produced at the plant. This may help attract more customers and if well packed these could then be sold in supermarkets around Labasa.

However, due to irregular and inconsistency of fishing trips by fishermen, low number of customers have been purchasing ice from the Naduri Ice Plant. This has affected and limits the production of ice and perhaps may have contributed to the high cost of ice production at the plant. In practice, a lot of fishermen do not use ice when they go out fishing in the night. However, they only use ice when the fishing trip is longer i.e. for 2-3 nights. It is therefore recommended that a proper cost-benefit analysis to be carried out on the ice plant to assess its profitability and its benefit to the Macuata Community especially with availability of two other competitive ice plants available in Labasa town. Similarly, good marketing and promotion for wider visibility of the ice plant needs to be carried out to encourage the sale of ice from the plant. In such a case perhaps a survey could be conducted to assess the quality of fish and the profit obtained by fishermen and middlemen that use ice verses those who do not use ice. This would be useful in the provision of evidence to demonstrate the relationship between the use of ice, quality of fish and sale/profit at local community, even though it's common knowledge and been proved elsewhere.

It is obvious that there is low demand in the use of ice by the fishermen affecting the low ice production at the plant. Fishermen, middlemen and retailers need to be encouraged to practice cold chain below 4.4°C supply of fish which not only preserve fish but also raise the safety and the taste of the fish. The increase use of cold chain will demand high use of ice which in return will improve the sale of ice from the plant.

Furthermore, due to low demand in the purchase of ice from Naduri Ice Plant by the Macuata fishermen, the left over ice have also been transported and used at the Macuata Holdings Fish Shop display counter in the Labasa market (Figure 2). This is perhaps a potential fish market outlet for the approved Macuata fishermen which then could be processed and then sold to hotels in Viti Levu through the “Sustainable seafood project” facilitated by WWF. However, the Macuata Holding Fish Shop has to be first upgraded to work towards compliance to GMPs, OPRPs and HACCP prior to becoming the high quality central fish market outlet in Labasa from approved Macuata fishermen. A good example is the minimal use of ice in display cabinets evident by the high temperature of 7.1°C. This means that GMP and OPRP trainings for the employees need to be undertaken and as well the development, implementation, monitoring, verification and validation of GMPs and OPRPs will need to be carried out.

Figure 2: Fish Display Counter at the Macuata Holding Fish Shop



7.0 Conclusion:

The inspections revealed that the ice plant in Naduri, Macuata needs to implement the GMPs and OPRPs recommendations provided in order to produce high quality ice that may attract more customers including for sale in supermarkets. If the ice is GMP and OPRPs compliance, it will be a step away from Hazard Analysis Critical Control Points (HACCP) and these will give consumers confidence in the quality of products produced at the plant and even with the fish cooled with ice produced from the plant.

8.0 Appendices: Photos of important areas in the ice plant.

A: Ice plant external view



B: Ice production room



C: Counter for packing ice



D: Spade used for scooping ice



E. Ceiling of the ice production room



F. Opening from which ice drops from



G. Ice packaging 40kg bag size



H. Hand washing facility outside the building



I. Storage room



J. Water filter



K. Ice formation rods



L. Walking space (floor) of ice production room



M. Walking space of ice production room



9.0 Acknowledgement:

I wish to take this opportunity to sincerely thank Ishigakisan, the JICA senior volunteer for his continuous assistance and support for this project. My appreciation also to Mr Areki and Ms Agela for their field assistance support and especially to WWF for funding the project.

10. Reference:

Fiji Islands Government Gazette Supplement (2009). Food safety Regulation 2009. Fiji Government, Suva. Pg 246.